THE CONTRIBUTION OF THE STANDARD GAUGE RAILWAY (SGR) TOWARDS PROMOTING HARMONY IN THE EAST AFRICAN MEMBER STATES

BY

OLUOCHI JANE NTHENYA

ID NO 650376

SUPERVISOR: MR. WELDON NG’ENO

THESIS SUBMITTED TO THE SCHOOL OF SOCIAL SCIENCE IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF A DEGREE OF MASTER OF ARTS IN INTERNATIONAL RELATIONS

UNITED STATES INTERNATIONAL UNIVERSITY

SUMMER 2018
DECLARATION

I declare that this is my original work and has not been submitted to any other college, institution or university for academic credit.

Signed: ___________________________ Date: _____________

OLUOCHI JANE NTHENYA

ID NO 650376

This thesis report has been submitted for consideration with my approval as the University appointed supervisor.

Signed: ___________________________ Date: _____________

Mr. Weldon K. Ng’eno

School of Humanities and Social Sciences – USIU - A

Signed: ___________________________ Date: _____________

Prof. Angelina Kioko

Dean, School of Humanities and Social Sciences (SHSS)

Signed: ___________________________ Date: _____________

Amb. Prof. Ruthie Rono

Deputy Vice Chancellor, Academic Affairs (DVCAA)

UNITED STATES INTERNATIONAL UNIVERSITY – AFRICA
DEDICATION

I dedicate this thesis to my doting husband, Dominic Ogero, who has been very supportive and patient as I pursued this academic interest. I also dedicate this thesis to the memory of my late mother Regina Kamanthe who taught me to be a fighter and to never quit in life and to my son Brianlewis.

Brian,

Life is a never ending struggle; nothing comes on a silver platter. Put your trust and loyalty in God and work with all your ability to achieve your dreams.
ACKNOWLEDGEMENT

This thesis was made a success with the great support of several people and institutions. My special gratitude goes to Mr. Weldon Ng’eno for his assistance in the structural conceptualisation and composition of this thesis. His continued support, feedback and advice were a stepping stone for the completion of this thesis. Special thanks to my USIU-A lecturers and colleagues who in one way or another contributed to the realization of this thesis.
ABSTRACT

Evidently, after road transport, rail transport comes second as the most important mode of transport in East Africa, for freight as well as passenger services. The study sought to critically analyze how the Standard Gauge Railway (SGR) had contributed to the promotion of harmony among the East African member states. The SGR being a futuristic project serves to integrate Tanzania, Uganda, Rwanda, Burundi and Kenya. The SGR will act as an integration tool and will enable the East African Community (EAC) to better enhance cooperation and resolve conflicts in building and operating the SGR. It is thought that the SGR project will bring about strong interdependence among the EAC and hence will foster peace and minimize conflicts. This study presents an analysis of the SGR to define the benefits that have and will be realized. The research will analyze how the SGR as a tool will promote harmony among the East African member states, how the SGR will enhance tourism and how the SGR will create employment opportunities and finally how the SGR will enhance environmental conservation among the East African countries.

The methodology for the study was mainly based on secondary sources and inclined on predictive analysis. The study included review of existing literature on metropolitan rail development with a few case studies from advanced economy Nations and low income Nations. The study found out that the Standard Gauge Railway (SGR) will have massive harmonization values for the East African member states and is crucial to development and attaining the development goals of the EAC including but not limited to guaranteeing environmental sustainability and to develop a global partnership for development. The fifth East Africa Committee’s (EAC’s) development strategy is to build a firm foundation for transforming the EAC into a stable, competitive and sustainable lower middle income region by 2021. Priority areas include among others the development of regional infrastructure, promotion of regional peace, security and the enhancement of free
movement of factors of production all of which cannot be attained without harmony in the region.

The research used inferential method of analysis and found out that human behavior has significantly influenced the success of the Standard Gauge Railway infrastructural megaproject. The study also revealed that while optimism bias contributed to cost and schedule under performance in this megaproject, loss aversion stood out as the most occurring cognitive bias. In light of this finding, the study recommends that the implementing East African Governments adopt structures that allow for continued business justification, focus on products and back up project administrators with sufficient authority over project resources in line with the structural contingency theory. The study strongly recommends the completion of the remaining SGR phases in the projected time frame for the railway industry to play a positive role in national and regional development.

There should be a direct and reliable connection between the airports, main city centers and the SGR stations to help alleviate traffic and move passengers and tourists faster between destinations. The Government should put up more localized training institutions to shape and retain future professionals to operate the SGR instead of importing experts from overseas. The construction of the standard gauge railway transport infrastructure in the East African region is a major element of regional economy that aims at improving the Gross Domestic Product. The SGR transport infrastructure will strengthen the domestic economic environment on the basis of the regional integration of the East African community. The SGR will provide economic, social and strategic unity of the East African member states and will play a major role in the integration of the constituent sectors and will also be a stabilizing factor of the region’s economy.
# TABLE OF CONTENTS

DECLARATION ......................................................................................................................... i
DEDICATION .......................................................................................................................... ii
ACKNOWLEDGEMENT .......................................................................................................... iii
ABSTRACT ............................................................................................................................. iv
TABLE OF CONTENTS ........................................................................................................ vi
LIST OF TABLES ................................................................................................................... viii
LIST OF MAPS ...................................................................................................................... ix
LIST OF DIAGRAMS ............................................................................................................ x
LIST OF FIGURES ................................................................................................................ xi
LIST OF ABBREVIATIONS AND ACRONYMS .................................................................... xii
OPERATIONAL DEFINITION OF TERMS ............................................................................ xiv

CHAPTER ONE: INTRODUCTION ......................................................................................... 1
  1.1 Background to the Study ............................................................................................... 3
  1.2 Statement of the Problem .............................................................................................. 5
  1.3 Objectives of the Study .................................................................................................. 6
  1.4 Research Questions ....................................................................................................... 7
  1.5 Significance and Justification of the Study .................................................................... 7
  1.6 Scope of the Study ........................................................................................................ 9
  1.7 Limitations and Delimitations of the Study ................................................................ 9

CHAPTER TWO: LITERATURE REVIEW .............................................................................. 11
  2.1 Introduction .................................................................................................................. 11
  2.2 The Rail Transport ....................................................................................................... 11
  2.3 Theoretical Framework ............................................................................................... 17
      2.3.1 Linear Stages of Growth Model ............................................................................ 19
      2.3.2 Structural change Theory .................................................................................... 22
  2.4 Empirical Review ......................................................................................................... 23
2.4.1 SGR and Promotion of Harmony in East Africa .................................................... 23
2.4.2 SGR and Job Creation in East Africa ................................................................. 31
2.4.3 SGR and Environmental Conservation ............................................................. 36
2.4.4 SGR and Tourism in East Africa ......................................................................... 48
2.5 Conceptual Framework ......................................................................................... 51

CHAPTER THREE: METHODOLOGY ......................................................................... 53
3.1 Introduction ............................................................................................................ 53
3.2 Research Design ..................................................................................................... 53
3.3 Data Collection Sources and instruments ............................................................... 53
3.4 Data Analysis and Presentation ............................................................................. 53

CHAPTER FOUR: FINDINGS AND DISCUSSION ....................................................... 54
4.1 Introduction ............................................................................................................ 54
4.2 Data Analysis ........................................................................................................ 54
4.2.1 SGR and Promotion of Harmony in East Africa ................................................. 62
4.2.2 SGR and Job Creation in East Africa ................................................................. 79
4.2.3 SGR and Environmental Conservation ............................................................. 83
4.2.4 SGR and Tourism promotion in East Africa ...................................................... 87

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSION AND
RECOMMENDATIONS ............................................................................................... 93
5.1 Introduction ............................................................................................................ 93
5.2 Summary of Findings ........................................................................................... 93
5.3 Conclusion ............................................................................................................. 93
5.4 Recommendations ................................................................................................. 94
5.5 Suggestions for further research ........................................................................ 98

REFERENCES ............................................................................................................. 99
LIST OF TABLES

Table 1: East African Transit Traffic: 2011–2015 (Dwt) ............................................. 67
Table 2: Statistics show the Intra-Regional Trade Volumes within EAC in 2013 .......... 75
Table 3: Lapsset Freight Volume Forecasts for 2020 & 2030 (000 tonnes) ................. 77
Table 4: EAC Rail Network Total Traffic Forecasts, 2015 – 2075 (million tonnes) ...... 78
LIST OF MAPS

Map 1: Standard Gauge Rail (in red) that will run from Kenya's coast to Uganda, Rwanda and South Sudan. ................................................................. xv
Map 3: Standard Gauge Railway Master Plan................................................................. xvi
Map 4: Kenya’s Standard Gauge Railway Project Showing Phase 1 & Phase 2 .......... xvii
LIST OF DIAGRAMS

Diagram 1: Lewis Structural Model of Growth................................................................. 22
Diagram 3: Conceptual Framework.......................................................... 51
Diagram 4: East African Transit Traffic Statistics between the years 2011 – 2015........ 68
Diagram 5: EAC Rail Network Total Traffic Forecasts, 2015 – 2075 (million tonnes) .. 78
LIST OF FIGURES

Figure 1: Standard Gauge Railway – Kenya................................................................. xviii
Figure 2: Standard Gauge Railway – Kenya................................................................. xviii
Figure 3: Standard Gauge Railway – Kenya................................................................. xix
Figure 4: SGR trains ........................................................................................................ 13
Figure 5: Launch of Standard Gauge Railway project in Uganda in 2014..................... 27
Figure 6: Double Stacked Trains ..................................................................................... 34
Figure 7: SGR Earth work and Slope Protection Works in Uganda............................... 46
Figure 8: SGR Earth work and Slope Protection Works in Uganda............................... 47
Figure 9: SGR Stations in Nairobi and Mombasa ......................................................... 50
Figure 10: Container Depot at Mombasa Port ............................................................... 65
Figure 11: Automatic ticket machine in the subway station, in Chengdu, Sichuan, China. ........................................................................................................................................... 95
### LIST OF ABBREVIATIONS AND ACRONYMS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADB</td>
<td>African Development Bank</td>
</tr>
<tr>
<td>AfDB</td>
<td>African Development Bank</td>
</tr>
<tr>
<td>COMESA</td>
<td>Common Market for Eastern and Southern Africa</td>
</tr>
<tr>
<td>DRC</td>
<td>Democratic Republic of Congo</td>
</tr>
<tr>
<td>EAC</td>
<td>East African Community</td>
</tr>
<tr>
<td>EACC</td>
<td>Ethics and Anti-Corruption Commission</td>
</tr>
<tr>
<td>EIA</td>
<td>Environmental Impact Assessment</td>
</tr>
<tr>
<td>ERSWEC</td>
<td>Economic Recovery Strategy for Wealth and Employment Creation</td>
</tr>
<tr>
<td>GHG</td>
<td>Greenhouse Gases</td>
</tr>
<tr>
<td>GNP</td>
<td>Gross National Product</td>
</tr>
<tr>
<td>INTP</td>
<td>Integrated National Transport Policy</td>
</tr>
<tr>
<td>ISI</td>
<td>Import Substitution Industrialization</td>
</tr>
<tr>
<td>KES</td>
<td>Kenya Shillings</td>
</tr>
<tr>
<td>KETRACO</td>
<td>Kenya Electricity Transmission Company</td>
</tr>
<tr>
<td>KM</td>
<td>Kilo Meters</td>
</tr>
<tr>
<td>KPH</td>
<td>Kilometer per Hour</td>
</tr>
<tr>
<td>KR</td>
<td>Kenya Railways</td>
</tr>
<tr>
<td>KRC</td>
<td>Kenya Railway Corporation</td>
</tr>
<tr>
<td>LAPSSET</td>
<td>Lamu Port-South Sudan-Ethiopia-Transport</td>
</tr>
<tr>
<td>LDCs</td>
<td>Least Developed Countries</td>
</tr>
<tr>
<td>LLDCs</td>
<td>Landlocked Developing Countries</td>
</tr>
<tr>
<td>MDGs</td>
<td>Millennium Development Goals</td>
</tr>
<tr>
<td>MM</td>
<td>Mili Meters</td>
</tr>
<tr>
<td>MW</td>
<td>Mega Watts</td>
</tr>
<tr>
<td>MNTL</td>
<td>Mombasa-Nairobi Transmission Line</td>
</tr>
<tr>
<td>Acronym</td>
<td>Full Form</td>
</tr>
<tr>
<td>---------</td>
<td>-----------</td>
</tr>
<tr>
<td>NCIP</td>
<td>Northern Corridor Integration Projects</td>
</tr>
<tr>
<td>NEMA</td>
<td>National Environment Management Authority (Kenya)</td>
</tr>
<tr>
<td>PIDA</td>
<td>Programme for Infrastructure Development in Africa</td>
</tr>
<tr>
<td>PPP</td>
<td>Public Private Partnership</td>
</tr>
<tr>
<td>SADC</td>
<td>Southern African Development Community</td>
</tr>
<tr>
<td>SDGS</td>
<td>Sustainable Development Goals</td>
</tr>
<tr>
<td>SGR</td>
<td>Standard Gauge Railway</td>
</tr>
<tr>
<td>SSA</td>
<td>Sub Saharan Africa</td>
</tr>
<tr>
<td>TEU</td>
<td>Twenty Foot Equivalent Units</td>
</tr>
<tr>
<td>UN</td>
<td>United Nations</td>
</tr>
<tr>
<td>UNFCCC</td>
<td>United Nations Framework Convention on Climate Change</td>
</tr>
<tr>
<td>$US</td>
<td>United States Dollars</td>
</tr>
<tr>
<td>US</td>
<td>United States of America</td>
</tr>
<tr>
<td>VIP</td>
<td>Very Important Person</td>
</tr>
</tbody>
</table>
OPERATIONAL DEFINITION OF TERMS

Standard Gauge Railway: The standard gauge (also known as Stephenson gauge after the founder, George Stephenson, International gauge, or normal gauge) is a widely used railway track gauge. Approximately 55% of the lines in the world are using this gauge. The distance between the inside edges of the rails is defined to be 1,435 millimeters (4 ft. 8 1/2 in) (except in the United States and Canada, where it is still defined in Imperial and US customary units as 4 feet 8 1/2 inches (1,435.1 mm).

Gross Domestic Product (GDP): This is the broadest quantitative measure of a country's total economic activity. The GDP represents the monetary value of all goods and services produced within a nation's geographic borders over a specified period of time.

Logistics: The detailed coordination of a complex operation involving many people, facilities, or supplies.

Hinterland: The often uncharted areas beyond a coastal district or a river's banks.

Infrastructure: The basic physical and organizational structures and facilities such as buildings, roads, and power supplies needed for the operation of a society or enterprise.
Map 1: Standard Gauge Rail (in red) that will run from Kenya's coast to Uganda, Rwanda and South Sudan.

Source: Kenya Railways Corporation.
Map 2: Standard Gauge Railway Master Plan

Source: (KRC, 2017).
Map 3: Kenya’s Standard Gauge Railway Project Showing Phase 1 & Phase 2

**Figure 1: Standard Gauge Railway – Kenya**

Source: (KRC, 2017).

**Figure 2: Standard Gauge Railway – Kenya**

Source: (KRC, 2017).
Figure 3: Standard Gauge Railway – Kenya

Source: (KRC, 2017).
CHAPTER ONE: INTRODUCTION

In order to grow the East African economy by double digits, decent infrastructure is a prerequisite. Among the required infrastructure, transport is a vital constituent of development and socio-economic growth. Key of the factors suitable for economic and social harmony, reliable transport infrastructure and service facilities are precursors for facilitating regional and international trade and the movement of goods and persons from one place to another and from country to country. Transport infrastructure remains a fundamental pillar of regional development if accelerated multi-faceted growth and poverty reduction is anything to go by. In the African continent, the East African countries lag significantly behind because of the lack of reliable and adequate transport. The recent Standard gauge railway project development comes as a uniting aspect not just for Kenya but for the entire East Africa region. The SGR is seen as a tool of promoting harmony by strengthening interdependence in East Africa and minimizing conflicts. (United Nations Economic and Social Council, 2009).

According to the Ugandan Government, the SGR project runs in tandem with number nine of the seventeen Sustainable Development Goals (SDGs) which encompass building resilient infrastructure, promoting inclusive and sustainable industrialization and fostering innovation (United Nations, 2018). According to a report by the Ugandan Government (2015), the East African Member states are mandated to develop quality and dependable infrastructure, to comprise of regional and trans-border infrastructure. This will support regional economic and social development with a focus on affordable and fair access for all (Uganda Government, 2015).

The project also addresses one of the top five challenges in the East African countries; that of transportation and communication (Sachs, 2005). The project was kick started in Kenya. Incidentally, at the United Nations (UN) summit, Kenya set the pace for the other East African countries.
In line with Kenya’s vision 2030, the SGR infrastructure is undoubtedly among the flagship mega projects in the region that focuses on reinforcing the regional framework for infrastructure and economic development. This project aims at incorporating the local private sector in the provision of infrastructure materials and services through the intervention of the East African governments. The SGR project will develop and maintain a relatively safe and efficient regional rail transport network, benchmark transport infrastructure facilities and services and provide globally acceptable performance standards that are well targeted to enhance customer satisfaction (Kenya Vision 2030, 2018).

The project is designed to put up a standard gauge railway that will meet ultra-modern standards with high speed and high capacity for both passenger and freight transportation within the Northern Corridor. With average speeds of between 80 – 120 Kilometers per hour (Kph) for freight trains and between 120 - 160 Kilometers per hour (Kph) for passenger trains, the SGR will cut the round trip from Mombasa to Nairobi to about eight hours for freight and about four hours for passengers. The SGR comes with promises of cost savings projected in the next three to five years when the project is estimated to be fully operational in Kenya and in the neighboring East African countries. It is also expected to be a major economic transformation that would come with huge price cuts for commodities (Kenya Vision 2030, 2018).

This is chief of the reasons as to why the EAC should put aside their conflicts and collaborate if speedy regional development is to be attained. Among the tools that can be used for regional integration, the SGR on completion will make a huge difference in East Africa. All East African countries are highly interdependent. The land locked countries need the countries bordering the ports for them to be able to transport their goods and commodities to the hinterlands. Uganda realizes the importance of this interdependence and has already taken a stride by setting the example through committing at least 80 per cent of all her cargo to be conveyed through the SGR from the Mombasa port in Kenya to
its capital city Kampala for onward distribution to other towns. Rwanda and Burundi is working with Tanzania towards the same goal (Lang’at, 2017).

The link between SGR and trade is apparent; in Kenya, more than half of the cargo handled at the port of Mombasa is destined for markets beyond Kenya. In Uganda for instance, Lang’at (2017), submits that approximately 11.2 million tonnes of cargo are moved between the two nations annually (Lang’at, 2017). The Tanzanian section of the SGR will help ease the flow of freight and passengers in the neighboring landlocked East African countries of Uganda, Burundi and Rwanda and further to Zambia and the Democratic Republic of the Congo, (Xinhua, 2018).

