

**ASSESSING THE EFFECT OF CONSTRUCTION DELIVERY AND LEAD TIME
ON THE PERFORMANCE OF LOCAL ROAD CONTRACTORS IN LUSAKA
DISTRICT, ZAMBIA.**

BY

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**A Dissertation Submitted to the University of Zambia in Partial Fulfillment of the
Requirements for the Award of Master of Business Administration-General**

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DECLARATION

I, Elizabeth Bwebe Bobo, do hereby declare that this work is my original work achieved through personal reading and research. This work has never been submitted to the University of Zambia or any other universities. All sources of data and literature on related works previously done by others, used in the production of this dissertation have been dully acknowledged. If an omission has been made, it is not by choice but by error.

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APPROVAL

This dissertation by **Elizabeth Bwebe Bobo** is approved by the University of Zambia in partial fulfilment of the requirements for the award of the degree of Master of Business Administration - General.

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ABSTRACT

Contractor's expertise and performance plays an important role in successful delivery of a project. While clients want to make the best decisions in selecting the right contractor for the job, a clear understanding of the underlying attributes associated with contractors' selection in the context of achieving successful project outcomes poses to be a critical issue. The purpose of the research was to establish whether Construction delivery and lead time have an effect on the performance of local road contractors in Lusaka. This research used the mixed method research methodology. The research was an evaluative in nature and followed the descriptive approach and was conducted in Lusaka district of Zambia. The research used a non-experimental design to assess the effects of construction delivery and lead time on the performance of local road contractors in Lusaka city. The local road contractor's performance was looked at from the perspective of quality of work and timely completion of projects. The sample consists of 54 respondents from local road contractors, chosen using data from National council of Construction, of Grade 1 to 4 of Road contractors in Lusaka and directors from government agencies using purposive sampling to select key informants. The data collected was quantitative in nature and was analyzed using Statistical Package for Social Sciences (SPSS), percentages and chi-square to establish the results to the study. Findings reviewed that there is an association between construction delivery and the quality of work and timely completion as well as between lead time and the quality of work and time timely completion of projects by the local road contractors in Lusaka. The research results further identified the following as reasons to why road local contractors are having challenges: (1) local road contractors lack professionalism in their operations. (2) Lack the financial capacity, human resource. (3) Lack of sufficient support from government. (4) The lack of expert skills and technical experience by road local contractors. Recommendations include: (1) Government to help to make the business environment conducive for local road contractors in order for them to compete favorable with foreign contractors. (2) A request for a call on government to amend the National Council for Construction Act No. 13 of 2003 so that it (NCC) can also regulate and punish all the erring contractors that do sub-standard jobs and those that abandon works before completion. (3) Government through its partners and stakeholders should provide financial schemes for the local road contractors to access loans, equipment and raw materials and the necessary technical support for them to compete favorable with foreign contractors.

Keyword: Project completion, Lead time management, local road contractors, Project cost and Construction delivery.

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DEDICATION

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LIST OF ACRONYMS AND ABBREVIATIONS

A	Agree
CBD	Central business district
D	Disagree
DB	Design-Build
EIZ	Engineering Institution of Zambia
IRCP	Improved Rural Connectivity Project
NCC	National Council for Construction
NFRA	National Road Fund Agency
PPP	Public Private Partnership
RDA	Road Development Agency
SA	Strongly agree
SD	Strongly disagree
SPSS	Statistical Package for Social Sciences
UC	Uncertain
ZDA	Zambia Development Agency

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

This chapter presents the background to the study, statement of the problem, study objectives, conceptual framework, and the scope of the study, significance of the study in assessing the effect of construction delivery and lead time on performance of Local Road Contractors.

The roads and infrastructure projects are budgeted under the Economic Affairs section of the Zambian annual budget which has accounted for on average of 25% of the annual budget from 2016 to 2020 (Appendix 3). Road infrastructure is the largest budget item under the Economic Affairs section accounting for on average K8, 197.81 million or 11% of the budget. From 2016 to 2020, the Zambian government had planned to spend K40, 989.03 million on building and repairing roads in a bid to improve the road network in Zambia (Ministry of Finance, Zambia, 2017). With such amounts being planned for, it makes these projects attract attention from stakeholders, ranging from cooperating partners to project funders. In 2017 Government planned to work with the private sector using the Public Private Partnership (PPP) model for the Lusaka-Ndola, Ndola-Kasumbalesa, Kasomeno-Mwenda road projects (Ministry of Finance, Zambia, 2017). In 2017, the government launched a US \$ 200million Improved Rural Connectivity Project (IRCP) set to cover 3,375 km of roads in the country (Namukolo, 2019). The project is funded by the World Bank in collaboration with the Zambian Government and was said to be implemented in 6 provinces over an 8 year period (Namukolo, 2019).

The road projects have been seen more in Lusaka than any other town in Zambia. Lusaka city is the capital and largest city in Zambia with an estimated population of 2.774 million as of May 2020 (Central Intelligence Agency, 2020). This is compared to 2.191 million as at the last official census in 2010 (Zambia Central Statistics Office, 2020). In 2018, Lusaka accounted for about 60 percent of Zambia's estimated 780,000 cars making traffic in the city a nightmare (Namukolo, 2019). Additionally, Lusaka has the fastest-growing road users with the registration of about 100 vehicles a day on average (Nawa, 2017). Some of the existing roads have become compromised in the central business district (CBD). Building capacity for local contractors has the potential of reducing road construction costs which in turn have a repel effect to help build the economy. Therefore, the acute shortage of proper roads in urban and rural areas of the country coupled with delays by some contractors has been a thorny issue not

only motorists, but the local authority too. The huge population size and density in Lusaka district exerts pressure on service delivery.

The National Road Fund Agency (NFRA) noted the lack of visibility of Zambian construction companies stating that most of the construction companies that excelled were foreign companies (National Road Fund Agency, 2017). NFRA contended that most Zambian contractors were subcontractors who suffered project management problems like design, contract management, quality and financial aspects.

This low participation of local contractors in the road sector had been identified by the Parliamentary Committee on Communications, Transport, Works And Supply in 2014 which noted that only 12% of the Link Zambia 8000 projects were awarded to Zambians as principal contractors (National Assembly of Zambia, 2014).

A field inspection conducted by NRFA in 4th quarter of 2017 revealed the following observations:

- (i) A total value of works of K43,505,210,000 for all projects. Out of this total only K10,394,714,847.44 which is 24% was attributable to Zambian contractors. This was despite having 5,959 Zambian registered contractors out of a total number of 6,266 registered contractors in 2017. Meaning 24% of value of projects inspected in Q4 2017 was being done by 95% of the contractors while 76% value of projects was given to the 5% foreign contractors.
- (ii) Lusaka province had total project worth K5,320,381,769.15 being done by 31 contractors (16 Zambian and 15 foreign).
- (iii) The total value of works of K22,624,810,000 was done on roads in a total of 83 projects. Out of this K2,363,560,000 representing 10% was for Lusaka province road works being done in 1 project.

Despite government opening institutions such as National Council for construction (NCC) there is still levels of poor project performance among local contractors. National Council for Construction (NCC) is a statutory body set up under the National Council for Construction Act No. 13 of 2003 under the Laws of Zambia. Under this Law, NCC is charged with the responsibility of providing for the promotion, development, training and regulation of the Construction Industry in Zambia. NCC has a number of functions a few being: Monitor and

evaluate, from time to time, the capacity and progress of persons engaged in the construction industry; Promote and develop the construction industry in Zambia, and give priority to Zambian firms and Zambian companies. The aim of the National Council for Construction is to promote and build the capacity of the Zambian construction industry (National Council for Construction, 2019).

It is government policy that a minimum of 20 percent of all government funded road contracts awarded by the Road Development Agency, Local Road Authorities and other government institutions be executed by Zambian owned companies in line with the shareholding structure specified in the Citizens economic empowerment Act No.9 of 2006. Government through the various agencies has been trying to implement this policy. The National Road Fund Agency said it was important that capacity should be developed among local contractors (Namukolo, 2019). Namukolo (2019), further pointed out that building capacity for local contractors had the potential of reducing road construction costs.

The inquiry of the Parliamentary Committee established that the challenges that hindered local contractor participation were: Access to finance; Collateral requirements; high Interest rates; Limited technical and managerial skills; Lack of access to plant and equipment; Document preparation; Corruption and unfair competition; Delayed payments; The need for public institutions to outsource consultancy services; Lack of Zambian Construction Industry professionals in the Office of the Auditor General; Procurement method; Indifference to provisions of the law of Zambia; Perceptions of lack of capacity.

1.2 Statement of the Problem

The essential problem that necessitated this study was the lack of performance by Local Road Contractors not being proportional to the projects given to the local contractors. To manage and decongest the city of Lusaka various road infrastructure development interventions had to be undertaken including the famous L400 focused on the expansion and upgrading of roads within the city to bituminous standards. In an RDA publication called 'Lusaka: A City Under Construction' Namukolo (2019) said one of the biggest and ambitious road projects was the \$289 million Lusaka Decongestion Project spear headed by the Ministry of Local Government and jointly funded by the Exim Bank of India and the Zambian Government. The city of Lusaka can be described as constantly under road construction with new roads in many residential areas and points of traffic being changed.

In the construction and telecommunications industry as an example, time interval management has proved over the years to be vital since the sectors are highly hooked into very recent technology which is capable of drastically reducing lead times (Christopher, 2000). On the other hand, the planning and delivery of a project has proven to be a high-risk venture. Not one single project delivery system is the best choice for all projects; all methodologies have trade-offs that need evaluation before choosing a project delivery (Christopher, 2000). That's one reason why numerous different project delivery systems and permutations have existed and still exist (Christopher, 2000).

There are studies that have been quoted in the literature review chapter showing some causes of poor performance among local contractors. The studies also have a bias focus on the manufacturing sector than the construction sector. This leaves a knowledge gap of road construction delivery and lead time in the construction sector that needs to be filled.

Another factor worthy of investigation is that one key finding of the Parliamentary Committee was the perceptions of lack of capacity. The Committee learnt that there were perceptions of inadequate capacity among the Zambian contractors and as such even the most basic of projects had been floated to foreign companies.

As highlighted earlier, 24% of value of projects (inspected in Q4 2017) was being done by the 95% of the road contractors. The effect is that of the 11% national budget (5 year average between 2016 and 2020 - Appendix 3) of roads, 8% is going to foreign contractors and not being ploughed back in the hands of local contractors for growth of the economy.

To further give socioeconomic emphasis on this, the amount given to foreign contractors in 2017 is 8 times the total amount budgeted for the CEEC empowerment fund. The value of projects inspected in Q4 of 2017 given to foreign contractors is 116 times the total budget releases made by parliament to the CEEC empowerment fund in period 2008 to 2018.

The challenges presented by some large and complex projects, and the opportunities provided by new technologies, are not always a good fit for project delivery systems that have been most used to date. As a result, new methodologies are emerging.

This study therefore sought to address this gap by answering three important questions:

- (i) What construction delivery and lead time management are used by Local Road Contractors?

- (ii) What is the effect of construction delivery and lead time management on the quality of work done by the Local Road Contractors in Lusaka?
- (iii) What is the connection between construction delivery and lead time management on the timely completion of projects by the road local contractors in Lusaka?

There is a perception of performance of Local Road Contractors and the research sought to provide some insights on this lack of adequate participation in this key sector of road construction.

1.3 Aim of study

The aim of the study was to establish whether Construction delivery and lead time have an effect on the performance of Local Road Contractors in Lusaka.

1.4 Research Objectives

1.4.1 General Objective

The general objective was to assess the effect of construction delivery and lead time on the performance of Local Road Contractors.

