

**ASSESSMENT OF CHALLENGES FACING PORT CARGO HANDLING
EQUIPMENT IN TANZANIA: A CASE STUDY OF
DAR ES SALAAM PORTS**

By

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**Dissertation Submitted For the Partial Fulfillment of the Requirement for the
Award Postgraduate in Shipping and Port Management of the
At National Institute of Transport**

2016

CERTIFICATION

The undersigned certifies that he has read and hereby recommends for acceptance by The National Institute of Transport, a research paper titled “Challenges Facing Port Cargo Handling Equipment in Tanzania: A Case Study of Tanzania Ports Authority (Dar es Salaam Port)” in Partial Fulfillment of the Requirement for the Award of the Postgraduate in in Shipping and Port Management at National Institute of Transport.

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DECLARATION AND COPYRIGHT

I, **Yusuph Seif** , declare that, this study is my own original work and it has not been presented and will not be presented to any other university for a similar or any postgraduate award.

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ACKNOWLEDGEMENT

I would like to thank our Almighty God for making me healthy and strong at both normal and difficult times for the whole period of undertaking this research.

Also I would like to thank my family, parents, relatives and friends for their valuable contributions they made on accomplishing this research. Indeed, there is nothing better I can say to them than thanking and praying for them to continue having this heartfelt love and affection.

I extend my gratitude to my supervisor Mr. Muyaa for his time and efforts while supervising this study. To me, he has been a mentor; he did more than his normal share as a lecturer and he has been so committed and dedicated towards this achievement. May our Almighty God bless him in all of his undertakings.

It is definitely impossible to mention every person who has helped in one way or the other during the execution of this study, but I really recognize the role played by everyone who knowingly or unknowingly helped me particularly my respondents in various organizations such as Tanzania Port Authority (TPA), Tanzania International Container Terminal Services (TICTS), Tanzania Revenue Authority (TRA), and Inland Container Depots (ICDs) and the managements as a whole for their support in data provision whenever needs arose.

DEDICATION

This research paper is dedicated to my family, my parents, and all relatives and friends who devoted their spacious time and other resources to support my research undertaking. I will always remember them.

LIST OF ABBREVIATIONS AND ACRONYMS

BLTM	-	Bachelor degree in Logistics and Transport Management
BPLM	-	Bachelor degree in Procurement and Logistic Management
DSM	-	Dar es Salaam
Ft	-	Feet
ICDs	-	Inland Container Depots
Km	-	Kilometers
KOJ	-	Kurasini Oil Jet
NIT	-	National Institute of Transport
NIT	-	National Institute of Transport
SPSS	-	Statistical Package for Social Sciences
SSG	-	Ship to Shore Gantry Crane
SUMATRA	-	Surface and Marine Transport Regulatory Authority
TEUs	-	Twenty Feet Equivalent Units
TEUs	-	Twenty-Foot Equivalent Units
THA	-	Tanzania Harbors Authority
THA	-	Tanzania Harbours Authority
TICTS	-	Tanzania International Container Terminal Services
TISCAN	-	Tanzania Inspection Company Limited
TPA HQ	-	Tanzania Port Authority Headquarter
TPA	-	Tanzania Port Authority
TPA	-	Tanzania Ports Authority
TPSF	-	Tanzania Private Sector Foundation
TRA	-	Tanzania Revenue Authority

ABSTRACT

The purpose of this study was to identify challenges that were facing cargo handling equipment at Dar es Salaam Port and devise appropriate measures to overcome them. Data were analyzed by using content analysis technique which is the most desirable in this study, the data were presented in form of tables and pie charts by using Statistical Package for Social Scientists (SPSS) and Microsoft Excel as tool of analysis and later on explanation was done in words to give clear interpretation of findings

The findings of the conducted study indicate that Dar es Salaam port have revealed common challenges of port cargo handling equipment's such as Truck attachments, Gravity conveyors systems, Conveyors, Lifting, Order picking trucks, Industrial tracks and attachments and Power rollers conveyors are available at Dar es Salaam port but there were few in number compared to port operation and result in inefficiency on port operations such as delay of loading and unloading activities which result in port congestion. Other equipment for loading and unloading have to be hired from other countries, also it is expensive in terms of money where many laborers are needed in operation.

For the purpose of an organization to achieve its goals effectively and efficiently, the following are recommended: Provision of cargo handling equipment and not renting from neighboring countries because a lot of foreign exchange (income) gets lost or disappears. In minimizing running cost that results from poor working machines that need to be disposed and replaced with efficient machines, an organization needs to procure modern machines that fit to the world technology for profit making. Dar es Salaam Port should arrange periodic training and workshops for workers to improve efficiency in cargo handling equipment. Highly and modified equipment should be used so as to facilitate the port operation, Improvement of Port Exit Gates.

Currently there are three exit gates (Gate number 3, 4, and 5) which do not match with the flow of trucks out of the port.

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CHAPTER ONE

PROBLEM SETTING

1.0 Introduction

This part presents the background to the problem providing the setup of the research problem; it also presents the statement of the problem, research objectives, research questions, rationale of the study, and the limitations of the study which entails the challenges faced by a researcher during the execution of the study.

1.1 Background to the Problem

The port of Dar es Salaam is the principal port of Tanzania which handles 95% of the country's international sea trade. It has been a major port for imports to Tanzania and other landlocked countries which includes Rwanda, Burundi, Zambia, Uganda and Democratic Republic of Congo. Similarly, it has also been the major port for exports from Tanzania and other landlocked countries which includes Burundi, Zambia, Uganda and Democratic Republic of Congo. Due to the increase in International trade, the demand for both imports and exports has increased considerably resulting to the increased volume of cargo passing through the port of Dar es Salaam. This situation has increased the port activities throughout the year, which in turn has led to the port to operate over its accommodation capacity, (TPA Annual report, 2009).

The government through the Tanzania Ports Authority (TPA) has implemented a number of development projects which were designed to further modernize our ports and upgrade infrastructure facilities as follows ,Completion of Tanzania Ports Master Plan Study, New Port Control Tower and Search and Rescue, Coordination sub centre, Increase container handling capacity at Dar es salaam Port, Creation of more space inside and outside the port area causes TICTS container handling capacity to increase from 7500, TEUs to 11,000 TEUs (by stacking three containers high). The Government also managed to register six Inland Container depots (ICDs) from only two in 2008. The handling capacity of ICDs increased from 3500 TEUS in 2008 to

9,000 TEUs. Dar es Salaam port container terminal had a capacity of handling 3000 TEUs. Today, Dar es Salaam port is capable to handle 23,000 TEUs, 14,000 TEUs inside the port area and 9,000 TEU. By 2005, container volumes reached 250,000 TEUs a level that was not expected until 2010. Growth has continued (driven by economic growth in Tanzania and landlocked neighbors) but handling efficiency has declined. In 2007, the volume of traffic reached 343,000 TEUs and the cargo dwell time reached 27 days, storage space for 27,000 TEUs was therefore needed at any one time, (TPSF report, 2008). Therefore, insufficient storage capacity of the port as at that time (i.e. 2007) led to the severe port congestion, shippers, shipping lines and the port as a whole suffered a lot from this congestion.

The achievement in the transport sector notwithstanding, the transport sector is facing a number of challenges. Some of these challenges by sector include: Lack of sufficient government funding for port projects, Port projects need huge capital investments, The Government is trying to encourage the participation of private sector as partners to these projects, Dilapidated infrastructure facilities and inadequate cargo, handling equipments at inland ports especially Mwanza and Kigoma ports, causes the diversion of cargo to other modes of transport and customers to opt for other nearby ports of Mombasa and Durban for Uganda and DRC car- goes respectively, Inadequate interface connectivity from other modes of transport (i.e. Railways and Roads). This problem contributes to high total transport costs as most cargo is trans-ported by road which is very expensive, Inadequate interface facilities such as trucks, engines and wagons and cargo handling equipments, Inadequate experts for provision of cargo facilitation services such as Clearing and Forwarding Agencies, Inadequacy of own public resources – due to poorly performing economy (external finance 60 % of budget), Impact of the global financial crisis on levels of resources mobilized from traditional donors, Resources committed by development partners remain largely unattained; Private Sector is least interested in transport infrastructure sector venture (Dar es salaam Port 2009/2010).