1.1 Background to the Study

The SGR idea was born in June 2013, when the initial infrastructure Summit of the Presidents of the tripartite countries of Rwanda, Kenya and Uganda was held in Uganda. The summit put in place a system for fast tracking the SGR development that would link Rwanda and Uganda to the port of Mombasa to enable faster socio-economic transformation of the East and Central Africa Economies (Northern Corridor Integration Projects, 2018).

The Uganda based infrastructure summit led to the signing of the three fold Agreement for the advancement and operation of the SGR between Mombasa-Kampala-Kigali with branch lines to Kisumu (Kenya) and an area called Pakwach/Gul-Nimule (Uganda) between the Republics of Kenya, Uganda and Uganda in August 2013. The Republic of South Sudan followed in suit when it acceded to the agreement in May 2014 extending the line to Juba. The third Joint Communiqué directed the Partner States to develop a SGR Protocol for the development and operations of the Standard Gauge Railways. The Protocol was signed by Kenya, Uganda, South Sudan and Rwanda in May 2014 (Northern Corridor Integration Projects, 2018).
The Northern corridor Integration Projects (NCIP) 2018 spells out the overall objective of the SGR as to jointly develop and operate a modern, fast, reliable, efficient and high capacity railway transport system as a one-piece single railway operation among the involved parties with the specific aims of:

1. Expediting economic growth and development of the Parties by reducing the cost of doing business and to increase the region's competitiveness;
2. Enhancing spatial development along the SGR corridor;
3. Enhancing efficient and cost effective movement of cargo and passengers in the region to accelerate trade and services; and
4. Sustaining development of other transport infrastructure and adopting new technologies to enhance regional economic development (Northern Corridor Integration Projects, 2018).

The SGR was also motivated by the prospects of the ease of the cost of doing business by lowering transport costs and time, as well as trade facilitation and integration in the EAC. In 2014, the Government of Kenya and Uganda made a comeback in the transformation of the railway sector by developing the Standard Gauge Railway (SGR) project in partnership with the Chinese Government. Tanzania on the other hand decided to engage a Turkish contactor by name Yapi Merkezi Insaat VE Sanayi As, on construction of its second phase of the SGR (Gachanja, 2017). All efforts are ultimately geared towards a common goal; that of integrating the EAC.

After road transport, rail transport fundamentally comes in as the second most important mode of transport both for freight and passenger services (ERSWEC, 2003 - 2007). The very first railway in the region, dubbed Uganda Railway (or the Lunatic express), owing to its destination in Uganda was built by the Imperial British East Africa Company (IBEAC) supported by Indian laborers. This railway commenced in the 1890s in the Port city of Mombasa and arrived at Kisumu in around 1901 (Gachanja, 2017). It was
1,000mm gauge and was a single track network called the metre gauge. This railway laid a basis for and defined the location of most towns which sprung up along its course. It first came into operation in 1903. According to Kenya Railways Corporation (KRC), it had branches peeling off to Thika town in 1913, Lake Magadi in 1915, Kitale in 1926, Naro Moru in 1927, Tororo branch to Soroti in 1929 and to Mount Kenya in 1931. The line was instrumental for East Africa in that it linked the Indian Ocean to Lake Victoria and the East African interior (KRC, 2017).

Gachanja, (2017) submits that the old railway transport sector saw pitfalls that affected its contribution to the East African economy and the Government. The railway line experienced a myriad of challenges including poor administration, segmentations of the East African Community in 1960s and underfunding by the Government. The inevitable outcome was its collapse and the dominance of road transport (Gachanja, 2017).

The total length of the Nairobi - Mombasa standard gauge railway is 472 Kilometers (KMs) long and runs through the counties of Mombasa, Kilifi, Kwale, Taita-Taveta, Makueni, Kajiado, Machakos and Nairobi (Railway Technology, n.d.). The current SGR line principally runs parallel to the existing metre gauge railway and the Mombasa-Nairobi Road or A109 Highway. It has deviations at some points to achieve the desired gradient and curvature. Eventually, the line is purposed to link up the East African countries and will help bring about harmony in business as it will connect the land locked countries to the ocean ports (Railway Technology).

### 1.2 Statement of the Problem

In East Africa, Kenya was the first country to launch the 472 Kilometer stretch of SGR on 31st May 2017. According to Nkirote (2017), this saw the largest, most ambitious and costly infrastructure project in Kenya since independence from the British Colonial Government 55 years earlier (Nkirote, 2017). The operational section of the SGR in
Kenya has redefined and modernized railway transport in Kenya and East Africa. This historic development comes at a whooping cost of about $3.4 billion for the first phase in Kenya (Kacungira, 2017). The huge cost of the project and estimated low returns leads many East Africans to concur with the works of Bent Flyvbjerg “iron law of mega projects” which states that mega projects are repeatedly over time, over budget, and under benefits (Flyvbjerg, 2014). There is ongoing pessimism on the feasibility of the project, owing to the huge cost and mired allegations of graft. The main concern is whether the project will be successful and whether the benefits will materialize as expected in order to compensate for the high cost of building the project.

On their part however, the East African governments expect the SGR to bring a turn around to the economy through integration and boosting the respective country’s GDP (The Star, 2017). The intention of this study therefore is to attempt to analyze how the SGR will harmonize the East African countries and cut costs of doing business within the region.

1.3 Objectives of the Study

The study will seek to:

1. Find out how the SGR has contributed towards promotion of harmony among East African Member states
2. Establish how the SGR has enhanced tourism among East African member states
3. Determine the value of SGR in job creation among East African member states
4. Find out how SGR has enhanced environmental conservation among East African member states.
1.4 Research Questions

1. How has the SGR contributed towards promotion of harmony among East African Member states?
2. Has the SGR enhanced tourism among East African member states?
3. Has the SGR created employment for East African member states?
4. How has the SGR enhanced environmental conservation for East African member states?

1.5 Significance and Justification of the Study

Garmendia et al (2004), posit that in tandem with supplementary financial and economic policies, transport infrastructure including railways and ports used as a means of facilitating the movement of freight and passengers has long been acknowledged as a crucial element in supporting the background for economic growth (Briceño-Garmendia, Estache, & Shafik, 2004). A latest study by the World Bank revealed that an emphasis by the development community in fostering productivity and economic development, affordable and reliable transport is crucial in reducing dearth levels and contributes to achieving the Millennium Development Goals (MDGs) (World Bank 2010).

The development of a modernized railway transport infrastructure in a great degree contributes to growth and development through several channels including reducing transaction costs, reducing tear and wear of vehicles and roads, adding to the durability of capital goods, fostering national and international trade and investment, expansion of demand and diversifying supply and attaining economies of scale and scope (United Nations Conference on Trade and Development, 2013).
There seems to be adequate evidence to support this in developed countries; however, supporting research with regards to the effect of railway infrastructure on developing Nations in Africa and East Africa to be precise, is severely lacking.

Barrow (2017), points out that poor connectivity or the lack of it thereof among East African countries is a fundamental cause for intra-African trade and economic imbalance. The African Economic Outlook 2017, compiled by the African Development Bank (AfDB), the OECD Development Centre and the United Nations Development Programme, reveal that the transport and communication infrastructure needed to speed up economic development is less developed than those that link the continent to the rest of the world and recommends that increasing transportation links, improving rails that connect internal growth centers is a priority in reducing time and cost of doing business not just in East Africa but in Africa as a whole (AfDB OECD UNDP 2017). The lack of which would present a major setback where impacts of regional integration on trade and development are concerned (Barrow, 2017).

Statistics indicate that railway infrastructure in developing countries is generally either in poor condition or is nonexistent. A considerable investment is required to return it to an optimal functional state. This rings particularly true for Sub-Saharan Africa (SSA) where railways lag behind those of other regions both in quality and quantity (African Development Bank, 2006). To actualize this goal, the East African Governments are constructing a standard gauge railway that will connect the port cities with the hinterlands. In the long run, this railway line is projected to continue onward to neighboring Rwanda and South Sudan. The end goal would be to reduce travel costs and simplify transport operations across borders as well as provide massive social and economic harmonization benefits to all the East African member states. According to the United Nations economic and social council, the SGR mode of transport has thus far
proven to be cost-effective as far as moving bulk cargo over long distances efficiently is concerned (United Nations Economic and Social Council, 2009).

The World Bank has indicated that there are massive benefits that an efficient railway network could offer to boost economic growth, social growth and trade integration in the East African Community (EAC) region (World Bank - Africa Transport Unit 2013). It does not therefore come as a surprise that the SGR is the flagship project Vision 2030 especially for Kenya.

To clear and demystify the question of the ongoing pessimism and uncertainty as to the economic success of the project considering the huge capital costs, allegations of corruption, the concern that the projected benefits will fail to materialize as expected, or will not compensate for the high cost of the project, this study will attempt to analyze the harmonizing benefits that the SGR will achieve for the East African countries.

1.6 Scope of the Study

This study was carried out in the East African member states specifically Kenya, Uganda, Rwanda, Burundi and Tanzania.

1.7 Limitations and Delimitations of the Study

The study was carried out in the East African countries specifically Kenya, Uganda, Rwanda Burundi and Tanzania. It relied on secondary data sources available in public domain relevant to the area and objectivity of the research. The research was limited to exploration of factors that the standard gauge railway project is relatively new hence is a pilot project in the East African region and is still a work in progress since the phases in
their entirety are yet to be completed. The ultimate value of the SGR cannot be entirely measured as the project will take time to be completed and be fully operational in all the East African member states.

The study was delimited by virtue of analyzing some of the values already realized by the completed and operational phases of the SGR in Kenya flagged off on 31st May of 2017 and the first phase of the SGR project in Tanzania.
CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

It rings true according to Frank that rail transport is increasingly being favored regionally and nationally by governments as the most energy and cost efficient mode for the movement of freight and passengers (Frank, 2014). Compared to other means of transport, railway transport is more reliable in transporting large numbers of people and freight at high and safe speeds over long distances. Notably, rail systems come in handy in decongesting road transport networks. Granted, the initial implementation of new rail systems can initially be difficult and cost forbidding; but the long term benefits of a well planned and operational railway are tangible, fruitful and long-lasting.

2.2 The Rail Transport

It is thought that railway transport began in over 2000 years ago in the ancient civilizations of Egypt, Babylon and Greece (Train History, 2018). Transport of people and goods was mainly by animal propelled carts. This development then gave way to construction of wagon ways to enable faster movement and provide lasting maintenance of the wagons. By the 18th century, the carts were upgraded to the stationary steam engine and steam powered locomotives. These were operated on primitive rail tracks in around the year 1804. This age cascaded down to several numerous improvements and developments which led to the railways and trains we see today (Train History, 2018).

Barrow, (2017) presents history as to indicate traditional north-south divide when it comes to gauges in Africa. In North of the Sahara for example, the standard-gauge style of rail construction dominates, while in sub-Saharan Africa, narrower gauges (particularly 1067mm or Cape Gauge) predominate. Most of these networks were built by colonial powers to serve the primary, albeit selfish objective of extracting and exporting
raw materials as efficiently as possible from the hinterland to the port (Barrow, Cross-border rail links - the spark to ignite intra-African trade?, 2017). Suffice it to say, these railways did not serve the needs of modern African economies of scale as would be required. The modern Africa is in a rapid industrialization and urbanization age whereby movement of goods, services and people takes place on the fast lane. Countries that are landlocked need fast and reliable transport systems to move much needed resources from the neighboring ports to the hinterlands. Any obstacle in this process would pose a huge setback in the economy and growth of such countries.

There exists a strengthening consensus in sub Saharan Africa that good quality railway links are urgently needed to reduce the cost of transport and unlock the potential of regional economies, especially in areas that are landlocked or have poor access to ports. The issue of gauge definitely becomes important when the question of underdeveloped networks and better connections arise.

A Standard Gauge Railway is defined as one that is built based on a uniform distance, or width between the inner sides of the rail. Such lines are adapted when the expansion of rail transport as part of efforts to allow inter-connectivity and inter-operability become inevitable (africanews).
Figure 4: SGR trains

Today, the standard-gauge is seen as the new global standard, save for a few countries such as the United States which do not use the standard gauge. It is rare to see new railways being built to any other gauge unless there is a strong connective element with existing lines for example in South America. Another reason for the popularity of the SGR is the growing Chinese economic influence in East Africa. Chinese technical standards and support has been brought to many African countries that are now embracing financial support from the East. Prime examples of where Chinese-backed standard-gauge networks are taking shape in the region are Ethiopia, Kenya and Uganda. In Tanzania, some sections of the SGR are being financed by the World Bank, the Turkish Government and the Tanzanian government. There are probable chances that the
standard-gauge will soon be welcomed across the East and Center of Africa sooner than later (Oirere, 2017).

Rwanda is one of the landlocked countries in East Africa. It is situated about 1,400KMS away from the nearest sea port of Dar es Salaam. This presents a major challenge in her national development efforts. The present state of transport infrastructure in Rwanda may be accredited to the holocaust of 1994, which saw considerable devastation of the economic infrastructure of the country. The economic development of Rwanda is plagued by the lack of effective international transport services, which increases the country’s cost of exports and reduces her competitive edge in the world market. The ripple effects are directly felt by the Rwandan consumer in terms of high cost of living arising from taxes on international transport and imported products. Today, Rwanda is involved in regional integration, which is one of the pillars of her economic development and poverty reduction strategy in her vision 2020 goals (President Paul Kagame, 2012).

Rwanda is strategically located between the Eastern and Western/Central regions of Africa. The country is part of several regional and international organizations, including being party to agreements and conventions where development of transport infrastructure is prioritized. These organizations include COMESA (Common Market for East and Southern Africa), CEPGL (Economic Community of the Great Lakes Countries), Southern African Development Community (SADC) and the EAC (East African Community). The long-term development of Rwanda, as is stipulated in the country’s Vision 2020, which assigns fundamental importance to the development of the economic infrastructure of the country, particularly the transportation infrastructure. This gives Rwanda an edge when it comes to lobbying other partner states to enact regulations that facilitate regional transport and trade. With the SGR fully operational, Rwanda will have the advantage of providing an important link between the three regional blocks and the Northern and Central Transport Corridors. Incorporation of the SGR with Rwanda’s
position in regional transport would strengthen the case for her domestic and external investors to provide the much-needed resources. The SGR would further provide lessons that could inform general regional transport harmonization strategies.

In the year 2011, Rwanda’s capital Kigali was famed for being the safest and cleanest city in the world. This is not all; the country is taking development by storm. The SGR will give momentum to Rwanda’s development by providing a vital link to the sea ports of Mombasa and Dar es Salaam because the alternative ports of Durban, Maputo, and Cape Town are located a long distance away.

Rwanda and Burundi have no operating railway systems in place presently. Plans have been rolled out through the Common Market for Eastern and Southern Africa (COMESA) to link Kigali to the Tanzanian railway network. The Rwanda project is expected to be under public private partnership (PPP) arrangements. Rwanda has the option of either connecting to the port of Dar es Salaam in Tanzania or Mombasa in Kenya or both. According to Fortune of Africa (2016), the key principles of the rail transport policy in Rwanda revolve around promoting rail connectivity for the Central and the Northern corridors including regional rail connectivity and ensuring harmonization of all future infrastructure, gauge and service provision, legal and regulatory framework for rail transport system within EAC countries (Fortune of Africa, 2016). The SGR will foster trade and development in Rwanda and beyond. To reap the most benefits from the SGR, Rwanda will need to engage the neighboring countries to ensure that the intended investments in the SGR are undertaken before her own section of the SGR is developed.
According to Fortune of Africa (2016), the following principles are being considered in the construction of the new railway line in Rwanda

1. Promotion of rail connectivity for both the central and the northern corridors including regional rail connectivity with DRC.
2. Harmonization of all future infrastructure, gauge and service provision, legal and regulatory framework for rail transport system within EAC countries.
3. Separation of powers in the form of an independent regulator and the separation of path allocation and infrastructure charging from any organization (Fortune of Africa, 2016).

Tanzania and Rwanda have been in frosty diplomatic relations since May 2013. In addition to Information Communication and Technology development strategies that are working well towards uniting the two countries, the SGR is coming through as a essential tool that could be used to break the ice between the two countries and rebuild the bridge. When the upcoming SGR project is fully operational, Rwanda will reap more benefits from a stable partnership with Tanzania in terms of trade, social and economic development. Rwanda and Tanzania will do well to foster productive development that will bring essential growth to both countries. The two countries, who are both members of the EAC, are looking for strategies to complement and support each other. The SGR could just be the missing link to creating unity and minimizing conflict between the two countries. About 75% of Rwanda’s imports and exports go through the Dar es Salaam port (Clottey, 2016). This means that the Tanzanian section of the SGR which leads to the Dar es Salaam sea port would offer a more direct, efficient and cost effective alternative of transporting Rwanda’s imports and exports. The two way process will also see Tanzania benefit from this newly found relationship with Rwanda as it would distribute its downstream finished gas products to Rwanda and further on to Burundi (Beloff, 2016).
The Government of Tanzania has spearheaded efforts to increase essential transport infrastructure and services tailored to improve access to jobs, education and social amenities and to facilitate not only local and international trade but to strengthen regional integration as well as attract foreign investment. This socio-economic harmonization of Tanzania’s developmental infrastructure approach underscores the fact that transportation is pivotal to the general development of the country. Indeed, the SGR is a key infrastructure sector that acts as a stimulus to socio-economic harmony and is cause for a large proportion of public investment.

In Tanzania, the SGR will go a long way in boosting the existing transport sector which will help in market integration, strengthening competition, increase access to farming inputs and techniques, promoting trade, tourism, foreign investment, and growing the government returns. This can be achieved through the implementation of a number of transport development and maintenance programs and interventions aimed at enhancing the provision of an efficient, dependable, cost effective and safe transport system in the country.

The SGR in Tanzania will augment the existing Reli Asset Holding Company/Tanzania Railway Ltd and Tanzania–Zambia Railway Authority (TAZARA) railway lines. The SGR will form an important link to the Port of Dar es Salaam for the neighboring East African countries of Burundi, Rwanda, Uganda and beyond to the DRC, Malawi, and Zambia.

2.3 Theoretical Framework

Countries do well to prioritize and strive after development. To accomplish this goal, both citizens and governments have a participatory role. In order to achieve development, a country has to undergo a process entailing certain changes in social and administrative institutions, political conditions, and moral values among others. According to Ogoko
(2016), the main goals of development revolve around improving the quality of life for citizens; growth of Gross National Product (GNP) and promoting sustainable development (Ogoko, 2016).

Rodney, (1972) opines that development is a many-sided process implying for the individual, skills and capacity, greater freedom, creativity, self-discipline, responsibility and material well-being. The process involves the development of tools, skills and the mobilization of required resources for development purposes (Rodney, 1972).

Todaro and Smith argue that development economics deals with economic aspects of the development process in low income and developing countries such as the case is with countries of Asia, Africa, Europe and the former Soviet Union, which are presently characterized by low living standards and other development deficits (Todaro & Smith, Economic Development, 2012).

According to Clive (1987), development entails promoting economic development, economic growth and structural change and also on improving the potential for the mass of the population both through public or private channels (Clive, 1987). The development field of study further examines both micro and macroeconomic factors relating to the structure of developing economies in the span covering domestic and international economic growth (Investopedia).