The following were the specific objectives of the study:

- (i) To establish the construction delivery and lead time management being used by Local Road Contractors in Lusaka.
- (ii) To determine the relationship between construction delivery and lead time management on the quality of work done by Local Road Contractors in Lusaka.
- (iii) To assess the connection between construction delivery and lead time management on the timely completion of projects by the Local Road Contractors in Lusaka.
- (iv) To make recommendations based on study findings on how to improve performance of Local Road Contractors.

1.5 Research Questions

1.5.1 Main Research Question

What is the effect of construction delivery and lead time on the performance of Local Road Contractors?

1.6 Specific Research Questions

The questions that guided the researcher are;

- (i) What construction delivery and lead time management are used by Local Road Contractors in Lusaka?
- (ii) What is the effect of construction delivery and lead time management on the quality of work done by the Local Road Contractors in Lusaka?
- (iii) What is the connection between construction delivery and lead time management on the timely completion of projects by the Local Road Contractors in Lusaka?
- (iv) What recommendations would be made based on the study findings on how to improve performance of Local Road Contractors?

1.7 Scope of the study

In the interest of time and given the fact that Lusaka has many contractors, the study focused to understand the effect of construction delivery and lead time on the performance of Local Road Contractors with specific focus on Lusaka district. The study was limited to questionnaires for collecting data. The study was restricted to two performance factors affecting Local Road Contractors in Lusaka district. These being quality of work done and timely completion. While there being the other factor of cost that influence performance in this sector, this study traded it off and only initially look at the two mentioned.

1.8 Delimitation of the study

The focus of this research was to understand the effect of construction delivery and lead time on the performance of Local Road Contractors in Lusaka, Zambia. Hence it required full participation of contractors to ensure an understanding is reached.

Therefore, due to limit of resources and time the study was limited to selected 54 Local Road Contractors in road construction sector in Lusaka, Zambia although there are many others road contractors involved in other projects in the country.

The study interviewed Local Road Contractors (Grade 1 to 4 of category R) who are registered with National Council for Construction (NCC) is a statutory body set up under the National Council for Construction Act No. 13 of 2003 under the Laws of Zambia and representatives from the government agencies (RDA, NRFA, NCC, ZDA and EIZ). The aim of the National Council for Construction is to promote and build the capacity of the Zambian construction industry.

Lusaka district was chosen for the study because of a number of reasons. First and foremost, Lusaka has the largest number of local contractors companies operating alongside the local authority. Secondly, Lusaka has the largest population and one of the fastest developing cities in Africa. In 2010, the district had a population of 1,747,152 and a projected 2,426,898 people in 2017 (CSO, 2013). Thirdly, the city is the economic hub of the country.

1.9 Limitations of the study

The study had limitations in relying on the information given by Staff from Local Road Contractors in that they may have answered the questions to portray a better picture of their company. Such responses can be misleading and be a poor guide to determine the relationship that truly exists between the factors and performance. However, conscious of this potential sample bias, the researcher took a few minutes before data collection to clearly explain the purpose for the study, which was purely academic and that no grants or assistance of any kind would be based on their participation in the research.

1.10 Significance of the study

This research is significant in that the benefits of identifying effects of construction delivery and lead time on performance of road local contractors can have a positive effect that can be passed on to the construction industry for the existing and upcoming contractors, local government, non-governmental organizations, public institutions, the nation and future generations. This study can reveal areas that can help with incompetency and attitudes of local contractors and incapability among players in the road sector and can be beneficial. The selection of construction delivery method is one of the factors that can influence the success of

a construction project. Therefore, understanding of the primary construction delivery methods used in construction industry such as Design-Bid-Build (DBB), Construction Manager at Risk (CM at Risk) and Design-Build (DB) is important for a contractor.

The research results will therefore, assist policy makers in making informed decisions in construction sector. The Parliamentary Committee on Communications, Transport, Works and Supply, in their report of 2014, noted the lack of research in construction sector. This lack of research was further highlighted by the NRFA which explained that this lack of research made it difficult for local construction companies to improve their performance (National Road Fund Agency, 2017). This makes inquiry into the area very important to contribute to the body of knowledge in contractor performance.

The findings of this study will also assist those in the academic realm. They will be able to get access to a pool of knowledge that can be important in their studies on lead time management, construction delivery and contractor performance.

1.11 Assumptions of the Study

The research assumed that the respondents would be frank, obliging, truthful and dependable in their response to the research instruments and would be accessible to respond to the research instruments in time. Further assumptions are that the management of the organizations targeted would give permission to collect data from employees and that there would be no major changes in the composition of the target population that would affect the effectiveness of the study sample.

1.12 Organization of the Study

This report has six chapters. Chapter One contains the background to the study, statement of the problem, objectives of the study, research questions, conceptual framework, significance of the study and structure of the dissertation. Chapter Two reviews the relevant literature on the factors affecting Local Road Contractors. Chapter Three focuses on the methodology of the study. It describes the study design, the target population, the sampling procedure, sample size, the research instruments used, data and sources, data processing and analysis, the ethical issues considerations and the challenges from the fieldwork. Chapter four contains the presentation of findings. Chapter five contains discussions of findings and chapter six gives conclusion and recommendations of the study.

1.13 Chapter Summary

This chapter looked at the background of the study, statement of the problem, the aim of the study, objectives, research questions, and scope of the study, significance of the study and the organization of the study. The next chapter will provide the literature review.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter provides a review of studies that have been conducted on lead-time management and construction delivery as regards to effect of performance. The researcher looked at an overview of Construction Delivery, Lead Time Management, Performance and Contractor's performance in Africa.

2.2 Construction Delivery

Construction delivery is the period that is required to finish the work, starting from site handover until completion and the final handover of the completed project. "Duration" is the time, normally within times, instituted in accordance with perfecting the whole project besides beginning the preceding challenge after finishing the last one (Baker and Baker 2003).

A significant number of literatures emphasized more the time aspect as an indicator for project success. Nkado (1995) quoted NEDO Faster Building for Commerce published in 1988, which regarded completing projects on time as a logo of an efficient housing industry. The Latham Report (1994) suggested that ensuring timely delivery of projects is one of the important needs of clients of the construction industry.

2.3 Lead Time Management

Lead time refers to the time taken between the start and completion of an operation or project (Joseph Sarkis 2012). On construction projects, Joseph Sarkis mentioned that lead time typically refer to the amount of time that elapses between placing an order for an item and its delivery to site, but it can also refer to the time required for the preparation of drawings, plant hire, approval processes, and so on. In relation to the activities of the main contractor, the term 'lead time' may be used in relation to mobilization activities (Al-Moumani -2000).

According to Al-Moumani, current construction projects are complex, requiring the support of the design and construction profession to complete. A realistic project execution time will decrease the possibility of dispute between state agencies and contractors (Nordas K. H. et al, 2006). To the clients, delay means loss of revenue through lack of productive facilities and rentable space or a dependence on present facilities (Nordas K. H. et al, 2006). For the

contractor, on the other hand, delay means higher overhead costs because of a longer work period, increased material costs as a result of inflation and labour cost increases. Nordas K. H. et al further mentioned that the amount of time that elapses between when a process starts and when it's completed is lead time.

Lead time is examined closely in manufacturing, supply chain management and project management, as companies want to scale back the quantity of time it takes to deliver products to the market and it is therefore required in business. Nordas, Pinali & Geloso (2006) indicated that Lead time is the amount of time between the placement of an order and the receipts of the goods ordered. They further stated that it depends on the nature of the product for example whether it is made to order or if it is from a shelf product. Lead time also depends on planning and provides chain management, logistics services and in fact distance to customers and suppliers. Long time interval doesn't get to be a drag if delivery is predictable and demand is stable.

According to Pongpeng and Liston (2003), problems such as schedule delays, budget overruns, low quality work, as well as a large number of claims and litigation result largely from not selecting the best contractor to construct the facility. Williams (2003) posits that in recent decades, projects have tended to be more time- constrained and the ability to deliver a project quickly is becoming an increasingly important element in winning a bid.

However, Olatunji, 2010 ascertained that if there's uncertainty about future demand, long time interval is expensive even when the customer knows exactly when the merchandise will arrive. If future demand have been underestimated, running out of stock has costs in terms of foregone sales and therefore the possibility of losing customers. If future demand has been overestimated, excess supply must be sold at a reduction. Furthermore, the longer the lead time and the more varieties of the product in question are on the market, the larger stocks are needed. It is also important to note that competitiveness on time interval is not a static concept (Olatunji, 2010). When some firms can shorten lead time, others must follow to avoid punishment in terms of discounted prices or at worst exclusion from the bidding process. The latter can happen when a critical mass of suppliers is able to deliver just-in-time and the customer finds it safe to reduce inbound inventories to a couple of days or in some cases even a couple of hours (Nordas, et al., 2006). Gross and Soriano (n.d) demonstrate that lead-time variation has a major impact on lot size and inventory costs. Furthermore, they indicated that a listing system is more sensitive to lead-time variation than to demand variation. Variations in time interval can occur

for purchased items and for people who are manufactured in-house. A major factor associated with these variations is quality problems. Typically, either safety stock or safety time interval is employed to cushion the impact of this variability. In either case, larger variability requires increased inventories. High lead-time variability may be a major reason for a plants' inability to realize inventory goals and to incur longer average throughput.

The development of service processes is treated with a lot of significance both in the public and private sector organizations since it affects the level of customer satisfaction. Most contemporary organizations face myriad challenges in efficient time interval management thanks to turbulent financial times. When a corporation experiences long lead times, there's an opportunity of getting high supply chain costs also as poor quality of services being delivered. It is therefore important for organizations within the industry to practice better time interval management practices so as to enhance their quality and reduce supply chain costs (Henri & Janne, 2018). Time Performance and Delay in Construction Project Delay in construction could be described as an action and event that extends beyond the required time in conformity with performing the construction of a contract (Sweis et al. 2008) and are of the opinion that delay often gives additional days of work. According to Assaf and Alhejj (2006), extension of time could be defined as the time overrun both beyond ending date designated in a contract, or beyond the date that the parties agreed to on the delivery of a project. It is a project shedding above its deliberate time table and is considered common problem in construction projects. In some cases, to the contractor, delay connotes higher overhead expenses as a result of longer duty period, high material charges through inflation, and due to labour cost increase. Aibinu and Jagboro, (2002) described delay as a situation where the contractor and the project owner at the same time make a contribution to the non-finishing of the project within the agreed arrangement time. Delays in building project are often expensive, considering the fact that generally, construction projects are financed through foreign loans involving charges, expenses interest, administration of workers devoted to the construction whose prices are time reliant, and ceaseless inflation of salary and material costs.

2.4 Performance

Performance is commonly refers to the carrying out of works according to requirements set out in a given contract. Any business, big or small is affected by internal and external environment in which it operates and this determines its success or failure of its performance. Delma and

Wiklund (2008), poise that the business environment is considered to play a vital role in the growth. Factors inside the business are called internal factors while the factors outside the business are called external factors.

Contractor Performance involves the process that enables both parties to a contract to meet their obligations in order to deliver the objectives required from the contract. It also involves building a good working relationship between the client and its contractors. Therefore it is very important that measures to ensure project success are taken into consideration. A client is considered as the initiator of a project, responsible for the production of the project. There are two types of clients; public and private clients. Private clients could further be divided into private (home dwellings) and private commercial. It is important that private clients understand the design, procurement, and construction processes. The clients provide valuable information which may help various participants to improve their performance on a project. Clients are either experienced or inexperienced.

Several research studies have been conducted in different parts of the world prior to the year 2000 with respect to construction delays. Some examined the causes as well as the effects of delays in construction project delivery, while others used a predictive model to ascertain construction period estimation and effects on performance.

Beginning in the year 2000, a concerted effort has been made all over the world to determine remedies to the issues of project delivery.