1.2 Statement of the Problem

Ports provide a regional gateway to international trade. They are the entry and exit points for a nation import and exports. Both people and goods pass through ports. The ports may be their final destination or a point from which they will resume their journey. Goods arriving in ports may be in bulk or travelling in specially made vessels for such items as oil, petroleum or chemicals. Therefore vessels arriving in ports may be passenger vessels or vessel built to carry goods or both (Kimberly ,2000).

The role and significant of ports has changed dramatically in recent days and become much higher profile both economically and technically in maritime and international trade. Not only is the port a link in international transport chain but also many of the major ports become trading centers. In Tanzania the ports of Mwanza, Bukoba, Kigoma and Kyela could be trading centers. Also higher trade growth in Dar es Salaam, and Mtwara as major ports could be attained with improved port efficiency (Bruun,1995).

Nobody can ignore the role of seaports when talking of the growth of Tanzania economy. Most successful ports have been market oriented ports. Many ports have taken initiatives in addressing issues of decline in traffic, increasing competition, changing needs of port users and new market prospects. All these therefore call for port investments (Kissa, 2005).

Problems of inadequate handling equipments (Power rollers conveyors ,Gravity conveyors systems ,Conveyors, Lifting, Order picking trucks, Truck attachments, Industrials tracks and attachments) in the ports normally depend on various factors including port infrastructure (inland transport system), port capacity, logistics integration, technology, management planning, human resources, warehousing, clearance procedures and documentation, lack of capital and cargo clearing and forwarding procedures. Thus, smooth availability or existence of all outlined factors will lead to better performance of cargo handling in the port; otherwise will lead to unfavorable cargo handling performance.

Dar es Salaam port suffers from extensively inefficiency, safety management, corruptions, technology and system break downs, system break down go up to 24 hours of 72 hours sometimes leading to long trucks lining up for container clearance. Corruption is also very high affecting the custom duties paid by both importers. There are different factors that can lead to port congestion among the factors is cargo handling operations .The research aimed at identifying factors related to cargo handling which lead to port congestion, thereafter come up with recommendations on how to improve the operations and reduce congestion.

1.3 General Objectives

The main objective of the research was to identify challenges that were facing cargo handling equipment at Dar es Salaam Port and devise appropriate measures to overcome them.

1.3.1 Specific Objectives

- i. To explore cargo handling equipment's in Dar es Salaam Port.
- ii. To assess challenges facing cargo handling equipment in Dar es Salaam Port
- iii. To provide suggestions to be taken to improve the performance of Dar es SalaamPort in cargo handling process.

1.4 Research Question

- i. What is the cargo handling equipment's use in Dar es Salaam Port?
- ii. What are the challenges facing cargo handling equipment in Dar es Salaam Port
- iii. What are the suggestions that can be taken to improve the performance of Dar es SalaamPort in cargo handling?

1.5 Significance of the Study

The study will help the Government through Tanzania Ports Authority (TPA) to realize whether Dar es Salaam Port have managed to reduce the challenges that affect performance of Port. Hence, it will be a step forward for the Government to consider any other measure for port challenges to improve the Dar es Salaam Port and thereby

enhance global competition. The study will enable the higher learning institutions to secure reference materials for developing other research findings and to raise the students' awareness on port related courses.

1.6 Scope of the study

The study was to identifying challenges that were facing cargo-handling equipment at Dar es Salaam port as the case study. Thus the study concentrates on answering research question in the organization which was used as a case study.

1.8 Limitations of the Study

Due to a research being a vital study, a number of setbacks were encountered, these include:

Uphill Task in Data Collection: The researcher faced this task in tracing respondents in order to obtain required data, because the study respondents were not confined in a single area.

Financial Capacity: Due to financial position of the researcher, researcher faced with inadequate financial capacity to meet daily traveling, meal and stationary cost during undertaking this study.

Respondents Reluctance: Some of respondents were reluctant in expose their correct responses as they considered being confidential.

1.7 Delimitations of the Study

Limitation 1: The researcher overcomes this limitation by spending an adequate number of days on data collections task so as obtain the targeted number of respondents in study area.

Limitation 2: The researcher overcome this by borrowed some money from family and friend in mutual understanding so as to supplement his financial needs in undertake this study.

Limitation 3: The researcher overcomes this through convincing language which accompanied by clarification of the purpose of the study, where by eventually the respondents willingly expose their true response.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This section covered fundamental definitions of the key terms used in the study, relevance of theories and principles of the study, and clear links of the proposed study to other previous study.

2.1 Theoretical literature Review

2.1.1 The meaning of ports

Port and Harbor are the two words which are used synonymous but in practice they stand for different meanings. A port is a town with a harbor and facilities for a ship/shore interface and also Customs facilities whereas a harbor is a shelter, either natural or artificial, for ships (Nargoski B, 1972).

2.1.2 Delay Factor

Delay usually has time-associated cost effects on a contract, which measured in terms of time, money, or a combination thereof, (www.businessdictionary.com).

2.2 Objectives and benefits of better handling

Reduced costs; cost reduction program have two broad goals either to reduce the cost of cargo handling or to reduce total production costs by improved handling procedures. Increased capacity; increased capacity is frequently used as a justification for improving a handling a handling system, where a firm needs more space or increased output. Cargo handling improvements can increase capacity in the following ways, better space utilization, improving the layout to reduce travel or excessive waste of space, higher equipment utilization and faster loading and discharge .Improved Working Conditions such as Safety to men, cargo and associated equipment. These may be enhanced by a proper cargo handling system.

Easier jobs. Where heavy objects must be handled, the rate of output may significantly be affected by the physical ability and condition of the operator and

Lighter work. If the work is physically lighter it may be possible to use operators of a different job classification which can mean lower wage rates, (Imakita, 1978).

2.3 Models Adaptable to Practical Situations

2.3.1 Industrials tracks and attachments

According to Tomkins (1998). Industrial tracks are used in warehouse comparatively short distances, for lifting goods into and out of storage and for vehicle loading and unloading. The use of tracks also facilitates loading unification and large load so reducing the frequency of movement it enables quicker movement and the use of height for storage purposes. The main types of tracks encountered in warehousing and similar types of operation are Pallet track- manual and powered, Fork lift trucks, Order picking trucks, Tug and tractors, Straddle carriers and Crane units (mobile cranes and portal cranes), Manual trolley and Reach stackers.

- (i) Order picking trucks** these are free path truck for order picking and are available for low level, intermediate and for high level picking pallet truck; they are often used for case picking at ground level, in addition to various types of pedestrian trolleys and roll cage pallets.
- (ii) Lifting Crane** and hoists are generally for raising and moving cargo on an intermittent basis, within an area which is defined by the equipment configuration (The exception is mobile cranes) Installation are therefore less flexible than for example, fork lifting trucks, though for regular lifting within a define areas, and for heavy loads, may be much more suitable .Because they lift overhead, they do not required aisles for horizontal movement of cargo.
- (iii) Conveyors** systems are used for moving cargo between specified period for holding cargo, and for process proposes, e.g. cooling its Characteristics involves, High throughputs on fixed routes, Manning required only for feed and discharge and Usable where other handling system cannot be used e.g. across uneven floors, in confined spaces, between floors.

(iv) Gravity conveyor system Gravity systems are simple in concept, not requiring power supplies, motors and switch gear. However, control of speed can be a problem and inclines should always be tested when designing such systems. There includes the following Chutes, Gravity roller conveyors and Skate wheel conveyors.

