THE ROLE OF RAIL TRANSPORT TO THE PORT PERFORMANCE:

A CASE OF DAR ES SALAAM PORT

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A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION IN TRANSPORT AND LOGISTICS MANAGEMENT OF THE OPEN UNIVERSITY OF TANZANIA

2015

CERTIFICATION

The undersigned certifies that he has read and hereby recommends for acceptance by the University a dissertation entitled **"The Role of Rail Transport to the Port Performance: A Case of Dar es Salaam Port"** in partial fulfillment of the requirements for the degree of Master of Business Administration in Transport and Logistics Management of the Open University of Tanzania.

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Dr. Salvio Macha

(Supervisor)

……..

Date

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DECLARATION

I, **Ambwene Mwakibete,** do hereby declare that this dissertation is my own work and that; it has not been presented and will not be presented to any other University for a similar or any other degree award.

……..

Signature

……..

Date

DEDICATION

To my family and my children, all of you I say thank you.

AKNOWLEDGEMENT

In conducting this study I have benefited enormously from the help and assistance of many people. I would like, first, to thank my supervisor Dr Salvio Macha for the supportive comments and criticism which have become the strength of this study. Whilst it is impossible to name them all, I would particularly like to thank my course instructors for academic nurturing.

Special thank should go to my family for their support, care and tolerance as well as moral and material support in the whole period of my studies. Lastly, would like to thank my respondents and post graduate course mates for the support and sharing ideas.

ABSTRACT

The study examined the role of rail transport in improving the port performance with particular reference to Dar es Salaam port. The study used exploratory research methodology and survey techniques to collect data related to the topic understudy. Both qualitative and quantitative approaches were used in data analysis. In particular, the software used is SPSS Version 16.0 and Ms Excel. The findings of the study revealed that rail transport plays a great role in the port performance. Among them include reduction of port congestion, improve cargo handling system and increases the port and government revenues. It increases the average of cargo traffic, lowering the cost of logistic and improves customer satisfaction. Therefore, rail transport is one among the major factors which can accelerate the growth in economies. Despite of this contribution to port performance, the situation of railway transport is in a poor state. It is noted that, the government have invested mainly in road infrastructure improvement, while neglecting railways. The responsible factors for this decline includes lack of efficient rail system, low capacity of rail transport, poor emphasis in rail/port intermodal and limited financial resources. This implies that there are strong and positive relationship between rail transport and the operation performance of the port. Finally, the study recommends that the government should promote railway sector in order to improve port performance and raise port and government revenues. The process should include the private sector in their capacity as major users of the railway infrastructure and facilities. The Government should look for stakeholders, financiers and development partners to ensure that railway financing is enhanced.

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DRC	Democratic Republic of Congo
EU	European Union
GDP	Gross Domestic Product
NPA	National Ports Authority
RO-RO	Roll on Roll off
SCM	Supply Chain Management
TEU	Twenty Feet Equivalent Unit
TPA	Tanzania Ports Authority
UNCTAD	United Nation Conference on Trade and Development
UNESCO	United Nation Education Scientific and Cultural Organization
URT	United Republic of Tanzania

CHAPTER ONE

1.0 GENERAL INTRODUCTION

1.1 Background of the Study

The economic policy in many countries especially in the developing world is currently encouraging the export-led economic growth with an increasing in value-added manufactured goods. This emphasis will continue to affect the technology required by transport operators. International transport trends are having an influence on the manner in which Tanzania operates its transport sector. Hence the transport sector needs to be shaped in order to compare favorably with international standards.

A critical area of focus for government is a seamless logistics system characterized by an efficient flow of freight that promotes the Tanzania economy's competitiveness. Government analysis points to the fact that poor performance of the transport system is imposing significant costs on business activity and therefore considers it important that blockages within ports and rail systems be dealt with urgently. This chapter provided a background to the problems of the role of rail transport in the Port of Dar es Salaam and presents the research problem (URT, 2013).

The trend of cargo traffic at Dar es Salaam port is posing new challenges in the transport sector to accommodate the amount of cargo the port is served. Evidence from literature suggests that Dar es Salaam port is one among the largest port in Africa Mombasa, Durban and Richards Bay. Currently, the port handles over 12 million tons of cargo of about 90% of Tanzania's import and export volumes (URT,

2013). As noted by TPA, (2012) it follows that, during 2011/12, the ports handled total cargo traffic of 12.084 million tons compared to 10.993 million tons handled in 2010/11. This is an increase of 1.091 million tons or 9.9%. Most of this was destined for domestic markets. The transit trade to Tanzania's neighbors accounted for approximately 35% of all port throughput volumes, most to the Zambia and the DRC (which combined currently account for 21.3% of imports and 33.1% of exports), Rwanda and Burundi (which account for 10% of imports and 1% of exports) and the remainder to Malawi and Uganda (1.9% of imports and 0.4% of exports), (TPA annual Report 2013)

Likewise, the average year on year growth for the various trades in the last 10 year period though Dar es Salaam has been: 8% for liquid bulks (mainly petroleum cargo – especially white products); 17% for dry bulks (mainly grains); 5% for vehicles; and 13% for containers. Break-bulks volumes have declined year on year by about 4%, reflecting a shift towards bulk handling or containerization (for low and high value commodities respectively). Actually, this shows growth of the Dar es Salaam port.

This growth is coming when the country faces the inadequate in terms of transport infrastructure's (Tanzania Trade Policy, 2003). This increased volume of cargo trafficking is well conceptualized in the observation made by EU, (2013) that, ports play a key role in economic growth and development, because nearly 75% of the trade between developed and developing nations is handled in ports. However, this has challenged the capacity and ability of various transport infrastructures of various countries especially African countries and Tanzania in particularly.

It is important to note that maritime transport is growing at a high pace since transport users understand the laws of the economy of scale that favors maritime transport above other transport modes (UNESCO, 2009). Therefore as the marine transport grows rapidly also the supportive modes shall grow together. For the port performance improving, rail is important mode for two reasons. One as stated above, the cheapest surface modes of transport is rail, and the cheapest of all modes is marine, so the combination of the two create supper intermodal in logistics. Two is that the rail has a big comparative ability of carrying traffic to road. That means the sound rail operation would enhance port performance.

The rationale for examining the role of rail transport to the performance of Dar es Salaam port comes about because; Dar es Salaam is significant as an international gateway and the hub of East and Southern Africa, serving neighboring landlocked territories. The traffic in and out of Dar es Salaam port is currently mainly cleared by roadways, this is costing too much the stakeholders and the entire societies linked in one way or another with Dar es Salaam port.

1.2 Statement of the Problem

Rail transport is critical for the efficient functioning of an economy and subsequently performance of the port (Bojan, 2010; César Ducruet, 2009). This is due to the fact that, other modes of transport such as roads transport especially in urban setting are suffering from traffic congestion because of inadequate and poor road infrastructure, city structure, and rapid population increase (Thadeo, 2012; Robert, 2013) which also leads to port congestion. Dar es Salaam port as a case study, it was expected that

the use of railway transport (port/rail linkages) in general cargo and container would have reduced urban road traffic congestion, port congestion, transportation costs, increases tonnage of transported cargo and port revenues.

However, this has not been the case. Noticeably, exporters, importers, ocean carriers, marine terminal operators, and truckers all experience additional costs because the cargo and equipment does not move efficiently and cost effective through the terminals especially because of road traffic and port congestion. The assumption is economic situation and comparative advantages of the Port of Dar es Salaam are no more than important preconditions of its development and competitive ability. No adequate connection of the Port of Dar es Salaam to its catchment area is possible without the emphasis in the use of rail transport in general cargo and container in order to improve the port performance. As noted by EU, (2013) ports play a key role in the economic growth and development, as nearly 75% of the trade worldwide is handled in ports.

Thus, the importance of ensuring efficiency in transport infrastructure including rail transport is related to the ability of the Dar es Salaam port to be competitive at international level. Foolchand, (2006), Song et al, (2013) noted that business environment around ports have changed rapidly, competition among ports has become intense.

Despite of the observation presented above especially in the importance of railway transport to port performance, few studies have reported about it. In so doing, the available knowledge is insufficient to understand the topic understudy. Therefore,

this study intends to fill that knowledge gap through examining the role of rail transport to port performance at Dar es Salaam port.

1.3 Research Objectives

The general objective of this study is to examine the role of rail transport in improving port performance at Dar es Salaam port.

1.3.1 Specific Objectives

i) To determine the level of current rail delivery operations at the general cargo and container terminals in the Port of Dar es Salaam

ii) To analyze the operational growth of the port and to obtain an understanding of the constraints inhibiting port operations.

iii) To determine the relationship between the rail transport and the port operational performance.

1.3.2 Research Questions

i) What is the level of current rail delivery operations at the general cargo and container terminals in the Port of Dar es Salaam?

ii) What is the operational growth of the port and to obtain an understanding of the constraints inhibiting port operations?

iii) To what extent is the relationship between rail transport and the port operational performance?

1.4 Significance of the Study

The general purpose of this study is to increase knowledge towards existing stock of

knowledge related to port performance and logistics transport. The findings are also expected to inflict an increasingly interest and importance to Tanzania Ports Authority (TPA) on its new expansion strategy on building new ports and upgrading an existing ones and for achieving higher levels of competitiveness, where specifically, it's now about to install a new ports at Bagamoyo, Coast region and Mwambani Tanga, and upgrading Ports of Dar es Salaam and Mtwara to suit International competition.