Generally, performance magnitude may have one or more indicators, and could be influenced by various project characteristics. Performance is defined as results from processes, products or services that on the set goals and conditions. Tahir & Darton (2010) confessed that measuring the performance of any construction project in terms of success or failure, despite looking simple, is in fact a very complex process. Modern construction projects even moderate in size are generally multidisciplinary in nature and that they involve participation of designers, contractors, subcontractors, specialists, construction managers, and consultants. The objectives or goals of all participants need not be the same even in a given project. Tahir & Darton contended that to define the success or failure of a project without specifying the participant and without specifying the criteria for judging the performance holds no meaning to measuring the performance of any construction project. The study will measure project performance on quality of work and timely completion as measures of performance.

The Project Management Book of Knowledge (2007) states that project management knowledge areas are project integration management, scope management, time management, cost management, quality management, human resource management, communication management, risk management, procurement management, safety management, environmental management, financial management and claim management on which success measures need to be based. Sustainable development concepts, namely, environmental respect, social integration and social economy, are factors with growing importance as indicators of successful performance of infrastructure projects.

The concept of performance has attracted an escalating debate over the years, being all- which explains a huge number of significant reflections on the concept and its measuring instruments (Criveanu, 2016). For decades now, assessing performance in the construction had remained a problem. A number of concepts and measures were experimented to assess and measure performance of projects. Alarcon (1994) indicated that the majority of these procedures slow down their assessment to required standards such as, time, cost or output. Contractors are required to evaluate performance and upgrade strategies to gain competitive advantage. To boost competitiveness and be relevant in the industry, construction firms have to make use of performance evaluation methods to ensure sustainable performance (Baldwin et al., 2001).

The measuring of performance in any construction project with regards to success or failure, in spite of looking simple, is in fact a very difficult procedure (Shrestha, Burns, and D. R. Shields, 2013). In this new era road construction projects are moderate in size and commonly multidisciplinary in nature as they require the participation of various expertise such as designers, contractors, subcontractors, surveyors, specialists, construction managers, and consultants. Atkinson (1999) explained that in the early 1990s, project success was tied to performance measures, which in turn were tied to project objectives. At the project level, success was measured by the project duration, monetary cost, and project performance. Atkinson called the time, cost, and quality criteria the “Iron Triangle.” However, he argued that using the Iron Triangle of project management, time, cost, and quality as the criteria of success may have resulted in biased measurement of project management success.

The contractor in a construction project has the task of achieving success in the execution of a project which largely depends on the contractor’s performance. On the other hand, it has become a universal inclination that local contractors in developing countries are not performing to expectations of the customers that they serve and indeed many road local contractors have

been unable to perform (Aftab, 2012). The delays by local contractors in project execution and poor quality works in the construction industry has led to failure in achieving effective time and cost performance (Aftab, 2012).

In this study performance is operationalized using the following two indicators:

- Quality of work
- Timely completion

Based on the evidence the following hypothesis was formulated:

H1: Performance has a significant influence on construction delivery and lead time of local road in Lusaka district.

2.4.1 Working Capital and Contractor Performance

Working capital is the amount of available capital that a company can readily use for day-to-day operations. It measures a company's liquidity, operational efficiency, and short-term financial health.

Contractor's working capital is the resource required to effectively implement the procedure of the construction work on site and this includes cash as hand, in the bank, overdraft, credit purchases, and work-in-progress and invoiced amount. Working capitals also include resources needed to smear the daily activities of the construction firm (Harris and McCaffer, 2005).

The management of working capital is very important to make sure that the level of working capital is constant and that there is enough provision of funds to finance existing possessions to facilitate projects to be project conclusion within cost and time, there is a required of coming up with most favorable level of working capital requirements of a project. There is also need of constant scrutiny and monitor of the quantum of individual parts that comprise the working capital to ensure that the requirements are not exceeded. The awarding of major construction projects favors foreign contractors because of their technical experience and finance capability compared to local contractors who lack the technical ability and financial stability (Harris and McCaffer, 2005).

In most cases, contractors are accused of not having the required experience and skill required for the necessary project. Local contractors find it hard to have the required funds and tools for

a particular project. Sufficiency of working capital relies on the ability of having the precise financing at all times during construction (Badu et al., 2012). This requires the local contractor to have a positive effort as any mismanagement and poor pricing affects productivity and profit level (Nwude, 2010).

A study by Koppelman (2011) concluded local contractors face a number of challenges in the road construction industry; these included the lack of acceptance of local contractor's ability to performance, local contractors not having a strategy, inability to procure project materials, lack of skills and experience for a particular project, poor costing and pricing and lack of innovation amongst some the challenges contributing failure by local contractors in national government tender process.

Misozi (2020) shared this same concern by insisting that most emerging economies did not have qualified individuals to perform and meet quality contractual obligations to satisfy the government. The number of foreign companies participating in bidding processes of emerging economies had increased and this was because of the existing market available. Most of these foreign contractors win government and donor tender projects, subjecting local contractors to only being sub-contractors (Shachinda, 2016).

Sadly enough, local contractors require an international recognized credibility beyond the profile and reputation that they used to enjoy in their country. Moreover, they find they need to adapt to meet the requirements of clients from different cultures and with disparate values (Shachinda, 2016).

Laryea (2010) demonstrated the importance of having right and correct contract price as both affect the supply chain and project function efficiency, effectiveness and the success of the project. Laryea further emphasize the role of the engineer in estimating the project price because it affects the successful execution of the supply chain management during the construction project. Only if the engineer's estimate is correct will it be possible to attain the level of service required to produce the right quality of products, at the correct time and budget.

In this study Working Capital is operationalized using the following 4 indicators:

- Correct timing and budget
- Experience and skill

- Inability to procure project materials, lack of skills and experience for a particular project
- Poor costing and pricing

Based on the evidence the following hypothesis was formulated:

H2: Working Capital has a significant influence on the Contractor Performance of local road contractor's in the road Sector in Lusaka district.

2.4.2 Quality of Work

Quality is how good or bad something is. Quality management offers several opportunities to enhance all aspects of a project, and those of the company delivering it.

Chilongo & Mbetwa (2017) noted that in construction projects, quality of work is associated with adherence to conditions of the contract and specifications stipulated in the contract documents in their entirety during the execution of the project. The Concise Oxford English Dictionary defines quality because the standard of something as measured against other things of an identical kind.

However, Soanes and Steven (2004) showed that there are two distinct areas during which quality of labor achieved is measured for fulfillment. Soanes and Steven further said that the primary one is by measuring and testing of construction materials forming the weather of the work product in situ or within the materials laboratory against a typical measure or specification. These materials must fulfil the prescribed characteristics within the contract documents for them to be incorporated into the development process. Similarly, the work product must be within prescribed standard characteristics to be considered successful. This is often generally fulfilled through the testing of the merchandise at different stages during or after each job process. The second aspect of quality of labor concerns what beneficiaries see and feel when making use of the event product. This is often a product of workmanship.

Chilongo & Mbetwa (2017) noted that workmanship was defined as the degree of skill with automatically when project specifications are adhered to. For example, when the surfacing stone sizes are within tolerance, the roads are going to be nice and smooth to drive on. Similarly, when the ultimate layer of a road base is within the stipulated level tolerance, the roads are going to be comfortable to ride on. However, the degree of riding comfort of a road,

all other things being equal, will depend upon how the extent tolerance has been controlled within the lower and upper limits. The road are going to be easier to ride on where the upper and lower tolerance limits are maintained to the minimum than where they need been allowed to fluctuate from the uppermost to the lowermost limits.

Kulemeka, Kululanga & Mortonet (2015) described the organization and management of quality control for small works, combined the phrases “quality of work” and “workmanship.” He labelled quality of work (workmanship) as involving, ensuring that the attributes of the work satisfy the required needs. Kulemeka, et al. (2015) further described quality of work as measuring the ongoing and finished works against recognized standards and implementing quality control and quality assurance procedures. Quality is meeting the customer requirements.

Quality of management during construction concerns the steps taken to ensure that products are in accordance with the quality standards and measure the effectiveness / competency of consultants and contractors (Orji and Obodah, 2019). Orji and Obodah further mentioned that supervision during construction is critical to ensure quality. They mentioned that the following can determine the speed of construction and ensure quality of the product: timely inspection procedure, adequate quality management inspection resources, quality management information processing requirements, materials or work rejection rate, and clean / dry working environment requirements. On the part of the contractor, the effectiveness of construction management will affect the speed of construction. Data such as analysis of construction methods, analysis of resource movement to and within site, analysis of work sequencing to achieve and maintain effective workflow, monitoring and updating of plans need to be prioritized. Supervision during construction is critical to ensure quality products and timely delivery of project. On the part of the contractor, the effectiveness of construction management will affect the speed of construction.

According to Olatunji, 2010, the quality of management during construction does significantly influence project delivery time. Olatunji further showed the result of the analysis revealed that effective coordination of resources, developing an appropriate organisational structure to maintain workflow, analysing of work sequencing to achieve and maintain workflow and forecasted planned date (activity duration and resource quantity required) were the factors, inter alia, that contributed to quality management.

In this study quality of work is operationalized using the following 7 indicators:

- Measuring and testing of construction materials or specification.
- Effective coordination of resources,
- Supervision during construction
- Analysis of resource movement to and within site
- Developing an appropriate organisational structure to maintain workflow,
- Analysing of work sequencing
- Maintain workflow and forecasted planned date

Based on the evidence the following hypothesis was formulated:

H3: Quality of work has a significant influence on the construction delivery and lead time on Local Road Contractors in the road Sector in Lusaka district.

2.4.3 Timely Completion of Construction Projects

Timely completion is working at the appropriate time that is completion of the work or designated portion thereof on or before the date required.

According to Elinwa & Joshua (2001), time on construction projects is concerned with (i) planning of the work over the anticipated duration (programme) in relation to its requirements with full appreciation of the resources needed and resources available; planning for utilization sets the basis or yardstick (plan) against which progress can be monitored and assessed; (ii) progressing which follows the programming of the work and compares the work undertaken against the plan allowing the redistribution of resources, if necessary, to hurry up the work if it's falling behind the plan.

Kaming et al (1997) defined time overrun as the delay beyond planned completion dates traceable to the contractors. The construction industry plays a serious role within the development of the many countries. At the macro level, delay will cause a negative rate of national economic process and monetary loss. Kaming, et al. (1997) noted that at the micro level, a delayed project can lead to time and cost overruns, disputes, arbitration, and even total abandonment. Elinwa & Joshua (2001) confesses that delays in construction projects are global phenomena and the sub-Saharan region is no exception. This trend has become the norm instead of the exception, especially in developing countries. This scenario, thus, constitutes a

serious risk and debilitating effect on relationships and income among employers, consultants, and contractors, which may cause exhaustive disputes, arbitrations, and expensive litigations. The significance of this impact, therefore, clearly justifies the concern over such a chronic problem facing the industry. Timely Completion of work or designated portion thereof on or before the date required.

In this study timely Completion of work done is operationalized using the following 3 indicators:

- planning of the work
- Progress reports which follows the programming of the work and
- Comparison of the work undertaken against the plan allowing the redistribution of resources.

Based on the evidence the following hypothesis was formulated:

H4: Timely Completion of work done has a significant influence on the construction delivery and lead time on Local Road Contractors in the road Sector in Lusaka district.

After an extensive literature review, the study focused on two factors that influence performance of road local contractors, quality and timely completion of work.

2.5 Global view on Contractor's performance

In developing economies, a number of studies on contractor performance have been conducted, there were extensive disappointments in meeting performance landmarks in the construction sector. On the other hand, local contractors in emerging economies face serious competition from foreign contractors who have the required funds, experience and skills to undertake any construction project (Guyani, 2016). Guyani advised governments in developing nations to make sure they help build capacity of local contractors by empowering them through financial help to enable them to compete favorably.

In Malaysia delay is a common occurrence particularly where the government projects are concerned. Three of the most decisive factors noted in Malaysia are fluctuation in cost of materials, cash flow and financial difficulties faced by contractors, poor site management and supervision (Rahman, 2013). Ejaz et al., (2013) maintained that a contract is an exchange of something of value by two or more parties" meaning that they have entered into a legally

binding agreement between them. Further, Murali Sambas Ivan in his research Causes and effects of delays in Malaysian construction industry said “the problem of delays in the construction industry is a global phenomenon and the construction industry in Malaysia is no exception.”