The development enterprise is backed up by the quest for theoretical inquiry. At its bare minimum a theory is one directed towards identifying, formulating, refining and questioning general assumptions on which we should acknowledge and investigate rather than ignore or leave unchallenged (Burchill, et al., 2005).

Todaro and Smith (2015), argue that there is no standard or universal model of development. This is because economic development theories differ from country to
country. These theories seek to explain and predict how economies develop, under develop or do not develop over time; they also identify barriers to growth and how to overcome them. These theories seek to understand how governments can induce, sustain and accelerate growth with appropriate development polices (Todaro & Smith, Economic Development, 2015).

In the quest for knowledge to establish the main assumptions in the economic value of the SGR development in Kenya, the following theories are explored in relation to the study: The classic post-World War II theory is one of such and it is dominated by four major schools of thought:

1. The Linear-Stages-of-Growth Model
2. Structural-Change Model
3. The International-Dependence Revolution
4. The Neoclassical Counterrevolution

For purposes of this study, only the first two will be explored.

2.3.1 Linear Stages of Growth Model
The linear stages of growth theory are attributed to one Walt Whitman Rostow (W.W Rostow), a professor of Economics and History at the University of Texas at Austin. He developed this theory in the year 1960. Rostow’s approach suggests that developed countries go through five stages before they reach their current level of development. Each stage supersedes the previous stage. He asserts that all developed countries have gone through these development phases and that developing countries are in one of these stages (Rostow, The Stages of Economic Growth: A Non-Communist Manifesto, 1960).

This theory, also known as Rostow’s stages of growth theory, was inspired by the effort of the U.S. Marshall Plan in rehabilitation of Europe’s economy Post-World War II
Crisis. Economists tried to come up with a suitable concept as to how underdeveloped and developing countries could transform their subsistence economies into industrialized ones (Rostow, Politics and the stages of growth, 2008).

The stages are:
Traditional Society
Pre-conditions for takeoff
Takeoff
Drive to maturity and
Age of high mass consumption (Rostow, Politics and the stages of growth, 2008).

These stages of development will be used to explain the development of the railway line in the East Africa community to its present super level of SGR.

The railway development in East Africa has gone through several stages to get to the point where it is at today. From the colonial ages where the metre gauge network was built purposely to serve the export of raw (mostly agricultural) materials to the West, today the network has transitioned to a standard gauge railway line fit enough to compete at the international front and to harmonize East Africa. Development of the East African region is the gateway to true independence from foreign, development of strong trade ties with the West, a gateway to economic opportunities, and long-term security stability (Kwemo, 2017).

There was no much need for an advanced transport system for the East African society at the age of the Lunatic railway line that only served to connect Kenya and Uganda since little was known about the enterprise of science and technology. Back then, the societies relied heavily on manual transport which was either human or animal based to transport the excess subsistence produce to distant markets for barter trade. This form of transport
was difficult, slow and unreliable especially during inclement weather and in harsh geographical restraining areas (Rostow, The Stages of Economic Growth: A Non-Communist Manifesto, 1960).

Over time, output expanded and extended beyond agricultural produce to manufactured goods. Education in East Africa opened the way to the use of technology in various sectors of the economy including Agriculture. The Governments enacted policies in socio-political structure and production techniques extending to neighbouring countries, the returns were used in developing manufacturing industries and infrastructure; one of which was railway transport (Allaway, 2008).

Agricultural production shifted from subsistence farming to export crop farming that included coffee, tea, pyrethrum etc, for export purposes to foreign and international markets. These export crops attracted foreign exchange requiring more resources to be acquired for development and capital formation (Puri, 2010).

The take off stage in the East African SGR development was occasioned by an evident stimulus driven by the sustainable Development Goals (SDGs); where technological and infrastructural changes were a top priority to the East African Governments. The SGR came as a result of this self-sustained change in both agriculture and industry and is slowly paving way to self-sustaining regional economic growth.

The improvement of the state of infrastructural technology is being devolved to county level and this in turn propels growth to different parts of the region thus ushering in the final stage, that of drive to maturity stage. Most of the East African member states are thought to be in this stage in matters innovation in the main sectors.
2.3.2 Structural change Theory

In the year 1955, Nobel laureate William Arthur Lewis, presented the structural change theory. The focus was on the need for countries to transform their structures, away from agriculture, where there was low productivity of labor, towards industrial activity, with a high productivity of labor. In his theory, Lewis explained the inter-relationship between diffusion of new technologies and economic development. He further argued that underdeveloped economies consist of two sectors: A traditional, over populated rural subsistence sector with surplus labor and a high productivity modern sector to which the surplus labor is transferred. The model focuses on the process of surplus labor transfer from the traditional sector which leads to the growth of output and employment in the modern sector (Economics online).

**Diagram 1: Lewis Structural Model of Growth**

![Lewis Structural Model of Growth Diagram](erikkrantzwordpress.com)
The structural aspect of the SGR comes at a suitable time to remove the obstacle to the economic growth of the developing East African countries. The metre gauge railway lines have undergone rapid structural transformation in an effort to drive the transformation forward. African economies are mandated to make contributions to the national income by the manufacturing sectors and are surpassing the contribution made by the agricultural sector. The SGR is seen to be able to transform the East African economies from traditional subsistence agriculture to modern urbanized industrialized economies in a bid to create economies which in the end will enjoy self-sustaining growth. This goal is being realized through the policy prescriptions to include major government intervention in the economy to fuel the industrial sector, known as import substitution industrialization (ISI). The East African governments are bringing an end of exports of primary goods (agricultural and mining products), and pursuing inward-oriented development by shielding the domestic economy from that of the developed economies (Sekhampu, 2010).

2.4 Empirical Review

2.4.1 SGR and Promotion of Harmony in East Africa

EAC (2000) defines the East African community as a regional intergovernmental organization established under Article 2 of the Treaty for the establishment of the East African Community. It entered into force in July 2000. Members of this community comprise of the republics of Burundi, Kenya, Rwanda, Uganda and the United Republic of Tanzania. The community was founded upon the objectives of regulating the industrial, commercial, infrastructural, cultural, social, political and other relations of the partner states to attain accelerated, harmonious and balanced development and sustained expansion of economic activities that would be shared equitably by the member states (East African Community, 2000).
The treaty highlights the need for cooperation in infrastructure and services specifically transport and communications to support regional integration and socioeconomic development. The community stresses the need for well coordinated, harmonized, matching transport policies, improvement and expansion of existing links; and establishment of new ones as a means of furthering the physical cohesion of the countries and facilitating intra-regional commerce and global connectivity. The EAC aims to improve connectivity, in order to ease the flow of goods, services and persons, add weight to the regional economy and facilitate a competitive regional economy that attracts investment and one that can generate economic growth, create jobs and alleviate poverty in the region (CPCS, 2016).

Running in tandem with the EAC Rail sector enhancement program, the SGR infrastructure is considered essential in long distance transport within the EAC. The SGR as a tool can be used to unite the EAC by reducing conflicts and working towards a common goal of trade and development. Its key objective is to prepare bankable projects for investment and policy-related documents to assist in the reforming of the railway sector in the EAC region. Some of the benefits that will be realized from the SGR include cost and time savings in movement of passengers and cargo. For instance it costs KES 1,000 for the economy class trip from Nairobi to Mombasa as compared to a minimum of KES 1,200 for the same trip on a bus trip which is longer and exhausting compared to a ride on the SGR. The SGR comes with accelerated economic development owing to the rise of new routes and transport choices, employment creation, reliable and efficient transportation networks and new business openings both regionally and internationally.

Article 89 of the EAC Treaty gives prominence to regional infrastructure development as one of the major areas of cooperation to facilitate the movement of traffic within the community, promote integration within the regional and global markets and further the physical cohesion of the partner states (The East African Community, 2000). The treaty urges partner states to upgrade and expand the existing transport and communication
links and establish new ones. The SGR will serve to actualize the dream of an efficient railway system as envisioned in the EAC Transport Strategy and Road Sector Development Program (2010–2020), and the 4th EAC Development Strategy for the period 2011/12-2015/16 (Uganda Government, 2015).

Kyte et al define infrastructure as the existence of and access to an enabling physical infrastructure, especially in terms of energy, communications and transport of essential services. Governments should tailor infrastructure to meet actual needs and spread opportunities across societies and countries equitably. Infrastructure should be open, accessible and should be maintained and funded through tax or other sustained income. Public infrastructure should be managed for the public benefit (Kyte, Kaldany, & Wormser, 2015).

The future of the SGR is to augment regional integration by enhancing the existing regional infrastructure in terms of transport and hence facilitation of increased business, transportation of passengers, goods and commodities and cooperation among the East African member countries. The Phase 2B of the SGR project in Kenya will entail the construction of a port on Lake Victoria which is shared by Kenya, Uganda and Tanzania. This section is expected to grow transportation of goods using the Lake among the three countries and further cut down transport time and cost to Rwanda and Burundi (Kamau, 2017).

The African Agenda 2063 framework was adopted by the African Union Summit in January 2015 with a strong focus area in national and regional plans. The African Union (AU) aims at an all rounded African development encompassing aspects of propelling and guiding the economic, social, political, scientific as well as cultural transformation of the continent over the next fifty years.
According to a Tralac Trade report (2017), agenda 2063 seeks to hasten the realization of past and existing continental initiatives for growth and sustainable development. The Tralac Trade report further explains that among the seven African aspirations that were resultant of the consultative process with the African citizenry is a prosperous Africa, based on inclusive growth and sustainable development and a peaceful and secure Africa and an Africa whose development is people driven, relying not on outsiders but on the potential offered by its people (Tralac Trade, 2017).

The Standard Gauge Railway project fits in well as one of the African Union Flagship Projects/Initiatives which looks at having projects and initiatives that are aimed to impact on the socio-economic development of the continent such as developing an integrated high speed train network for the East African Region (Agenda 2063, 2013).

The SGR delivery is directly dependent on positive and speedy collaboration of the EAC members. The EAC has put aside her differences and has united to put up a Standard Gauge technology with identical design specifications that will allow for seamless operations across the borders of the countries with each country responsible for construction of the section that lies within its boundaries (Kiganda, 2016). The East African countries depend on each other and have to pull together to achieve this objective. These countries must harmonize and collaborate to attain this goal. Uganda is dependent on Kenya to complete the Kisumu – Malaba stretch of the SGR. Likewise Rwanda depends on the Kampala-Kigali stretch completion and on Tanzania for completion of the Isaka – Kigali section. This in turn will directly affect the delivery of the SGR section in Rwanda (Esiara, 2018). For the SGR to become a regional commitment, all East African member states are required to promote peace initiatives and work towards the common goal of building a SGR. Harmony is when East Africans come together in unified synchronized action to do something that will benefit the entire region such as is depicted in the SGR launch photo below.
Distrust and hatred between different countries whether political, economic, religious or other allegiances, prevents countries from integrating and living in peace. The SGR comes at an opportune time to strengthen the connections between East African communities and help overcome divisions. The network will enable East Africans to cooperate and work together, whether through community reconciliation, political dialogs or business partnerships. Ultimately, the SGR will largely contribute to promotion of harmony among the East African Nations (Vennon, 2015).

There is a close connection between regional integration, growth, and transport infrastructure. Infrastructure development helps to bring down the cost of production and of transacting business; it widens and integrates markets; achieves economies of scale;
encourages participation of the local private sectors; attracts foreign direct investment and technology and hence increases a country’s competitiveness and effective participation in regional and global value chains (Uganda Government, 2015).

In Kenya, the SGR journey was started way back in 2008 when the National Rainbow Coalition (NARC) Government Cabinet approved the project. The dream was finally realized and owned by President Uhuru’s Jubilee Government in June 2017. In Kenya, the 13 Billion dollar new ultra-modern SGR will outsmart but supplement the old metre gauge railway which cost the then colonial Government 5 million USD. The new railway will cut the travel time down to about four and a half hours from the 10 hour long exhausting tour between Nairobi and Mombasa and has a capacity to ferry about 2,400 passengers per return trip compared to 960 passengers back in the days. The SGR is also a cargo master with a 22Million ton capacity per year compared to 4.8Million tons per year that the Lunatic Express could ferry over fifty years ago. The SGR has also created over 60,000 employment opportunities in collectively in East Africa.

The SGR framework has been distributed regionally to enable the development of corridors, value chains, governance, hinterlands, and labor. The Mombasa gateway embodies and integrates the essential structure between regional and global transport systems. The project will finance the issue of ownership and governance by the East African countries to ensure that effective services are attained. The SGR development strategies are paralleled to with the development strategies of the East African trade infrastructure and logistics. The project is designed to facilitate trade among the East Africa Community members and steer up their economic growth and environmental conservation.

Kithinji (2016), submits that the SGR is part of the larger trans East African railway project that is a deliberate effort to connect East Africans to their economies, as well as to
enable East Africans build economies of scale, lower the cost of doing business, attract foreign investment and ultimately accelerate regional growth and development (Kithinji, 2016).

A study of the World Bank’s economic growth statistics indicates that East Africa is accounting for the highest growth rate in the continent. The economic growth in the East African region was 5.6% in 2016 in comparison to an average of 4.5% of the entire African continent. The southern African region growth was the slowest at a pace of 3.1% (White & Kitimbo, 2015). According to White & Kitimbo (2016), the global infrastructure development survey done in 2016, revealed that the East African infrastructure was one of the least developed in the world. Economic experts have demonstrated that infrastructure development and economic growth have a positive relationship. The completion of the Standard Gauge railway will leap frog infrastructure development in the sub-region to the next level, that of a full economic development (White & Kitimbo, 2015).

East Africa is gaining momentum in establishing the robust infrastructure required to realize the region’s economic goal. This is evident in the recent investments which have prioritized infrastructure development. White & Kitimbo are of the view that the East African political commitment to boost regional competitiveness through broader and deeper integration is a drive to real connectedness of people, commodities, services, technology and capital through tangible projects such as the Lamu Port-South Sudan-Ethiopia Transport (LAPPSET) corridor. This unified action is geared to steer the region to the forefront of the Africa rising narrative (White & Kitimbo, 2015). The standard Gauge railway is part of the wider LAPPSET corridor which when completed will link the East African region, including Uganda and Rwanda via its route through ports, railway lines and oil refineries.
The SGR in Kenya has introduced the reefer which is a specialized refrigerated container wagon designed for transportation of delicate and sensitive cargo. This type of cargo is categorized as dangerous cargo and includes flowers, meat products, milk, chocolates, and fuel. This new addition to the SGR has paved way for haulage of dangerous cargo from the port of Mombasa to the inland container depot in Nairobi and can be used to transport delicate and perishable cargo to the neighboring countries as well (KTN Prime, 2018).

The SGR line, the biggest infrastructure project ever undertaken in the East Africa region, will improve the movement of goods and citizens between the port cities of Mombasa and Dar es Salaam to the vast hinterlands of Kenya, Uganda, Rwanda and parts of the Eastern Democratic Republic of Congo. Kithinji (2016) opines that an efficient transport system will not only improve Kenya’s and the region’s competitiveness as an investment destination but will spur the EAC to the next level of international competitiveness (Kithinji, 2016).

The SGR transport infrastructure when fully active will play a key role in facilitating activities such as trade, agriculture, tourism and the movement of labor and other resources within the East African communities and beyond. SGR as one of the core infrastructure in East Africa will bring about movement of citizens in the region thus enhancing harmony between member states.

The SGR is coming up as one of the great economic success stories where businesses are concerned. Economic development and infrastructure development go in tandem. This is because prosperity symbolizes ambitions for progress and a better life. The two are often the major preoccupations of both governments and individuals. Notwithstanding, some economic approaches can also undermine peace. The SGR development plays an influential role in defining the East African National progress.
Venon (2015), is of the idea that when the SGR is fully completed and becomes operational, the East African states will be able to collect sufficient revenue, which could be ploughed back to provide the infrastructure and services needed for the economy and peace to thrive. To do so fairly and strategically, mechanisms in both economic growth and strengthening peace as explicit policy intentions will have to be put in place (Venon, 2015).

Atanas Maina, the managing director of Kenya Railways, opines that the SGR is the most significant game changer ever seen in the region. The Mombasa-Nairobi section of the SGR serves only as the first part of a much larger project. Initially running between Mombasa and Malaba, the SGR will eventually link Kenya to other major East African cities such as Kampala, Kigali, and Juba. This will help the Kenyan government to strengthen its social, political and economic fiber with the corresponding countries creating a network of viral links between ports and key cities in East Africa (Kenya News, 2017).

Tanzania and Kenya, being entry points for the other three landlocked countries; namely Rwanda, Burundi and Uganda, mean that what happens in these countries directly impacts business in the landlocked countries of East Africa. Felipe Manga, research, and planning manager at the Kenya Railways Corporation, posits that the benefits thus realized from the SGR will create efficient regional links, improve business within the EAC and foster strong multilateral relationships (Kenya News, 2017).

2.4.2 SGR and Job Creation in East Africa

Economy and conflict are closely related. Antagonism over access to resources is often at the heart of most conflicts and other forms of organized violence. The solution for sustainable peace within and between the East African societies would be through giving the East African communities equitable access to sustainable means of livelihood and asset accumulation opportunities achievable in a context of good governance.
Once operational, the SGR line will provide the basis for further economic growth in East Africa. Thus far, the first phase of the project in Kenya and Tanzania has already provided significant additional jobs (Oirere, 2017). In Kenya alone, the SGR has created over 30,000 jobs both directly and indirectly. In Tanzania, the SGR would help create about 30,000 direct employment opportunities and some 60,000 projected indirect jobs (The Citizen, 2018). It is expected that the same will replicate or even go above in the other East African countries and will afford thousands of households’ empowerment through employment opportunities.

In providing job creation opportunities for the locals, the Chinese contractor, aside from the main civil works, is mandated to construct freight terminals, traffic control centers, install utilities, signaling and information technology facilities for all the SGR stations in East Africa. According to an African news source, the SGR apparently requires massive quantities of construction inputs such as steel, ballast among others all likely to be sourced from local industries and companies (africanews).

According to Freight Africa, the SGR trains consist of about 52 wagons. The freight trains will have a maximum capacity of 4000 tonnes, or 216 twenty foot equivalent units (TEUs), and the line has been designed to accommodate double-stack container trains (Freight Africa, 2018). This translates into job opportunities for the loaders and off loaders whether mechanized or manual and also provides opportunities for retail and wholesale distribution services for the end users.

East African countries, especially the land locked countries stand to reap huge revenues from the SGR introduction. The SGR commencement of freight services for East Africa would cut costs and delays for businesses. Designed with an axle load of 25 tonnes, the SGR line is forecast to carry around 22 million tonnes of freight per year at a speed of between 80-100km/h and 120km/h respectively for passenger trains. The introductory offer for transport of a 20 foot container is about $US 500, and $US 700 for a 40-foot
container for a minimal chargeable distance of 300km (Smith K., 2018). This is equivalent to approximately USD 777 Billion at a minimum per year for the respective Governments.