The study is also important in that it will reveal valuable information that can help various stakeholders and the public in general to find amicable solutions to improvement of the port services linked to rail transport and consequently lead to more revenue to the government and improved port services such as expedited delivery services to the users of the Port (the public). The study is predicted to divulge important information for academic succession, whereby new ideas will be poured out and will be used as a cornerstone for other similar studies.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 An Overview

The objective of this chapter is to review some relevant literatures relating to the topic of the study. The purpose of the review is to develop a good understanding and insight into relevant previous research and the trends that have emerged. The review further, focuses on rail transport and its roles to the port performance. The section will draw some examples from other part of the world. In so doing, a regional perspective is included to illustrate the importance of improving transportation and communication linkages and the need for greater economic integration when viewing transportation infrastructure within Africa, East Africa and Tanzania in particularly.

2.2 Concepts and Definitions

2.2.1 Rail Transport

Rail[1] transport is the movement of passengers and goods using wheeled vehicles, made to run on railway tracks. In most countries, this transportation method helps international trade and economic growth. Railways provide an energy-efficient way to transport material over land. A train is a connected series of rail vehicles that move along the track. Propulsion for the train is provided by a separate locomotive or from individual motors in self-propelled multiple units. Most trains carry a revenue load, although non-revenue cars exist for the railway's own use, such as for maintenance-of-way purposes.

[1]https://en.wikipedia.org/wiki/Rail_transport. Retrieved on Wednesday 29th July, 2015 13:30

2.2.2 Port Performance

As used in this study port refers to a location on a coast or shore containing one or more harbors where ships can dock and transfer people or cargo to or from land. Port locations are selected to optimize access to land and navigate water, for commercial demand, and for shelter from wind and waves. Since ports throughout history handled every kind of traffic, support and storage facilities vary widely, may extend for miles, and dominate the local economy. Some ports have an important military role. However, port performance is measured by its capacity in cargo handling, the size of vessels, and amount of cargo traffic as well as ship turnaround.

2.3 Theoretical Literature

There are rich theoretical explanations concerning transport infrastructure especially in port/railway transport. Several literature have explained this modal as useful, cost effective, time management, efficient, and play a great role to port performance and regional economic developments. The explanations clarifies that the integration is primarily an intermodal facility where the modes of rail, road and shipping converge to facilitate the loading and unloading of cargo from ships onto and from road and rail trucks (Foolchand, 2006).

The fixed components of this intermodal facility are such as roadways, rail tracks and terminal facilities which include the quay wall, warehousing and stacking areas. According to Foolchand, (2006), the efficiency of operations determines the adequacy of infrastructure that is provided. Its successful demand the technological improvement in shipping especially through containerization, revolutionized ship

design, cargo handling equipment, intermodal facilities, road and rail transport, port design, port investments and inland transportation. Efficient intermodal facilities mean that larger vessels can call only at a few ports known as hub ports where large volumes of containers would be consolidated by land transport, barges and small feeder vessels. Dedicated rail and road terminal facilities in the vicinity of the quayside are required to facilitate the efficient transfer of goods to and from ships.

Next to Foolchand is Bektas (2007), he puts clear that in today's world, intermodal transportation forms the backbone of world trade. It aims at integrating various modes of services of transportation to improve the efficiency of the whole distribution process. It is documented that parallel to the growth in the amount of transported freight and the changing requirements value (supply) chains, intermodal transportation exhibits significant growth. It is said that volumes of containers would be consolidated by land transportation, barges and small feeder vessels.

He concludes that ports that possess efficient cargo handling systems and intermodal connections are more competitive than competing ports in terms of attracting business. Some shipping lines have equity in companies that provide rail services especially in the United States and Canada. Because of the large distances between the west and east coasts of these countries, rail trucks were designed to carry containers that are double-stacked in an attempt to significantly reduce unit transportation costs to and from their vast inland destinations. In general it can be said that all major ports have dedicated rail and road terminal facilities in the vicinity of the dockside to facilitate the efficient transfer of goods to and from ships.

Another expressions show that, port/railway intermodal is said to be cost effective. It raises tonnages transported since various means of transport converge to facilitate the distribution of goods and services. Resultant outcomes have said it raises revenue, creation of good asset utilization that helps to deliver a reliable and cost competitive service. The model has been tested in developed world such as in USA.

According to US Department of transport (2006), the value of multimodal transportation like port, rail and roads increased from about $662 billion to about $1.1 trillion in the period of nine years from 1993 to 2003. This is because all organizations move materials. Manufacturers build factories that collect raw materials from suppliers and deliver finished goods to customers; retail shops have regular deliveries from wholesalers; a television news service collects reports from around the world and delivers them to viewers; most of us live in towns and cities and eat food brought in from the country (Waters, 2003). On a national scale, logistics involves a huge amount of effort. The USA has a gross domestic product (GDP) of US$10 trillion, 1 so its population of 280 million produces and consumes an average of US$36,000 of goods and services.

This implies that logistics is essential features of all economic activity (Christopher, 1986). Similarly, Shapiro and Heskett, (1985), there are few aspects of human activity that do not ultimately depends on the flow of goods from point of origin to point of consumption. That means without logistics no material move. In fact, logistics is one among the aspect that give value the port/railway intermodal. As a matter of fact organizations are not supposed to work not in isolation.

However, the convergence of various mode of transport went together with planning and management of port development. The United Nations Conference on Trade and Development (UNCTAD) have published a handbook on Port Development (1985) for international port development based on best practices that are economically and technically sound.

In formulating a national ports plan they have stipulated that the following factors be considered; that a coordinated plan for a transportation system be developed to include shipping, port and inland transport facilities in order to optimize the capacities of the various ports. This is particularly relevant in developing countries where freight traffic is rapidly growing and changing. Second, within the ports sector a plan is needed for the handling of each type of commodity. The number of ports, their area of specialization and location have to be considered as part of their contribution to the country's trade and should be included as part of a national plan.

Third, national planning will assist to implement, monitor and optimize investment strategies for ports which can only afford to install low volume equipment. Where national resources are limited the trend should be to develop specialized high-throughput terminals e.g. Iron-Ore Terminal at the Port of Saldanha and the Richards Bay Coal Terminal at the Port of Richards Bay irrespective of geographical considerations. Economies of scale are obtained through the use of large bulk carriers at these specialized terminals, which in turn translate into lower unit handling and transportation costs for the annual throughputs, which are measured in millions of tons.

The other one is that a National Ports Authority (NPA) which in most instances is a specialist government agency be established to articulate expenditure for port infrastructure, set financial objectives e.g. return on investment, set-up a tariff structure, collect, collate, analyze and disseminate statistical information on port activities for public and business use and concessioning of terminals for use by other parties.. Hence, the identification and removal of bottlenecks, which impede the productive flow of goods, be studied by methods indicated by UNCTAD on berth throughputs. Current throughputs and efficiencies and estimates of future productivities have a major impact on how much of additional infrastructure is required.

The study continues to note that, the preparation of a National Ports Plan the Transport capacities: Road, rail, inland waterway and air route capacities taking into account demands between ports and other origins need to be established among other factors.

2.4 Empirical Literatures

Estado (2002) port/railway linkages are becoming ever more important, many ports needs to upgraded their rail connections to turn them into a competitive differentiator. This practical experience is based in North America, Asia-Pacific and Europe, identifying the main issues that have driven port-rail integration as a source of port competitiveness. This study agreed with his finding that port-rail connectivity is a strategic element of port development, both in economic and competitive terms and to reduce negative externalities on people and the environment. Not only does

proper rail connectivity expand the port hinterland and so increase the capture of new value added freight and services for the port it also promotes growth in capacity without affecting the port-city relationship, by linking "spatially" fragmented processes without congesting the urban environment surrounding the port.

This issue analyses port-rail integration as a factor of competitiveness in Latin America's port industry. While the developed world are encouraging the improvement of port/railway linkage Africa and Tanzania in particular little effort is made to ensure the efficiency of this connectivity especially in its role on port performance, regional economic growth and development. According to Organization for Economic Co-operation and Development [OECD], report (2007), traffic congestion is one of the major problems facing Dar es Salaam City and is attributed by a number of factors including, inadequate and poor road infrastructure, city structure, rapid increase in number of cars and lack of physical plan to control city development. The city is already implementing a number of strategies in order to minimize traffic congestion.

However, many of the strategies are focusing on improving the capacity of roads in terms of increasing number of lanes, proposing new overpasses and underpasses at the main road intersections and improving public transport. These strategies cannot fully overcome the congestion problems in Dar es Salaam on their own unless efforts are made to redistribute services and community infrastructure. The latter can be achieved through physical planning, which has the potential of influencing trip generation and travel patterns and traffic volume in specific roads. Therefore to

minimize traffic congestion in the Dar es Salaam both strategies for improving road capacity, public transport and physical planning solutions ought to be applied together.