Thomas & Ellis, (2007) described the construction industry as where public economy depend on, contracts in the construction industry causes mutually contractual and legal promises on partners that are not easy to adjust based on financial exchanges. The client employs the services of a construction firm to execute a contract in order to deliver a project on the fixed timeline. Concerning the factors in performance of local contractors, the increased in the cost makes a key financial risk for clients and construction companies (Akinci and Fischer, 1998).

Tao and Kumaraswamy (2012) in Hong Kong cited that the link between employers and their advisers” calls for an evaluation process that is price-based. Even then, the least offer normally leads to encounters such as inferior quality, cost increase, including lateness. Contractors are more accepting of threats that are incorporated in contracts than of additional types of threats that materialize during the project (Hatami and Behsan, 2012).

Abbasnejad and Moud (2013) argued that most projects suffer from delays, leading to severe problems for contractors, and that these problems are unbearable and terribly affect contractor’s performance, which vary among nations (Proverbs, 1998).

Rateb et al, (2014) examined factors affecting contractors” performance on public construction projects. In this study, contractors, advisers, and owners decided on the most important factors affecting contractor. First among these important performance factors are contractors” financial difficulties, shortage of manpower, and change orders. The results agree with Xiao and Proverbs (2003), research results on contractor performance in Japan, the UK, and the USA.

Dainty *et al.* (2002) in Cooke-Davis (2001) declare that project management competence represents only one of many criteria upon which project performance is contingent. It is also arguably the most significant as it is people who deliver projects, and not processes and systems. According to Pongpeng and Liston (2003), problems such as schedule delays, budget overruns, low quality work, as well as a large number of claims and litigation result largely from not selecting the best contractor to construct.

Santoso *et al.* (2003) studied risk in high-rise building construction in Jakarta and determined that management and design are the most significant factors affecting construction performance. The study by Ponpeng and Liston (2003) of contractor ability criteria determined, inter alia, a contractors quality management system is an important factor affecting a contractors delivery of a project within schedule.

In the United Kingdom, according to Yakubu and Sun (2009), design change(s) is the most influential factor inhibiting the delivery of projects on time in the United Kingdom construction industry from the perspective of the contractor and the consultants. Walker and Shen (2002) declare that a delay in design documentation was ranked the second most influencing factor that negatively affects project delivery. Time should not be wasted in the process of issuing revised drawings.

2.6 Africa's prospective on Contractor's performance

Most African countries on local contractor's performance have similar system and regulations regarding tenders and bidding process. Local contractors in Africa, depend on the existence of business opportunities in the construction industry. These contractors only survive if they are able to win tenders or are subcontracted to undertake a job in their particular area of expertise from time to time. Approaches used by contractors to remain in business are through direct engagement by employer or buyer or through tendering and this is made possible only if they participate in bids from time to time in a competitive bidding or tendering process (Joshua, 2010). CIDB (2013) found that in Africa public sector projects have requirements to give confidence local economic development and to obligate contractors to stick to various policy and regulatory conditions such as local employment, socio-economic targets like training and skills development.

World Bank (2010) indicated that in Africa, there is a lot of effort made towards tenders and a negative outcome really dampens the morale of bidding organizations. Reasons given for disqualifying some bids are not convincing to bidders that have lost the opportunity. Generally, these bids are affected by political influence which shape the way such exercises are conducted as they favor foreign contractors.

2.6.1 Contractor performance in Nigeria

Ngomi (2017) quote Adams (1997) who identified that constraints on original contractors' in Nigeria being the following: uncertainties in supplies and costs of materials, obtaining temporary payment, procuring work, admission to assets, negotiate difference payment, admission to plant and equipment, unsuitable contract conditions, maintaining plant and equipment, resolving contract disputes, reaching contract deadlines, design changes, incomplete contract documents, transporting materials and tools materials control on location, providing reliable tenders, communicating with customer/representatives, shortages of skilled labour, public picture accounting of monetary management, inadequate supervision by client, project planning and place management, technical know-how, obligation to construction, company organization, personnel management, providing quality workmanship, dishonesty, changes in government and economy, prejudice against original contractors' competence, stealing and scam by own employees, double taxation, and breach of contract by public clients.

Omoriegbe & Radford (2006) revealed the following delay factors: poor contract management, financing and payment of completed works, changes in site conditions, shortages of materials, contractor's financial difficulties, client's income problem, architect's incomplete drawing, subcontractor's slow mobilization, equipment breakdown and maintenance problem, suppliers late delivery of ordered materials, incomplete structural drawings, contractor's planning and scheduling problems, price escalation and subcontractor's financial difficulties, contractors' difficulties in receiving payments from public agencies, inadequate public agencies' budgets, improper payment to contractor for completed work, problems in planning, unrealistic time estimation, frequent changes in material and design, and noncompliance with the contract conditions.

2.6.2 Contractor performance in Ghana

Fugar & Agyakwah-Baah (2010) quoted by Ngomi (2017), found the subsequent to be causes of delays in building construction projects in Ghana: delay in honoring payment certificates, underestimation of cost of projects, underestimation of complexity of projects, complicatedness in accessing bank credit, poor supervision, underestimation of a while for conclusion by contractors, scarcity of materials, poor qualified management, fluctuation of costs, poor site management, construction methods, stoppage in instructions from consultants,

late deliveries of materials, lack of programme of works, delay by sub-contractors, poor design, breakdown of kit , client initiated variations, obtaining permit from municipality, inadequate communication between parties, essential variations, shortage of skilled labour, legal disputes, unfavorable site conditions, foundation conditions encountered on site, discrepancy between design specification and code , inclemency conditions, mistakes with soil investigations, unskilled equipment operators, accidents during construction, shortage of unskilled labour, and public holidays.

Frimpong, Oluwoye & Crawford (2003) studied factors that cause cost overruns in construction of ground water projects in Ghana. Frimpong explained that the contractors and consultants mentioned monthly payments difficulties because the foremost vital cost overruns factor, while owners ranked poor contractor management because the foremost vital factor. Frimpong, et al. (2003) added that despite some difference in viewpoints among the three groups surveyed, there is a high degree of agreement among them with respect to their ranking of the factors. The three groups felt that the main factors which will cause excessive groundwater project cost overruns in developing countries are poor contractor management, monthly payment difficulties, material procurement, poor technical performances, and escalation of material prices.

2.6.3 Contractor performance in Swaziland

Thwala & Mvubu (2008) identified the following factors as constraints to the success of local contractors in Swaziland: lack of business management skills, lack of financial management skills, exorbitant interest rates from banks, compulsory business management services, risks involved in housing industry, lack of access to finance both during preconstruction and construction, bad relationships with suppliers, late payments of completed work by the client, lack of collateral, bidding for projects beyond contractor technical or financial capacity, lack of skills to properly program projects resources in monthly segments for healthy cash flow, inability to prepare documents for timely payment, misunderstanding of terms of contract and inability to use applicable contractual instruments to demand performance by client.

2.6.4 Contractor performance in Malawi

Kululunga (2012) explained that training (to teach writing and reading skills, financial management and business management skills), business management skills (to ensure sustainable business enterprises), financial management (to manage cash flow, among other things), unethical manners (to combat collusion, professional pricing the same job for more than one bidder, among others) and information technology (to make specific software available such as those required to aid preparation of works programmes) were areas identified to be amongst constraints and challenges faced by local contractors in Malawi. According to National Construction Industry of Council of Malawi (2012) the causes of delay in traditional contracts were due to owner interference, inexperienced contractor, and improper payments of completed work, labour productivity, poor site management, slow deciding, construction methods and improper planning subcontractors.

2.6.5 Contractor Performance in Zambia

According to Coyle et al. (1996) quoted by Ngomi, the Zambian construction industry has undergone some change due to the changing nature of the marketplace, globalization of the economy and markets, the upsurge of technology including information technology (IT), the changes in government policy including privatization and liberalization and strategic changes in supply chains. Nsabika (2002) explained that the changing nature of the marketplace with the liberalization and privatization programmes which were put into effect in the early 1990s almost complete, construction customers not need to stay loyal to their former sister companies under the Zambia Industrial and Mining Corporation (ZIMCO) group of companies, the economic Development Corporation (INDECO) group of companies or the Zambia Consolidated Copper Mines (ZCCM). INDECO and ZCCM jointly formed ZIMCO, which until its unbundling and subsequent privatization of the individual corporations was the second largest corporation in Africa. Nsabika (2002) added that the changes have a fundamental implication on the way ZIMCO construction contractors used to conduct business. The privatized companies have become increasingly more knowledgeable about construction products and have become much more demanding about price and quality. Quality and delivery are and will remain the most critical factors in the market. Moreover, they need a free market from which to settle on contractors from.

Similarly, Kangwa (2012) also eluded that the need for developing countries government to make financial provisions fixable to local companies so that they can build the local contractors in project engagement.

2.7 Lessons Learnt

Past studies have indicated that the following are the factors identified which contribute to the effect of construction delivery and lead time on the performance of Local Road Contractors: Correct estimation, Efficiency & Effectiveness, Productivity & Profitability, Project goals & objectives, Detailed project plan, Effective Project plans communication. Other factors include complete projects design, lead management, not having enough qualified and competent Local Road Contractors, Competence and experience of foreign contractors disadvantages local contractors, drawing and bill of quantity variations, stiff competition, and economic issues, the use of inexperienced and cheap labour and incompetent project management personnel.

The lack of the following: access to finance, commitment, reliability, professional development facilities, adequate equipment, technological advancement, and employee motivation as well as late payments of completed work by the client, exorbitant interest rates from financial institutions, bidding for projects beyond contractor technical or financial capacity predominantly inhibit enhancement of key project performance indicators resulting into the project delay and abandonment.

Developing countries government should make financial provisions fixable to local companies so that they can build the local contractors in project engagement. Al-Moumani (2000) mention that current construction projects are complex, requiring the support of the design and construction profession to complete. The problem of delays in the construction industry is a global phenomenon.

2.8 Knowledge Gap

Although many researchers have studied the effect of construction delivery and lead time on the performance of local contractors in general there is still need to further assess this effect on the road sector industry to be specific. In Africa, research on the performance on the local contractors is limited to a few countries. There is however need to understand why local

contractors participation in the road sector is still low as compared to foreign contractors. The problems, experiences, effects and solutions of the performance of the road local contractors in the road sector are yet to be captured in empirical literature. The performance of road local contractors has a remarkable impact on the general performance of a country's economy. This study fills the void by providing some specific knowledge on the performance of these road local contractors.

2.9 Theoretical Framework

In some circumstances, the factors may interact with each other in different ways in different circumstances. Therefore, it may be possible to identify factors that affect the growth of MSMEs by combining different theories. The theoretical framework for this research was drawn using the Game and Expectancy theories in mind.

2.9.1 Game Theory

The Game theory is the formal study of decision-making, where several players must make choices that potentially affect the interests of the other players (Theodore & Stengel, 2001) such as Local Road Contractors, these players may be individuals, groups, firms, or any combination. The game growth theory is appropriate for this research because the main respondents were senior personnel from the local contractors in the road sector. Their view of what could be the best predictors of performance was paramount. Further, this research investigates the capabilities of managers and how they make choices in the execution of projects.

2.9.2 Expectancy Theory

Expectancy theory proposes that an individual will decide to behave or act in a certain way because they are motivated to select a specific behavior over other behaviors due to what they expect the result of that selected behavior will be (Ward et al. (1991). Using expectancy theory reasoning states that: Risks should be borne out of willingness if there is adequate perception of risk/return trade-offs risk assessment, ability to bear occurring consequences and real ability to manage the associated uncertainty and thereby mitigate project risks. Risk should not be willingly borne if there is inadequate perception, need to obtain work and false perception of the risk/return trade-offs of transferring risk to another party such as funders.