(v) Power rollers conveyors There are available in wide range of size from about 200 mm wide to 1500mm wide and capacities from 5 to with 3 rollers in contact at all times. In drives are not recommended and for changes of heights felt belt conveyor may be more suitable

(vi) Truck attachments there is various for lift truck attachment for handling load which cannot be handled with forks, or for providing additional degrees of movement. These are Clamps, Side shifts, Rotating head, Load push- pull and Non- powered attachments.

2.4 Empirical Review

According to P.A. Ioannou (2002). Containerization has grown remarkably since the Korean War in the 1960's. Today approximately 70% of seaborne cargo is carried out in containers. Among the advantages of containerization is that containers come in standard forms and that only a few types of handling equipment are needed, no matter what kind of cargo is carried inside the container. With containerization many small packages are combined to a larger unit to simplify the handling costs. Moreover, it is also likely that fewer damages occur; compared to non-containerized cargo and the containerized goods are safe in the container during storage of the container in the warehouse and during transportation. This is especially important when the cargo contains explosive material or goods that need to be kept in either low or high temperatures.

Mariamamu (2011) conducted a study on benefits and challenges facing the growth of multimodal transport networks in Tanzania and observed the challenges as follows; TPA for a long time has not assigned a high priority to expand and improve its ports

in terms of infrastructure and superstructure, on the rise without enhancing the port capacity. This has also resulted to slow improvement of port productivity in ship operations and land side operations including efficient cargo delivery and achievement of low cargo dwell times.

Rabia (2013) conducted a study on the analysis of dwell time factors and cargo delivery costs in Tanzania and indentified the challenges as follows; TPA does not have adequate infrastructure to provide services without delay, there is insufficient gates, documentation process is long and unnecessary, lack of ICT and lack of proper road network connecting the port with its hinterland.

Asteris (2008), congestion at the port was caused by inefficiency in management of the port, especially in handling of cargoes at the cargo terminal. The study also found that lack of sufficient space at the cargo terminal in Dar es Salaam port undermined the ability of the port to handle and clear the growing volume of cargo passing through the port. The volume of cargoes passing through the port of Dar es Salaam reached 250,000 TEUs in 2007. This volume was expected to grow due to expansion of economic activities in Tanzania and neighboring landlocked countries. The increase in volume of cargo passing through the port has resulted in to more congestion. Furthermore, TPA has taken measures to ensure that all cargoes offloaded from ships are transported directly to AMI ICD, TRH ICD, DICD and AZAM ICD. Other efforts to clear the congestion include, location of more spaces outside the port of Dar es Salaam to accommodate vehicles awaiting handling.

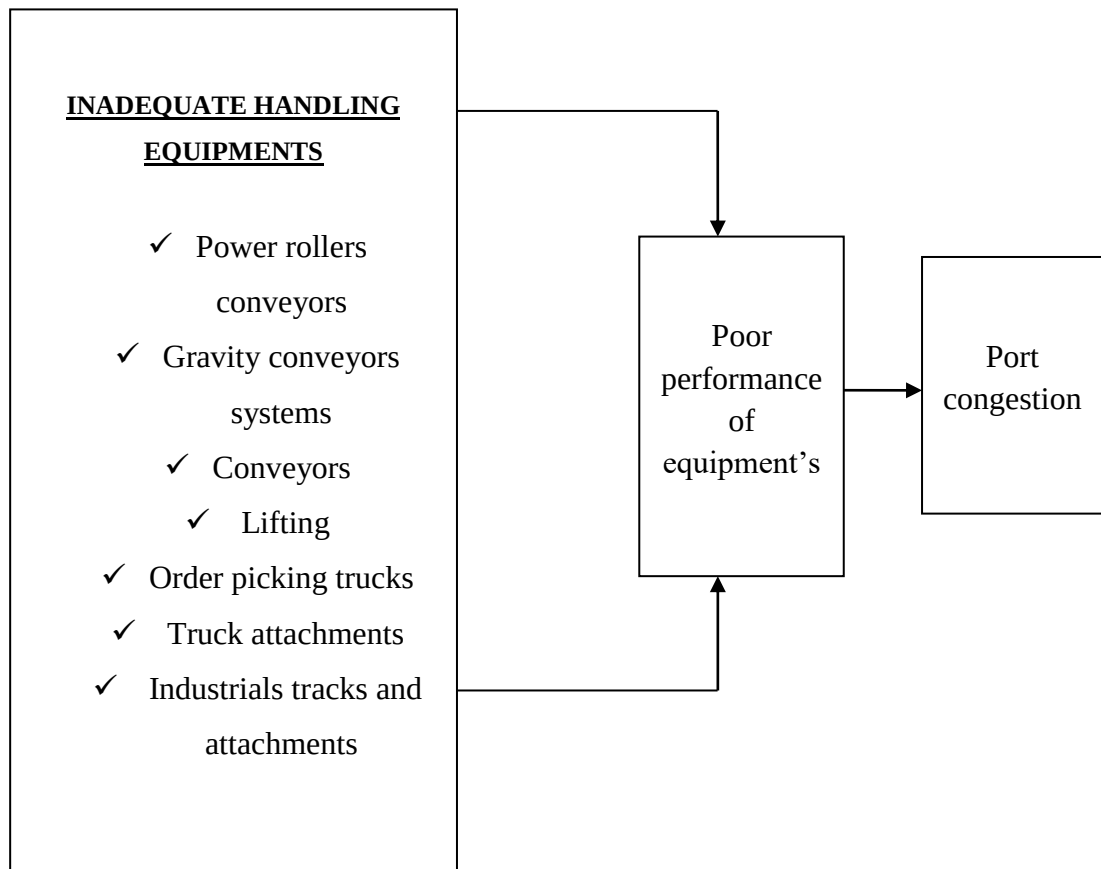
The Tanzania Ports Authority (TPA) has a challenge to reduce number of days in cargo clearance to make it more competitive against the other ports in the eastern and southern Africa region. Currently cargo clearance at the port takes between 3 to more than 4 weeks which is not healthy for many businessmen (The Guardian, 2014).

The Tanzania Ports Authority (TPA) has put a modern system at the Dar es Salaam port that has seen days to clear cargo from South Africa going down to seven from 14 some years back. The move has drawn praise from the port users including the

Tanzania Shipping Agents Association (TASAA) Chairman, Emmanuel Mallya. He said that the progress would make the Dar es Salaam port most competitive at the East African region and especially on cargo from South Africa. Average vessel berthing delay last February was 12.29 days while average vessel productivity was 16.33 per vessel per hour. But after three months, the situation has not improved much as expected with average vessel berthing delays at 11.24 days, while average vessel productivity is 16.36 per vessel per hour (Daily News ,2012).

2.5 Model of the Study

Figure 1: Visual model for the challenges facing Dar es Salaam port.



2.6 Research Gap

All theoretical and empirical literature show challenges faced ports in general and not at Dar es Salaam port. Key challenges that are facing cargo handling activities in Dar es Salaam port are not known. Therefore, this study aims to fill the gap by

critically assessing on challenges that were facing cargo handling equipment at Dar es Salaam Port. This is because the factors have not been critically assessed in previous studies.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter describes the research design and methodology, which will be employed in undertaking the study. It comprises the research design, area of study, the target population, sample of the study, sampling techniques data collection methods, data analysis.

3.1 Type of the Study

Kothari (2006), defines research design as the “conceptual structure within which the research will be conducted, it constitutes the blue print for the collection, measurement and analysis of data. In this study, case study is deploy as a research design where by descriptive research is taken place at Dar es salaam Port, where by large number of Dar es Salaam Port international trade stakeholder are found. The researcher prefers this design because it allows application of all possible data collection techniques namely; observation, questionnaires, interviews, and documentary reviews.