The Port of Dar es Salaam has been experiencing high growth rates in container traffic and bulk and break bulk goods. The trend of cargo delivery as presented by URT, (2012) annual report shows that this industry is growing. Perhaps this is due to the fact that globally, maritime transport is growing at a high pace since transport users understand the laws of the economy of scale that favors maritime transport above other transport modes. UNESCO, (2009) noted that ocean going cargo vessels becoming more fuel and capacity efficient, shipping is an industry in which supply and demand are more harmonized in sub-markets to reduce empty legs on maritime routes as much as possible.

Spiekermann and Neubaer, (2002) gave practical application of transport infrastructure. The study noted that the task of transport is to enable interaction that is the mobility of person and goods for social, cultural or economic activities. In the context of spatial development, the quality of transport infrastructure in terms of capacity, connectivity, travel speed determines the quality of location relatives to other locations that is the competitive advantage of locations, which is usually measured as accessibility. Spiekermann and Neubaer, (2002) gave practical application of transport infrastructure.

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Likewise, Schumann and Talaat (2000) described a transport and regional development modal. In his study it is shown that the relationship between regional development and transport can be seen as a self-reinforcing positive feedback loop in which regional economic growth creates more traffic and vice versa, transport opportunities generate regional economic growth. The findings of his study concludes that the use of inter-modal transport facilitate this explained economic growth. However, his study is based on Australian experiences in which the country is one among the developed nations. In Africa and Tanzania in particularly the situation is different.

It is noted that, globally port performance is closely linked with rail efficiency. For instance Amsterdam port has such good rail connection although most of the cargo is flowing by road and budges (EU, 2013; Enrico, 2015). The port of Amsterdam is well served with rail connections. Because of this, Europe as a whole is very accessible. The port has its own marshaling yards and connections to main lines. If there is no railway connection up to a company site, then this can be created in co-operation with Port of Amsterdam. From Amsterdam there are international rail connections to Belgium, France, Germany, and Switzerland and beyond. Four million tons of goods are transported by train in the Amsterdam region each year.

Products vary from oil, steel and coal to waste, cars and general cargo. The expectation is that rail transport will grow healthily in the future. Rail is an excellent alternative for road transport over long distances (European Union, 2013)

In Africa the same can be viewed in South Africa, the Port of Durban and Port Elizabeth Since 1840 Durban has grown to become Africa's busiest general cargo port. It is situated on the East Coast of South Africa, 680 nautical miles northeast of Cape Agulhas on a longitude of 31º 02' E and Latitude of 29º 52' S. Durban port has 58 berths and is South Africa's main general cargo and container port. It consists of bulk handling facilities, multipurpose terminals, and ro-ro as well as container terminals. A total of 302km of rail tracks extends throughout the port area along with several major marshaling yards, (Foolchand, 2007)

For East Africa, Kenya is trying to dominate the port business. Kenya had managed to revive the rail connection linking with Mombasa Port, intending to enhance port performance and dominate the trade. The China-financed Mombasa-Nairobi rail link that is under construction is facing competition from Africa's largest private equity firm that has invested $70 million in a competing rail connection that will also link the two cities. Egypt Exchange listed Qalaa Holdings is the majority shareholder of Rift Valley Railways (RVR) that operates the Mombasa-Uganda train service.

The managing director at Qalaa Holdings, said in a statement the company had overhauled the key railway network and was "investing heavily in a new subsidiary that would complement RVR by handling cargo at the port of Mombasa in Kenya.

“However, the Export-Import Bank of China (Exim Bank) has also started work on a $3.8 billion railway connecting east Africa’s busiest container port with Kenya’s capital and beyond. It will take just over three years to complete and will eventually give the landlocked African nations of Uganda, Rwanda, Burundi and South Sudan vital access to the sea via the port of Mombasa. .Rival rail networks from the port city will certainly be welcomed by shippers. More than 90 percent of cargo travels by road between Mombasa and Nairobi, which is wreaking havoc on the highway network and adding time and cost to the transport of cargo (Evaristus M, 2001).

At a ceremony to celebrate the first year Mombasa has handled 1 million containers, Kenya Ports Authority (KPA) managing director said container dwell time in 2014 had been reduced to 3.7 days from 5.8 days in 2013. Truck transit time was reduced from an average of 7 days to 4 days, while average vessels turnaround time was at 3.4 days, the same as in 2013 despite the port handling more ships and container volumes.

It is therefore, necessary to improve transport infrastructure in Tanzania, especially the railway because of continued growth in world trade and the globalization of production and markets has created competition amongst ports and countries. This intense competition is necessitating governments to enhance the efficiency of their ports. However, this enhanced efficiency must be integrated with the total transport system to improve supply chain performance and to provide a comparative advantage against other supply chain systems. Globally the combination of the two (marine and railway transport) is which have the lowest logistics costs.

It should also be noted that ports are links in the supply chain of goods and commodities and as such part of Trade Facilitation. Supply chain management has gained importance in the past 25 years and is now a vital part of overall industry and trade development management in any country or global region. When assessing ports and planning port development, a holistic view needs to be applied that includes assessment of other parts of the supply chain, implying rail and road networks next to transport services and transport market regulation (URT, 2012).

It is suggested that, rather than improving individual (sub-sector) transport infrastructure and services, entire supply chains needs to be improved, meaning that all weak parts of the chain need to be addressed. Increasing East African regional trade volumes is unlikely without improving the port performance and transport infrastructure, especially rail in Tanzania.

2.5 Policy Implication

The influence also to undertake the study of this kind is partly inspired by Tanzania National Trade Policy (2003). The policy shows that Tanzanian infrastructure is generally underdeveloped and sparse relative to needs, making service delivery unreliable and expensive. There are major challenges in the capital market with pressing needs to widen and deepen financial markets. Lack of financial instruments in the formal sector to serve the informal sector and the Small and Medium Enterprises (SME) niche remains a major constraint and impediment to private sector development and economic empowerment. Despite the fact trade policy competitive

economy encourage export based growth still the effort to develop other means of transport such as railway are minimal.

The policy identified two categories of infrastructure, i.e. hard and soft infrastructures. Both hard and soft infrastructures are vital for economic growth. Hard infrastructure includes telecommunications, transportation, power, water and sanitation. Soft infrastructure refers to financial and information services. Efficient delivery of both categories is critical to the development of a competitive economy and for broader participation in economic activity. However, both kinds of infrastructures are underdeveloped.

2.6 Research Gap

There are few studies in Tanzania which have examined the role of railway transport to the port performance (Dar es Salaam). Although, there are patterns that show the port is growing due to geographical location, and it serves the land locked countries but few studies have researched the status of port infrastructures. The available literatures discussed more about problems in cargo handling, problems in container handling, congestion and the way these components affect the performance of a Dar es Salaam port.

The assumption of this study is that poor connectivity or lack of convergence in modes of transport especially in the growing port like Dar es Salaam port affect the port performance, creates congestion, lack of space in cargo handling. Therefore, this study wants to examine the role of railway transport to the port performance, taking Dar es Salaam port as a case.

This is evidenced in the study conducted by Ministry of Transport of the United Republic of Tanzania in 2014. The study shows that, the Ministry are aiming at strengthen the logistics capacity and develop the intermodal and railway container operations on the Dar es Salaam Isaka corridor section in Tanzania". This will facilitate trade, economic productivity and efficiency, and global competitiveness of rail related operations in Tanzania. This will be achieved through establishment of core train operations between Dar es Salaam and Isaka, providing reliable and efficient intermodal services supported by an associated management entity.

2.7 Theoretical Framework

2.7.1 The Balance Scorecard Theory

This study intends to adopt balance scorecard theory and the transformation model to investigate the problem under study. It is suggested that implementing new operating strategy requires ownership by all those affected by the change. The new strategy is essential to measure the performance outputs and take relevant action. Actually, the Balance Scorecard originated in the period between 1950's.

The concept of this theory is useful in studying the performance measurement in companies whose intangible assets played a central role in value creation (Nolan Norton Institute, 1991). In the work of Foolchand (2006) the balance scorecard act as a management tool that helps to measure performance of an organization and predict the future outcome of the organization. Noticeably, the Balance Scorecard is a structure that translates mission and strategy into a coherent set of objectives and performance measures that view organization performance from the perspectives of

financial, customer, internal business process and learning and growth (Kaplan and Norton (1996)

2.7.2 The transformation Model

This study will also use the transformation model highlight the role of operations in creating and delivering the goods and services produced by an organization for its customers. The represents in three components of operations: inputs, transformation processes and outputs. Operations management involves the systematic direction and control of the processes that transform resources (inputs) into finished goods or services for customers or clients (outputs). This basic transformation model applies equally in manufacturing and service organizations and in both the private and not-for-profit sectors (Saylor, 2011). A logistic Transformation Model developed for the port/railway interface. The advantage for converging the Balance Scorecard and The Transformation Model are many. This study will only discuss few among them. As noted from Kaplan and Norton (1996) the Balance Scorecard is the ideal framework to translate Transnet's new strategy direction into a coherent set of objectives and performance measure.

The Transformation Model is fundamental to the understanding of the various processes that are associated with the working of the port/railway intermodal. The output is critical element of the transformation process. The benefit derived from these outputs can be enhanced through their assimilation into the four perspectives of the Balanced Scorecard. In this case the Balanced Scorecard is essentially a management tool to monitor the outputs/targets of the various processes associated

with workings of the port/railway transport and to track continuous improvement progress.