2.10 Conceptual Framework

In this study, an analysis of the different factors that affect the performance of Local Road Contractors and impede their growth in the road sector in Lusaka was conducted. Based on the literature review and the current research undertaken the research model presented in Figure 2-1 was constructed to investigate the factors affecting performance Local Road Contractors in the road sector. Figure 2-1 illustrates how the concepts in the framework are related. The independent variables which include construction delivery and lead time are listed on the left side of the model. The dependent variable which is performance of Local Road Contractors being quality of work done and timely completion. This conceptual framework was also used in conducting analysis and explains the relationship that exists between construction delivery and lead time management with performance of Local Road Contractors. The presentation of the conceptual framework has definition of key concepts and the conceptual framework guiding the research.

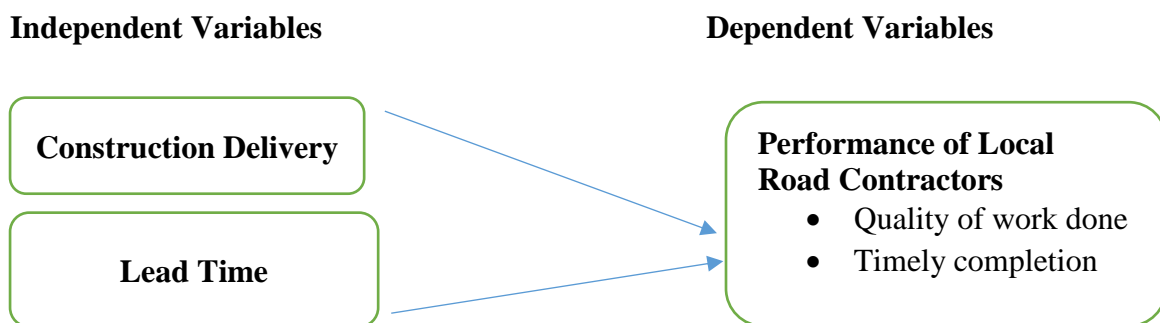


Figure 2-1 Hypothesized relationship between construction delivery, Lead time and road local contractor Performance

Source: Author

The Conceptual Framework gives a depiction on how the variable relates to each other. Independent variable affects and determines the effect of dependent variables. Performance of contractors could be researched and examined by means of many indicators of performance such as; quality, time, cost, including environmental impacts and Government policies.

2.10.1 Statements of Hypothesis

The following hypotheses were tested by this research:

H1: There is a significant relationship between construction delivery and timely completion of projects by the Local Road Contractors in Lusaka.

- H2: There is a significant relationship between construction delivery and the quality of work done by the Local Road Contractors in Lusaka.
- H3: There is a significant relationship between lead time and the quality of work done by the Local Road Contractors in Lusaka.
- H4: There is a significant relationship between lead time and the timely completion of projects by the Local Road Contractors in Lusaka.

2.11 Chapter Summary

This chapter looked at the introduction to literature review and reviewed the literature in relation to the research. This was done to establish what other underlying concepts in the area as well as what other researchers have found in their previous studies. The conceptual framework was drawn showing the relationship existing between independent variables and dependent variables under study. The chapter closed with the list of hypotheses which were developed for testing and analysis purposes.

The next chapter will provide the Research Methodology used in the findings of the study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The methods and research design presented in this section were developed with a view to achieve the study objectives. Research methodology shows how the researcher will collect, arrange and analyze data in the research. ‘Research design is the plan and structure of investigation so conceived as to obtain answers to research questions’ Blumberg, Cooper and Schindler (2014).

Blumberg, et al. (2014) contend that the typical research design elements are: Purpose of study in terms of descriptive, casual or predictive; Degree to which the research question must be crystallized, which is either exploratory or formal study; Method of data collection; Power of the researcher to influence the variables under the study; Time dimension; Research environment that being field study, laboratory or simulation.

This chapter presents the methodology that was adopted for this research. The section looked at the research approach, population, design, the sources of data, the sample size, the sampling methods, the data collection methods, the reliability of data, the validity of data, the data analysis techniques and the ethics to be applied when conducting the research.

Table 3-1 Research Design Matrix

Research Question	Research Objective	Population & Sampling	Data Collection	Data Analysis
Research Question 1: What construction delivery and lead time management practices are used by Local Road Contractors in Lusaka? (Ontology and deductive logic)	To establish the construction delivery and lead time management being used by Local Road Contractors in Lusaka?	Local Road Contractors Government Agencies Maximum Variation type of Purposive Sampling Stratified sampling	Survey Questionnaire	Univariate and Bivariate analysis
Research Question 2: What is the effect of construction delivery and lead time management on the quality of work done by the Local Road Contractors in Lusaka? (Rationalist epistemology, pragmatism and inductive logic)	To determine the relationship between construction delivery and lead time management on the quality of work done by Local Road Contractors in Lusaka.	Local Road Contractors Government Agencies Stratified sampling Purposive Sampling	Survey Questionnaire	Univariate, bivariate and Bivariate analysis
Research Question 3: What is the connection between construction delivery and lead time management on the timely completion of projects by the Local Road Contractors in Lusaka? (Rationalist epistemology, pragmatism and inductive logic)	To assess the connection between construction delivery and lead time management on the timely completion of projects by the Local Road Contractors in Lusaka.	Local Road Contractors (Maximum Variation type of Purposive Sampling) Stratified sampling	Survey Questionnaire	Bivariate analysis and Thematic analysis

Question 4: What recommendations would be made based on the study findings on how to improve performance of Local Road Contractors? (Rationalist epistemology, pragmatism and inductive logic)	To make recommendations based on study findings on how to improve performance of Local Road Contractors	Local Road Contractors Government Agencies (Maximum Variation type of Purposive Sampling) Stratified sampling	Survey Questionnaire	Univariate analysis

3.2 Research Approach

The purpose of the research was to establish whether construction delivery and lead time management have influence performance of Local Road Contractors. The Local Road Contractor performance were looked at from perspective of quality of work done and timely completion of projects. It is important to explore the main research methods to determine what is best suited for the research to be undertaken. Shank (2002) defines qualitative research as “a form of systematic empirical inquiry into meaning”. By systematic, he means planned, ordered and public, following rules agreed upon by members of the qualitative research community. By empirical, he means that this type of inquiry is grounded in the world of experience. ‘Inquiry into meaning’ indicates that researchers try to understand how others make sense of their experience. Denzin & Lincoln (2000) claim that qualitative research involves an interpretive and naturalistic approach: “This means that qualitative researchers study things in their natural settings, attempting to make sense of, or to interpret, phenomena in terms of the meanings people bring to them”. Qualitative research is a flexible and repetitive process allowing the researcher to respond to unanticipated opportunities that arise in the route of the research.

According to Leedy & Ormrod (2015), qualitative research methods can be:

- Case study where particular phenomenon is looked at in depth over a period.

- Ethnography methods where an entire group is looked at in depth.
- Phenomenological study where people's perceptions and perspectives are looked at detail.
- Grounded Theory study where data is analysed to develop a theory.
- Content analysis which analyses content or particular material.

The methods used in qualitative analysis serve the purpose of exploration, multifaceted description, verification, theory development, problem identification and evaluation (Leedy & Ormrod, 2015). Although some aspects may apply to the research, these methods may not be suited for the type of research being conducted on the two factors of the effect local contractor performance.

Quantitative research on the other hand, is the systematic investigation of observable phenomena via statistical, mathematical or computational techniques (McNabb, 2009). Quantitative methods emphasize objective measurements and the statistical, mathematical, or numerical analysis of data collected through polls, questionnaires, and surveys, or by manipulating pre-existing statistical data using computational techniques. Quantitative research focuses on gathering numerical data and generalizing it across groups of people or to explain a particular phenomenon. A study classified as quantitative is primarily concerned with the quantification of a problem or situation. Kumar (2005: 13) notes that "quantitative methods emphasize objective measurements and the statistical, mathematical or numerical analysis of data collected through polls, questionnaires and surveys or by manipulating pre-existing statistical data using computational techniques."

Quantitative research methods include using descriptive research, experimental, quasi-experimental and Ex Post Facto design methods (Leedy & Ormrod, 2015). Further, Leedy and Ormond said that descriptive research methods can be:

- Observation studies.
- Correlational Research, examining associations between or among variables.
- Developmental designs, which may investigate people over a period.
- Survey research which entails acquiring information about one or two groups of people.
- Face to face or telephone interviews.
- Questionnaires distributed to a large number of people from the target population.

Descriptive studies entail descriptions of a phenomena and measuring the extent of the population with those characteristics (Blumberg, et al., 2014). Blumberg, et al. (2014) further contends that this type of studies helps “discovery of associations among different variables”. The quantitative approach will be used to assess the effect of lead time on the performance of Local Road Contractors in Lusaka city.

Mixed methods combine both qualitative and quantitative methods. The strengths of these approaches can be put together to overcome the limitations of each. In addition, most modern studies are not entirely quantitative or qualitative hence the use of mixed methods approach proves to be more precise (Creswell, 2012).

This research used the mixed method, a combination both qualitative and quantitative using explanatory design.

3.3 Characteristics of Research

The type of research conducted took up three forms in the quest to finding answers to the research objectives. The first form was based on the purpose of the research. The research was an evaluation research. Evaluation research studies the processes and outcomes aimed at attempted solution (Jason, n.d.). The research was thus evaluative in nature because evaluative research attempts to investigate what works best, with the purpose of basing future policy and practice upon the results of the changes (Kumar, 2005). The research was an evaluative in nature because it attempted to assess the effect of construction delivery and lead time on performance of Local Road Contractors in Lusaka.

The second form that the study took was based on the number of cases to be investigated. In this regard, the research was a case study of Local Road Contractors in Lusaka city. Rhee (2004) defined a case study as a “detailed examination of an event (or series of related events) which the analyst believes exhibits the operation of some identified general theoretical principles”. Rhee further stated that “a vital strength of case studies can thus be seen to be the ability to conduct a detailed investigation or inquiry. One of the most significant benefit of case studies is that they enable a holistic review (ibid.). Unlike stand-alone research techniques which give more of a snapshot, such as surveys, a case study offers the opportunity for a researcher to use a range of tools on one subject (ibid.). This gives time and space to build a detailed understanding of the topic, establishing a sound platform from which to explore the

factors influencing the case study in greater detail (Salmon, 2017). In addition, case studies reduce bias.

The third form is based on the time frame within which the research was conducted. In line with this, the research was a one-time research or one-time study. It was conducted at a one point in time without room for follow-ups. The essence of a one-time study is to find out the prevalence of a phenomenon, situation, problem or attitude by obtaining an overall picture as it stands at the time of the study (Kumar, 2005). The time frame in which this study was conducted was between December 2019 and January 2021.

3.4 Selected Research Approach

The approach best suited for this study was a descriptive approach. This study followed the descriptive approach to access the relationship of construction delivery and lead time management and contractor performance. As earlier explained in section 1.3, the study sought to get correlations of construction delivery and quality of work done; construction delivery and timely completion of projects; lead time management and quality of work done; lead time management and timely completion of projects. The approach used, was to make the researcher answer the research questions of the study.

To answer the questions under investigations convincingly, this research obtained relevant evidence to test the theory that construction delivery and lead time management influences performance by Local Road Contractors in Lusaka. The design that was used in this study is that of a survey. Staff from 54 Local Road Contractors in Lusaka, Road Development Agency (RDA), National Road Fund Agency (NFRA), and National Council for Construction (NCC), Zambia Development Agency (ZDA) and Engineering Institution of Zambia (EIZ) were selected to participate in the research.

3.5 Research Population

The research was conducted in Lusaka district of Zambia. The population was chosen using data from NCC, which has a list of contractors according to the various categories and grades.