The passenger service trains in Kenya dubbed Madaraka Express are well designed to seat up to 1200 passengers. There are two return SGR passenger trains in Kenya per day between Mombasa and Nairobi, and 613 000 passengers had so far been transported on the SGR between the second half of 2017 (Freight Africa, 2018). The standard fare from Mombasa to Nairobi is Shillings 900 ($US 8.77) in standard class and Shillings 3000 in Very Important Person (VIP) or first class. These charges are set to be reviewed upwards. At a bare minimum, this is equivalent to USD 4 Million per year for passenger transportation. Other charges include but are not limited to terminal charges, last mile transport charges, customs charges and 16% VAT on all domestic traffic (Freight Africa, 2018).
Figure 6: Double Stacked Trains

Source: (Nairobi Wire, 2016).

In Kenya, one will find out that other than the rail construction related job creation opportunities, the areas around the SGR stations, along the routes, or towns where the trains will be stopping are set for increased economic activity. This will include sprouting markets, hotels and an increase in transport and trade. When business people are assured of timely target markets for their produce, processing plants are bound to naturally sprout creating even more jobs (Kenya News, 2017).

Targeting to produce some fifteen thousand Kenyans with the required skill set to work in various departments associated with the SGR, local training institutions are sprouting along the SGR line to take advantage of the existing skill deficit in the country within this sector. In building capacity, a training program for operation and maintenance of the
SGR project is under way. The China Road and Bridge Corporation (CRBC) gave out some 60 undergraduate scholarships to Kenyan students to study railway engineering in China for a period of four years. This will create a pool of talent for the much needed current and future railway development and sustainability in East Africa (CRBC). This training program denotes that the CBRC contractor is living up to her contractual obligations that call for knowledge transfer and capacity building for the locals (Morangi, 2016).

With the SGR advent in Kenya, some businesses have lost some of their customers. Cargo trucks and long distance buses have lost some of their businesses with the flagging off of the SGR. Some of the bus companies have withdrawn some of their buses from the routes owing to a down surge in customers. This is because many a passenger will opt for the SGR owing to less travel time, fair cost of transport and the comfort and style that the SGR offers. Most buses spend a long time on the road with factors coming into play such as traffic, police road blocks, poor road status, single carriage roads among other challenges. Business merchants are also jumping ship to SGR owing to faster and reliable cargo transport. A good number of Container Freight Stations at the Coast have seen a drop in business following the government’s move that mandated importers to use the SGR. According to Ocharo (2018), the Kenyan government required all un-nominated containers to be transported on the SGR to the Inland Container Depot in Embakasi, Nairobi for final clearance. This saw more than 10 clearing agents relocate from Mombasa to Nairobi resulting in job and business losses at the port city (Ocharo, 2018). Some of the restaurants and stop over’s along the Nairobi Mombasa route experienced a drop in business. The same was true for small businesses along the route such as curio sellers, hawking businesses; petrol shops etc. all translating to a significant loss of jobs and business opportunities.
Initially the SGR passenger tickets in Kenya were generic. This could lead to a crime surge as no personalized details were reflected on the ticket and hence it was difficult to trace the customers travelling on the SGR. Vital details such as the travel time, date of travel, carriage number, and class were not reflected on the ticket. Any passenger could pick a misplaced ticket and comfortably use it without leaving a trace. The ticket verification points also presented bottlenecks for the travelers. Moreover, direct links are missing from the airport to the SGR station, from the city center to the station or from the SGR to the ferry station in Mombasa.

It is worth mentioning that the SGR is like a double edged sword, apart from creating employment opportunities in Kenya, the Kenyan tax payer will now dig deeper in their pocket to ensure that the SGR remains operational. This is because the SGR operation in Kenya between Nairobi to Mombasa costs KES 1Billion to run in a month making the SGR one of the most expensive infrastructure projects in the country (Wafula, 2018). Further to this, in the maiden year of her operation, the SGR in Kenya incurred a loss of KES 10Billion!

2.4.3 SGR and Environmental Conservation

In East Africa, Kenya holds a reputation for being a leader in clean energy. Starting with environmental conservation, the Government of Kenya has proven her commitment in addressing climate change locally, as well as internationally by demonstrating leadership in the global fight against climate change by enhancing a climate proofing of her transport infrastructure. Climate change can adversely impact on a country’s economic development and threatens the realization of projected visions and goals of creating competitive and prosperous nations. The ministry of Environment and Natural Resources indicates that in the tourism sector, climate change has the potential to restrict tourism expansion through infrastructural disruptions, loss and degradation of natural habitats and changes in demand. Adaptation measures are therefore required to ensure long-term sustainable growth of the tourism industry if tourism is to bring about positive
contribution to the local economies of the EAC (Ministry of Environment and Natural Resources, 2016).

In Uganda, the SGR will cut down the rail transit times from the sea port of Mombasa to the city of Kampala from the current estimate of ten days to about one day. The transport fuel will also be reduced by at least 80% while the toxic motor vehicle emissions will go down by at least 72%. The SGR will integrate Uganda into the countries keen on environmental conservation.

The Kenyan ministry of Environment and Natural Resources provides that he built environment such as the SGR infrastructure may underpin social and economic systems and is subjected to an ever increasing pressure to meet changing user in a dynamic climate. For the transport sector, an efficient and accessible transportation network fortifies the operation of all sectors of the economy. Kenya’s transport sector faces several challenges that are identified in the sectoral development plans (Ministry of Environment and Natural Resources, 2016).

The SGR has played a significant role and stands out as a major achievement in adopting green initiatives in the transport sector. Before the SGR inception, around 90-percent of goods transported in the East African region used to be transported mainly by road (CGTN Africa, 2017). The SGR has not only improved the efficiency of transport, but has also reduced carbon emissions through decongestion of roads. Vehicular exhaust emissions are rich in carbon dioxide which is a major component of greenhouse gases that contributes to global warming. The SGR has enhanced fuel combustion through increased speeds and smooth movement of the SGR trains (National Environment Management Authority Kenya, 2012).
The SGR is constructed in tandem with the green construction forum and is built to sustainably accommodate human life, plant life and animal life. Every segment complies with both the Environmental Impact Assessment (EIA) and the National Environmental Management Agency (NEMA) requirements. The Rail network allows for the free movement of animals through the incorporation of viaducts and watering points along the SGR route.

The separation of rail and guided bus-ways from the road network not only reduces tear and wear on the roads and vehicles but also saves time by negating delays caused by congestion or negotiating in and out of traffic. In the U.S. for example, rail transport is the preferred mode of transport especially during peak hours. To keep people and vehicles moving is one way to control carbon emissions. As opposed to having both man and vehicles held up in traffic, this study will later recommend that the East African countries upgrade to the use of rail platforms as seen in developed countries where the opportunity for level access to the train carriages combined with automated ticketing will massively decrease what is offered by the current platform. This will also increase average travel speeds (Wolcha, Byrne, & Newell, 2014).

Noise affects the worth of people’s lives. In Kenya, each mapping body is required to make a noise map indicating noise levels. The noise maps are reviewed every five years. Mapping bodies are expected to develop action plans, to control noise levels and protect silent zones. The regulations are meant to protect human health and the environment from the ill effects of noise and vibrations. Further, the regulation prohibits loud and unusual sound and control of noise and excessive vibration. The SGR complies with the noise levels control requirement notice. The SGR has installed rubber insulators on the rail racks which greatly reduce vibration. The SGR strives to maintain a healthy environment for Kenyans as enshrined in the environmental management and coordination control
regulation Legal Notice No. 61 of 2009 by regulating noise levels and excessive vibration (NEMA, Kenya, 2018).

According to Jefferson (1996), one freight train can carry 1000 tonnes of freight therefore comfortably replacing 50 lorry movements. Lorries produce the most noise, vibration and harmful particulates in the form of black smoke emissions. Rail systems, on the other hand, especially the electrified version can provide increased environmental benefits such as low carbon footprint, reduction in noise pollution and vibrations. The fixed nature of rail has the advantage of predictability due to train schedules and high visibility. The trains sound a long warning when approaching a crowded area or a rail station. This has increased pedestrian and passenger safety (Jefferson, 1996).

The Integrated National Transport Policy (INTP) of 2010 provides for transport solutions that have relevance to climate change mitigation (Government of Kenya, 2009). In East Africa, Kenya for example, recognizes the problems posed by climate change and the importance of taking the necessary action to mitigate climate change impacts. The Government of Kenya ratified the United Nations Framework Convention on Climate Change (UNFCCC) on 30th of August 1994. Article 2 of the Kyoto Protocol to the United Nations Framework Convention on Climate change, (Kyoto Protocol to the United Nations Framework Convention on Climate Change, 1997) aims to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.

NEMA’s (2015), proposal to tackle the climate change challenge lies in the development of sustainable development initiatives that promote strong, clean and climate-resilient economic growth. In the transport sector, the SGR is one way the Kenyan Government has improved this mitigation potential. One of the seven low carbon development options analyzed for the transport sector was the development of an extensive mass
transit system. The SGR idea fits perfectly in this strategy. It will among other public transport systems have an abatement potential of approximately 2.8 Metric Tons of Carbon Dioxide Equivalent (MtCO2e) a year by the year 2030 (NEMA, Kenya, 2015).

According to a Construction Plant Competence Scheme (CPCS), transcom report (2009), electric traction has the potential to lower energy costs and emissions (Construction Plant Competence Scheme, 2009). With the global car fleet due to triple by 2050, greenhouse gas emissions from transport industry is growing faster than in any other sector. Pollution kills more than 9 million people every year – equivalent to one in six deaths worldwide.

According to the United Nations Environmental Program (UNEP 2015), constructing new greener infrastructures, retrofitting or reconfiguring existing infrastructure systems and exploiting the potential of smart technologies can greatly contribute to the reduction of environmental impacts and disaster risks as well as the construction of resilience and the increase of efficiency in the use of natural resources (UNEP, 2015).

Currently, the transport sector is almost completely dependent on fossil fuels. Fossil fuels contribute approximately one quarter of all energy related carbon dioxide emissions to the air which is set to rise by one-third; a growth that is faster than in any other sector. Leading by example, some countries have put in place policies to support the use of electric vehicles. For example, through a comprehensive set of fiscal and non-fiscal measures, one out of four cars sold in Norway today is electric, while in China a national two and three wheelers strategy that started ten years ago has seen 230 million electric bikes being put to use to date. Such practices need to be scaled up and replicated around the world and in East Africa to achieve the desired impact (United Nations Environment Programme).
The UNEP is working with countries and its strategic partners to support a shift from fossil fuels to electric vehicles, including busses and trains. The UNEP is using its extensive network and country contacts to promote electric mobility with a special focus on exchanging best practices and clean technology options and by supporting the development of electric mobility strategies and roadmaps at national and regional levels (United Nations Environment Programme).

Aradi (2018), is of the view that the signing of a Shillings 24.2bn ($US 239M) contract with China Electric Power Equipment and Technology Company (CET) for the electrification of the Mombasa - Nairobi section of Kenya’s Standard Gauge Railway (SGR) in February 6th 2018, Kenya Electricity Transmission Company (KETRACO) continues to prove her commitment to be environmentally friendly. The new power line has a reliable transmission capacity of 1500MW, just short of the current national demand of 1700MW. KETRACO asserts that the Mombasa-Nairobi Transmission Line (MNTL) was constructed to address the challenges of low voltages, high transmission losses and unreliable supply in Kenya’s national electricity grid (Aradi, 2018).

According to KETRACO, power for the SGR in Kenya will be provided by geothermal plants, reducing carbon dioxide (CO₂) emissions from train operations to zero. The electrification project is due to be completed within 28 months of the contract signing (Barrow, 2018). Electrification of the SGR will put a stop to harmful train emissions and cut on diesel cost which is massively expensive. Research has shown that electricity is not only cheaper; it is greener and also lighter. This means that when the trains are on the track they don't damage the tracks much and ultimately bring maintenance costs down (The Guardian, 2018).

The electrification of the SGR across the EAC is geared to change the social economic welfare of the people along its trail. Rural electrification impacts on the local communities and brings about long term cumulative advantages. Diesel powered trains
tend to pollute the air along their tracks. Electrification of the SGR will improve the air quality and will pollute the environment less. Electric trains emit less carbon per passenger mile as compared to diesel powered trains. This makes electric trains more sustainable.

On the other hand, the use of electricity over diesel for the SGR trains would greatly degrade the landscape aesthetics along the railway line. Overhead power lines sometimes can be an eye sore and their effects can be both cumulative in the long term and can be residual. Clearance of vegetation along the railway line may lead to long term deforestation and a destruction of both flora and fauna. With electrification also come increased risks of fire and a myriad of accidents related to transmission power lines due to electrical and magnetic fields to tampering of the wires by unprotected personnel from the communities living around these areas. This is sometimes brought about by the high electrical voltage and high currents around sub stations. Accidental fires are likely to be caused by theft of transformer oil, vandalization of cables, electrocution, birds, animals, children at play and flash over of electricity. Such impacts could be long term. Such hazards can be mitigated by early planning and design of operations.

Carbon Dioxide (CO₂) is a major contributor to climate change. Unfortunately, all motorized transport produces Greenhouse Gases (GHG) in this form. Railway transport is an energy-efficient mode of transport when compared to other modes. In comparison, the emissions of CO₂ per passenger/Km are, on average, approximately half that of travel by car (Friends of the Earth - Fact Sheet).

The modernized standard gauge railway system will reduce emissions of localized air pollutants which include but are not limited to hydrocarbons, particulate matter, carbon monoxide, nitrogen oxide among others. Air pollution generated by vehicles brings with it direct and indirect costs which include health costs and building as well as material damage costs.
The SGR construction may lead to the noteworthy cutting and felling with associated wetland degradation due to the damming and downstream risks and hazards associated with potential flooding and often dam break-downs during the rainy season. With the early 2018 downpours witnessed in East Africa, it is not certain that the EAC has the capacity to manage environmental pollution as yet (CPCS, 2016).

The SGR section in the Democratic Republic of Congo and Kenya cuts across the parks of Nyungwe and Virunga Volcanoes National parks and Tsavo national parks respectively. This interferes with the free movement of wildlife including the endangered chimpanzees, gorillas and elephants. In Kenya for example, elephants are required to walk many miles looking for a passage to cross over to the other side of the railway line. This also interferes with the feeding and breeding behaviors of wildlife given that wild animals take a longer amount of time to adapt to new environments and structures.

The construction of the SGR would tap into the use of the local water resources used by wild life and local communities for domestic purposes and industrial use such as mining and irrigation. This could be mitigated by drilling bore holes by the construction companies such as the CBRC along the railway route.

According to the Friends of the earth fact sheet, Transport contributes to some 24,000 premature deaths each year owing to poor air-quality thanks to engine exhaust emissions. In matters safety, rail transport is still a far safer mode of transport than road. One is 9 times more likely to be killed travelling by private car and 2.5 times more likely by air. Road users do not pay the true financial cost of the environmental damage they impact. A recent consultant’s report calculated that the costs of environmental damage, accidents and congestion per passenger kilometer travelled are 3-10 times higher for road than for rail (Friends of the Earth - Fact Sheet).

According to Muhumuza (2018), 97 percent of cities with more than 100,000 inhabitants in developing countries do not meet the World Health Organization (WHO) air quality
guidelines. Air pollution, mostly by breathable particulate matter, leads to 3.3 million premature deaths a year worldwide, and that by 2050 the death total would double, to about 6.6 million a year, if the trend is not reversed (Muhumuza, 2018).

Seiler and Folkeson (2006), submit that transport infrastructure is likely to cause landscape and habitat fragmentation. This may result into biodiversity decline, a common phenomenon when natural habitats and ecosystems spilt into smaller and more isolated patches. The movement and dispersal of species is disturbed by construction and presence of infrastructure. Seiler and Folkeson recommend avoidance, mitigation and compensation as remedies to combat habitat fragmentation (Seiler & Folkeson, 2006).

In matters energy conservation, rail transport scores highly as a relatively energy efficient transport mode by using far less energy per passenger per kilometer in comparison to road. For instance, a rail passenger travelling by high speed train, even at 200Km/hr., the train typically uses only 0.8 - 1.0 MJ of energy compared to 1.4 - 2.8MJ for a car driver/passenger (Friends of the Earth - Fact Sheet).

Railways are far less visually intrusive. A huge section of the rail network constructed in the 19th century has over time blended in to the landscape and in many cases arguably, actually enhanced it. The Kenyan stretch through the Tsavo National game reserve is a testament to this.

For distant transport to and from cities along the line, the SGR is rapidly gaining popularity in East Africa perhaps owing to the worsening congestion on the roads which has seen most roads get dilapidated resulting into excruciatingly long road trips. Another reason for rail transport is that road transport causes adverse effects on human health and the environment. This is not to say that rail transport does not have an impact on the
environment but compared to other modes of transport its impacts are significantly less (Friends of the Earth - Fact Sheet).

CRBC has also helped the locals tackle the water shortage problems by digging boreholes and sharing the water with the local communities. Further the SGR design has ensured the ecosystem along the project is not damaged by ensuring that land and rivers are not polluted and wildlife habitats are protected. For instance, CRBC contributed to wildlife conservation by rescuing an elephant, which had been trapped in a puddle while drinking water, near the town of Makindu in Kenya. The staff used an excavator to dig a gap to let the elephant crawl out (Zhao 2016).

In contrast to road transport where passengers throw used plastic bottles and plastic bags through the windows after use (which are environmental hazards and decreases safety of other road users); the SGR ensures that the environment is clean by providing trash cans inside the trains for trash disposal by the passengers.

Another environmental input that the SGR project has attained includes soil conservation activities such as building drainage works, earth work slope protection works and grassing in areas where the SGR has traversed.
Figure 7: SGR Earth work and Slope Protection Works in Uganda

Source: (Kateeb, 2015).
CRBC has come up with a diverse portfolio of projects aimed at improving lives of all Kenyans particularly those living along the SGR corridor. The firm has been philanthropic enough to allow the locals to use water from their boreholes. Among other projects CRBC has put up boreholes, school facilities, trading premises, sports grounds and feeder roads all geared towards improving the living standards of the local communities’ (Zhao, 2016).

Source: (Kateeba, 2015).
2.4.4 SGR and Tourism in East Africa

In Kenya, the tourism sector alone accounts for around 10 per cent of the country’s GDP, and contributes towards eradication of poverty by providing employment opportunities to the local population. Growth in this sector is dependent on the adequate development of infrastructure, transport, and human resource skills; a stable internal security, and ecosystem protection (Ministry of Environment and Natural Resources, 2016).

According to the New China, the poor state of roads has direct effects on tourist arrivals in East African destinations. Tourists have been affected by connectivity issues due to the high cost of flying, and insufficient, irregular and sometimes unreliable road transport. The introduction of the SGR will project a seamless connectivity between and closer to tourist destination sites and will create an attractive environment for potential tourism boom. The Kenyan tourism Minister Najib Balala, once opined that trains would double domestic tourism (Ruibo, 2017).