3.2 Study Area

The study is taken place in Dar-es-salaam port. It is located in Temeke municipal. Temeke municipal is one of three municipal of Dar es Salaam region, others being Ilala to the South and Kinondonito the North. The reasons behind of selecting this area, first the area is very crucial to the economy of the nation, due to nature of business and port industry which is very crucial. Second, the area is feasible to majority of international trade stakeholder. Third, limited time and cost constraints, which limit the researcher to cover the entire population of international trade stakeholders in Tanzania.

3.3 Study Population

Population is the target group to be studied, it is the aggregate of all the units pertaining to a study, (Krishnaswami, et al, 2007).The study population for this study

involved fifty (50) employees who are working in operations departments for Dar es Salaam port,

3.4 Sample size and Sampling Techniques

Kothari (2006), a sample refers to the respondents selected for the representation of the total population in order to produce a miniature cross section. The sample size for this study is drawn from a study population of the Dar es Salaam Port stakeholders, Fifty (50) respondents are used as a sample size, because it is a reasonable number, manageable and affordable in analysing the data which are collected, so as to get good results, instead of having more respondents which will be difficult to administer, or having few respondents which will be bias for the study.

3.4.1 Sampling Technique

Kothari (2004), defines sampling techniques as the selection of some part of an aggregate or totality of what the population is made. Sampling is one of the best systematic techniques of choosing a group of individuals, in choosing a sample technique for this study; the researcher closed purposive sampling techniques.

3.4.2 Purposive Sampling Technique

Kothari (2004), define purposive sampling technique as the one, which enables a researcher to select a sample based on his /her knowledge of population, research elements and objectives. Purposive sampling is also based on researcher's judgment and purpose of the study. This technique is used to all targeted respondents of this study. The technique is selected purposely to all respondents since they are likely to be available and they had an experience and knowledge that could help to provide detailed information regarding the study. Apart from that purposive sampling is appropriate sampling procedure because it is typical the universe with regards to the characteristics under investigations.

3.5 Data Collection Methods

The researcher in this study used combination of data collection methods in order to obtain actual and complete information.

3.5.1 Primary Data Collection Method

The primary data collection method comprising of Questionnaires

3.5.2 Questionnaires

These are set of questions intended to capture the feelings, attitudes and Values of respondents in a systematic way. Questionnaire is one of most used in data collection methods; the researcher is used it to all categories of the respondents. The method is suitable to the respondents because majorities are literate, that is they can read and write. However, due to their daily activities or some limitation, it is possible to contact them under other data collection methods such as interview. Additionally, the method is free from bias of the researcher as it gives the respondents enough time to reply the questions on his or her own understanding (Kothari, 2004).

3.5.3 Secondary data Collection Method

The primary data collection method comprising of content analysis and documentary sources

3.5.4 Content Analysis

Kothari (2004), content analysis is a method for summarizing any form of content by counting various aspects of the content. The researcher will use this method in obtain key content arises during the interview. This enables a more objective evaluation than comparing content based on the impressions of a listener. Content analysis enables researchers to sift through large volumes of data with relative ease in a systematic fashion.

3.5.5 Documentary Sources

The researcher collecting data available from various documents found at different library office of study respondents and in electronic source such as, internet. The document will be viewed are those related to the study, such document are published and unpublished research on international trade, global trade and customs journal and journal of world trade. The documents provided reliable, suitable and valid data and in general, documentation save money and time because the information is being ready made, (Krishnaswami et al, 2007).

3.6 Reliability and Validity of Data

3.6.1 Reliability

This is the extent to which an experiment, a test or any measuring procedure gives the same results on repeated trials (Kothari, 2004). The researcher will use the test and retest procedure in which the set of questions intended to capture the feelings attitudes and Values of respondents in a systematic way.

3.7.2 Validity

Shows the degree of which an instrument measured what it is supposed to be measured (Kothari 2004). To achieve this, researcher make sure the research data are valid and reliable by constructing questions that appropriate with the research problem, drawing a representative sample and secondary data once will be used its source, content, time collected and its applicability on the study research problem will be analysed.

3.7 Data Analysis and Presentation

According to Kombo and Tromp (2003) data analysis refers to examining what has been collected in survey or experiment and making deductions and inferences. It involves uncovering underlying structures, extracting important variables, detecting anomalies and testing any underlying assumptions. In this study, since it is qualitative descriptive approach, the researcher analyze collected data which are in qualitative nature by use content analysis technique which is the most desirable in this study, the data will be presented by using statistical techniques via uses of SPSS 18 and Micro soft Excel 2007 and later on explanation was be done in words to give clear interpretation of findings.

CHAPTER FOUR

RESEARCH FINDINGS, DATA ANALYSIS AND DISCUSSION OF THE RESULTS

4.0 Introduction

This chapter presents the findings of the study based on the methodology as described in Chapter Three. It provides the description of respondents and thereafter explains their responses on the research questions that cater for objectives of the study. It further presents the finding of the study by analyzing and tabulating the collected data from several study areas through carefully selection to represent the population thereafter discusses the findings as per objectives of the study and research questions.

4.1 Respondents Profiles

The researcher distributed a total of fifty (50) questionnaires to be filled by the respondents in all of the study units thought. However, only thirty two (32) questionnaires were duly filled and collected. The response rate was therefore eighty percent (64%). Following are the respondent's profiles in terms of their employment organizations, gender status, age, education, position, employment status, and work experience.

4.1.1 Gender status of the Respondents

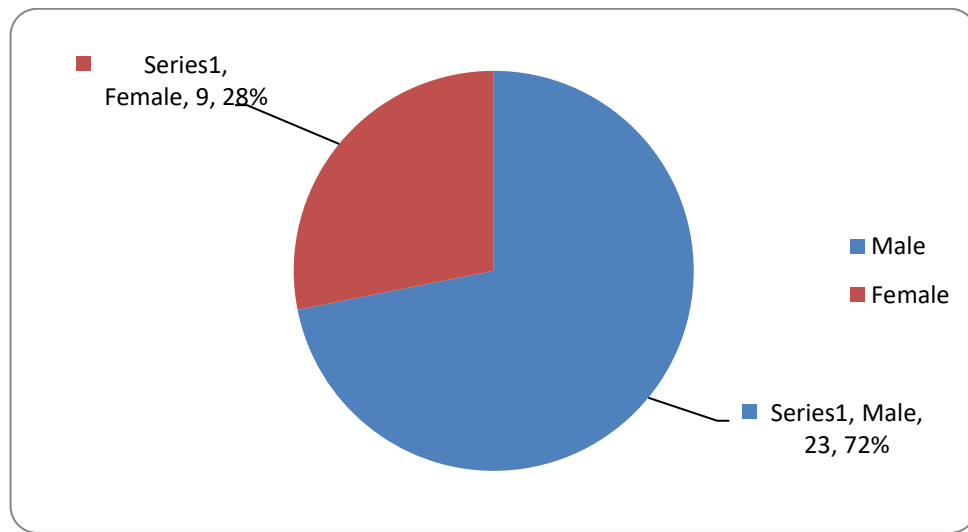
Data were collected from both genders to merge the knowledge of understanding between male and female respondents and so to comply with gender mainstreaming policy.

Table 4.1: Gender Status

Gender		Frequency	Percent	Cumulative Percent
Valid	Male	23	72.0	72.0
	Female	9	28.0	100.0
Total		32	100.0	

Source: Research Findings, 2016.

Figure 4.1: Gender Status



Source: Research Findings, 2016.

From table 4.1 and figure 4.1 above, the research results revealed that, out of 32 respondents to this research, 23 respondents equal 72 percentage were males and 9 respondents equal to 28 percentages were females. This results shows that the research was dominated by male respondents due to the fact that most of the women does not prefer port related works due to their incapability of performance.