There is a total of seven (7) construction categories each having different grades based on annual turnover (Refer to Appendix 1 and 2). Category R is for General Roads and Earthworks

which caters for various road contracting types as such as Bituminous Surfacing & Paving Applications; Drainage Structures; Off-carriageway Rehabilitation & Maintenance; On-carriageway Rehabilitation & Maintenance; and Road Furniture; signage & markings; Quarrying (National Council for Construction, 2019).

	Zambian Contractors		Foreign Contractors		Unknown		Total
	Number	Percent	Number	Percent	Number	Percent	
Total - All Contractor categories	7461	96%	271	4%	1		7733
Total - Lusaka	2996	93%	209	7%			3205
Lusaka Contractors as % of Total Contractors		40%		77%			41%
Zambia Total Category R Contractors	2160	98%	50	2%	0		2210
Lusaka Total Category R Contractors	911	95%	45	5%			956
Lusaka Category R Contractors as % of Total Category R Contractors		42%		90%			43%
Lusaka Grade 1 Category R - General Roads and Earthworks	13	27%	36	73%			49
Lusaka Grade 2 Category R - General Roads and Earthworks	12	57%	9	43%			21
Lusaka Grade 3 Category R - General Roads and Earthworks	17	100%					17
Lusaka Grade 4 Category R - General Roads and Earthworks	66	100%					66
Lusaka Grade 5 Category R - General Roads and Earthworks	246	100%					246
Lusaka Grade 6 Category R - General Roads and Earthworks	557	100%					557

Figure 3-1 Contractor Categorization Summary - December 2019

Source: Author

	Zambian Contractors		Foreign Contractors
	Number		Number
Lusaka Grade 1 Category R as % of Total Lusaka Category R Contractors	1%		4%
Lusaka Grade 2 Category R as % of Total Lusaka Category R Contractors	1%		1%
Lusaka Grade 3 Category R as % of Total Lusaka Category R Contractors	2%		
Lusaka Grade 4 Category R as % of Total Lusaka Category R Contractors	7%		
Lusaka Grade 5 Category R as % of Total Lusaka Category R Contractors	26%		
Lusaka Grade 6 Category R as % of Total Lusaka Category R Contractors	58%		

Figure 3-2 Lusaka Category R Contractor Categorization Summary by Percentage - December 2019

Source: Author

This study was confined to Local Road Contractors in Lusaka city. Of all the 7,733 contractors registered with NCC as of December 2019, 3,205 representing 41% are domiciled in Lusaka (Refer to Figure 3-1). Of the 2,210 category R contractors registered with NCC as of December 2019, 956 representing 43% are domiciled in Lusaka hence the researcher choosing Lusaka to be the research area. Lusaka has the highest concentration of category R contractors. In addition, Lusaka is the most populated district in terms of size and population density in Zambia. The road contractors in Lusaka account 12% of all contractors registered in Zambia.

Local Road Contractors was chosen because roads are the main means of transportation used in Zambia and are a major driver of economic activities. If people cannot find means to move, or if they have to pay too much for transportation due to poor roads, these people probably will not engage in higher productivity which is supposed to lead to the growth of the economy. As argued by the National Road Fund Agency (NFRA), roads help to facilitate regional integration, ease of transportation of goods and services and significant linkage with national and international corridors (Namukolo, 2019). Zambia currently has numerous projects which are being funded by various cooperating partners and financiers. Some examples are the link Zambia, Senanga–Sesheke road, Kazungula Bridge, toll plaza projects in Southern, Lusaka, Copperbelt, Central provinces.

In addition, key political, economic and administrative institutions of the country are in Lusaka district. The Headquarters of Government Ministries, Departments and other major actors involved in the transport sector are in the district. This enabled the researcher to have easy access to key informants.

3.6 Research Design

Akhtar (2016) says the research design is regarded as a blue print, a master plan that specifies the methods, techniques and procedures for collecting and analyzing the needed information or simply a framework or plan of action for the research. The research used a non-experimental research to assess the effects of construction delivery and lead time on the performance of Local Road Contractors in Lusaka city. Non-experimental research is research that lacks the manipulation of an independent variable, random assignment of participants to conditions or orders of conditions, or both (Creswell, 2012). Rather than manipulating an independent variable, researchers conducting non-experimental research simply measure variables as they naturally occur. A non-experimental research was used because the researcher had little or no control over the conditions under which the research was being conducted hence subjects of the research were observed in their natural setting.

The research design used was explanatory mixed method design to assess the effects of construction delivery and lead time on the performance of Local Road Contractors in Lusaka city

3.7 Sources of Data

The research used both primary and secondary sources of data. Primary data is data that was collected by a researcher from first-hand sources, using methods like surveys, interviews, or experiments. It is collected with the research project in mind, directly from primary sources (Stephanie, 2018). Primary data for this research included departmental minutes, ministerial speeches, circulars, letters, memoranda, agreements and operational guidelines. Data found in such documents are unprocessed hence the research used these documents to obtain first-hand information on the effects of construction delivery and lead time on the performance of Local Road Contractors in Lusaka city.

On the other hand, secondary data is data that has been gathered before by other researchers and is already documented (Surbhi, 2016). This data was obtained from books, research reports, working papers and dissertations, among others. These were obtained from individuals, library and the internet. The reason for using secondary data is to collect information on what is already known about effects of construction delivery lead time on performance of Local Road Contractors.

3.8 Sample Size

Leedy & Ormrod (2015) contend that the larger a sample size is in research, the better. According to Gay, Mills & Airasian (2012), the following guidelines can be used for determining a sample size:

- 100% survey if the population if it is less than 100
- 50% survey if the population if it is around 500
- 20% survey if the population if it is around 1,500
- 400 when population is beyond 5,000

As of December 2019, there were a total of 911 Zambian Grade R contractors based in Lusaka (Figure 3-1 Contractor Categorization Summary - December 2019).

Table 3-2 below gives the summary of the sample to be selected for the study.

Table 3-2 Study Sample

	Total Number of Contractors	Number of Contractors to be Sampled (50%)		Respondent		Total Targeted Respondents
				Directors	Employees (Operations, Project Management, Monitoring)	
Lusaka Category R (General Roads and Earthworks) Contractors						
Grade 1	13	7		2	2	26
Grade 2	12	6		2	2	24
Grade 3	17	9		2	2	34
Grade 4	66	33		2	2	132
Grade 5	246			2	2	0
Grade 6	557			2	2	0
Government Agencies						
Road Development Agency (RDA)				1	1	2
National Road Fund Agency (NFRA)				1	1	2
National Council for Construction (NCC)				1	1	2
Zambia Development Agency (ZDA)				1	1	2
Engineering Institute of Zambia (EIZ)				1	1	2
Total		54				226

Source: Author

The research had a sample size of 54 Local Road Contractors drawn from 108 contractors in the total population of Grade 1 to 4 of Road contractors in Lusaka. The population was adjusted to exclude Grade 5 and 6 as these are not given major roads contracts. According to (Gay, et al., 2012) this is an adequate sample for the study. Several respondents from the Local Road Contractor companies were selected. Additionally, respondents were drawn from government agencies as indicated in table 3-2 above.

3.9 Sampling Methods

The research used purposive sampling to select key informants that is Directors from RDA, NRFA, NCC, ZDA and EIZ. Purposive sampling is a non-probability technique where sampling is done in a deliberate way, with some purpose or focus in mind (Punch, 2005). The respondents were purposively selected because of their knowledge in the construction industry. These answered questions regarding construction delivery and lead time management on the quality of work and the timely completion of projects by the Local Road Contractors. This was done by establishing contact with key personal in order to get assistance. To select contractors for the study, the researcher used stratified sampling. Stratified sampling is a method of sampling from a population which can be partitioned into subpopulations or strata (Wikipedia,

2020). The contractors were divided in their categories (Figure 3-1 & 3-2) and the researcher used purposive sampling to draw sample of contractor from grade 1 to 4 of category R. To select respondents from Local Road Contracting Companies, the researcher used systematic sampling. This is the type of sampling that is done randomly by first selecting a first element and picking the remaining elements using a standardized pattern (Creswell, 2012). The reason for selecting systematic sampling is due to the availability of a full list of contractors which was obtained from NCC. To encourage participation in the research, the researcher solicited buy in and assistance from NCC to encourage participation in the survey.

3.10 Methods of Data Collection

Questionnaires were used to collect data in the research. A questionnaire is a structured tool for data collection based on pre-determined sets of questions and with possible response categories recorded on a standardized schedule (Robson, 2011). Questionnaires are an essential method used to collect statistical data from large numbers of people. Questionnaires are the most cost-effective method of collecting data. The questionnaire method gives accurate and precise information for the quantitative research conducted - Rashid (2008). The reason why questionnaires were chosen is because they enable the collection of quantifiable data from many respondents. To reduce bias, the questionnaires were administered to several people in each contractor company, (two directors and two employees). Yu (2005) criticized approach of relying on the responses of a single person in an organization arguing it may be insufficient and incorrect.

3.10.1 Pre-testing of Questionnaire

The questionnaire administered was pre-tested before starting data collection. The testing enabled the researcher to get an indication as to the effectiveness of the questionnaire in meeting the research objectives and highlight flaws of the tool. The test helped in bringing out the questions that were difficult to understand, redundant and element of bias.

The questionnaire was pre-tested by a statistician and administered to 1 contractor and several colleagues of the researcher. Leedy & Ormrod (2015) advise that at a minimum the researcher should give the questionnaire to several friends and colleagues to assess if they have difficulty understanding any items. Feedback on the pre-test questionnaire were discussed with the

respondents afterwards. People completing the test questionnaire were told to complete it like it is the final administered one. Changes to questionnaire, where necessary, were made before final version was completed.

3.10.2 Reliability of Data

Reliability means being able to demonstrate that the operations of a study, such as data collection procedures can be repeated with the same results (Yin, 2009). Certain things can threaten the reliability in research and Robson (2011) identifies these to be subject error, subject bias, and observer error and observer bias. Threats to reliability are those factors that cause or are sources of error. To achieve reliability, the data collected was pre-tested for internal consistency of reliability. The internal consistency reliability of the sets of items is cardinal for the research to have accurate and significant findings. To ensure validity and reliability of the data collected, a reliability test (Cronbach's alpha) was conducted to gauge the internal consistency of variables under the study.

Gliem & Gliem (2003) utilized Cronbach's alpha coefficient previously for multi-item statements to measure students' pleasure with their graduate program at Ohio State University. The study showed the power and usefulness of using Cronbach's alpha for giving reliability estimates for multi-items. Reliability was tested using Cronbach's alpha in SPSS. According to Tatham, (2007) Cronbach's alpha is most commonly used when you want to assess the internal consistency of a questionnaire that is made up of multiple Likert-type scales and items. For this study 10 items were subjected to the test. A measuring instrument is reliable if it provides consistent results.

In the Pilot, the Cronbach's alpha coefficient (Table 3.3) was $\alpha = .81$, the score was above the .7 threshold for high internal consistency, an indication that the questionnaire was reliable for the study. Basing on this test, any items which had extreme scores (high and low) from the others were removed to make the questionnaire more reliable.

Table 3-3 Cronbach's Alpha Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No. of items
.811	.812	10

3.10.3 Construct Validity

Construct validity is the most complex and abstract measure of validity. This research measured construct validity, construct validity is simply concerned with establishing correct operational measures for the concepts under study by ensuring that data collected are relevant to the research (Riege, 2003). Thus, the constructed validity was tested using multiple sources of evidence which include triangulation of data. It involved establishing the same fact by collecting data from different sources. Construct validity requires a definition with clearly specified conceptual boundaries (Newman, 2002) and concerned with the underlying attributes rather than with the scores the instrument produces (Salkind, 2000). The validation emphasizes a logical analysis and tests the relationships predicated based on theoretical considerations.