The Madaraka Express in itself is a tourist attraction. For example, Mwakio (2017), put forward a report where the Kenya Tourism Board (KTB) reported on an increase in tourist arrivals with key attractions being the wildebeest migration at Masai Mara and the Madaraka Express passenger train between Mombasa and Nairobi. In the year 2017, hotels at the Coast region of Kenya recorded an increased occupancy of between 50 and 60 per cent of tourists of both local and international descents. Most hotels along the East African coast recorded a population increase oscillating between 40 and 50 per cent following the commencement of the Madaraka Express rail service. Launched in 2017, the SGR train in Kenya ferried more than a million passengers between Mombasa and Nairobi. The SGR service has opened up the coastal area and hotels to a new segment of holidaymakers (Mwakio, 2017).

One way the SGR in Kenya has enhanced tourism is through its route which cuts through parks. This offers travelers a free and an amazing sightseeing of wild animals including
elephants and zebras roaming Nairobi Park and the vast Tsavo East and West national parks. The SGR will bring both local and international tourists convenient and cheaper mass transport closer to the Kenya and Tanzania reserves famous for the eighth world wonder - the breathtaking wildebeest migration.

In Nyabundi’s view, the railway will also open up the not so famous tourist sites such as the Virunga mountain home of gorillas in Rwanda, Konoin caves, Itare and Chepkulo waterfalls in Kenya to tourist exploration. Another site that would attract tourists is the Mau Forest complex where lucky tourists could catch a glimpse of the yellow-backed duiker antelope, the golden cat, the great African elephant, the giant forest hog, the rare Columbus monkey, potto, Sotik bush baby among other species present along the SGR route in Kenya. The region is also home to indigenous mosaic cedar and podocarpus forests and enjoys a natural grassy landscape filled with meadows in lovely natural glades (Nyabundi, 2017).

Tanzania has great tourist attractions, 30% of the country is covered in game reserves this heritage has boosted Tanzania’s tourism industry. Among other wildlife endowments, the Tanzania’s Serengeti game reserve hosts the wildebeest migration path to Masai Mara Park in Kenya. The SGR can be a uniting factor between Kenya and Tanzania if the two countries can deepen their cooperation to construct a route that connects the two great National parks for mutual tourist interest. Tanzania also hosts the largest fresh water Lake in Africa – Lake Tanganyika which is a great tourist and geographical attraction in East Africa. The lake is also shared by Rwanda and Burundi. The SGR could be built in such a way as to have common stations at the Lake for the three countries to facilitate tourist transport and trade activities. Mount Kilimanjaro in Tanzania is the tallest mountain in Africa, Ruwenzori Mountains, also known as the mountains of the moon, located in Uganda are definite sites for tourist mostly for hiking and prestige reasons.
Burundi, also known as the land of a thousand and one hills, is one of the smallest countries in Africa which prides in its culture such as that of the Gishora sacred drums and the National park of Ruvuba that many tourists have fallen in love with.

According to the head of Kenya Coast Tourism Association, Mohamed Hersi, both local and foreign travelers attested to enjoy the SGR train ride specifically to sample the natural wonders along the route and what world class train service felt like. This has brought about benefits to the local tourism industry in the coastal region (Xiaopeng & Lagat, 2017).

**Figure 9: SGR Stations in Nairobi and Mombasa**

Source: (KRC, 2017).
2.5 Conceptual Framework

The construction and development of the standard Gauge transport infrastructure in the East African region is a major element of the regional economy Integration and modernization and aims at a further national economy growth and improvement of the social sphere. The SGR in East Africa has provided over 60,000 jobs collectively for both locals and


Conceptual Framework

The construction and development of the standard Gauge transport infrastructure in the East African region is a major element of the regional economy Integration and modernization and aims at a further national economy growth and improvement of the social sphere. The SGR in East Africa has provided over 60,000 jobs collectively for both locals and
expatriates. The integrative role of transport infrastructure will strengthen the domestic economic environment on the basis of the regional integration of the East African community. On the other hand, though the SGR has created many job opportunities; not all of these jobs go to the ordinary East African. Chinese companies import their own labor and tend to employ majority of the locals for casual jobs and that at a stingy pay. In Kenya, the Chinese are determined to run the SGR for 10 years before the project is officially branded Kenyan (Obala, 2017). Allegation reports of harassment, discrimination and wage disparity despite are rampant (Wasonga, 2018).

The SGR will provide economic and strategic unity of the East African member states and will play a major role in the integration of the constituent sectors and will also be a stabilizing factor of the region’s economy. The tourism sector which is a major foreign income earner for East Africa stands to gain from the SGR as both local and foreign tourists are set to explore the riches tourism has in store in the region. The SGR once fully operational in East Africa will boost the tourism sectors by virtue of being able to move tourists in masses closer to their destinations faster and at affordable rates. This will greatly impact on the EAC GDP. The environment will greatly improve the effects of climate change which will see a reduction as trains are more ecologically friendly. The upcoming scheduled upgrades of the SGR to the electric propelled version will further reduce cost and will be more sustainable towards reducing the impacts of carbon emission.
CHAPTER THREE: METHODOLOGY

3.1 Introduction
This section described the methodology used in the study and detailed out the study’s sampling design, data sources, and data analysis and data presentation. Research methodology employed in this study included a reconnaissance survey of the SGR lines in Tanzania, Ethiopia, Kenya, Uganda, Rwanda and Burundi. The study heavily relied on secondary information and desk top research. The countries where the SGR projects were running railway were systematically selected.

3.2 Research Design
The research design in this context was defined as the conceptual structure within which research was conducted. The research study used the explanatory research design and predictive analysis. Sources were derived from the internet, newspaper articles, academic books, academic documentaries and scholarly and railway journals.

3.3 Data Collection Sources and instruments
The study mainly used the desk top research approach to collect secondary data that was drawn from Railway institution records, railway journals, railway magazines, internet and other scholarly materials available in the university’s repository for analysis.

3.4 Data Analysis and Presentation
Qualitative methods of data analysis and content analysis will be used to draw conclusions from the study. Data was edited and classified for easy analysis and interpretations. The completed draft was scrutinized for errors and omissions. The data will then be presented by use of pictures, figures and tables to show the relationship between the independent and dependent variables. The discovered useful information will be used to suggest the conclusions of the study.
CHAPTER FOUR: FINDINGS AND DISCUSSION

4.1 Introduction
The purpose of this chapter is to discuss and interpret the findings of the study in relation to the research objectives, questions and literature review in the preceding chapters. This study had a goal of finding out how the Standard Gauge Railway has contributed towards promoting harmony in the East African member states. The study further examined how the SGR has enhanced tourism among East African member states; the study examined the value of SGR in job creation among East African member states and also attempted to find out how the SGR has enhanced environmental conservation among East African member states. Where applicable, the findings have been presented in tables, pictures, graphs and charts for easy understanding and interpretation.

Over a decade ago the African continent was reawakened owing to the rapid modernization and sweeping tide of globalization. The entire world was a keen on developing a high speed rail bandwagon. This could only be achieved through modernization and upgrading the infrastructure systems. The East African countries have followed suit. East Africa is keen on upgrading her railway infrastructure to the next tier - that of a high speed, high capacity standard gauge railway line. To remain relevant, EAC has laid the ground work for the installation of a fully functional rail transport system.

4.2 Data Analysis
The SGR in Rwanda for example, will ease transportation in the country which in turn will contribute to the improved sustainability of other sectors of development that include information technology, energy related projects and the agricultural sector. Rwanda will also enjoy access to both regional and global markets. There will also be ease of movement of people across the region for both leisure and business.
The SGR involves acquiring huge chunks of land by the respective EAC governments. Not all land in East Africa is Government owned as the case is with Tanzania and Ethiopia. In Kenya, challenges that come with this include just and prompt compensation which often stalls the SGR construction. An example was the SGR section in Ongata Rongai in Kenya where the communities put up a protest owing to delayed compensation by the Government for their land, smooth relocation of displaced communities, land ownership concerns which include procedures for acquiring the already scarce and inaccessible land for the displaced populations. Relocation of these populations to neighborhoods far away from their ancestral settlement areas has interfered with the communities’ moral and cultural principles and in the long run this may bring about human rights issues. Trans-boundary disputes are likely to arise in cases where communities feel that the newly relocated occupants were infringing on their property and basic space especially water and grazing land.

Further to this, the SGR construction has brought about a loss of farmland and agricultural throughput. The SGR has so far taken up a substantial chunk of arable farmland and therefore has reduced the agricultural sector contribution to the East African economy.

This study has revealed that the SGR driving spirit was founded upon the idea of integrating East African member states and fostering economic development, to include stimulating mineral exports from the hinterlands of the EAC, DRC and elsewhere. Without the SGR in place, both the Mombasa and Dar es Salaam ports would remain a non-investment as they are the key port gateway to East Africa. Thus far, the Mombasa-Nairobi section of the SGR has been completed and is fully operational. The challenge that remains is whether financing of the remainder of the Kenyan portion to Kisumu and then on to the Ugandan border will be achieved on time let alone the construction of the Ugandan, Burundian and Rwandan sections. Recently, Uganda joined hands with Kenya in support of the project probably after weighing up the pros and cons of the Kenyan and
Tanzanian SGR options. Rwanda seems optimistic. Apart from constituting a coordinated strategy to promote EAC economic integration, it is evident that the Kenyan and Tanzanian SGRs in progress are competing for much of the modest cross-border freight business. Dar es Salaam and Mombasa ports remain rivals for transit traffic which should not be the case as there is massive business potential in East Africa for both ports if only the transport infrastructure can be strategically aligned (Sarokin, 2017).

The issue of the SGR and cost implications continues to rear its ugly head when the cost of the SGR in Kenya is compared to other railway lines in the continent. With all factors considered, the average international standard for building railways is 3M dollars per Kilometer. Tanzania spent 2.5M dollars per Kilometer while Kenya spent a whooping 8M dollars per kilometer of the SGR construction. To understand this debate, it is worthwhile to look at the various variables that are in play such as design specs, geographical terrains, elevations, and stations, Government policies in land acquisition, political factors and purpose of the SGR in the country in question.

Compared to other Railway lines in the continent, it is argued that the Standard Gauge Railway in Morocco is far more superior in comparison to the one in Kenya. It has electrified bullet trains which move at a maximum bullet speed of 320 KM/H. Moreover, the Moroccan system has a double line and was built at half the cost of the Kenyan SGR who’s Nairobi to Mombasa section alone cost four hundred and forty seven billion and that of Nairobi to Malaba is estimated to cost another sixty hundred and twenty eight billion shillings. Economists further argue that the revenue realized from the SGR in Kenya will not be sufficient to repay the loan extended to Kenya by the Chinese Government.

The topography of the SGR in Kenya rises from an altitude of 500M at the coast to over 1700M by the time it is leaving Nairobi. The gradient of the rail line directly affects the cost and construction time with some parts of the route requiring tunneling to maintain
viability. This is different from what we have in Morocco where the railway line built along the coastal area never rose beyond an altitude of 600M meaning the ground is almost flat all the way. This makes the Kenyan SGR more expensive.

The Moroccan high-speed trains fit within the Moroccan Government’s wider program of infrastructure spending. Power for the high speed trains is supplied by the country’s world's largest solar power plant and several major ports. This is all done in the race to stimulate a sluggish economy. The infrastructure development in Morocco was informed by the government’s need to move between five and six million people up from three million between Tangier and Casablanca which stand out as popular tourist locations. The trains in Morocco are therefore designed to move as many people as possible between these two tourist destinations. This is a strategic move that aims to justify the development and achieve an operating margin that far exceeds that of the existing conventional trains that are already saturated. This makes the new line a necessity for Morocco. Bullet trains are not intended to move cargo. They are designed for passengers only.

The SGR system is mainly freight oriented with double stack capability to handle enormous cargo containers. It also has provision to accommodate passengers, though it is not its mainstay, it has rapidly gained popularity.

An analytical cost comparison between the operational Phase one of SGR from Nairobi to Mombasa that covers 472 Kilometers was built at a cost of Ksh327 billion while the Ethiopian 750KM cross-border railway line linking Addis Ababa to the Red Sea port of Djibouti, costKsh340 billion. This may give the impression that the Kenyan SGR railway is more costly. Both the railways in Kenya and Ethiopia were built by Chinese contractors. In Ethiopia the railway project was 70 per cent financed by China’s Exim Bank and built by China Railway Group and China Civil Engineering Construction while the one in Kenya was 90 per cent financed by the same China based Bank.
The KRC Corporation has attempted to justify the huge cost discrepancy basing on the fact that the SGR was built in alignment with the needs of the country, key of which was to ease the movement of goods to and from the port of Mombasa to the hinterlands.

Kenya’s dynamics and objectives for her railway are dissimilar from those of other countries. Ethiopia for example, has put up a class two (type) railway which fits in well with her demands. The cargo volumes in Ethiopia are less than 10 million tonnes while the Kenyan SGR has a capacity of about 22 million tonnes per year. This brings about the requirement for a train with double stack capability and with it comes a cost implication. The port of Djibouti does less than 7 million tonnes per year while the port of Mombasa is doing nearly 30 million tonnes per year. The Ethiopian corridor on the other hand has enough level crossings as it passes through areas with a scarce population. In Kenya on the contrary, some of the areas where the SGR is traversing are heavily inhabited such as Mulolongo and Athi River for example. This means a lot of bridges and more stations need to be constructed. Moreover, the population bordering the railway line needs to get compensation for their land before the construction takes off. This is not the case in Ethiopia where when the Government desires land, it acquires the land at no cost and legal implications as all land is Government owned. The SGR line in Kenya traverses through private property thus the mandatory acquisition poses a myriad of challenges to the contractor and Government. Some private citizens have instituted court proceedings against the contractor while some have refused the market rate compensation offered by the government. This has not only delayed the construction but pushed the costs higher both in legal fees and compensation.

While Ethiopia has 18 stations, despite being 100 KMs shorter, Kenya has 33 crossing stations with overpasses in large sections to allow for wildlife migration. This is almost double of what Ethiopia has at 18 stations which are not as big compared to those in Nairobi and Mombasa. This is also over and above compared to Tanzania whose SGR
project has only two major stations, seven intermediate stations and twenty three passing stations.

It is worthwhile to note that electric operated trains do not always mean that they are superfast. The Ethiopian SGR trains are only 40KM/H faster than the Kenyan train. This aside, Kenya has no dam big enough to compare to Ethiopia’s Grand Renaissance Dam which is projected to generate some 6,000 Mega Watts (MW) with the first 750MW. This gives the Ethiopian train service stable power supply whereas Kenya does not have enough current electricity supply to run an electric train at the moment. This translates into more cost in terms of diesel fuel to run the SGR. However, according to Kenya’s Cabinet secretary for transport Mr. James Macharia on a TV interview indicated that plans were in the budget to electrify the Kenyan SGR by the year 2020 to acquire the same status and to compete with her Ethiopian and Tanzanian counterparts.

Another factor why the Kenyan line appears to be expensive owes to the massive bridges on its route where some stretch kilometers on end. Unlike the iron fist government in Ethiopia, Kenya has to listen to all contending voices which have led to factoring in tunnel passage allowances for wild animals in Tsavo and Nairobi National Parks. These bridges have greatly impacted on the final cost.

Kenya is buying more than double what Ethiopia has. Ethiopia so far has 3 passenger trains and 32 freight trains. Kenya has bought 56 diesel locomotives to power 40 passenger coaches and 1620 freight wagons. This translates to 50 freight trains in Kenya which is 18 more than those in Ethiopia (Jamii Forums, 2016).

Compared to Ethiopia where there are only single stack wagons, Kenya’s SGR is more superior by virtue of its double stack wagons. Kenyan freight trains have the ability to carry twice as many containers by stacking one on top of the other (Jamii Forums, 2016).
The SGR in Kenya for example has faced construction challenges from animal rights defenders especially after it was realized that the SGR had to traverse protected wildlife areas. A law suit was lodged at the courts stalling the project construction for many valuable weeks. The verdict meant that the route had to be modified to accommodate wildlife crossing areas and herders routes. This brought about direct and escalated costs since the delays meant that a cost was incurred for work that was not being done.

Since 2013, this quagmire has spiked Kenya’s external debt value seven times the country’s annual budget. According to Otieno (2017), if Kenya had a one-year deadline to pay the debt it owed by the end of 2015, every Kenyan would have paid Ksh4, 905 a month for a year or an equivalent of Sh59, 000 per Kenyan per year. If not controlled, these high debts threaten to expose the economy to systemic risks (Otieno, 2017).

China has taken credit for promoting the standard gauge railway in East Africa which is a mega infrastructure development project set to bolster modernization and to integrate transportation systems in the East African countries of Uganda, Rwanda, Burundi, Congo and South Sudan. The SGR will also link East Africa to China and help enhance trade. Whether China will take advantage of East Africa in trade matters by directly or indirectly extracting raw materials from Africa and then selling back finished made in China goods at a humongous price is a question waiting to be answered.

The standard gauge railway is set to contribute greatly to East Africa’s harmonization through economic and social development as well as improving people's livelihoods and stirring the country to heights of prosperity. According to Atanas Maina, the managing director at KRC, the Kenyan project will raise Kenya's gross domestic growth by 1.5 percent when fully in operation.

Shim opines that Kenya is expected to repay the $3.5 billion loan as economic activity grows with the railway. Skeptics doubt that there is enough capacity to keep the railway
running owing to the huge costs incurred in its construction. A 2013 report by the Economics of Rail Gauge in the East Africa Community from the World Bank argued that in order to service the China loan, the railroad must attract additional freight in the order of 20 to 55 million tons per year if the Kenyan bit of the standard gauge railway is to stay economically viable (Shim, 2017).

On her first anniversary, the Standard Gauge Railway passenger train service, Madaraka Express, was celebrated with hitch free operations. A year after its launch, the SGR in Kenya had ferried 1.3 Million people between the port city of Mombasa and the Country’s capital Nairobi and the towns along its route. Over 4,000 passengers were transported on a daily basis. This translated to over USD11.7M per year or over USD36,000 per day (The East African, 2018). On the other hand however, all is not flowery for the SGR in Kenya. Reports from the ministry of transport in Kenya have revealed that the SGR incurred a 10 billion loss in her first year of operation owing to low cargo business (Mwiti, 2018).

It is evident that the SGR has so far unleashed massive benefits to critical sectors of the East African economy such as manufacturing and tourism and has also greatly enhanced technology transfer. The Madaraka Express passenger train today makes two trips in each direction between Nairobi and Mombasa daily, has attained more than 95 percent occupancy hence reducing by half the time spent to connect to Kenya’s first and second-biggest cities (China Daily, 2018).

The SGR train has revolutionized movement of people, goods and services in the country since its operations commenced in 2017. This achievement has been attained by lowering the cost of transport thereby making the SGR more affordable, convenient and reliable for Kenyans to travel for business and for leisure (China Daily, 2018).
4.2.1 SGR and Promotion of Harmony in East Africa

The main Standard Gauge Railway projects in East Africa include: in Kenya, the SGR phase one between Mombasa and Nairobi and then phase two from Nairobi to Kampala and Kigali. Uganda has the Kampala – Malaba, Kampala – Kasese-Kigali and Tororo – Pakwach/Gulu – Nimule. In Tanzania the SGR projects are Dar es Salaam – Isaka – Kigali/Keza – Musongati, which also serves as the SGR project in Rwanda, Tanga – Arusha – Musoma and Mtwara – Songea – Mbamba Bay section and in Burundi there is the Burundi – Musongati and Keza – Musongati – Bujumbura railway link.