4.1.2 Age of Respondents

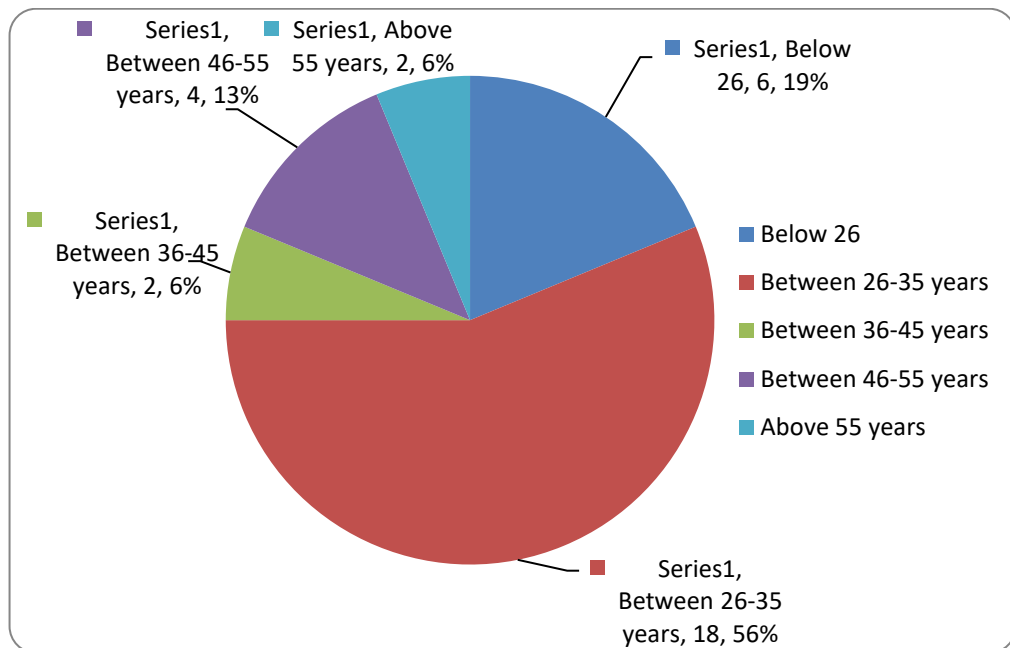
The researcher used all age groups to help him in merging the knowledge of both seniors and juniors respondents.

Table 4.2: Age of Respondents

Age		Frequency	Percent	Cumulative Percent
Valid	Below 26	6	19.0	19.0
	Between 26-35 years	18	56.0	75.0
	Between 36-45 years	2	6.0	81.0
	Between 46-55 years	4	13.0	94.0
	Above 55 years	2	6.0	100.0
Total		32	100.0	

Source: Research Findings, 2016.

Figure 4.2: Age of Respondents



Source: Research Findings, 2016

From table 4.2 and figure 4.2 the age groups of the respondents were found to be as follows; 6 respondents equal to 19 percentage were aged below 26 years, 18 respondents equal to 56 percentage were aged between 26-35 years, 2 respondents equal to 6 percentage were aged between 36-45 years, 4 respondents equal to 13 percentage were aged between 46-55 years, and 2 respondents equal to 6 percentage were aged above 55 years. The results shows that a cumulative 26 respondents equal to 81.2 percentage where all below the age of 45 years which means that the validity and reliability of the data collected were large enough.

4.1.3 Education of Respondents

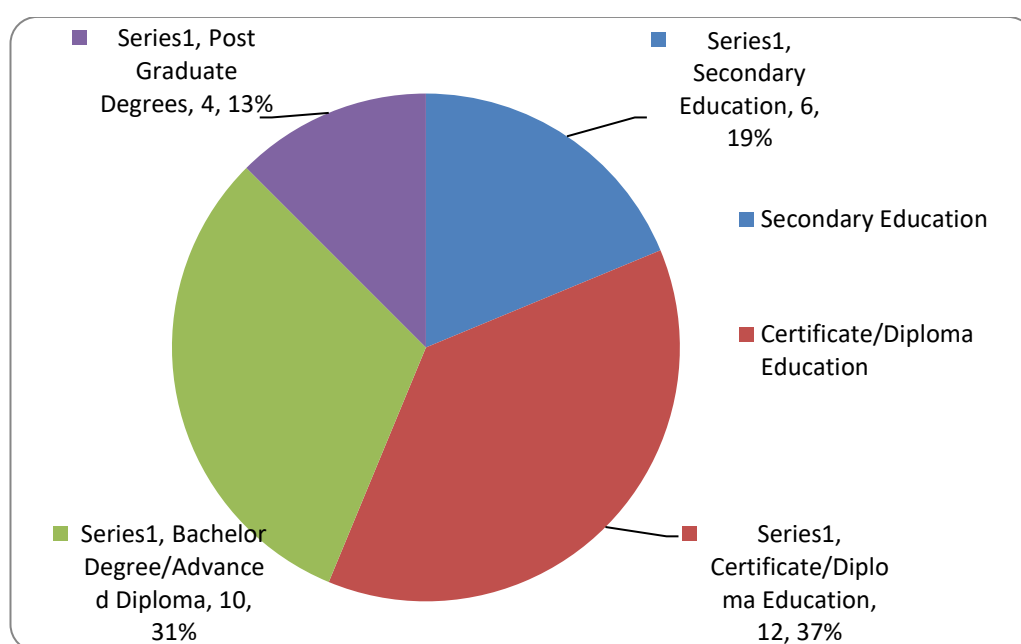
The respondents were sorely engaged basing on their professional and level of education, only respondents with port related professional were selected while putting into consideration on all level of education as from primary to post graduate education.

Table 4.3: Education of Respondents

Education		Frequency	Percent	Cumulative Percent
Valid	Secondary Education	6	19.0	19.0
	Certificate/Diploma Education	12	37.0	56.0
	Bachelor Degree/Advanced Diploma	10	31.0	87.0
	Post Graduate Degrees	4	13.0	100.0
	Total	32	100.0	

Source: Research Findings, 2016.

Figure 4.3: Education of Respondents



Source: Research Findings, 2016.

From table 4.3 and figure 4.3 above, the research reveals the following results; out of 32 respondents, none of the respondents were found having primary education, 6 respondents equal to 19 percentage were respondents with secondary education, 12 respondents equal to 37 percentage were respondents with certificate/diploma

education, 10 respondents equal to 31 percentage were respondents with bachelor degree/advanced diploma, 4 respondents equal to 13 percentage were respondents with post graduate education. The absence of respondents with a primary education indicated that the information gathered were valid and reliable due to being provided by the respondents with relevant education and professional.

4.1.4 Position on Employment

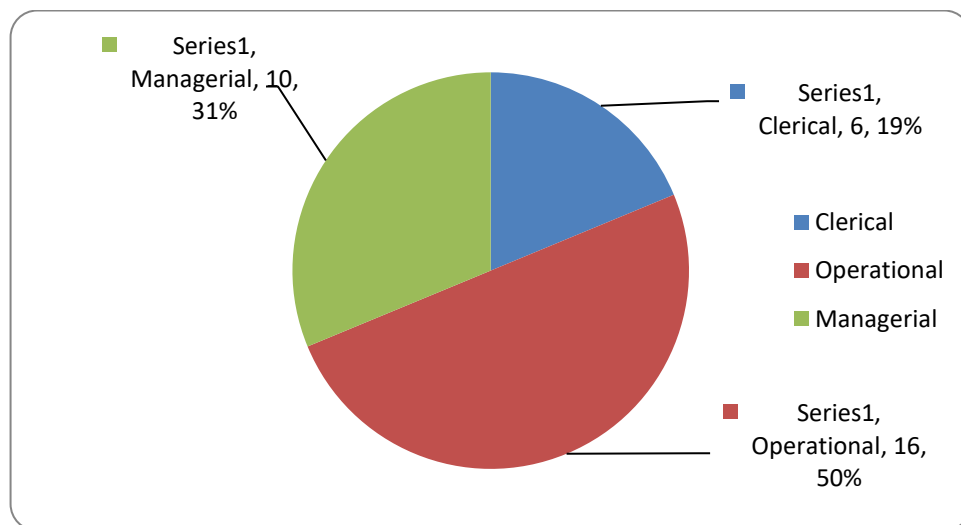
The researcher used all levels of position in employment ranging from clerical level to managerial level.