Joppe (2000) defines construct reliability as the extent to which results are consistent over time. Joppe, further ascertained that accurate representation of the total population under study is referred to as reliability. If the results of a study can be reproduced under a similar methodology, then the research instrument is reliable.

Factor analysis is a methodology that is used in research to validate the constructs and reduce the number of variables, where necessary. Leedy & Ormrod (2015) guide that factor analysis is a method for examining correlations among numerous variables and identify clusters of highly related variables reflecting themes under study. Factor analysis was used in this research to scrutinize the relationships between the variables and identify clusters of variables that are closely associated to each other.

Criterion validity was also considered in the research. 'Criterion validity is the extent to which the results of an assessment instrument correlate with another' (Leedy & Ormrod, 2015). Leedy & Ormrod (2015) support the use of triangulation in finding consistencies or inconsistencies in the data collected. Respondents' views on influence of construction delivery and lead time

management practices on road local contractor's performance was collaborated with NCC reports, economic and planning data from relevant Ministries where possible.

To further ensure the reliability of data and the validity of a measuring instrument, the researcher engaged services of a statistician in the development of the measurement tool and analysis of collected data. Data was collected using the questionnaire and was measured using a five-point Likert scale ranging from 1, representing strongly negative, to 5, representing strongly positive.

3.11 Methods of Data Analysis

Research data was analysed using descriptive statistics and for ascertaining association between variables. The researcher utilised Statistical Package for Social Sciences (SPSS) as the main descriptive statistical tool to analyse the data and determine the extent of relationships between the independent and dependent variables. The results of the processed data was presented using percentages, means, standard deviations, frequencies and tables for easy understanding.

This research adopted quantitative data analysis techniques. Quantitative data was analysed using Statistical Packages for Social Sciences (SPSS). At the initial step of data preparation, raw data was converted into structured format that is more appropriate for the analysis. Where necessary the researcher conducted data editing. The results of the analysis involved presenting and interpreting data using descriptive statistics by utilizing figures, tables and graphs for the various variables that were under analysis. Further, this study utilized one-dimensional frequency tables to get patterns and relationships.

3.12 Research Ethics

Ethical consideration, being important moral principle was followed in conducting this research. This research observed ethics by ensuring that participants were fully aware about the research problem before they take part. The researcher sort consent from the participants who took part in the survey. Confidentiality and anonymity was also upheld, and participants were told about this. Job titles were used to identify respondents hence guaranteeing them anonymity. Participants were informed of their right to withdraw their consent without

condemnation. Other people like statistician or research assistants who took part in the research signed a confidentiality agreement.

Ethical clearance certificate was sought from the ethics committee at the University of Zambia.

3.13 Chapter Summary

The chapter has mentioned the methodology used in this study. It has significantly highlighted the research design, population, the sample design, information collection techniques, validity and reliability of data and the application package deal for facts analysis sampling methods, methods of data analysis and research ethics.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This chapter presents the findings and analysis of the Effect of Construction Delivery and Lead Time on the Performance of Local Road Contractors in Lusaka District, Zambia.

The research utilized primary data and that was collected through the use of questionnaires and observation from Local Road Contractors. The Statistical Packages for Social Science (SPSS) was used to analyze the data so as to obtain some level of significance or agreement of the structured questions. The results rendered an enhanced reflection on the study.

4.2 Responses from Local Road Contractors

4.2.1 Work Experience

Figure 4-1 showed the working experience in the organization (39%) the majority was more than 20 years, (26%) was between 11 to 20 years, (17%) of the respondents were 6 to 10 years, (7%) were between 1 to 5 years and (3%) was less than 1 year. The results implied that the respondents have experience to enable them to answer the questions contained in the questionnaire regarding the industry, therefore the data obtained from these respondents can be deemed to be reliable.

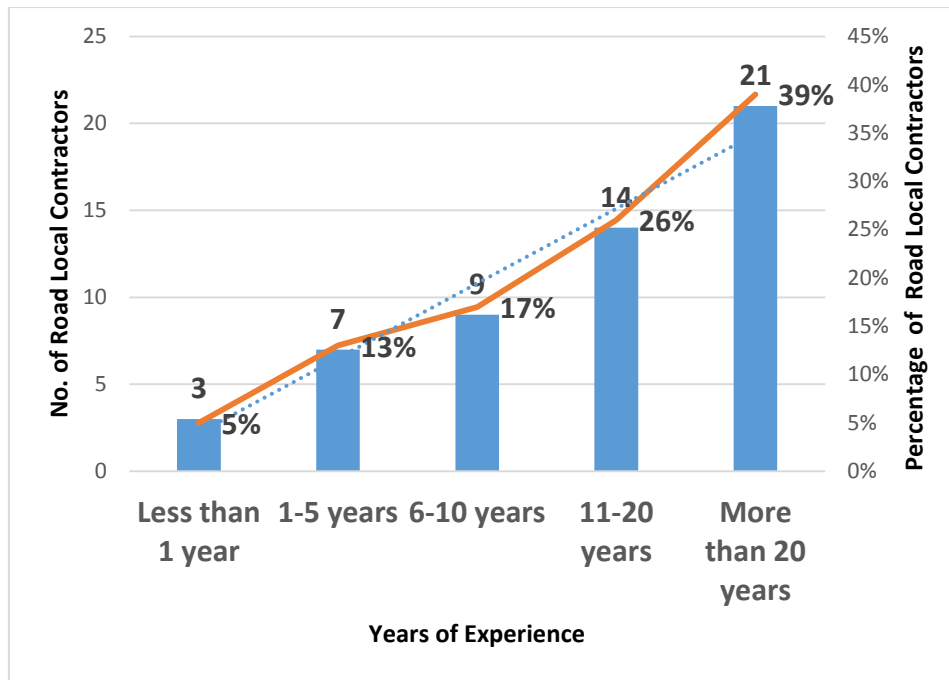


Figure 4-1 Respondents Work Experience

Source: Author field data, 2020

4.2.2 Level or Function in Organization

Figure 4-2 indicates the level or function in organization (31%) the majority were from management, (26%) were from operations, (18%) of the respondents were directors, (15%) were technical, (6%) were from logistics and (4%) were from administration. Based upon the above analysis 90% constitute experienced staff, which is an indication that the data obtained from these workers can be relied on.

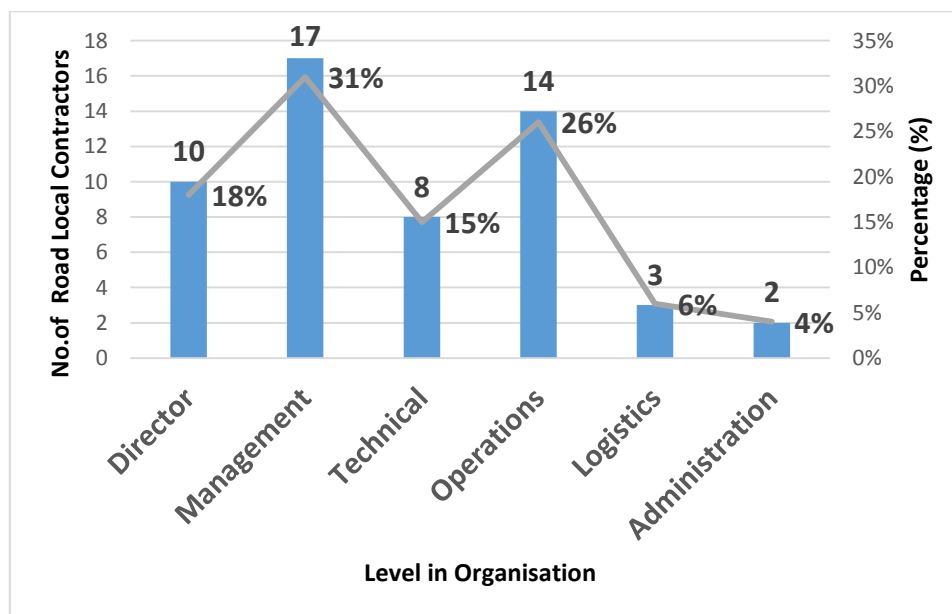


Figure 4-2 Respondents level or function in organization

Source: Author field data,2020

4.2.3 Highest Academic Qualification

Figure 4-3 indicates the highest academic qualification, (39%) being the majority were postgraduate, (35%) had PHD, (21%) of the respondents were graduate and (5%) had college diplomas.

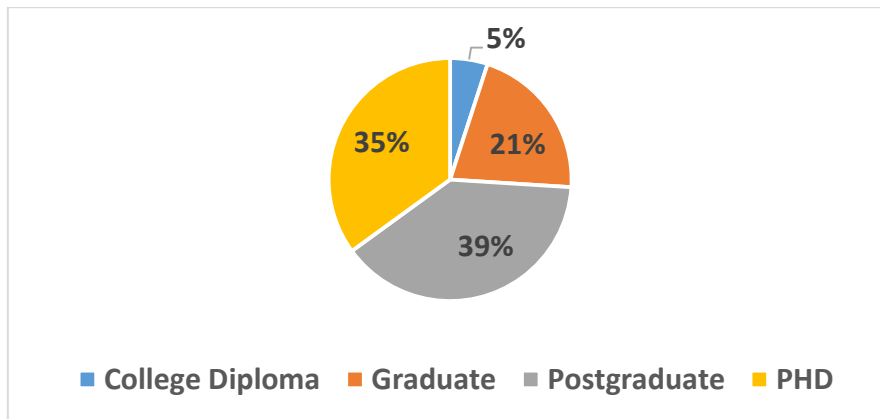


Figure 4-3 Highest academic qualification

Source: Author field data,2020

4.2.4 Age Share of Respondents

Figure 4-4 below indicates the age share of respondents, from the results of the research most of the respondents (61.4%) were between 31- 40 years, then followed by (32.9%) who were up to 30 years, and (5.7%) who were between 41 and 55 years old.

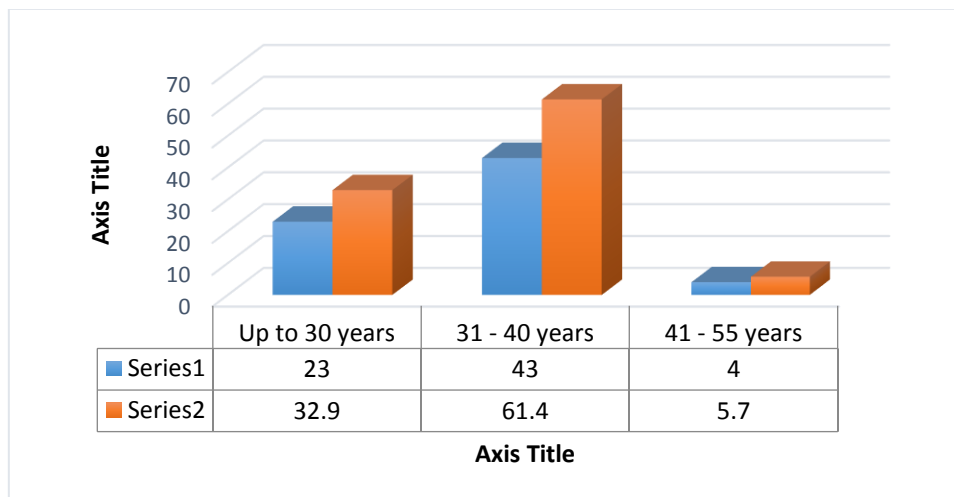


Figure 4-4 Age of Respondents

Source: Author field data,2020

4.2.5 Sex of Respondents

Figure 4-5 indicates the sex share of respondents, from the results of the research (79.6%) of the respondent was male and (20.3%) were female. This supports the statement that the industry is masculine-inclined, but the research was fairly represented both male and female respondents' employees from the Road Local Contractors.