Infrastructure is one of the most critical enablers of successful regional integration. The SGR transport infrastructure when fully operational will integrate East Africans owing to its non-discriminatory nature in service delivery whether used for freight movement or for passenger travel. This will go a long way towards coordinating, harmonizing and complementing transport and communication policies in East Africa. True to the objectives of EAC (2017), the SGR has improved and expanded the existing transport and communication links; and has established new ones as a means of furthering the physical cohesion of the East African States. This has facilitated and promoted the movement of traffic within the East African Community (East African Community, 2017).

An analysis of the SGR over the past one year since its inception indicates that the SGR continues to provide globally competitive quality services encompassing safety, reliability, efficiency and cost effectiveness. Characteristic of all infrastructures, the SGR has been designed with an end goal of stimulating development in East Africa (Uganda Vision 2040). To attain this much desired development in East Africa calls for an integrated economy. East African countries need to continually adopt and integrate the latest technology in service delivery in order to improve their human debt indices. According to the SGR Uganda project coordinator, Eng. Kasingye Kyamugambi, SGR
will position EACs to compete globally. This in return will attract foreign direct investments from developed and developing economies (Kyamugambi, 2017).

The East African region is a wide market. Both the landlocked countries such as Rwanda, Burundi and Uganda and the countries with access to the Indian Ocean ports need each other. The SGR as a tool can be used to foster both economic and social harmony among the East African countries. When completed, the SGR in Tanzania can be used to link Rwanda and Burundi to the sea port in Dar es Salaam while the SGR in Kenya can link Uganda to the Mombasa port. With this kind of balance and the wide regional market, the seeming competition and rivalry between Kenya and Tanzania to serve the other East African landlocked countries will be replaced by unity and will lead to the wholistic development of East African regional bloc to heights of competing in world markets.

Lake Tanganyika is both a tourist and geographical attraction in East Africa. The lake is shared by Tanzania, Rwanda and Burundi. An SGR link to the Lake could be built in such a way as to unite the three countries to facilitate tourist transportation and especially trade activities. With coffee being Burundi’s major export commodity, the country could benefit immensely from such a relationship where the coffee exports could be transported directly from the Lake stations to the Port in Mombasa. This could generate far more revenue for Burundi than what is being gained at the moment and see the country’s growth established.

Cost effectiveness and operational efficiency are going to be crucial in ensuring the Standard Gauge Railway (SGR) achieves its great promise of being a game changer in the economy. The first dynamic that the SGR will deliver is definitely the time factor. Transport of goods, particularly perishable goods, such as agricultural products at competitive rates across long distances gives SGR an upper hand where faster access to markets matter. Passengers will also now move faster between destinations, and so have more time to do business and engage in social and Nation building activities.
According to KRC, more and more passengers have preference for the SGR over road transport when travelling between the towns where the SGR cuts through. For one, the SGR fares are competitive and the SGR comes with a travel in style comfort. Since inception of the SGR in Kenya, there has been a recorded increase in capacity from 5 million passengers to 15 million passengers initially then to 60 million passengers per year in Phase 1 (KRC, 2017).

Transporters are taking advantage of technology in cost reduction. With the SGR, it will cost less to move a ton of cargo not to mention the substantial savings that will be made such as a reduction in fuel consumption. In SGR, fuel efficiency ranges between 35 and 50 per cent. Maintenance costs will be brought down because of the nature of infrastructure. The expected substitution of road transport with SGR, usage of tires by trucks and vehicles will go down. Tire replacement is one of the major costs in transport, and this reduction in replacement cost may result in substantial savings to the larger economy.

The next dynamic is the axle factor. SGR gives Kenya Railways the opportunity to increase the load that can be carried on the trains. According to experts, if you can increase the throughput of one wagon, that is an advantage.

The fifth dynamic is alignment. The metre gauge railway was built over 100 years ago. Because of the level of technology then, the train could not pull cargo up gradients, and therefore, had to meander. SGR has the major benefit of alignment, which has introduced gentler curves. It is, therefore, able to operate at higher speeds. The benefits arising from all these advantages must be translated into tangibles in terms of travel costs and travel time (Max, 2017).

The Northern Corridor SGR network has registered communication, transportation and development in the EAC. It has enhanced overall efficiency and capacity building. It has
opened connections with the neighboring countries. Freight arrives at Mombasa and Dar es Salaam ports before onward transmission into the hinterlands of the EAC.

There is no one single project that is perfect. This study found out that the SGR like any other project has its downsides. There are fraudsters using fake SGR accounts to dupe the public about opportunities in the project sourcing bids. There has been substantial displacement of populations, others from their ancestral lands, schools, factories. For example five industrial plants in Uganda to include Abacus, a drugs factory in Uganda were displaced to pave way for construction of the modern railway line (Bwambale, 2017).

**Figure 10: Container Depot at Mombasa Port**

![Container Depot at Mombasa Port](image)

Source: (Kenya Ports Authority, 2017).

The above photo is testament that the Mombasa port is East Africa’s busiest gateway for cargo destined to the hinterlands and to the landlocked East African countries. According to the Kenya Ports Authority, cargo throughput at the Mombasa Port surges every year. For instance, according to the Kenya Port’s Handbook 2017 – 2018, cargo throughput surged by 2.4% of the million tonnes handled by the port in 2016 only; with imports making the bulk of the cargo handled at the port. This rates at about 23.12 million tonnes
when compared to imports that stood at 3.66 million tonnes. Meanwhile, cargo movement to and from countries outside Kenya shot up by 7.7 million tonnes from 1.1% in the year 2015 (Kenya Ports Authority Handbook, 2017).

Uganda remains the largest market directly benefiting from Mombasa port, followed by South Sudan. Other markets are Burundi, Democratic Republic of Congo, Tanzania and Somali (Kenya Ports Authority Handbook, 2017). By end of the year in 2017, the Mombasa Port recorded a total container population of 14,411 Twenty Feet Equivalent Units (TEUs) (Kenya Ports Authority, 2017). These statistics indicate that there are many containers lodged at the ports awaiting transit either to the inland depots or other destinations within the country and across borders. These containers that weigh millions of tonnes have to get a supplementary transportation channel as the road network alone is not sufficient and fast enough to handle such an enormous amount of cargo. This is where the standard gauge railway comes in as a revolutionary rejoinder and this not only to supplement the many lorries on the roads that add to tear and wear on the road and environmental pollution; but a firm guarantee that the cargo will arrive at its scheduled destination in half the time that the lorries would normally spend on the road.

According to Oruko, where the meter train used to carry twenty to thirty containers, the standard gauge train has the capacity to carry 216 containers and to transport 104 containers in one trip, which is almost equivalent to all the trucks operating daily (Oruko, 2018).
The Table below shows East African Transit Traffic Statistics between the years 2011 – 2015

Table 1: East African Transit Traffic: 2011–2015 (DWT) in Tonnes

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>UGANDA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imports</td>
<td>4,028,361</td>
<td>4,499,302</td>
<td>4,508,118</td>
<td>5,132,276</td>
<td>5,592,914</td>
</tr>
<tr>
<td>Exports</td>
<td>347,314</td>
<td>346,193</td>
<td>404,198</td>
<td>389,844</td>
<td>384,418</td>
</tr>
<tr>
<td>Total</td>
<td>4,375,675</td>
<td>4,845,495</td>
<td>4,912,316</td>
<td>5,522,120</td>
<td>5,977,332</td>
</tr>
<tr>
<td>TANZANIA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imports</td>
<td>150,516</td>
<td>168,006</td>
<td>180,131</td>
<td>173,022</td>
<td>190,880</td>
</tr>
<tr>
<td>Exports</td>
<td>10,441</td>
<td>18,163</td>
<td>12,344</td>
<td>14,827</td>
<td>13,898</td>
</tr>
<tr>
<td>Total</td>
<td>160,957</td>
<td>186,169</td>
<td>192,475</td>
<td>187,849</td>
<td>204,778</td>
</tr>
<tr>
<td>BURUNDI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imports</td>
<td>1,201</td>
<td>38,917</td>
<td>66,227</td>
<td>78,961</td>
<td>75,690</td>
</tr>
<tr>
<td>Exports</td>
<td>688</td>
<td>243</td>
<td>682</td>
<td>139</td>
<td>121</td>
</tr>
<tr>
<td>Total</td>
<td>1,889</td>
<td>39,160</td>
<td>66,909</td>
<td>79,100</td>
<td>75,811</td>
</tr>
<tr>
<td>RWANDA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imports</td>
<td>216,306</td>
<td>247,730</td>
<td>223,127</td>
<td>221,323</td>
<td>273,815</td>
</tr>
<tr>
<td>Exports</td>
<td>9,787</td>
<td>12,508</td>
<td>16,972</td>
<td>14,589</td>
<td>18,109</td>
</tr>
<tr>
<td>Total</td>
<td>226,093</td>
<td>260,238</td>
<td>240,099</td>
<td>235,912</td>
<td>291,924</td>
</tr>
<tr>
<td>SOUTHSUDAN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imports</td>
<td>375,897</td>
<td>736,266</td>
<td>716,470</td>
<td>696,816</td>
<td>652,513</td>
</tr>
<tr>
<td>Exports</td>
<td>41,135</td>
<td>30,390</td>
<td>58,679</td>
<td>64,520</td>
<td>50,018</td>
</tr>
<tr>
<td>Total</td>
<td>417,032</td>
<td>766,656</td>
<td>775,149</td>
<td>761,336</td>
<td>702,531</td>
</tr>
<tr>
<td>D.R. CONGO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imports</td>
<td>339,287</td>
<td>464,989</td>
<td>491,367</td>
<td>383,461</td>
<td>362,976</td>
</tr>
<tr>
<td>Exports</td>
<td>16,004</td>
<td>17,369</td>
<td>20,346</td>
<td>24,267</td>
<td>33,156</td>
</tr>
<tr>
<td>Total</td>
<td>355,291</td>
<td>482,358</td>
<td>511,713</td>
<td>407,728</td>
<td>396,132</td>
</tr>
<tr>
<td>SOMALIA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imports</td>
<td>29,329</td>
<td>16,359</td>
<td>6,969</td>
<td>4,592</td>
<td>11,697</td>
</tr>
<tr>
<td>Exports</td>
<td>0</td>
<td>53</td>
<td>29</td>
<td>19</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>29,329</td>
<td>16,412</td>
<td>6,998</td>
<td>4,611</td>
<td>11,697</td>
</tr>
<tr>
<td>OTHERS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imports</td>
<td>24,901</td>
<td>29,115</td>
<td>3,531</td>
<td>387</td>
<td>6,973</td>
</tr>
<tr>
<td>Exports</td>
<td>5,000</td>
<td>39</td>
<td>47</td>
<td>73</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>29,901</td>
<td>29,154</td>
<td>3,578</td>
<td>460</td>
<td>6,973</td>
</tr>
<tr>
<td>TOTAL</td>
<td>5,165,798</td>
<td>6,200,684</td>
<td>6,195,940</td>
<td>6,690,838</td>
<td>7,167,458</td>
</tr>
<tr>
<td></td>
<td>430,369</td>
<td>424,958</td>
<td>513,297</td>
<td>508,278</td>
<td>499,720</td>
</tr>
<tr>
<td></td>
<td>5,596,167</td>
<td>6,625,642</td>
<td>6,709,237</td>
<td>7,199,116</td>
<td>7,667,178</td>
</tr>
</tbody>
</table>

Source: (Kenya Ports Authority, 2016).
The development of infrastructure is an essential backbone for a country’s competitiveness and trade. In today’s world, adequate and working infrastructure is a precursor to achieving sustainable development. It is almost impossible for a country to develop without access to well-functioning infrastructure. To propel the sustainable development goals (SDG’s), the East African community, is prioritizing trade and its related transport and infrastructure activities which include upgrading the railways and road networks. This structural transformation is faced with a myriad of both natural and man-made constraints such as the lack of harmonization of policies, regulations, and procedures that govern both trade and infrastructure development. These issues pose an obstacle in the East African regional integration process (Kingombe, 2017).
Kingombe, (2017) opines that in order to move goods and services across the East African community, barriers to regional integration need to be removed. This would among other factors necessitate the rising investment in a cost-effective transport that is smooth, seamless and with proper structure and networks, as well as in soft infrastructure reforms such as one-stop border posts. This fits in line with the Programme for Infrastructure Development in Africa (PIDA). According to the Economic Commission for Africa, PIDA’s 51 program visualizes a fully interconnected, integrated, and transformed African continent (United Nations Economic Commission for Africa, 2018).

Kingombe (2017), further argues that the construction, rehabilitation, and the maintenance of reliable and efficient regional infrastructure would act as a catalyst for development, by bringing down the time and costs of cross-border trade and transport, which in turn would foster trade, create decent jobs, provide a framework for inclusive green growth, and would lead to an integrated continent as a pathway to sustainable development (Kingombe, 2017).

Seven of the seventeen SDGs encompass specific targets that incorporate both rural and urban transport. Access to reliable transport, precisely through trunk and feeder roads, has massive impacts on inclusive growth, access to social services, and regional integration. Transport has stood out as an important tool for reducing emissions, improving equity and reducing poverty. The East African road infrastructure development remains weak in terms of quantity, quality, or accessibility owing to its geography.

The East African community is now focusing on developing a single and integrated regional road transport market characterized by harmonized policies. The development of a more competitive, integrated, and liberalized regional transport network in East Africa will be fundamental to achieving the SDGs. Ad-hoc and fragmented approaches to policy making and private sector consultation mostly result into ineffective transport, trade and
infrastructure development strategies and low policy coherence. These uncoordinated policies have made it difficult to achieve the SDGs. Harmonization of the regional integration policy making process will ensure alignment with the East African member states sustainable development objectives (Kingombe, 2017).

The development of reliable, efficient, and sustainable transport infrastructure systems is of particular importance for the East African region. This augments the special situations description of both Least Developed Countries (LDCs) and Landlocked Developing Countries (LLDCs). In Kingombe’s view, history is indicative that the levels of investment required for the development of large-scale regional infrastructure projects are often beyond the individual capacity of LDCs and LLDCs, this calls for regional cooperation and international financial support. To get this support from the international community would call for the improvement of international support measures considering that the cost of addressing Africa’s infrastructure needs is estimated at around US$100 billion a year (Kingombe, 2017).

The advent of Chinese technology in high-speed rail has become an important driver of infrastructure investment for a number of countries in East Africa. In its strategy to expand the use of its rail technology across the globe China has not only signed high-speed rail corridor agreements with Brazil and Turkey, but also in Africa specifically in East Africa by signing the Northern Corridor Integration Projects (NCIP). China has a critical lower cost factor as compared to other rail technology providers (such as France and Germany) an attractive factor for East Africa (Mpulo, 2014).

The SGR will achieve major milestones in terms of reducing transit times between East African destinations. The CBRC, Construction Company in Kenya has helped ensure that the recipients receive skill development by undergoing training at the Railway training institute (RTI) and elsewhere at the Beijing Biatong University (BBU) in China. This will bring about a change for both young and old East African citizens way of life through
employment creation directly and indirectly. This will go a long way in fostering new investment opportunities and will usher in economic growth and an uplifting of the community. The SGR has directly impacted and guaranteed thousands of East Africans travel every day.

The materialization of Africa’s Agenda 2063 which envisions a peaceful and prosperous continent has been propelled by the Chinese dream. The Wanshou Forum provided the kick start of a new era of China-Africa cooperation. In this forum, diverse topics such as building a China-Africa community of shared future through cooperation in advancing the Belt and Road initiative, were discussed (Global Times, 2018).

China has been very supportive of the South-South cooperation by filling the void created by Western powers to become a dependable partner for Africa in many spheres. The China-funded Standard Gauge Railway (SGR) project is one such initiative which has played a transformative role in East Africa’s economic development. China has enjoyed goodwill in Africa especially in East Africa thanks to investments in critical sectors like transport, manufacturing and information technology that are reshaping the continent’s growth. All the signs tell that China will remain an indispensable partner as the African continent charts a new path to sustainable growth (Global Times, 2018).

The growing Sino-African ties are proving to withstand stereotypical narratives from the West, and appear to be constantly upgrading to new levels with African countries looking up to China as a strategic partner to achieve their vision of a continent that is prosperous, integrated and peaceful.

African countries especially East Africa have reaped huge benefits from China’s foreign policy which has focus on respect for other countries’ political structures. These among other factors have been chief in hastening inclusive growth, peace and stability in Africa.
Moreover, China continues to be a key player in Africa’s quest to modernize its infrastructure, tackle poverty and expedite industrialization.

Work has been completed on the standard-gauge railway from Mombasa to Nairobi, which is now transforming the logistical environment and bringing down freight and travel costs. A recent extension of the rail line to cover ten berths at the Port of Mombasa that is due to be completed in August 2018 will make it possible for cargo to be discharged from a ship and be loaded directly into the SGR. This will enable the handling of conventional cargo such as clinker, fertilizer, grains, and steels. The Standard Gauge Railway (SGR) will soon start handling conventional cargo (Ocharo, 2018).

The multibillion projects are however, mainly being financed by Chinese loans and built by Chinese contractors. This has aroused controversy because of perceptions that the cost is excessive. This, in turn, has generated suspicions that the deal that was entered into between the Kenyan and Chinese governments without open tendering is mired in corruption and bribery. Two parliamentary committees (transport and public investment) and the Ethics and Anti-Corruption Commission (EACC) are probing the deal, although transport officials insist that no wrong doing took place (The Economist Intelligence Unit, 2014).

There have been concerns that the terms of the deal, which require about one third of port cargo to be carried on the new line, will limit traders' freedom to choose their onward mode of transportation. This has already caused a major uproar amongst the traders. Forcing importers to use the railway could be counter-productive. Another controversial aspect of the project is the requirement that one third of port traffic be carried on the new line, which has aroused the ire of importers, shipping companies, clearing agents and other stakeholders at Mombasa port. The Dockworkers Union is also opposed and launched a court case in November 2017 claiming that the contractor had broken procurement laws.
The Shippers Council of Eastern Africa has pointed out that onward transportation is typically at the discretion of the importer and that it would not make sense to use the new railway if tariffs were uncompetitive. However, pricing is unknown at this stage and there is a risk that traders could be locked into a costly tariff regime. This could lead to a much smaller reduction in overall logistics costs than the government is hoping for. Nonetheless, the government is defending the one third rule to justify the economics of the project and to finance loan repayments (The Economist Intelligence Unit, 2014).

In comparison with both international standards and a similarly large rail construction project taking place in Ethiopia, the Nairobi-Mombasa line will cost about US$5.6M/KM, for example, whereas the international norm is about US$2M/KM and Ethiopia's cost is about US$4.8M/KM. In addition, Ethiopia is laying a more expensive electrified, double-track line, whereas Kenya's railway will be single-track and will rely on diesel locomotives. Moreover, the terrain in Ethiopia is more challenging, and Kenya is also paying far more than Ethiopia for a similar array of rolling stock. Based on these figures, concerns about excessive costs appear to have a legitimate foundation, especially as cost overruns are commonplace in projects of this magnitude.