Table 4.4: Position on Employment

	Employment	Frequency	Percent	Cumulative Percent
Valid	Clerical	6	19.0	19.0
	Operational	16	50.0	69.0
	Managerial	10	31.0	100.0
	Total	32	100.0	

Source: Research Findings, 2016.

Figure 4.4: Position on Employment



Source: Research Findings, 2016.

From table 4.4 and figure 4.4 the results showed that 6 respondents equal to 19 percentage were employees working under clerical level, 16 respondents equal to 50 percentage were employees working under operational level while 10 respondents equal to 31 percentage were employees working under managerial level. These results indicate that a large number of respondents working under operational level in this study, reveals that the information provided is valid as it was desirable.

4.1.5 Working Experience

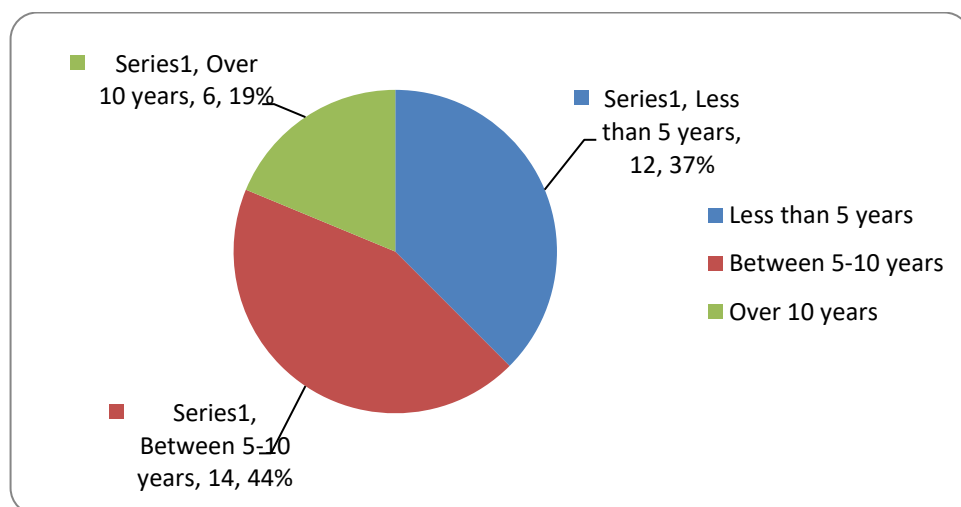
The researcher wanted to know the duration of respondents in port related jobs so as to judge on validity of data provided thereof. He therefore used both level of working experience and the results are as shown below.

Table 4.5: Working Experience

		Frequency	Percent	Cumulative Percent
Valid	Less than 5 years	12	37.0	37.0
	Between 5-10 years	14	44.0	81.0
	Over 10 years	6	19.0	100.0
Total		32	100.0	

Source: Research Findings, 2016.

Figure 4.5: Working Experience



Source: Research Findings, 2016.

From table 4.5 and figure 4.5, above, the results show that 12 respondents equal to 37 percentage were employees with a working experience of less than 5 years, 14 respondents equal to 44 percentage were employees with a working experience of between 5-10 years while 6 respondents equal to 19 percentage were employees with a working experience of more than 10 years. This indicates that, information obtained is valid since most of the respondents have enough experience in port related jobs.

4.2 Research Findings

As far as this study is concern, the stated research questions and specific objectives focused on challenges that were facing cargo handling equipment at Dar es Salaam Port.

4.3 Challenges Facing Cargo

Loss of flexibility; if a proposed handling system is designed around a cargo of a limited size, shape, volume or rate of production and geared to a particular sequence of operations, one should be aware of the impact of potential changes. Is the proposed system flexible enough to be economically and quickly adapted to the likely range of changes in the product or production technique? If not, exchange cost and time loss must be included in the evaluation or it must be shown that the investment was be satisfactorily recovered before the proposed handling system was require modification. Many conveyor systems come to economic grief on this failure.

Vulnerability to downtime; since a handling system is a composite of mechanical and electrical machinery and controls it must be recognized that it may break down at times. What happens then? How long was it take to get it back into service and what was be done while repairs are being made? If this is serious the handling system must be redesigned to provide for more reliability for alternate handling techniques in event of break down or for in process storage that can feed subsequent operations while the system is being repaired. All of these can result in additional costs that must be charged against the handling system (James M. Apple, 1977).

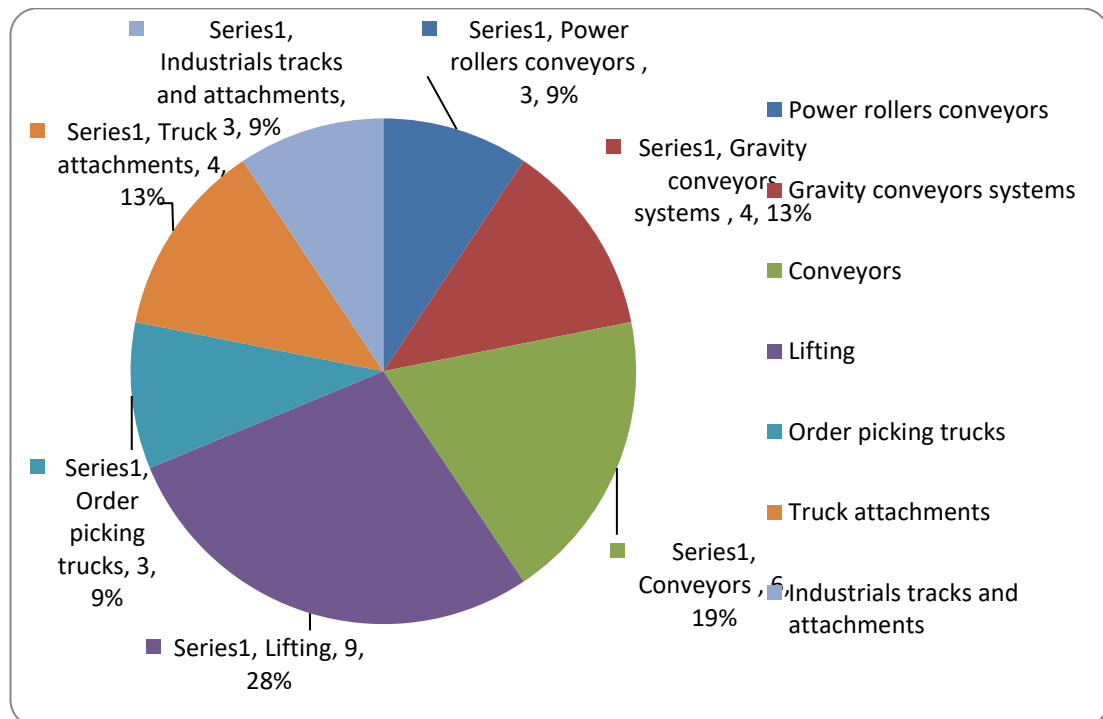
4.3.1 Cargo Handling Equipment in Dar es Salaam port

Table 4.6 Major's cargo handling equipment's in Dar es Salaam port.

S/N	Major's cargo handling equipment's in Dar es Salaam port	Frequency	Percentage (%)
(i)	Power rollers conveyors	3	9.0
(ii)	Gravity conveyors systems	4	12.0
(iii)	Conveyors	6	19.0
(iv)	Lifting	9	28.0
(v)	Order picking trucks	3	9.0
(vi)	Truck attachments	4	12.0
(vii)	Industrials tracks and attachments	3	9.0
TOTAL		32	100%

Source: Research Findings, 2016.