2.8 Conceptual Framework

The conceptual framework lays a foundation for empirical study to find out the influence of rail transport on port performance at Tanzania Ports Authority. It is expected that the findings of this study will be applied or lay a foundation for other similar studies in future, also will be a useful tool in policy formulation by relevant stakeholders in future. It is evident that rail transport has important role in enhancing port performance, and for economic development and taking into account of the growing needs of our country for improvement of international trade. It is imperative to study how rail transport influence port performance so to address them in line with country's economic development goals and policies.

The study therefore pre supposes certain roles that either inhibiting or catalyzes ports performance which are experienced by the Tanzania Ports Authority (TPA). The study also presupposes that identification and improvement on the railway infrastructure will help foster port performance and hence spearhead country's economic development.

It is on the basis of the above pre suppositions and the nature of the problem, data collection instruments are chosen (Mwanje (2001). For this case mainly self-administered both close ended and open ended questionnaires, personal interviews and observations instruments will be employed in order to address the pertinent

issues which are in line with the study/research objectives. The figure 1.1 below depicts various pertinent independent variables that are presupposed by the research.

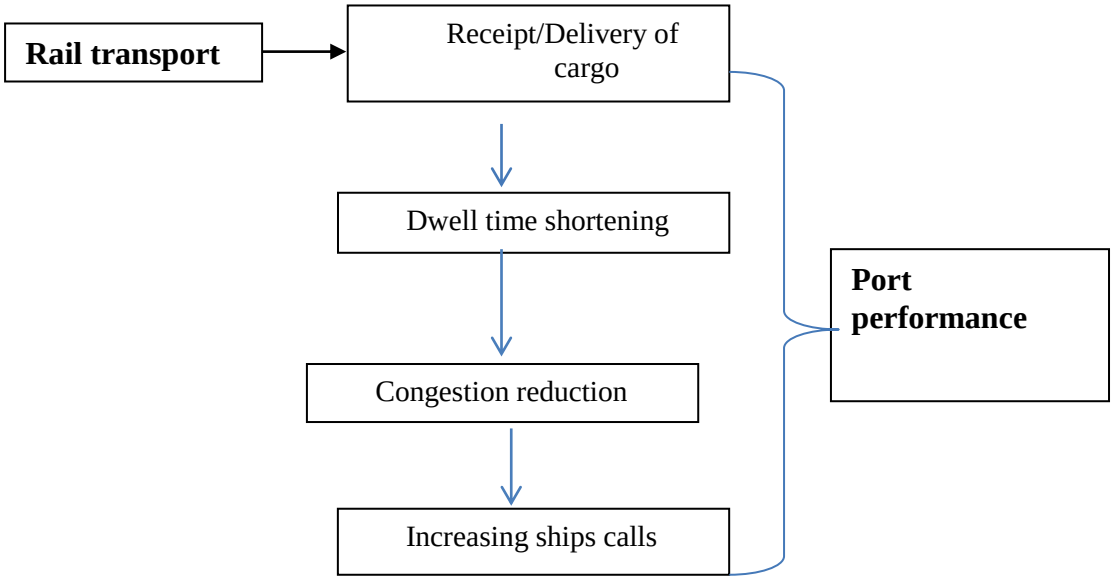

Figure 2. 1: Conceptual Framework

2.9 Theoretical Framework

Increased global competition has resulted in shipping ports that are increasingly congested. To provide adequate space for the increased traffic, ports must either expand facilities or improve the efficiency of the operations. Because many ports are land constrained, the only available option the one examined in this study is the role of rail transport to port performance. In doing so, the study used queuing theory to make sense on the topic understudy. The theory was developed by Agner Krarup Erlang, in 1909. As mentioned, congestion within ports results in inefficient operations and, thus, longer than necessary delays for ships in service or awaiting service. Port authorities have recently placed ship turnaround time as one of the most important factors considered in selecting a port

The theory is chosen because of its ability to explain the phenomenon understudy. Queuing time at single and multiple berth facility is considered. They presented the ratios of average waiting and average service time of ships as function of number of births and expected occupancy rate and studied problems of applying regression analysis to queuing time functions.

Additional to that, the theory is capable in explaining the service facility and Customer's behavior of waiting. In case of service facility, the theory revealed that Single server-customers line up and there is only one server, Parallel- servers-customers line up and there are several servers and tandem queue-there are many counters and customers can decide going where to queue. In terms of customer behavior of waiting, the theory states that Balking-customers deciding not to join the queue if it is too long, Jockeying-customers switch between queues if they think they will get served faster by so doing and Reneging-customers leave the queue if they have waited too long for service.

The service facility at Dar es Salaam port dominated by road transport, in doing so, customers line up because the capacity of road is insufficient and does not match with the amount of cargo handled by the port. Therefore, this has changed the behavior of customers. It is noted that some shippers deciding not to join the queue if it is too long while others leave the queue if they have waited too long for service. This is the reasons why some customers have shifted to Mombasa port because of the queue.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Introduction

In order to find answers for the developed research objective and subsequently research questions raised by this study, this chapter is about to highlight the procedures which used in the collect of data related to the topic understudy. The section covered the aspect related to research design, study area, sampling techniques, sample size determination and its selection, and methods of data collection.

3.2 Research Design

The research design of this study could be classified as an exploratory study. This type of design applied because the problem has not clear defined in the context of Tanzania. Both qualitative and quantitate approach will be applied. This is because researcher interested in both numerical data such as trend of revenues, but also opinions, perception about the efficiency of rail/port in logistic management and transportation. Hence, by utilizing a qualitative approach a better understanding of the issues related to the efficient functioning of the port/rail interface can be obtained through semi structured interviews.

3.3 Study Area

The study area was the Tanzania Port Authority in Dar es Salaam region. Dar es Salaam Port is the largest Port in Tanzania and currently handles over 9 million tons

of cargo (90% of Tanzania's import and export volumes). In 2010, Tanzania Ports Authority handled in excess of 10 million tons of cargo. Dar es Salaam port is also an important port in for the land-locked countries of the southern African region. According to the International Association of Ports and Harbors, it is the fourth largest port the African Continent's Indian Ocean coastline after Durban, Mombasa and Maputo.

3.4 Population Size

Polit and Hungler (1999:37) refer to the population as an aggregate or totality of all the objects, subjects or members that conform to a set of specifications. In this study the population constitutes Port authority and customers, TAZARA staffs and TRL staffs of all age groups, educational status and socio-economic who were knowledgeable with issues related to Port management and its operations as well as TAZARA/TRL management and their operations. In total the estimated number of population were 2500.

3.5 Sampling Techniques

This study opted for purposive sampling techniques to analyze the topic under study. This because the study wants to recruit people who are knowledgeable with issues related to port operation, logistic management and transportation. In qualitative research sample selection has a profound effect on the ultimate quality of the research (Coyne, 1997).

3.6 The Sample Size Determination and Its Selection

The other important task in scientific research is the estimation of sample size and its

selection. However, this study will select sample size through the formula developed by Krejcie and Morgan (1970). The formula contains a built correction for taking samples from a small population like that of Dar es Salaam port; the formula is as follows

Sample size = X2NP (1-P)/ C2 (N-1) + X2P (1-P)

Where X2is the Chi-square value for 1 degree of freedom at some desired probability level (3.841), N = is the population size, that is the total number of staff at Dar es Salaam port, which is 2500, P is the population proportion (assumed to be .50 since this would provide the maximum sample size), and C2 is the confidence interval (0.01). From the above formula the calculated sample size is an approximate of 96 sample size.

Sample calculation

3.841 x 2500 x 0.5 (1-0.5) / (0.01(2500-1) + (3.841 x 0.5 (1-0.5))

= 92.50978

= Approximately 93

The sample size calculated will be randomly selected; this procedure will increase the likelihood that the data to be collected will be representative of the whole population of interests.

3.6.1 Sampling Frame

Table 3. 1: Sampling Frame

Types of group	Number Of Key Informant	Recruited	Sampling Techniques
Port customers	30	30	Random
Port Staffs	30	27	Random
Customer department	2	2	Purposive
Logistic department	3	3	Purposive
Port manager	1	1	Purposive
Container terminal manager	2	2	Purposive
Operation manager	2	2	Purposive
TAZARA Manager	15	14	Purposive
TRL Manager	15	14	purposive
Total	**100**	**96**	

Source: Field Data, 2015

3.7 Method of Data Collection

3.7.1 In-depth Interview

An in-depth interview is a qualitative research technique conducted in a form of conversation/discussion between researcher and respondent (person to person discussion) with the purpose of exploring issues or topics in great detail (Babbie, 2010). The interviewer encourages participants to freely discuss their feelings and opinions, and probes on questions to gain insight and depth to responses. This type of interview is often unstructured. Therefore it permits the interviewer to encourage participants to talk at length about the study topic, hence to increase insight into people's thoughts, feelings, and behaviors.

This method was used in qualitative interview with the port managers and operations department staffs. According to Saunders et al. (1997; 215), Schindler, P.S. (2001) with semi-structured interviews the interviewer will be guided by a set of questions

or themes and shall attempt to establish rapport with the respondent to produce richer data. The advantage of a semi-structured interview is the flexibility in obtaining information based on themes e.g. economic development, importance of rail transport, globalization, infrastructure development and performance outputs at the port/rail interface. It also provides the opportunity to probe answers, to build on the interviewees responses and to address the sub problems under study. A pilot survey was conducted to ascertain the level of reliability, validity and ambiguity in respect of understanding the issues and the responses.