Kenya's need for new transport infrastructure is unquestionable if the country is to achieve a higher growth rate where a modern railway line could generate significant benefits and greatly reduce transit times. However, overpaying for any works would represent a waste of scarce resources, especially if the deals are also tainted by possible corruption. The outcome of the probes by parliament and the EACC are uncertain, but they could, at the very least, help to improve transparency in other planned infrastructure projects (The Economist Intelligence Unit, 2014).

With a market size of over one hundred and sixty eight million people, the East African community guides the interstate free movement of goods, people, labor, services and
capital. With a market this size, the SGR comes at the right time in support of the Common Market which is the second Regional Integration milestone of the East African Community (EAC).
Table 2: Statistics show the Intra-Regional Trade Volumes within EAC in 2013

<table>
<thead>
<tr>
<th>Origin</th>
<th>Rwanda</th>
<th>Burundi</th>
<th>E. DRC</th>
<th>S. Sudan</th>
<th>Uganda</th>
<th>Kenya</th>
<th>Tanzania</th>
<th>Zambia</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rwanda</td>
<td>59,248</td>
<td></td>
<td>152,256</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>472,189</td>
</tr>
<tr>
<td>Burundi</td>
<td>10,799</td>
<td>16,580</td>
<td>206</td>
<td>1,376</td>
<td>263</td>
<td>3,359</td>
<td>13</td>
<td>97</td>
<td>32,566</td>
</tr>
<tr>
<td>E. DRC</td>
<td>21,546</td>
<td>4,274</td>
<td></td>
<td>14,699</td>
<td>135,364</td>
<td>43</td>
<td></td>
<td></td>
<td>175,926</td>
</tr>
<tr>
<td>S. Sudan</td>
<td></td>
<td></td>
<td></td>
<td>2,606</td>
<td>180</td>
<td>97</td>
<td></td>
<td></td>
<td>2,883</td>
</tr>
<tr>
<td>Uganda</td>
<td>693,967</td>
<td>88,879</td>
<td>189,646</td>
<td>121,346</td>
<td></td>
<td>202,276</td>
<td>28,050</td>
<td>113</td>
<td>1,324,227</td>
</tr>
<tr>
<td>Kenya</td>
<td>139,248</td>
<td>62,978</td>
<td>154,835</td>
<td>319,919</td>
<td>1,266,624</td>
<td>473,195</td>
<td>29,268</td>
<td></td>
<td>2,446,067</td>
</tr>
<tr>
<td>Tanzania</td>
<td>199,482</td>
<td>191,117</td>
<td>220,107</td>
<td>2,939</td>
<td>76,791</td>
<td>280,105</td>
<td></td>
<td>105,484</td>
<td>1,076,025</td>
</tr>
<tr>
<td>Zambia</td>
<td>3,143</td>
<td>26,871</td>
<td></td>
<td>23,866</td>
<td></td>
<td>45,181</td>
<td></td>
<td></td>
<td>99,061</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,068,185</td>
<td>433,367</td>
<td>733,424</td>
<td>444,410</td>
<td>1,380,734</td>
<td>646,957</td>
<td>786,922</td>
<td>134,975</td>
<td>5,628,974</td>
</tr>
</tbody>
</table>

Source: (CPCS, 2016).

The figure above captures the international and inter-regional traffic flows that came through the gateway ports of East Africa. Another special category of domestic flows is those that neither cross national borders nor go to the ocean ports. Such include cement, limestone, agricultural products etc. Both categories will provide sizeable volumes for the standard gauge railway as they are not exhaustive and will only tend to increase with time.

Key developments in East Africa are set to provide supplementary traffic prospects for the SGR and are seen to impact the potential railway line traffic volumes. These developments include the Northern Corridor Pipeline which is proposed to traverse Kenya, Kampala and Rwanda. The second one is the crude pipeline development from South Sudan to Lamu. This would provide a transport market for the SGR which is an option besides the pipeline. The third one is the Lapsset project which would include the Lamu port, Lapsset railway, Lamu oil refinery, and Lamu, Isiolo and Lokichokio airports. The figure below projects volume traffic in a thousand tonnes when the Lapsset project is finally fully operational.
Table 3: Lapsset Freight Volume Forecasts for 2020 & 2030 (000 tonnes)

<table>
<thead>
<tr>
<th>Segment</th>
<th>2020</th>
<th></th>
<th>2030</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Railway</td>
<td>Highway</td>
<td>Total</td>
</tr>
<tr>
<td>S. Sudan-Isiolo</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulk</td>
<td>1,006</td>
<td>1,005</td>
<td>1,374</td>
<td>1,374</td>
</tr>
<tr>
<td>Break Bulk</td>
<td>423</td>
<td>338</td>
<td>85</td>
<td>552</td>
</tr>
<tr>
<td>Livestock</td>
<td>6</td>
<td>6</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>Liquid</td>
<td>77</td>
<td>77</td>
<td>105</td>
<td>105</td>
</tr>
<tr>
<td>Refrigerated</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Container</td>
<td>2,285</td>
<td>2,285</td>
<td>3,475</td>
<td>3,475</td>
</tr>
<tr>
<td>Total</td>
<td>3,797</td>
<td>3,635</td>
<td>5,521</td>
<td>5,385</td>
</tr>
<tr>
<td>Ethiopia-Isiolo</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulk</td>
<td>1,097</td>
<td>1,097</td>
<td>2,633</td>
<td>2,633</td>
</tr>
<tr>
<td>Break Bulk</td>
<td>1,622</td>
<td>1,298</td>
<td>324</td>
<td>3,194</td>
</tr>
<tr>
<td>Livestock</td>
<td>6</td>
<td>6</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Liquid</td>
<td>67</td>
<td>53</td>
<td>14</td>
<td>95</td>
</tr>
<tr>
<td>Refrigerated</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Container</td>
<td>1,654</td>
<td>1,654</td>
<td>3,786</td>
<td>3,786</td>
</tr>
<tr>
<td>Total</td>
<td>4,446</td>
<td>4,108</td>
<td>9,723</td>
<td>9,065</td>
</tr>
<tr>
<td>Isiolo-Garissa</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulk</td>
<td>2,103</td>
<td>2,103</td>
<td>4,007</td>
<td>4,007</td>
</tr>
<tr>
<td>Break Bulk</td>
<td>2,045</td>
<td>1,636</td>
<td>409</td>
<td>3,746</td>
</tr>
<tr>
<td>Livestock</td>
<td>12</td>
<td>12</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Liquid</td>
<td>144</td>
<td>54</td>
<td>90</td>
<td>200</td>
</tr>
<tr>
<td>Refrigerated</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Container</td>
<td>3,939</td>
<td>3,939</td>
<td>7,261</td>
<td>7,261</td>
</tr>
<tr>
<td>Total</td>
<td>8,243</td>
<td>7,744</td>
<td>15,244</td>
<td>14,371</td>
</tr>
<tr>
<td>Garissa-Lamu</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulk</td>
<td>4,703</td>
<td>2,103</td>
<td>2,600</td>
<td>8,882</td>
</tr>
<tr>
<td>Break Bulk</td>
<td>2,370</td>
<td>1,636</td>
<td>734</td>
<td>4,192</td>
</tr>
<tr>
<td>Livestock</td>
<td>18</td>
<td>12</td>
<td>6</td>
<td>45</td>
</tr>
<tr>
<td>Liquid</td>
<td>529</td>
<td>54</td>
<td>475</td>
<td>765</td>
</tr>
<tr>
<td>Refrigerated</td>
<td>64</td>
<td>64</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td>Container</td>
<td>5,814</td>
<td>3,939</td>
<td>1,875</td>
<td>9,882</td>
</tr>
<tr>
<td>Total</td>
<td>13,498</td>
<td>7,744</td>
<td>5,754</td>
<td>23,861</td>
</tr>
</tbody>
</table>

Source: (CPCS, 2016).
Table 4: EAC Rail Network Total Traffic Forecasts, 2015 – 2075 (million tonnes)

<table>
<thead>
<tr>
<th>Scenario</th>
<th>2015</th>
<th>2025</th>
<th>2035</th>
<th>2045</th>
<th>2055</th>
<th>2065</th>
<th>2075</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimistic</td>
<td>9.4</td>
<td>57.9</td>
<td>75.0</td>
<td>100.6</td>
<td>140.0</td>
<td>202.5</td>
<td>301.9</td>
</tr>
<tr>
<td>Base Case</td>
<td>6.7</td>
<td>30.3</td>
<td>43.1</td>
<td>61.9</td>
<td>90.4</td>
<td>134.9</td>
<td>204.3</td>
</tr>
<tr>
<td>Pessimistic</td>
<td>4.1</td>
<td>17.0</td>
<td>26.2</td>
<td>39.5</td>
<td>59.3</td>
<td>89.8</td>
<td>136.6</td>
</tr>
</tbody>
</table>

Source: (CPCS, 2016)

Diagram 4: EAC Rail Network Total Traffic Forecasts, 2015 – 2075 (million tonnes)

Source: (CPCS, 2016).
4.2.2 SGR and Job Creation in East Africa

The transformative power of a railway line has already been demonstrated by the current SGR line in Kenya; its deficiencies notwithstanding. Kanyua, (2014) opines that the transport channels that serve the port of Mombasa’s hinterland; and which constitute the greater Northern Corridor account for over 80 per cent of Kenya’s Gross Domestic Product (GDP). Kanyua (2014), further provides that the old railway line was a British enterprise built over 50 years ago with an objective to open up the Kenyan interior and provide access to overseas markets for goods (mostly agricultural produce) from the expansive hinterland (Kanyua, 2014). The map of Kenya points to a clear linear pattern to urbanization, with the railway line being the common denominator among Kenya’s main towns (Kithinji, 2016).

According to a World Bank report, the project will significantly boost Kenya’s GDP, making the country one of the fastest growing economies in sub Saharan Africa for the next 15 years. The SGR project comes at a time when Kenya is working tirelessly to position itself as the socio-economic powerhouse in the region. The concept and execution of the project is a multi-pronged approach to deliver sustainable development in East Africa. It remains to be seen how East Africans will take advantage of this new infrastructure (Zhao, 2016). If the entrepreneurial spirit exhibited by East Africans in the past is anything to go by, East Africa eagerly awaits and looks forward to the completion of this project.

China Road and Bridge Corporation (CRBC) is the construction company that implemented the mega SGR infrastructure project that is deemed an early result of the Belt and Road Initiative proposed by China in 2013. This program aims to build trade and infrastructure networks connecting Asia with Europe and Africa. According to Pigato and Tang (2015), China’s attraction to invest in Africa appears to be purely aligned to resource gains and the global power politics and a strategy to emerge as the centre of world development by connecting countries through infrastructure (Pigato & Tang,
2015). CRBC with the help of the ministry of roads and infrastructure aims to complete the SGR projects in Kenya and Uganda. According to Professor Munene United States International University Africa (USIU), the CRBC’s plan is to extend the SGR to Lake Victoria and beyond and possibly link up the SGR from Nairobi to the LAPSET Corridor from Lamu at Isiolo. Professor Munene opines that this move portends a regional economic and security boost to transform Eastern and Central Africa (Munene, 2018).

The transport ministry has concentrated on the development, design, and designing of infrastructures in transport and infrastructure. The ministry has spurred the development of the national economy and this has improved the level of employment. Mbambazi (2014) stated that East African governments aim at transforming the transport sector into a world class level to ensure that the quality of life in East Africa is improved. Additionally, the transformation will ensure the transport services are accessible, safe, efficient and sustainable (Mbabazi, 2014).

The contrary could also be true. The famous Chinese slogan of connecting Nations prospering People that appear on the SGR is part of China’s one Belt One Road Initiative. This could be China’s strategy to dominate the African continent in what is seen as sugar coated neo colonialism. China has put up huge infrastructure projects around the world to include sea ports, sky scrapers, bridges and now railway lines. This could well be fish bait in the African pond. China accounts for most of the huge loans extended to African countries. This could be an explanation as to how China’s economy has grown between the years 2010 – 2014 when she began strengthening ties with Africa.

The SGR has created many job opportunities; but not all of these jobs are going to the ordinary East African. Chinese companies import their own labor and tend to employ majority of the locals for casual jobs and that at a stingy pay. In Kenya, some local staff
especially the locomotive drivers reported cases of harassment, discrimination and wage disparity despite being equally qualified as their Chinese counterparts. For example, according to Wasonga (2018), some Forty local locomotive drivers hired by the Chinese operator reported an earning of KSh30,000 monthly while their Chinese counterparts take home KSh180,000 for the same job (Wasonga, 2018). The Chinese are determined to run the SGR for 10 years before the project is officially branded Kenyan (Obala, 2017).

Reports from the ministry of transport in Kenya have revealed that the SGR project in Kenya incurred a 10 billion loss in her maiden year of operation owing to low cargo business (Mwiti, 2018). The SGR also comes through as a very costly enterprise whose maintenance is impacting quite heavily on the Kenyan tax payer to keep the project running. According to Wafula (2018), this is because the SGR operation between Nairobi to Mombasa costs KES 1Billion in a month. This makes the SGR one of the most expensive infrastructure projects in the country (Wafula, 2018).

According to Mishra, Welch and Manoj, the new railway in Kenya has so far supplemented road transport, and will in future increase the efficiency of the Northern Corridor by providing a gateway that will link Kenya’s Maritime Port of Mombasa to the landlocked economies of Uganda, Rwanda, Burundi and South Sudan (Mishra, Welch, & Manoj ). The SGR has gone a milestone in significantly reducing the cost of road maintenance. By reducing many trucks from the roads, road tear and wear will significantly reduce and consequently this will lower the cost of doing business in the region.

The SGR has contributed to an improvement in trade and has attracted foreign investments. The implementation of the SGR is expected to transform Uganda, Rwanda, Burundi and the larger East African region for the better. Kenya being a prime example Mbabazi (2014), has shown how the SGR has satisfied the growing demand for port
services brought about by growing regional economies. There is a second commercial port underway at Lamu under the LAPSET project (Mbabazi, 2014). The Mombasa and Lamu Port are the beginning of a second transport and economic corridor for Kenya and the region.

The SGR appears to be gradually solving the problems that are currently facing the transport of cargo from Mombasa to various destinations. The decongestion of the port is one of the policies of the SGR project. In Kenya, the Government is coming up with a policy to have cargo above 15 tonnes transported using the trains to avoid damage of the roads. The project will reduce the cost of transporting the cargo that has been previously very expensive using the roads.

Uganda is a low income country with the income per capita estimated to be $506 and is focusing on transforming the economy to $9500 by 2040. The SGR project will enable Uganda to be categorized among the lower middle income earners in the year 2032 (Mbambazi, 2016). The government of Uganda has urged the various public departments to understand the importance of the infrastructural development such as the SGR since the railway line will ease road traffic.

Other ways that the SGR will directly and indirectly create employment opportunities is through the creation of opportunities for rolling stock leasing. The SGR will open up the East African countries through industrial business prospects and leisure parks. Hotels for planned accommodation will also come up and feeder transport systems will emerge such as the feeder road from Miritini via Kenya Ports Authority (KPA) to Changamwe in Mombasa.
4.2.3 SGR and Environmental Conservation

Like the rest of the world, East Africa is grappling with ways to tackle climate change by managing carbon emissions. Transport infrastructure should save energy, embrace safety, and be environmental friendly. The SGR will provide reprieve to the environment as it will significantly lower emission than the current meter gauge railway in present use. In future, as the East African region attains self-sufficiency in power generation, electric engines will be introduced to replace diesel ones. The introduction of electric-powered trains is expected to make the running of the SGR cheaper.

The SGR has enhanced protection of the ecological environment by building special passages for wild animals. Overpasses come with a huge cost but can be covered in soil, grass and shrubs to look like a small hill, the underpasses on the other hand can be intimidating to animals. Kenya is on the balance between losing its reputation as a bastion for wildlife and preservation in its race to modernize its colonial-era infrastructure to fit the needs of a middle-class industrial economy. Among the contribution of wildlife to the environment apart from their majesty, elephants for example are important to the rest of the wildlife because they dig wells and spread seeds. There are ripple and dramatic effects when you lose an elephant (Kushner, 2016).

Railways are increasingly becoming elements of a complex mobility system. They have become increasingly integrated, connected, efficient and user-friendly and have provided customers with seamless end-to-end journeys that combine all modes of transport available (European University Institute, 2017). According to Rodrigue (1998), this mobility brings about activities that have a wide range of environmental consequences which bring a cost that have to be assumed by both the railway users and the larger society (Rodrigue, 1998). Environmental issues can have negative health impacts. Societal tolerance to environmental externalities has significantly evolved. As income and levels of education increase, a society becomes more aware of environmental concerns and has less tolerance for its negative impacts.
Transportation has been blamed for contributing to atmospheric emissions from pollutants especially by the internal combustion engine which are associated with a great deal of air pollution and global climate change. Some pollutants (NOx, CO, O3, VOC, etc.) have produced respiratory troubles and aggravated cardiovascular illnesses. It is estimated that 3 million deaths per year are related to air pollution, although the contribution of transportation is less clear. In urban regions, about 50% of all air pollution emanates from automobile traffic. Since pollution is a health issue, its societal impacts are perceived to be significant (Rodrigue, 1998).

According to Samuel (2012), noise is a major irritant. It can impact on human health as well as human welfare. Noise can be manifested in three levels depending on emissions intensity; psychological disturbances (perturbations, displeasure), functional disturbances (sleep disorders, loss of work productivity, speech interference) or physiological disturbances (health issues such as fatigue, and hearing damage) (Samuel, 2012).

Projex.com (2016) indicates that in some countries, noise and vibration associated with trains, trucks, and planes in the vicinity of airports are major irritants and have commonly been associated with lower land values since it makes these locations less desirable. The same is true for East African countries especially for personal homes. The contrary may also be true. Land value in these areas may significantly increase as land becomes of high demand for thriving businesses such as hotels and eatery places (Projex, 2016).

To reduce the impact of rail vibrations the below different approaches have been proposed:

1. Installation of rubber insulators. It is thought that making use of rubber insulators under the track tends to dampen the vibrations. Rubber insulators have been proven to be long-lasting and economical. They can either be installed with new tracks or through track maintenance.
2. Track maintenance is another effective way to keep the tracks and trains well maintained. Rickety tracks are noisier and produce greater vibrations when trains pass over them when compared to tracks and trains that are kept in a serviceable state of repair.

3. Tracks can be raised to combine with adequate walling and insulation. Raised tracks greatly reduce the vibration impact in comparison to tracks located on the ground. Another way is to build underground tracks. Granted, a subway can still cause some vibrations, but the earth comes in to absorb a significant amount of the vibration and reduces the impact for those above and around the track.

4. Accidental and nominal runoff of pollutants from transport vehicles such as oil spills, are sources of contamination for both surface water and groundwater. In addition, rail tracks are more prone to floods with intense rainfall. Rail tracks just like other transport infrastructure consume a lot of space bearing in consideration its massive supporting infrastructure and equipment. Rail tracks take up community space and have also brought about competition and contention between societies. Ultimately, these impacts have adverse consequences on the quality of life of nearby communities.