Figure 4.6: Major's cargo handling equipment's in Dar es Salaam port.



Source: Research Findings, 2016.

From table 4.6 and figure 4.6 above, according to the respondents above, cargo handling equipment's (Truck attachments, Gravity conveyors systems, Conveyors , Lifting, Order picking trucks, Industrials tracks and attachments and Power rollers conveyors) are available at Dar es Salaam port but there were few in number compared to port operation and result on inefficiency on port operations due to:

Loss of flexibility; if a proposed handling system is designed around a cargo of a limited size, shape, volume or rate of production and geared to a particular sequence of operations, one should be aware of the impact of potential changes. Is the proposed system flexible enough to be economically and quickly adapted to the likely range of changes in the product or production technique? If not, exchange cost and time loss must be included in the evaluation or it must be shown that the investment was satisfactorily recovered before the proposed handling system was require modification. Many conveyor systems come to economic grief on this failure. Vulnerability to downtime; since a handling system is a composite of mechanical and electrical machinery and controls it must be recognized that it may break down at times. What happens then? How long was it take to get it back into service and what was be done while repairs are being made? If this is serious the handling system must be redesigned to provide for more reliability for alternate handling techniques in event of break down or for in process storage that can feed subsequent operations while the system is being repaired. All of these can result in additional costs that must be charged against the handling system (James M. Apple, 1977).

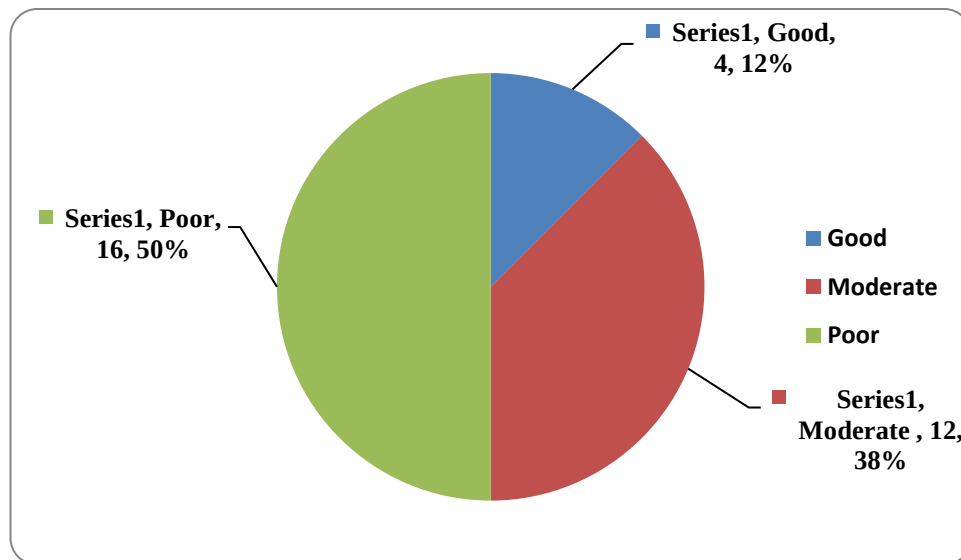
4.4.1 Condition overall performance of equipment's at Dar es Salaam port

Table 4.7: Performance of equipment's at Dar es Salaam port

Performance		Frequency	Percent	Cumulative Percent
Valid	Good	4	12.0	12.0
	Moderate	12	38.0	50.0
	Poor	16	50.0	100.0
Total		32	100.0	

Source: Research Findings, 2016.

Figure 4.7: Performance of equipment's at Dar es Salaam port



Source: Research Findings, 2016.

From table 4.7 and figure 4.7, above, the results showed that 4(12 percentage) of respondents agreed that there were good Performance of equipment's at Dar es Salaam port, 12(38 percentage) of respondents agreed that, there Moderate Performance of equipment's at Dar es Salaam port, 16 (percentage) of respondents, said that there were poor performance of equipment's at Dar es Salaam port. As the majority of respondents responded negatively, this gives the conclusion that there was poor performance of equipment's at Dar es Salaam port.

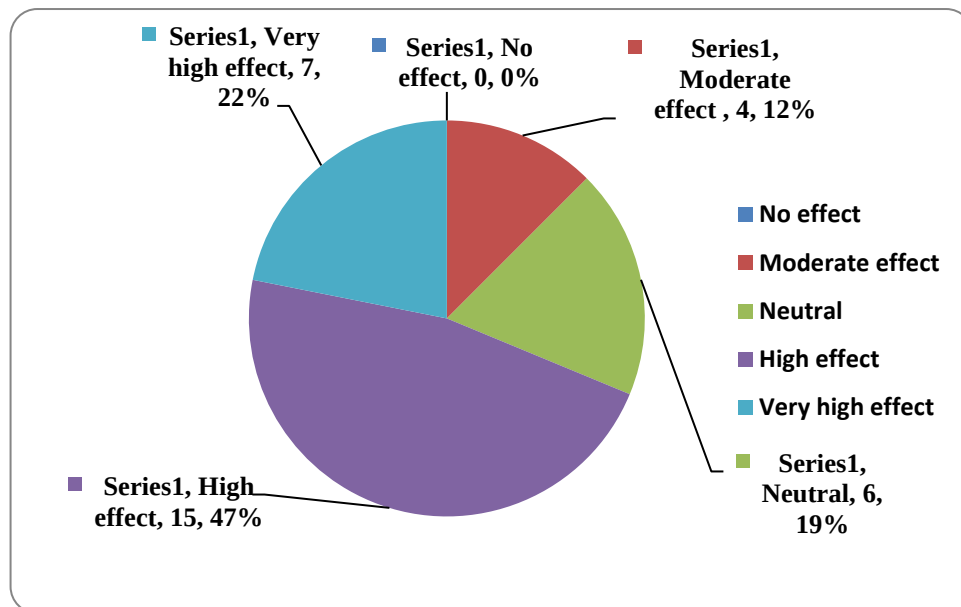
4.3.2 Impact of cargo handling equipment's at Dar es Salaam port.

Table 4.8: Impact of cargo handling equipment's at Dar es Salaam port

Performance		Frequency	Percent	Cumulative Percent
Valid	No effect	0	0	0
	Moderate effect	4	12.0	12.0
	Neutral	6	19.0	31.0
	High effect	15	47.0	78.0
	Very high effect	7	22.0	100.0
Total		32	100.0	

Source: Research Findings, 2016.

Table 4.8: Impact of cargo handling equipment's at Dar es Salaam port



Source: Research Findings, 2016.

From table 4.8 and figure 4.8 above, concerned impact of cargo handling equipment's at Dar es Salaam port, the results showed that, None of respondents said "No effect" concerned the impact of cargo handling equipment's at Dar es Salaam port, 4(12 percentage) of respondents agreed that, there moderate effect of cargo handling equipment's at Dar es Salaam port, 6(percentage)of respondents,

said there “Neutral effect” it means neither high effect nor low effects of cargo handling equipment’s at Dar es Salaam port, 15(47percentage) of respondents agreed that, there were high effect of cargo handling equipment’s at Dar es Salaam port during operations, 7(22 percentage) of respondents agreed that, there were very high effect of cargo handling equipment’s at Dar es Salaam port during operations. As the majority of respondents responded negatively, this gives the conclusion that there were negative of cargo handling equipment’s at Dar es Salaam port.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.0 Introduction

This chapter tells the nature of summarized findings from what the researcher was investigating, it is comprised of three main categorical parties which are summary of research findings, recommendations and conclusion, the chapter gives an insight on what has been discussed thereon and recommend on what has been seen to be the impacting part of the most research investigation and at last it end up giving conclusion.