3.7.2 Documentary Review

In this study the documentary review was used as a source of secondary data. Several documents are reviewed ever since it is impossible to review all of them. The review involves reports carried out by individuals and organizations on the problem understudy. The purpose is to generate concepts and theoretical knowledge available and to prepare research instrument and field observation.

3.8 Observation

This study was also used observation as method of data collection. This will be in the form of non-participant observation. In this method research will observe this like means of logistic transportation, traffic congestion and other logistic services that can be seen physically and interpreted.

3.9 Data Processing and Analysis

In this study, data and the information collected that related to the topic understudy were summarized and analyzed by software – Statistical Package for Social Scientist

(SPSS) Version 16.0 and Ms Excel (2007). In doing so, Correlation Coefficients and Multiple Regression Analysis were used to analyze the data. Content analysis used to obtain descriptive statistics (including mean, standard deviation and variance) to draw conclusion for the study. The research findings were organized and presented in form of words and numbers by using frequency tables, histogram, charts and simple percentage method.

3.10 Data validity and Reliability Analysis

3.10.1 Validity

Validity is defined as a measure of truth or falsity of the data obtained through using the research instrument. It is classified as internal and external validity of the measuring instrument (Burns & Grove 2001:226). In this study validity refers to the measure of truth or falsity of the assumed role of rail transport to port performance. The instrument's validity can be regarded as the extent to which "… the instrument actually reflects the abstract construct being examined" (Burns and Grove 2001:814). Several factors could influence the internal and external validity of the measuring instrument, the structured interview schedule used in this survey to gather data about the role of rail transport to port performance revealed that there is positive relationship between the two. In terms of internal validity, this concept indicates the extent to which the factors, identified as the role of rail transport to port performance by the respondents, truly reflect what hinders port performance. External validity considered by this study focused to the extent to which the research results can be generalized beyond the sample used in the study. This were in line with the Burns and Grove (2001) observations

3.10.2 Reliability

Reliability is the degree of consistency with which the instrument measures an attribute (Polit & Hungler 1999:255). It further refers to the extent to which independent administration of the same instrument yields the same results under comparable conditions (De Vos 1998:85). The less variation the instrument produces in repeated measurements of an attribute the higher the reliability. There is also a relationship between reliability and validity. An instrument which is not valid cannot possibly be reliable (Polit & Hungler 1999:250). In ensuring reliability in this study the responses obtained through the interview schedule was split into two equal halves, they were then scored independently to check correlation. These techniques are stability, internal consistency and equivalence (Polit & Hungler 1999:200).

3.11 Ethical implications

The researcher was considered every requirement of research ethics to establish trust with the participants and to respect them as autonomous beings, thus enabling them to make sound decisions (Bush and Grove 2003, p.65). Ethical measures are as important ensuring the validity and reliability of the data collected. Other ethics to be considered informant consent, confidentiality, anonymity, privacy, dissemination of results, by ensuring the respondents that, the information provided were going to be used in research purpose only, and the respondents have the right to withdraw from the study partially or completely.

CHAPTER FOUR

4.0 RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

In this chapter the results of the data analysis are presented and discussed. The data were collected and then processed in response to the problems posed in chapter one of this dissertation. The overall objective of the study was to investigate the role of rail transport to the port performance. In particular, this section addressed three research objectives and has answered three key research questions: one, what is the level of current rail delivery operations at the general cargo and container terminals in the Port of Dar es Salaam? Second, what is the operational growth of the port and to obtain an understanding of the constraints inhibiting port operations? And, finally, to what extent is the relationship between rail transport and the port operational performance? In order to find answers to these raised questions both quantitative and qualitative research methods was used in the process of collecting data and information's related to the topic understudy. Therefore, the chapter is arranged in the following themes and subthemes;

4.2 Characteristic profile of Respondents

4.2.1 Respondent Gender

Gender is an important variable in a given Tanzania social situation which is variably affected by any social or economic phenomenon and globalization is not an exception to it. Hence the variable gender was investigated for this study. Data related to gender of the respondents is presented in the Table 4.1.

Table 4.1: Percentage Distribution of Gender by Respondents

Gender	Distribution of Respondents	
	Frequency	**Percent**
Male	84	87.5
Female	12	12.5
Total	96	100.0

Source: Field Data, 2015

It is quite clear that out of the total respondents investigated for this study, overwhelming majority 87.5 per cent of them were males whereas about 12.5 per cent were found to be females. These data shows that male have more employment opportunity in Tanzania Port authority than female. It should be noted that, involvement of women in issues related to operational level is new. However, there are some transformations that the society has undergone and women involvement in financial institutions is increasing. Perhaps this is due to the fact that both male and female are both vulnerable with the nature of the economy that dominating the today's world. Therefore, both are required to participate equally in various economic opportunities

4.2.2 Respondent Age

As indicated in Table 4.2, the analysis of age composition revealed that the age of respondents varied between 20 and 50 years. This study revealed that more than 69.5 percent of the port population belonged to the age group of 30-39, while 19.8 percent of them belong to the age group of 40-50 and at least 14.6 percent of them belong to the age group of 20-29. Age of the respondents is one of the most important characteristics in understanding their views about the particular problems; by and large age indicates level of maturity of individuals in that sense age becomes more important to examine the response.

Table 4. 2: Respondents Age

Age in Years	Distribution of Respondents	
	Frequency	**Percentage**
20-29	14	14.6
30-39	63	65.6
40-50	19	19.8
Total	96	100.0

Source: Field Data, 2015

4.2.3 Education Level of Respondents

Education is one of the most important characteristics that might affect the person's attitudes and the way of looking and understanding about the role of rail transport to the port performance. In a way, the response of an individual is likely to be determined by his educational status and therefore it becomes imperative to know the educational background of the respondents. Hence the variable 'Educational level' was investigated by the researcher and the data pertaining to education is presented in Table: 4.3.

Table 4. 3: Level of Education of Respondents

Level of Education	Distribution of Respondents	
	Frequency	**Percent**
Diploma	36	37.5
Bachelor degree	48	50.0
Master's degree	12	12.5
Total	96	100.0

Source: Field Data, 2015

Table 4.3 shows that about 50.0 per cent of the respondents have the level of bachelor degree, while 37.5 per cent of them have attained the diploma level. On the other hands, at least 12.5 percent of them have attained Master's level of education.

It can be concluded from the Table 3 above that by and large percent of the respondents were progressive in education which is so important today to create a knowledge based society.

4.2.4 Respondent Occupation

Person's occupations do have a bearing on his or her personality and so also the ways of looking at the problem before him. The quality of life is also determined by an individual's occupation and the incomes he derives from it. Occupation of an individual also socialized him or her in a particular fashion which in turn reflects his or her pattern of behaviors and his/her level of understanding of particular phenomenon. In other words the person's response to a problem is possible determined by the type of occupation he is engaged in and hence variable occupation was investigated by the researcher and data pertaining to occupation is presented in Table 4.4.

Table 4. 4: Employment Position of Respondent

Position	Distribution of Respondents	
	Frequency	Percent
Middle level / line manager	45	46.9
Operation level	51	53.1
Total	96	100.0

Source: Field Data, 2015

It is evident from Table 4.4 that all respondents participated in this study are employed. In particular the findings indicate that about 53.1 percent of them were at a position of Operational level and the remaining 46.9 percent were in a position of Middle level/line manager.

4.3 Current Status Operational Growth of Tanzania Ports

Ports function as important gateways of international trade and, accordingly, they tend to be regarded as major accelerators of local economic development in the age of globalization. The ocean, as a major international trade route, provides low cost and massive transport means. This is to say that, shipping and port industries play an important role in integration of local and national economies into the international economy. Because of this importance, the study investigated the current status of Dar es Salaam port. The findings of the study suggest that despite of its contribution to economic growth, Tanzania ports are challenged with a number of problem. Data related to the current status of operation growth of Tanzania ports are presented in table 4.5.

Table 4. 5: Current Challenges Affecting the Operational Growth of a Port in Tanzania

Challenges	Distribution of Respondents	
	Frequency	Percent
Port congestion	86	89.6
Shortage in cargo handling equipment	84	87.5
Bureaucracy in cargo handling	72	75.0
Shortage in qualified personnel	60	62.5
Shortage in cargo space	72	75.0
Lack of financial resources for infrastructure	72	75.0

Total N: 96

Source: Field Data, 2015

It is evident in table 4.4 that port congestion constitutes 89.6 percent of the challenges facing Dar es Salaam port, while shortage of cargo handling equipment constitutes about 87.5 percent. Similar to that, is the lack of financial resources for extending port infrastructures, shortage of storage space, and bureaucracy in cargo

handling all of them account for 75.0 percent to the problem facing the operation growth of Tanzania ports. It is no doubt that port congestion is a major problem affecting the operation of the port. In doing so, the performance of a port have been dropped time to time. As noted by Gidado, (2015) of which this study agrees, Congestion in ports is a phenomena associated with delays, queuing and extra time of voyage and dwell of ships and cargo at the port, which always occur with unpleasant consequences on Logistics and supply chain. These often translate into extra costs, loss of trade and disruption of trade and transport agreements. The study continues to note that Transporting goods by sea remains the most common way to trade globally, but in Africa cargo spends an abnormally long time in ports before it is moved inland, presenting a serious obstacle to the successful integration of sub-Saharan economies in worldwide trade networks.