According to Rodrigue (1998), most societies have succeeded in mitigating environmental externalities of transportation by imposing regulations related to standards, level of emissions and operating conditions. Jurisdiction and advocacy groups have also played a significant role at promoting and defending existing environmental concerns (Rodrigue, 1998).

Rodrigue (1998), continues that many transportation infrastructure projects, such as railways, roads, terminals and pipelines, have become embattled in public debates over
environmental and at time aesthetic concerns. This calls for societal change requiring careful consideration of not only technical and commercial aspects of transportation infrastructure, but their level of social acceptance, or at least tolerance (Rodrigue, 1998).

Animals do not relate well with changes. For instance, the Qinghai-Tibet railway in China was built with wildlife passages beneath it. This necessitated the Tibetan antelope more than 10 years to adapt to the new paths, significantly impacting their feeding, migration and breeding patterns. In Tsavo, at least 18 elephants were killed by trains on the old railway or by trucks on the adjacent Mombasa-Nairobi highway since 2016 (cambridge.org, 2007).

Illegal settlements in Kenya for example have encroached and blocked some vital passages along the SGR line. This tendency could risk increased human-wildlife conflict and eventually if not controlled block the Tsavo East and Tsavo West link. Some of the wildlife passages have been used to illegally herd thousands of cattle into the national parks, a practice that exacerbates habitat degradation at the passages. Okita-Ouma (2017), points out that the SGR presents a great opportunity to design and develop infrastructure with wildlife in mind, or develop the country while keeping its national heritage intact (Okita-Ouma, 2017).

According to Ambani (2017), the construction of the SGR in Kenya which cuts through Kenya’s National park has as would be expected, sparked sharp protests by the civil society and environmentalists. The SGR encroaches on 87.29 hectares of the Nairobi National park wildlife habitat. This move has interfered with the accustomed wildlife migration and breeding corridors. The SGR has compensated for this with culverts and passages for the animals to use. This poses a challenge to the animals since its takes a long time for animals to adapt to changes. The construction of Transport Infrastructure
creates a movement barrier for most terrestrial animals and occasionally causes deaths of the animals as they attempt to cross (Ambani, 2017).

4.2.4 SGR and Tourism promotion in East Africa

The year 2017 was officially declared as the International Year of Sustainable Tourism for Development by the United Nations World Tourist Organization (UNWTO), the International Union of Railways (UIC) launched TopRail in 2016 to actively promote sustainable railway tourism. Its purpose is to enable close collaboration between stakeholders and their customers in order to grow railway tourism opportunities (Lempriere, 2017).

According to the TopRail project manager Ms. Vanessa Perez, from the onset of the nineteenth century, the concepts of tourism and travel are intrinsically linked, and tourism represents 10% of global GDP and one of every 11 jobs. It is thought that Travel and tourism continue to expand and have hitherto become one of the fastest-growing economic sectors in the world. The tourism sector is among the foreign income earners for East Africa and the third largest industry in the world trade after the oil and gas industry. The Standard gauge railway management is keen to stimulate travel across the region and to improve the tourism sector (Lempriere, 2017).

The tourism industry is built such that the customers go to the site to get service and not the other way round. A region may have natural beauty and all imaginable tourist attractions, but without appropriate physical and institutional transport infrastructure to take people to the region to exploit the potential of the region and its natural endowments tourists will not be able to enjoy the fruits of our God-given gifts. The SGR has opened up a physical connectivity moving away from the not well developed and in some places poor or non-existent transport infrastructure (Kikwete, 2012).

As is elsewhere around the globe, transport is a very vital component of activities in the tourism industry. Transport, the tourist product (or supply) and the tourist market (or
demand), all together form the three fundamental components of tourism (Michniak, 2016). In addition to the transport of tourist passengers to and within a destination, transport itself can be a tourist attraction that brings out the strengths of regional culture and communication. The breathtaking SGR passenger train in Kenya popularly known as Madaraka Express appeals to all types of customers, from children to the elderly and retirees and families, as well as rail transport enthusiasts because of its reasonable fares, safety, and comfort. Railway travel encapsulates a romantic era of tourism.

The idea of supporting sustainable tourism in East Africa using railways is not only a strategic framework for ensuring a positive image of the SGR, but is also a response to social concerns in the region. This will create a competitive advantage and manage risk hence a great tool for regional integration and development. Transport is an integral part of activities in the tourism sector.

With a capacity of transporting Nine Hundred and Sixty regular passengers per trip from Nairobi to Mombasa, the SGR will offer both local East African and international tourists the multidimensional and breath taking view of the vast East African panorama and a free scenic view of the rich wildlife while traversing the Tsavo National park in Kenya. The passenger trains would offer tourists a chance to interact with the rich East African culture as they visit dynamic culture hot spots across the region.

The SGR trains are built to meet comfort and luxury as the tourists experience the rich and diverse culture of East Africa. There ever smiling and courteous attendants are at the service of the traveler. The trains are well designed and customized to give the tourist a traverse of the various East African states and a detailed picture of the particular town or state.

The SGR passenger trains have introduced air conditioning and free wireless fidelity (WIFI) for all travelers to enjoy. The trains and stations are clean and have physical armed police officers on duty. This makes a good first and lasting impression to both
local and foreign tourists in the region. This is in contrast with the boring and grueling
railway transport system passengers had to contend with in East Africa in the previous
century. The rich East Africa terrain offers tourists on the go the refreshing ability to
view wildlife and to explore the mountains and the rich country side in a unique way.

According to Lempriere (2017), in the year 2017, only 2% of international tourists used
rail networks, today, there is significant growth potential for railways especially in Kenya
and UNWTO forecasts an increase of 3.3% of international tourist arrivals year-on-year
and Kenya is not to be left out of this equation. This would equate to an estimated 1.8
billion tourists travelling the world, East Africa included in 2030 (Lempriere, 2017).

The combination of the railway’s vital role in East Africa’s economic development and
current tourism trends support the region’s rail tourism’s opportunities for growth. Train
customers feel more empowered than ever before in shaping their tourism experiences.
Travel and tours companies in the region can now attract new customers by inventing and
marketing quality products tailored on the needs and expectations of the travelers. This
goes a long way towards generating positive stimuli and quality experiences where rail
transport is concerned.

The East Africa National museums in are a great place often frequented by tourists and
other rail enthusiasts to study the rich history and evolution of the Railway line and rail
transport system in East Africa. This great albeit almost forgotten mode of transport has
come a long way. Today railway travel in East Africa has gone a notch higher to
encapsulate a romantic era of tourism. From the old Lunatic express, East Africa now has
an ultra-modern high speed train good enough to move tourists closer to their destinations
luxuriously and efficiently.

The development of the SGR as a transportation means will speed up the development of
tourism in the region. The SGR will link tourists with various tourist destinations. It is
widely thought that tourism expands more when better transportation systems are in
place. The tourism sector in East Africa is among the main important sectors of the regional economy. The East African countries take advantage of covering their budget deficits with proceeds realized from tourism (Mdusm, 2016).

East Africa prides herself among global tourist destinations. Tanzania and Kenya are the hosts of the eighth world wonder. In the year 2010 alone, the East Africa region received about 4.3 million tourists and holiday makers from the international market. This is a small number when it is compared to the world’s total of over 900 million tourist arrivals in 2010. Tourism is an important source of tax revenues to the East African governments. In 2011, the tourism sector accounted for 17 per cent of the Gross Domestic Product (GDP) in Tanzania; 5.7 per cent of the GDP in Kenya; 4.0 per cent of the GDP in Uganda; 3.3 per cent of the GDP in Rwanda and 3.6 per cent of the Burundian GDP (Kikwete, 2012).

The East African community member states need to cooperate and forge a strong alliance in order to stand more chances to benefit from the region’s tourist attractions such as joint promotion of the East African tourism market, international tourist fairs. The ongoing issuance of a single tourism visa for the East African tourist market has greatly helped in promoting the community as a single tourist destination and is creating synergy in the tourism industry across the region (Kikwete, 2012).

The recent review of the 30 per cent annual growth in the Chinese tourists to Africa since 2012 brings about an economic boost to East Africa. Among the countries mentioned as likely to benefit from Chinese global adventurism is Tanzania. Kenya and Tanzania are listed among the ten countries considered the most competitive destinations for tourism in Africa and are most likely to benefit from increased numbers of visitors from China and other countries around the world. The increase in direct flights to some Chinese cities and the upcoming direct flight connection to the United States of America as the case is with Kenya has encouraged more visitors to Africa. For example, China Southern Airlines
increased the number of flights between Nairobi and Guangzhou city to three from two previously.

According to Irungu (2018), Kenya Airways has already signed a code share agreement with Hong Kong Airlines increasing the frequency of flights to daily from once a week between Nairobi and Hong Kong targeting the growing trade with the Chinese city. This has directly seen a further increase in tourism in East African destinations (Irungu, 2018).

The SGR has brought tourists closer to their destinations. The Kenya big five comprising of the Elephants, Rhinos, Lions, Cheetahs and buffalos are recognized as the most dangerous animals in the world and are mostly available in Kenya and Tanzanian National parks. The great wildebeest migration is now among the world wonders. The Kasubi tombs in Uganda are among the sights and sounds that many a tourist would find refreshing to see in the East Africa.

In Burundi tourists have found the beaches of beautiful Lake Tanganyika inviting. Attractions like the Kasumo area, the southernmost source of the Nile or stunning Saga Beach continue to be popular sites with tourists.

In Kenya, unlike elsewhere, wildlife sightings and the unadulterated Masai culture are unparalleled. The Masai are actually the tourist symbol for Africa. For tourists seeking outdoor adventure, a hike around Mt. Kenya or the Nandi Hills strategically situated by nature at the edge of the Great Rift Valley is rejuvenating. The Amboseli National Park and Lake Nakuru, Hell's Gate National Park, and the port city of Mombasa and Lamu are places where tourists can try the cultural donkey back rides and the rich Swahili culture.

Apart from being the third cleanest and greenest city in the world, Rwanda prides in offering the gorilla trekking for an unforgettable, up-close experience with mountain gorillas in Rwanda's Parc de Volcans. For tourists seeking a sobering and religious
experience, the churches at Kigali and St. Famille offer just that. Further, tourists can sign up for a personal tour by survivors of the horrifying mass murders in the great genocide.

Tanzania is home to spectacular scenery and culture. Mt. Kilimanjaro boasts the highest point in Africa, and enthusiastic tourists can enjoy a long hike or scenic drive to the summit. The Serengeti National Park are a must visit while in Tanzania for tourists who want to capture one of the world wonders - the wildebeest migration. Elsewhere, the Ngorongoro Crater is home to spectacular wildlife viewing. Tourists seeking a more urban experience will be directed to travel to Zanzibar and explore the old Stone Town and stunning beaches.

Uganda, the pearl of Africa, is home to the Mountains of the Moon in Rwenzori National Park are the highest range in Africa. The world-class whitewater rafting in Jinja, the source of the Nile River, Bwindi Impenetrable National Park and the elusive mountain gorillas are great top of the list attractions to see in the banana country of Uganda (Smith E., 2017).
CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction
The study found out that the SGR has played a crucial role in increasing freight, volume, strengthening passenger transportation capacity, boosting the domestic economy and East African Community infrastructure development, creating employment opportunities, stimulating the regional economy and enhancing people’s living standards in the region. Internationally, the SGR is a start of a new chapter for Africa’s regional development and is a game changer in promoting EAC international competitiveness.

5.2 Summary of Findings
The SGR is an ambitious and a very costly mega infrastructure project in East Africa. So far the sections that have been completed have borne fruit. The project requires 100% participation and cooperation from the East African countries to realize its full potential, that of integrating the East African region to a level where the EAC can compete with other regional blocks.

The SGR integration in the EAC will open up more employment opportunities especially for the youth. This will eventually go a long way towards building up the respective countries’ GDP and a strong regional economy.

The SGR will open the East African region to tourism prospects which is a great foreign income earner for the region. The SGR will also go a long way in environmental conservation and in reducing the effects of climate change.

5.3 Conclusion
The construction and development of the standard Gauge transport infrastructure in the East African region is a major element of the regional economy modernization and aims at a further national economy growth and improving the social sphere. The integrative
role of transport infrastructure will strengthen the domestic economic environment on the basis of the regional integration of the East African community. The SGR will provide economic and strategic unity of the East African member states and will play a major role in the integration of the constituent sectors and will also be a stabilizing factor of the region’s economy.

5.4 Recommendations

The ticketing experience needs to be revamped. This can be attained by building an e-ticketing or online platform such as is with the airline industry or modern long distance bus services. This would particularly be helpful to passengers where they can book and plan their trips without hassle. The mobile provided booking system where one dials *639# from a cell phone to book a ticket is a good starting point and should be supported by the online approach just in case there is a challenge with the mobile providers.

Auto ticketing or smart ticketing alongside effective connections with other train services and the bus network would provide benefits of a quick method that can be used to pay for tickets especially for shorter trips such as the intercity stops. In the United States of America, Metro transport is a great example of how well auto ticketing has fit into the industry. All passengers need is to buy a card, called a smart trip card, at one of the railway terminus then load it with cash. The card is then swiped as one boards a train or a bus. Alternatively, for those without a card, there is an auto slot machine on the train where one inserts the cash needed for the trip.
The SGR in Kenya initially started with one trip a day but it currently has two trips daily from Mombasa to Nairobi. With East Africa slowly embracing the 24 hour economy, the SGR management should start considering revolutionizing the SGR into a 24/7 transport system. This will speed up development growth and enhance income generation.

To keep up with embracing and assisting the disabled and elderly in society, the SGR needs to incorporate disabled-friendly facilities such as washrooms and priority seats to cater for the disabled and the elderly in society.

To enhance tourism in East Africa, the EAC is strongly encouraged to consider building tourist railways for tourists to be able to explore the rich heritage in East Africa. These can be operated across the region and can be tailor made to take tourists closer to their
destinations as the case is with the legendary tourist train in India, Colorado, Europe, West Virginia and other countries.

Rail transport continues to be a significant mode of transportation for both passengers and cargo with the entry of the Standard Gauge railway in Kenya, traveling by rail from Nairobi to Mombasa and back has become a very popular and convenient form of passenger transport. Although trains are more energy efficient as compared to automobiles, they do have effects on the environment which are not limited to producing nitrogen dioxide, carbon dioxide, and particulate matter. All these waste products contribute majorly to air pollution and are hazardous to health. When natural habitats are destroyed to pave way for railway construction, fragmentation of ecosystems and wildlife habitats is inevitable. These come about when these railroads act as physical barriers when animals are unable to cross through their usual habitats due to infrastructure characteristics. In addition, wildlife mortality collisions are high due to manmade barriers and human disturbance. In Kenya for example, over 15 elephants have died as a result of railway accidents. The construction of the SGR has disrupted animal movements, feeding and breeding behaviors. Animals take long to adapt to new environments.

The Government should consider building an interchange that actually includes a bus service. In the cities of Nairobi and Mombasa for instance, passengers have to find a means of commuting from the town center to the SGR train stations. This with the regular traffic makes travelling to the train station a nightmare and can cause unprecedented delays.

In Kenya, most accidents on the railway are caused by animals wandering into the protected area. The recent example is where the perimeter was torn down by an elephant and later a cow used this breach to graze on the grass near the railway track. Coincidentally a train that was passing derailed after hitting the cow. Railway patrol teams should be put in place to inspect breaches on the perimeter fence and provide early
warning for oncoming traffic to slow down. Communities living near the SGR tracks should be educated and sensitized to keep their livestock from grazing on the tracks. The same should apply to game wardens who should be alert to prevent animals especially elephants from veering off into railway tracks.

To better enhance the effectiveness of the SGR trains, the study recommended that the East African Governments source for better and modern locomotives for the SGR. The current situation is that Kenya for example is importing the old fashioned and psychedelic locomotives from China. These locomotives when in motion have less resistance to air. The East African countries should activate their EAC bargaining power to demand for modernized and better locomotives at subsidized costs which will go a long way in cutting costs in the future.

The findings of this study have confirmed flyvbjerg’s global finding that infrastructure megaprojects are usually delivered over budget and behind schedule. This is true since the summit that led to the signing of the Tripartite Agreement for the development and operation of the SGR between Mombasa-Kampala-Kigali with branch lines to Kisumu (Kenya) and Pakwach/Gul-Nimule (Uganda) between the Republics of Kenya, Rwanda and Uganda was signed in August 2013 and was flagged off in 2017. However, owing to the immense benefits already realized with the onset of the SGR, the findings of this study did not confirm the view that these projects are delivered with benefit shortfalls. In particular, infrastructure megaprojects generally suffer more from schedule delay as compared to cost overrun. This is attributed to the typical form of contractual arrangement used in the delivery of these projects.
5.5 Suggestions for further research

An interesting area of interest which the study would have liked to explore but which was outside the scope of the study would be the impact of the China’s emerging super power on the African continent or the effects of China’s emerging economic growth superpower on Africa. From the tourist perspective, one would wish to explore whether railway transport is more reliable when it comes to moving mass numbers of tourists faster from one destination to another.

Many a researcher would be interested in making an analysis of the impact of railway transport on tourism among other research fields.

With the background that megaprojects have a long payback period, and to give a clearer picture of both product and organizational success, it is recommended that another study be conducted after about ten years to ascertain the benefits of this project. In light of the findings of this study, it is recommended that the SGR megaproject facilitators and Governments implementing it adopt project structures that allow for innovation through the use of advanced technology. These structures should encourage the use of competitive tendering and a preference for pain/gain contractual arrangements to accommodate the differences in risk preferences between the client and the contractor, and to minimize the incidences of corruption among the various stakeholders.

Professionals, consultants, policymakers, stakeholders and Government advisors in the engineering and transport sector will benefit from this study from a cost benefit analysis point of view when comparing the SGR project successes and challenges with similar projects around the continent to know what went right or what went wrong where and how in the project so as to make informed decisions in the future. The study could be extended to study the nexus between railway transport and road transport in development and regional integration matters.
REFERENCES


42. CPCS. (2016). *EAC Railway Sector Enhancement project.* CPCS.
http://www.crbc.com/site/crbcEN/503/info/2017/4409357.html?id=06f6bff4-beef-
443f-ac83-b9fca1352e9?hfbcvovcvhovqvxml


can.co.ke:

http://www.theeastafri

can.co.ke/rwanda/Business/Rwanda-SGR-cargo-passenger-terminals-confirmed/-1433224-4263180-pr7hrdz/index.html


http://fsr.eui.eu/role-railway-undertakings-mobility-future/


64. Friends of the Earth - Fact Sheet. (n.d.). *Why travelling by rail is better for the environment.* Retrieved April 10, 2018, from www.foe.co.uk: www.foe.co.uk


136. Michniak, D. (2016). © 2016 Author(s) This is an open access article distributed uROLE OF RAILWAY TRANSPORT IN TOURISM: SELECTED PROBLEMS AND EXAMPLES IN SLOVAKIA. researchgate.


https://www.standardmedia.co.ke/business/article/2001289951/china-s-african-ties-unsettling-the-west


118


207. Uganda Vision 2040. (n.d.).