5.1 Summary of the findings

The purpose of this study was to identify challenges that were facing cargo handling equipment at Dar es Salaam Port and devise appropriate measures to overcome them. The data collection methods used included questionnaires and documentary review such as journals, books, dissertations, discussion papers, magazines and other records., also research techniques/ procedures were deployed by the researcher to come up with proportionate number of respondents involved in the study. The study were focus on the sample of 32 respondents from Dar es Salaam port and other crucial stakeholders were random chosen for the purpose of this study. Data were analyze by using content analysis technique which is the most desirable in this study, the data were presented in form of tables and pie' charts by using Statistical Package for Social Scientists (SPSS) and Microsoft excel as tool of analysis and later on explanation was done in words to give clear interpretation of findings and specific objectives are -;

- i. To explore cargo handling equipment's in Dar es Salaam Port.
- ii. To assess challenges facing cargo handling equipment in Dar es Salaam Port
- iii. To provide suggestions to be taken to improve the performance of Dar es SalaamPort in cargo handling process.

5.2 Conclusion

The findings of the conducted study indicates that Dar es Salaam port have revealed common challenges of port cargo handling equipment's such Truck attachments, Gravity conveyors systems, Conveyors, Lifting, Order picking trucks, Industrials tracks and attachments and Power rollers conveyors are available at Dar es Salaam port but there were few in number compared to port operation and result on inefficiency on port operations such as delay of loading and unloading activities which result on port congestion. Other equipment for loading and unloading have to hire from other country, also it is expensive in terms of money where by many labors are needed in operation.

5.3 Recommendations

After the research has been done and came up with number of findings regarding the performance of Dar es Salaam Port as well as the challenges facing the operation of the port. For the purpose of an organization to achieve its goals effectively and efficiently, the following are recommended:

- 1) Provision of cargo handling equipment and not renting from neighboring countries because a lot of foreign exchange (income) get lost or disappear
- 2) In minimizing running cost that resulting from poor working machines that need to be disposed and replaced with efficient machines, an organization needs to procure modern machines that fits to the world technology for profit making.
- 3) Dar es Salaam Port should arrange periodic training and workshops for workers to improve efficiency in cargo handling equipment.
- 4) Highly and modified equipment to be used so as to facilitate the port operation, for example modern cranes of high capacity of carrying load to be used and highly capacity pontoons of about 600tons to replace the 200tons pontoons.
- 5) Improvement of Port Exit Gates currently there are three exit gates (Gate number 3, 4, and 5) which do not match with the flow of trucks out of the port, they normally stay in queues resulting to road congestion and thereby limiting other trucks to enter and pick containers in the port. Due to this

situation, port operations become affected and port congestion may eventually result thereof. To rescue this situation, the port has to increase the number of exit gates so as to enable smooth entry and exist of trucks thereby increasing the speed of container delivery from the port to ICDs.

- 6) Ensure instant transfer of newly arriving containers from the port to ICDs. It has been observed that most of the containers arriving at the port of Dar es Salaam (about percentage) are accumulated within the port container storage yards rather than being taken to ICDs. As a result of this, the port becomes congested whenever an import surge happens.
- 7) Revival of rail transport currently, rail transport is abandoned, just accounting to 0.03 percentage usage over road transport. This has resulted to overreliance on road transport which is designed to carry goods at low volume and on short distance. Therefore, the use of rail transport will speed up the transfer of container from the port to the ICDs.
- 8) Introduction of conventional berths this will enable double handling of containers from the ship to the quay side. The double handling of containers will speed up loading and offloading of ships and so reduce the ship turn round time.
- 9) Improvement of container handling equipment's the container handling equipment's such as SSG, Mobile cranes, Rail mounted cranes, Empty container handlers, Reach stackers, Gottwald, Forklifts, Trucks and Tractors should be improved in terms of their number, speed, and capacity. This will increase the speed of container moves within the port.
- 10) Practice the use of nearby ports. This will reduce the burden of container handling at the port of Dar es Salaam since some of the containers will be delivered through the nearby ports such Mtwara and Tanga (Mwambani) ports.
- 11) Implementation of the port master plan TPA has prepared a Ports Master Plan (PMP) that seeks to develop all ports in the country for the next 20 years. The aim is to have a road map for the development of all ports in the country up to 2028.

12) The Master Plan to develop infrastructure has been necessitated by an expected increase in traffic passing through all ports in the future. The aim is to make Dar es Salaam port a 'hub port' and not a feeder port as is the case now.

13) This will enable huge ships to come directly to the port and discharge cargo as well as use it as a point for shippers to ship goods to other destinations. As it is now, Dar port is a feeder port for Dubai, Salalah and Sharjah where over 70 per cent of cargo coming to Dar es Salaam is from those ports.

14) In the port master plan, four infrastructure projects are proposed for the port of Dar es Salaam. These are:

- a. Dar es Salaam short-term container handling capacity enhancement (ICDs)
- b. Dar es Salaam single point mooring
- c. Dar es Salaam Container Terminal (Berth 13 -14)
- d. Dar es Salaam Dry Bulk and Break Bulk Facilities

Figure 5.1 The Port of Dar es Salaam Master Plan (The proposed plan)



Source: TPA, 50 years feature article

Figure 5.2 An expected port of Dar es Salaam (after implementation of the port master plan)



Source: TPA, 50 years feature article.

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APPENDICES

Appendix I: Questionnaire form to respondents

I am **Yusuph Seif**, a student at the National Institute of Transport (NIT) pursuing a Postgraduate in Shipping and Port Management of the National Institute of Transport. I am currently undertaking a research on Challenges facing port cargo handling equipment in Tanzania: A case study of Dar es Salaam port.

I am humbly requesting you to fill in this questionnaire and I will be much thankful if you can spare your time to respond to these questions. Please be free to give your responses/opinions, I strongly assure you on the confidentiality of the information collected as it will solely be used for academic purposes.

Thank you for your valuable cooperation for taking part on this study. May God bless you all.

Yours faithfully

.....

Yusuph Seif,

PART A: GENERAL INFORMATION OF THE RESPONDENTS

Under this part, you are required to select only one answer among the given alternatives and circle the letter of the answer you have selected.

1. What is your gender status?
 - A. Male
 - B. Female

2. How old are you?
 - A. Below 26 years
 - B. Between 26 - 35 years
 - C. Between 36 – 45 years
 - D. Between 46 – 55 years
 - E. Above 55 years

3. What is the level of your education?
 - A. Primary Education
 - B. Secondary Education
 - C. Certificate/Diploma Education
 - D. Bachelor Degree/Advanced Diploma
 - E. Post Graduate Degrees

4. What position do you hold in your organization?
 - A. Clerical
 - B. Operational
 - C. Managerial

5. How long have you been working in port related organizations?
 - A. Between 1 - 4 years
 - B. Between 4 – 8 years
 - C. Over 8 years

PART B: PORT INFORMATION

6. In the following question is the major's cargo handling equipments in different ports, choose and tick (✓) in the appropriate box those which are available at Dar es Salaam port.

S/N	Major's cargo handling equipments in Dar es Salaam port	tick (✓) space
(viii)	Power rollers conveyors	
(ix)	Gravity conveyors systems	
(x)	Conveyors	
(xi)	Lifting	
(xii)	Order picking trucks	
(xiii)	Truck attachments	
(xiv)	Industrials tracks and attachments	

7. What is the condition overall performance of equipments at Dar es Salaam port
- a) Good
 - b) Poor
 - c) Moderate

8. The following is the list of all taking cargo handling equipments at Dar es Salaam port. State their impact by indicating

Scale	No effect	Moderate effect	Neutral	High effect	Very high effect
Order	1	2	3	4	5

S/N	Challenges	1	2	3	4	5
	Absolute					√
	Industrials tracks and attachments					
	Gravity conveyors systems					
	Power rollers conveyors					
	Truck attachments					
	Order picking trucks					
	Lifting					
	Conveyors					