Drawing heavily from other countries/ports experiencing similar problem related to port congestion such as Durban port in South Africa, Nigeria and Mombasa port in Kenya, it is revealed fatherly that, port congestion in Africa is an inevitable seasonal occurrences that are largely associated with improper planning, inadequate equipment or dearth of ancillary infrastructure that could support the transport and logistics network requirements of the African ports. The manifestation of congestion in most African ports is attributable to either capacity constraints or procedural delays emanating from weak planning or docile regulatory mechanisms.

The findings of this study concur with Maduka (2004) observation that port congestion affects the economic performance of port. The problem is resulting in

delay of ships in the seaport. This occurs when ships spend longer time at berth than usual before being worked on or before berth. It is imperative to argue that increased competition, booming in international maritime trade and the associated port congestion is crucial in ports rethinking, how to bolster capacity and improve service quality, to maintain current and attract new business. In response to these opportunities and challenges most ports have started to or plan to redesign their operations and come up with long term investment plans and this has help to reduce the turnaround time of vessels calling at the port.

As shown in in table 4.4, shortage in cargo handling equipment's is one among the challenges facing port operation in Tanzania. Therefore, the involvement of shipping in Tanzania remains small, but is increasing. As noted by Alf, (2015) in which this study agree with, revealed that, in other parts of the world, like Sweden, the increasing volumes of cargo shipped is being facilitated by cargo handling equipment's whereby, larger ships are able to carry more cargo on each voyage because the capacity to handle.

The study continues to note that, shipping is probably the most international business undertaking, but also container handling in ports is getting increasingly internationalized. With the appearance of container handling and the increasing investments in ships and special handling equipment in ports, efficiency in operations has become a key issue. Sufficient investment resources are generally not available for cash strapped port agencies in African countries and hence, there are often few other alternatives available than to offer long term concessions to international port operators.

4.4 The Role of Railway to Port Performance

Rail transport is essential in the transportation and exportation of goods and services. Railways transform economic growth and social development. The findings of the study revealed that, Tanzania has two railway systems: A northern/central line extends towards Kigoma and Mwanza on Lake Victoria and is run by Tanzania Railways Limited ("TRL") with assets in the ownership of the Railways Assets Holding Company ("RAHCO"), and a southern route extends from Dar es Salaam into Zambia, operated by the Tanzania Zambia Railway Authority ("TAZARA"). The railway links the port of Dar es Salaam to Mwanza on Lake Victoria, providing part of a multi-modal link over the lake to Uganda.TRL provides both passenger and freight services. Therefore, understanding the significance of rail transport is essential in order to improve the port performance. In doing so, the study investigated the role of rail to port performance. Data related to it are presented in table 4.6.

As indicated in table 4.5, almost all respondents have explained about the role of rail to port performance where more than 91.7 percent of them see that rail transport raises revenue to both the port and the country. Similar to that, about 87.5 percent of them revealed that rail transport reduces port congestion, improves customer satisfaction and increases the average of cargo transported. Furthermore, about 86.5 percent of the explained that, it lowers the cost of logistics and at least 75.0 percent of them explained that, it improves cargo handling at the port. The forgoing implies that for the port to improve its operation there is a need to invest in the transport infrastructure especially the rail transport. Perhaps this is due to the fact that road

transport is already congested because it has many users from public transport, private, transit, motorcycle and pedestrian something which is not in rail transport.

Table 4. 6: Percentage Distribution of the role of Railway to Port performance

Statement	5 Strongly Agree	4 Agree	3 Neutral	2 Disagree	1 Strongly	Total
Rail delivery in general cargoes and container terminals reduces port congestion	62.5%	25.0%	12.5%	-	-	100.0
Rail delivery in general cargoes and container terminals improves cargo handling	37.5%	37.5%	25.0%	-	-	100.0
Rail delivery in general cargoes and container terminals increases the average of transported cargo	37.5%	50.0%	12.5%	-	-	100.0
Rail delivery in general cargoes and container terminals raises port and country revenue	46.9%	44.8%	8.3%	-	-	100.0
Rail delivery in general cargoes and container terminals improve customers satisfaction	37.5%	50.2%	-	12.5%	-	100.0
Rail delivery in general cargoes and container terminals lowering the cost of logistics	75.0%	11.5%	13.5%	%	%	100.0

Source: Field Data, 2015

However, the findings of the study revealed that, railway in Tanzania is in significant financial difficulties, and scheduling integrity is compromised by the lack of operable locomotives. The demand for rail in general is declining. The advantage of rail over roads lies in fuel costs and the ability to carry large tonnages of bulk freight far distances. Overloaded trucks accelerated road wear, making rail seem like the logical alternative from a policy point of view.

With this state of rail transport in Tanzania, the performance of a port especially Dar es Salaam port have been deteriorated time to time because of increased port congestion, customer dissatisfaction resulting shift to Mombasa port. Other resulting problem has been the poor cargo handling and shortage in port storage space. However, it is noted that some African countries have recognized the importance of rail transport to port performance; hence, they are now making effort in the intermodal transport. As noted by Fool hand (2007) of which this study agrees, shows that, the port of Durban in South Africa recognized this importance and have invested heavily in rail/port interface. It is revealed that, the port performance happens when the modes of rail, road and shipping converge to facilitate the loading and unloading of cargo from ships onto and from road and rail trucks. The roadways, rail tracks and terminal facilities which include the quay wall, warehousing and stacking areas are the fixed components of the intermodal facility. Nonetheless, the efficiency of operations determines the adequacy of infrastructure that is provided.

It is important to note that globalization has had a major impact on the economy. For countries to be competitive it necessitates adopting high quality standards and lowering logistics costs. The latter is even more relevant to Tanzania and other developing countries. The Port of Dar es Salaam is the fourth largest port in Africa in terms of the value of cargo handled as well as the number of vessels handled. Therefore, improving rail/port is essential in promoting the performance of a port.

Moreover, it should be understood that, advantage locational of Dar es Salaam port influences the potential of growth a port performance. But this can happen only if

transport infrastructures are a able to cope with the shipping cargoes. It is revealed that Uganda, Rwanda, Burundi, the eastern portion of Congo DRC, Malawi, and Zambia all either are completely landlocked, or, is in the case of Congo DRC, are so large that in effect portions are truly landlocked. In addition, all of the above except for Rwanda share coastlines amongst the major lakes of Tanzania, Lake Victoria, Lake Tanganyika, and Lake Nyasa. This makes the demand for transport in the ports sector a complex topic, depending on external factors (the demand in neighboring countries), competing ports (mainly Mombasa), modal challenges (the development of roads and failure of rail), and domestic needs, including needs in remote and rural areas.

The study revealed that, the port of Dar es Salaam is experiencing rapid demand and increases growth of import and exports related to Zambia. In more recent history, tonnage related to Tanzania's combined consumption and production has slowed in growth to 6.8% for the last five years, but the growth of land-locked country traffic has pushed traffic growth, even with the loss of Uganda, which is switching away to Mombasa.

Barring external shocks, one could assume that demand for the port will grow at the current rate, if not higher, for the next five years, especially considering the congestion developing in Mombasa. Growth in demand, however, does not mean the Dar es Salaam will be able to serve this demand without additional infrastructure investments, as wait times outside the port are increasing again, and Dar es Salaam may be facing the same congestion threat as Mombasa.

4.5 Factors Hindering Effective Use of Rail Transport in Tanzania Port

The advantages of rail transport to port performance are many. Among them as noted by this study include reduction in port congestion, lowering the cost logistics, improve cargo handling, raises port and government revenues and increases customer satisfaction. On the other hands, globalization has had a major impact on the Tanzania economy. For Tanzania to be competitive it necessitates adopting high quality standards and lowering logistics costs. Similar to that, is the fact that Dar es Salaam Port is the fourth largest port in Africa in terms of the value of cargo handled as well as the number of vessels handled. Despite of all issues and potentialities provided by rail transport to port and the contribution of port to the country economy, still rail transport in Tanzania is in critical condition and in a state of neglect. In doing so, this study investigated the factors hindering the effective use of rail transport in Tanzania port. Data related to it are presented in table 4.6.

Table 4. 7: Factors Hindering Effective Use of Rail Transport in Tanzania Port

Statement	5	4	3	2	1	
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Lack of efficient rail system	50.0%	37.5%	12.5%	-	-	100.0
Low capacity of rail transport	25.0%	37.5%	25.0%	12.5	-	100.0
Poor emphasis in port/rail intermodal	50.0%	37.5%	12.5%	-	-	100.0
Rail network has been in a state of neglect and dilapidated	62.5%	31.2%	6.2%	-	-	100.0
Limited financial resources	12.5%	62.5%	25.0	-	-	100.0
Shortage of rail personnel	75.0%	11.5%	13.5%	%	%	100.0
Low uptake of rail transport by shippers who opt to transport their cargo by road ways	25.0%	12.5%	62.5%	-	-	100.0

Total N=96

Source: Field Data, 2015

It is evident in table 4.6 that 93.7 percent of respondents claims that rail transport in a state of neglect and dilapidated while 87.5 percent of them whose that it is because of lack of efficient rail system and about 86.5 percent of them associated it to shortage in rail personnel. On the other hands, limited financial resources contributes for more than 75.0 percent to the factors hindering the effective use of rail transport, similarly, 62.5 percent of them associated it to low capacity of rail transport and at least 37.5 percent cane be explained by the low uptake of rail transport by shippers who opt to transport their cargo through road transport.

It is no wonder that, the expansion of road transport in Tanzania influences the neglect of railways. This study shared with Vasile, (2013) findings that in most of the sub-Saharan African (SSA) countries railways have played, throughout history, a key part in the economic development maintaining a dominant role in transporting freight and passengers at low costs. The study continues to note that, during the last 50 years, the road transport in the region as throughout the world has expanded rapidly due to the aggressive development of the automobile industry. Noticeable, African governments have invested mainly in road infrastructure improvement, neglecting railways.

The study found that, liberalization in road transport and the slow response of railways to adapt to the new market conditions resulted in dramatic traffic decline in rail transport. It is noted with concern that, by 1990 most of the sub-Saharan African railways were in virtual bankruptcy, requiring permanent cash injection and large investments in infrastructure and rolling stock.

It is reasonable to argue that, the growth of the railway transport market in SSA is much lower than that of the rest of the world. Since 2001, the volumes transported by railways recorded a consistent growth worldwide; in 2010, rail carried about 9.3 trillion ton-km and 2.8 trillion passenger-km. In spite of the volume losses in 2008-2009 due to the financial crisis, in 2010 the rail transport for freight and passengers increased worldwide by more than 40 percent compared with 2001. The trend varies for the different regions. As the case of Tanzania, the findings of the study noted the declining trend of the tonnage transported by port/rail interface compared to the raising tonnage transported through road transport. The peak performance of TRL was in the year 2002 when it moved 1.446 million tons of freight, yet, the performance started to deteriorate from that time after the donors stopped supporting TRC. During the 2007 TRC transported 570,000 million tons of freight. After concession the performance of TRL continued to deteriorate. In the year 2010 TRL performed 256, 000 tonnes of freight. Surprisingly, Tanzania port are handles as per 2013 the total cargo traffic handled at the ports reached 13.713 million tons equivalent to an13.4% increase from the preceding year. That means large percent of cargo tonnages transported through road transport as a result in port congestion and road congestion.

Furthermore, this study concur with Tito (2014) especially on his observation about the challenges facing rail sub sector in Tanzania that, despite of the effort made by the government from mid 1980s, on its program to upgrade and construct new roads in the country. However regrettably, this program did not go hand in hand with the development of the railway system. This resulted in the decline of railway

infrastructure and rolling stock performance. Lack of investment on rolling stock resulted into the decline of locomotive availability and reliability as well as decline in the availability of wagon and coach fleet. The study continues to note that, since 1980s, railway transport was the most dependable means of surface transport for both people and goods. The rail subsector was transporting about 70% of goods traffic for both domestic and transit to and from the neighboring landlocked countries.

Likewise, the study found that, because of inadequate funding for re-investment, the railway was faced with obsolete equipment and aged infrastructure, resulting into traditional customers diverting their goods to the road. At present the railway sub sector transports less than 10% of the total inland traffic. The challenges at hand therefore is on how to raise sufficient funds necessary to revive the performance of the existing railway infrastructure as well as development of new railway projects.

4.6 Measuring the Operation Growth of a Port

Another important area in which this study was interested to understand was the manner in which a port can measure its operational growth. This is essential to the port authority to understand various challenges and problem affecting the port and subsequently improving the performance of the port. The assumption is Ports play a key role in the economy and development. Large percent of the trade in the rest of the world is handled in ports. Thus, the importance of ensuring efficiency in ports is related to the ability of Tanzania ports to be competitive at international level.In this case, the study examined the factors that can be used to measure the operation growth of a port. The data related to it are presented in table 4.7

Table 4. 8: Percentage Distribution of Factor That Can Be Used To Measure Operational Growth of Port

Statement	5 Strongly Agree	4 Agree	3 Neutral	2 Disagree	1 Strongly Disagree	Total
Cargo handling system	62.5%	25.0%	12.5%	-	-	100.0
Tonnage of cargo trafficking	57.3%	25.0%	12.5%	5.2	-	100.0
Time used in vessels	44.8%	46.9%	8.3%	-	-	100.0
Increases in shipping	50.0%	37.5%	12.5%	-	-	100.0

Total N=96

Source: Field Data, 2015

The forgoing table 4.7 suggests that time used in vessels account for 91.7 percent as measure of operation growth while 87.5 percent of all respondent suggests that cargo handling system and increases in shipping proposed to be among measures in operational growth of a port and at least 82.3 percent of them constitute the tonnage of cargo trafficking. Basing on the data presented above, it follows that, the primary measures of vessel performance are the ship turn-round time and the tonnage handled per ship day in port.

The ship turn-round time is the duration of the vessel's stay in port and is calculated from the time of arrival to the time of departure. Traditionally expressed in days, it is now common to express turn-round time in hours. The port authority would normally compile statistics that would provide monthly and annually average turn-round times. The average turn-round time per ship is determined by dividing the total hours by the total number of ships calling at the port.

This study shared with Kek (1993) that, ship turn-round time does not mean much, as the length of stay of a vessel is influenced by the volume of cargo, the facilities made available and the composition of the cargo itself. In so doing, it becomes necessary for the port to break the basic ship turn-round time down for tankers, bulk carriers, container vessels and general cargo vessels, and even subdividing these into domestic trade, regional trade and ocean going vessels. Since the duration of a vessel's stay in port is influenced by the volume of cargo that it works, a more useful measure of vessel performance is the tonnage handled per day or hour that the vessel is in port.

The average tonnage handled per ship day or ship hour would be obtained by dividing the total tonnage of cargo that is loaded and discharged by the total number of hours that all vessels spend in port.

4.7 The Relationship between Rail Transport and the Port Operational Performance

Transport infrastructure is basic essential services that should be put in place to enable development to occur. Economic development of Tanzania can be facilitated and accelerated by the presence of transport infrastructure. If these facilities and services are not in place, development will be very difficult and in fact can be likened to a very scarce commodity that can only be secured at a very high price and cost. With this in mind, the study explored the relationship between rail transport and the operation performance of a port. The data related to it are presented in table 4.8 bellow;

Table 4. 9: Percentage Distribution on the Relationship between Rail and Port Operational Performance

Rail transport	Distribution of Respondents	
	Frequency	Percent
Improves port operational performance	86	89.6
Improves cargo handling	78	81.2
Reduces port congestion	90	93.8
Increase the volume of cargo traffic	89	92.7
Increases ship turnaround	87	90.6

Total N=96

Source: Field Data, 2015

For the table 4.8 it is evident that there is a strong and positive relationship between rail transport and port operational performance. For instance, about 93.8 percent of respondents explained that rail transport helps in reducing port congestion while 92.7 percent of them revealed to increase the volume of cargo traffic and 90.6 percent of them suggest that it increases ship turnaround. Additional to that, 89.6 percent of them shows that rail transport improves port operation performance and at least 81.2 percent of them see that it improves cargo handling at the port. Therefore, the data presented above affirm the importance of rail transport to port operation performance. Hence, the neglect of rail transport in this case have negative contributions to the operation performance of the port.

4.8 Discussion of the Findings

It was noted with concern that, the findings of this study reflects also what has been done by other researcher especially in other countries in the related topic understudy. Like previous researcher, this study also revealed that there is positive relationship

between rail transports to port performance. This implies that, the roles of rail transport to port performance are many. As noted by the study the other mode of transport linked to port is challenged with congestion, traffic management and delay cargo transportation. I doing so, the port have been faced with the problem of port congestion, delay in cargo clearance, reduction in ship turnaround and reduction in port and government revenues.

First and foremost, the findings of this study concur with Foolchand (2007) as explained in chapter two of this study. Though his study was based in the context of Durban port in South Africa, but the findings and concussion of his findings is related to this study. In the similar manner, Foolchand (2007) also have suggested for rail transport in order to improve port performance in Africa ports. The reasons behind this suggestion is road transport have more users that leads to traffic congestion and problem related to traffic management. The solution proposed is rail transport because of its uniqueness. Additional to that, he has suggested for intermodal especially port/rail interface and other mode of transport.

Similar to Foolchand (2007) is Estado (2002) who explained about the importance of port/railway linkages. His connotes the observation made by this study that ports needs to upgrade their rail connections to turn them into a competitive differentiator. It is noted that, the connection of rail transport to port have worked in North America, Asia-Pacific and Europe. Perhaps the report made by Organization for Economic Co-operation and Development (OECD) (2007), answered why rail transport is of great importance to port performance. It was noted with concern that

traffic congestion is one of the major problems facing Dar es Salaam City and is attributed by a number of factors including, inadequate and poor road infrastructure, city structure, rapid increase in number of cars and lack of physical plan to control city development. This implies that the port need to concentrate in rail infrastructure in order to minimize problems related to road congestions. The experiences provided above are also similar to Spiekermann and Neubaer, (2002) and Schumann and Talaat (2000) who have noted the same. Therefore, the findings of this study connotes with what have been discussed and revealed by other researcher and scholars as presented in chapter two of this study.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The previous chapter dealt with analysis, interpretation and discussion of data obtained by questionnaire and interview. In this final chapter of the study, the researcher outlines the conclusion and recommendations based on the findings of the study. The objectives of the study have achieved. Through the use of both quantitative and qualitative methods of data collection, it was possible to develop a holistic picture of the role of rail transport to port performance. In particular, the section is arranged in the following manner;

5.2 Conclusion

The overriding purpose of this study was to examine the role of rail transport in improving the port performance. In its specificity, the study wanted to examine the level of current rail delivery operations at the general cargo and container terminals in the Port of Dar es Salaam. Additional to that, the study explored the relationship between the rail transport and the operational growth of port. In doing so, the study addressed three fundamental research questions which are (i) what is the level of current rail delivery operations at the general cargo and container terminals in the Port of Dar es Salaam? (ii) What is the operational growth of the port and to obtain an understanding of the constraints inhibiting port operations? And, (ii) to what extent is the relationship between rail transport and the port operational performance?

In order to meet the objectives of the study and find answers to the raised research questions quantitative and qualitative research methodology was used by this study. Mixed methodology begins with the assumption that investigators, in understanding the role of rail transport in improving the port performance, gather evidence based on the nature of the question and theoretical orientation. The inquiry is targeted toward various sources and many levels that influence the problem understudy. Quantitative methods are ideal for measuring pervasiveness of known phenomena and central patterns of association, including inferences of causality. Qualitative methods allow for identification of previously unknown processes, explanations of why and how phenomena occur, and the range of their effects. This integration of quantitative and qualitative data maximizes the strengths and minimizes the weaknesses of each type of data collected during the field study.

5.3 Introduction

The study revealed that, the role of rail transport to port performance is many. Among them as noted by this study include reduction in port congestion, improve port cargo handling system and rail transport increases the port and government revenues. Rail transport has said to contribute in increases of cargo traffic, lowering the cost of logistic and improve customer satisfaction. Moreover, the study found that, railway transport is the second most-used mode of transport after roads. The improvement of this mode of transport in Tanzania would boost the economic performance of business enterprises. Therefore, rail transport is one among the major factors which can accelerate the growth in economies. A well-functioning and integrated transport system among other things in the economy stimulates national

growth and development which enhances the quality of life for all enabling the seamless movement of goods and services and people. Given the fact that transportation Infrastructure is very crucial to the growth of the economy, the situation of Tanzania transportation infrastructure especially railway is in a poor state.

In examining the level of current rail delivery operations at the general cargo and container terminals in the Port of Dar es Salaam, it can be concluded that;

The expansion of road transport in Tanzania influences the neglect of railways. It is noted that, African governments have invested mainly in road infrastructure improvement, neglecting railways. The study found that, liberalization in road transport and the slow response of railways to adapt to the new market conditions resulted in dramatic traffic decline in rail transport. It is noted with concern that, by 1990 most of the sub-Saharan African railways were in virtual bankruptcy, requiring permanent cash injection and large investments in infrastructure and rolling stock.

As the case of Tanzania, the findings of the study noted the declining trend of the tonnage transported by port/rail interface compared to the raising tonnage transported through road transport. The peak performance of TRL was in the year 2002 when it moved 1.446 million tons of freight, yet, the performance started to deteriorate from that time after the donors stopped supporting TRC. During the 2007 TRC transported 570,000 million tons of freight. After concession the performance of TRL continued to deteriorate. In the year 2010 TRL performed 256, 000 tonnes of freight. Surprisingly, Tanzania port are handles as per 2013 the total cargo traffic handled at

the ports reached 13.713 million tons equivalent to an13.4% increase from the preceding year. That means large percent of cargo tonnages transported through road transport as a result in port congestion and road congestion.

The responsible factors for this decline includes lack of efficient rail system, low capacity of rail transport, poor emphasis in rail/port intermodal and limited financial resources. Other hindrance factors include low uptake of rail transport by shipper who prefer to transport their cargo via road transport and rail network has been in a state of neglect. The conclusions of this study are that railway performance does not meet the expectations of its users and neither has it met those of its owners. It is inefficient, unreliable, and unprofitable in most years and operates a dilapidated, obsolete rolling stock

In exploring the relationship between the rail transport and the operational growth of port, it can be concluded that, there is a strong and positive relationship between the two. Improving rail transport is related to the improvement in cargo handling, reduces port congestion, and increases the volume of cargo and the increases in ship turnaround. The findings of the study demonstrate that railway transport is essential not only to port performance but also in economic growth and development.

However, in order to obtain information and collects data related to the topic under study, both qualitative and quantitative research methodology at all processes. The study was interested in both people's perception; opinion and understanding about the role of rail transport to port performance, in this case depth information were needed to understand the topic. Simultaneously, the study were interested to study

the correlation between the two variables rail transport to port performance which were to be provided by quantitative methodology in term of numerical, percentage of contribution etc.

5.4 Recommendation

- The government should promote railway sector in order to improve port performance. The process should, however, include the private sector in their capacity as major users of the railway infrastructure and facilities.
- The Government should look for other stakeholders, financiers and development partners to ensure that railway financing is enhanced. This will include making use of Public- Private Partnership (PPP) which is a legal framework currently in place in Tanzania and establishment of Railway Infrastructure Funds (RIF)
- Well-developed energy, transportation, and communication infrastructure networks are a prerequisite for linking less developed communities to markets in a sustainable way. Effective modes of transport including quality roads, railroads, air transport, and ports enable entrepreneurs to get their goods and services to markets in a secure and timely manner, facilitate the movement of workers to the workplace, and encourage foreign direct investment.
- Transport policy should focus on developing the intermodal transport especially the rail/port interface.

5.5 Areas for Further Study

This study recommends that, other study on similar topic should focus on how the Tanzania Port Authority, government together with TAZARA and TRL can

cooperate to generate financial resources in order to improve rail transport in the country especially the port/rail interface.

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APPENDICES

APPENDIX I: QUESTIONNAIRE

Dear Respondent, I am a Masters student in Business Management, Open University of Tanzania. I am currently conducting a research entitled "**The Role of Rail Transport to the Port Performance**". I would like you to assist me in answering the question follow below. The answers provided with you will remain confidential between you and researcher.

Section A: Demographic Characteristics

1. Name of respondents _____
2. Respondent Gender
    i) Male
    ii) Female
3. Education level of Respondents
    i) Have not gone to school
    ii) Primary school
    iii) Secondary school
    iv) Certificate
    v) Diploma
    vi) Bachelor Degree
    vii) Others specify (_____)

4. Position

a) Management level

b) Middle level / line manager

c) Operational level

d) None of the above

e) Other specify _____

5. Types of Employment

i) Full time

ii) Temporarily

iii) Other (specify) _____

Section B: The role of Rail to Port performance

6. Do you agree or disagree with the following statements?

Where **5**=strongly agree, **4**=agree, **3**=somehow agree, **2**=disagree, **1**=strongly disagree

	5	**4**	**3**	**2**	**1**
Rail delivery in general cargoes and container terminals reduces port congestion					
Rail delivery in general cargoes and container terminals reduces improve cargo handling at the port					
Rail delivery in general cargoes and container terminals increases the average of transported cargo					
Rail delivery in general cargoes and container terminals raises port and country revenues					
Rail delivery in general cargoes and container terminals improves customer satisfaction					
Rail delivery in general cargoes and container terminals improves lowering the cost of logistics					

7. Factors hindering effective use of rail transport in general cargoes and container terminals in Tanzanian port

	5	**4**	**3**	**2**	**1**
The lack of an efficient railway system					
The current rail capacity is subject to delays, breakdowns, low speeds and service disruption which result to high inefficiencies for the cargo owner who incurs costs due to delayed shipment.					
Poor emphasis on port/rail intermodal					
Rail network has been in a state of neglect and dilapidated.					
Little or no improvement upgrading of the railway line since construction					
Limited financial resources to get the infrastructure up and running and hence governments would opt for a much cheaper option of road development.					
Railway requires sufficient and constant funding to maintain the infrastructure as it requires highly qualified personnel, rolling stock and replacement of spare parts.					
The low uptake of rail transport by shippers who opt to transport their cargo via road than use the railway terming					

Section B: Operational Growth of the Port and the Constraints inhibiting Port Operations.

8. **The Operational Growth of the Port is measured by the following factors**

	5	**4**	**3**	**2**	**1**
Cargo handling system					
Tonnage of cargo trafficking					
Time used in vessels					
Increases in shipping					

9. **The Constraints inhibiting Port Operations**

a) Port congestion ( )

b) Shortage in cargo handling equipment's ( )

c) Bureaucracy in cargo handling ( )

d) Shortage in qualified personnel ( )

e) Shortage in cargo space ( )

f) Lack of financial resources for infrastructure

g) Others (specify)_____ ( )

Section C: The relationship between the rail transport and the port operational performance.

10. Rail transport improves port operational performance

a) Yes b) No c) No response

11. Rail transport increases productivity in cargo handling in the port

a) Yes b) No c) No response

12. Rail transport reduces port congestion

a) Yes b) No c) No response

13. Rail transport increases volume of cargo traffic

a) Yes b) No c) No response

14. Rail transport increases ship round turn

a) Yes b) No c) No response

Comments if any

_____

_____

THANK YOU