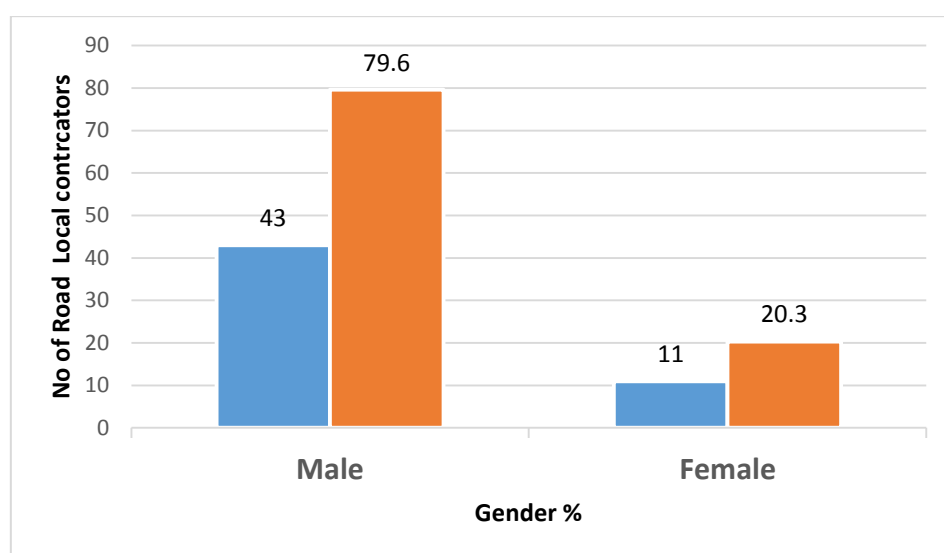


Figure 4-5 Sex of respondents

Source: Author field data,2020

4.2.6 Value of Contracts per Year

Figure 4-6 indicates the value of contracts per year that respondents managed, from the results of the research (52%) of the respondent indicated less than K5,000,000, while (24%) indicated between K5,000,000 to K10,000,000, (17%) indicated between K10,000,000 to K20,000,000 and (7%) indicated more than K20,000,000.

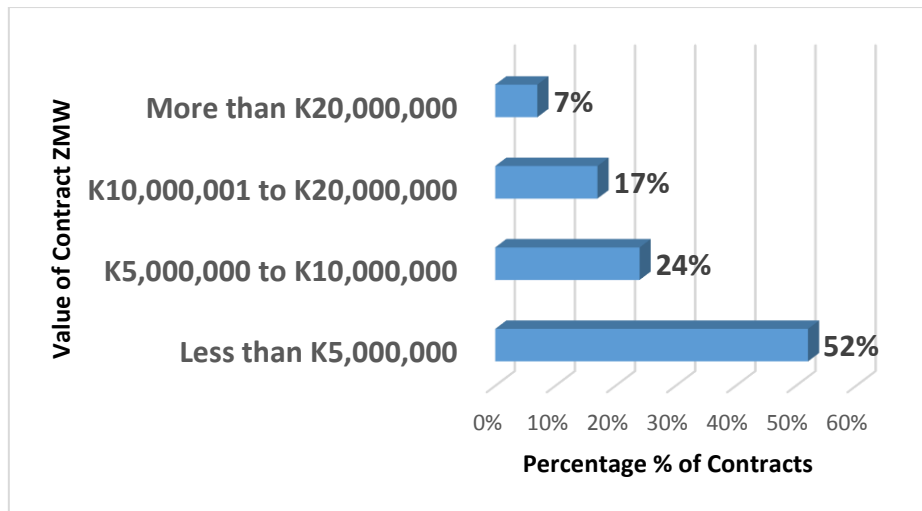


Figure 4-6 Value of contracts per year

Source: Author field data, 2020

4.2.7 Number of Employees in the Company

Figure 4-7 indicates the number of permanent employees in the company of respondents, from the results of the research (57%) of the respondent indicated having the number of permanent employees between 11 to 50, while (33%) have up to 10, (8%) indicated between 51 to 100 and (2%) indicated more than 100.

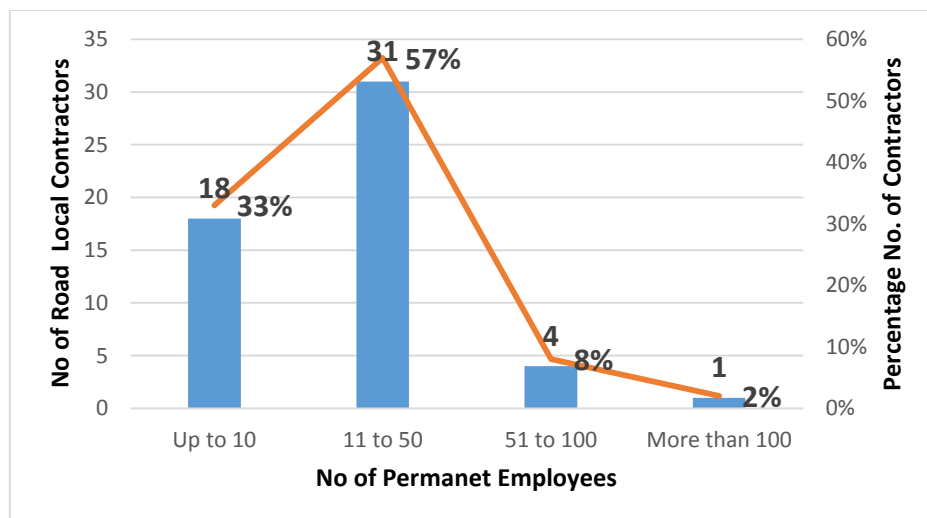


Figure 4-7 Number of permanent employees in the company

Source: Author field data, 2020

The average number of temporal employees employed (figure 4-8), indicates from the respondents, that (44%) of the respondent indicated having temporal employees between 11 to 50, (30%) indicated between 51 to 100, (17%) indicated more than 100 and (9%) indicated up to 10.

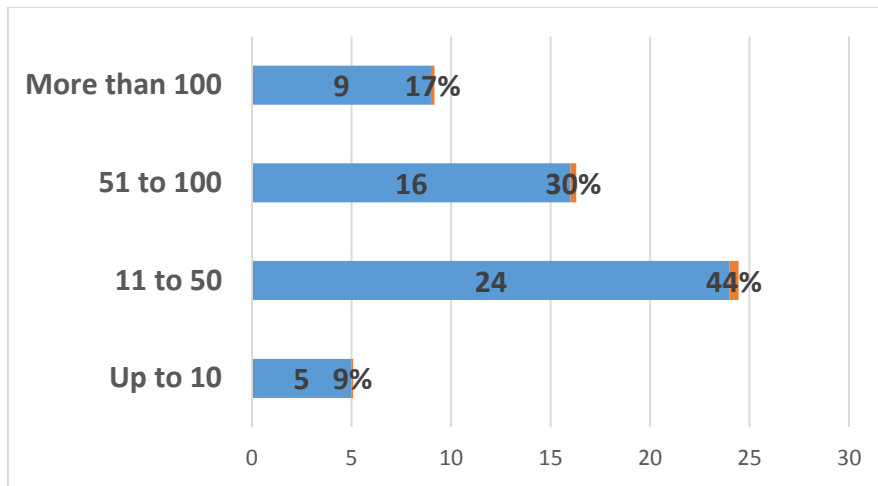


Figure 4-8 Average Number of temporal employees

Source: Author field data,2020

4.2.8 Qualified and Experienced Project Managers Managing Projects

Table 4-1 presents results on whether firms have qualified and experienced project managers managing projects, from the results of the research majority of the respondents 46.2% agreed, while 28.0% of the respondents strongly agree and 26.0% of the respondents indicated uncertain.

Table 4-1 Firms qualified and experienced project managers

	Frequency	Percent	Valid Percent	Cumulative Percent
Uncertain	14	26.0	26.0	26.0
Agree	25	46.2	46.2	72.2
Strongly agree	15	28.0	28.0	100.0
Total	54	100.0	100.0	

Source: Author field data,2020

4.2.9 Organization recognizes Importance of Project Management on Road Contracts

Table 4-2 below present's results on organization recognizes importance of project management on road contracts, from the results of the research majority of the respondents 56.0% agreed, while 33.0% of the respondents strongly agree, 11.0% of the respondents indicated uncertain.

Table 4-2 Importance of project management

Response	Frequency	Percent	Valid Percent	Cumulative Percent
Uncertain	6	11.1	11.1	11.1
Agree	30	56.0	56.1	67.1
Strongly agree	18	33.0	33.0	100.0
Total	54	100.0	100.0	

Source: Author field data,2020

4.2.10 Documented and consistently used Project Management Practices or Standard

Table 4-3 below shows results on whether organization documented and consistently used project management practices or standard, from the results of the research majority of the respondents 61.0% agreed, while 16.0% of the respondents strongly agree, 17.0% of the respondents indicated uncertain and 17.0% of the respondents indicated strongly disagreed and 6% disagreed.

Table 4-3 Documented and consistently used project management

Response	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	3	6.0	6.0	6.0
Uncertain	9	17.0	17.0	23.0
Agree	33	61.0	61.0	84.0
Strongly agree	9	16.0	16.0	100.0
Total	54	100.0	100.0	

Source: Author field data,2020

4.2.11 Influence of Construction delivery on Performance

Table 4-4 Influence of Construction delivery on Performance

Factor	Response %					Results Interpretation
	scale					
	SD	D	UC	A	SA	
Shared culture of Construction delivery	0	0	4	78	18	Results on whether organization has a shared culture of “construction delivery, from the results of the research majority of the respondents 78.0% agreed, while 4.0% of the respondent’s uncertain and 18.0% of the respondents indicated strongly agreed.
Correct estimation is one of the benefits	0	0	0	72	28	Results on whether Correct Estimation is one of the benefits of project delivery to any given project, from the results of the research majority of the respondents 72.0% agreed, 28% of the respondents strongly agree uncertain.
Efficiency & Effectiveness.	0	0	11	39	50	Results on whether efficiency & effectiveness is one of the benefits of project delivery to any given project. From the results of the research majority of the respondents 50.0% strongly agreed, while 39.0% of the respondents agreed and 11.0% of the respondents indicated uncertain.
Productivity & Profitability	0	0	6	61	33	Results on whether Productivity & Profitability is one of the benefits of project delivery to any given project, from the results of the research majority of the respondents 61.0% agreed, while 33.0% of the respondents strongly agree and 6.0% of the respondents indicated uncertain.
Project goals & objectives	0	0	0	67	33	Results on Meeting project goals & objectives is one of the benefits of project delivery to any given project, from the results of the research majority of the respondents 67.0% agreed, and 33.0% of the respondents strongly agre.
Completing projects on time	0	0	13	50	37	Results on whether completing projects on time is one of the benefits of project delivery to any given project, from the results of the research majority of the respondents 50.0% agreed, while 37.0% of the respondents strongly agree and 13.0% of the respondents indicated uncertain.
Detailed project plan	0	2	18	72	8	Results on whether firm has detailed project plan for contracts, from the results of the research majority of the respondents 72.0% agreed, 18.0% of the respondents uncertain, 2.0% of the respondents indicated disagree and 8.0% of the respondents indicated strongly agree.
Effective Project plans communication	0	0	0	78	22	Results on whether project plans are communicated to all staff and people involved in company projects, from the results of the research majority of the respondents 78.0% agreed, 22% of the respondents strongly agreeuncertain.

Source: Author field data, 2020

4.2.12 The Company uses Multi Lead Time Management Practices

Table 4-5 presents results on whether the Local Road Contractor's use multi lead time management practices, from the results of the research majority of the respondents 57.0% agreed, 37% of the respondents strongly and 6.0% of the respondents indicated uncertain.

Table 4-5 Company uses multi lead time management practices

Response	Frequency	Percent	Valid Percent	Cumulative Percent
Uncertain	3	6.0	6.0	6.0
Agree	31	57.0	57.0	63.0
Strongly agree	20	37.0	37.0	100.0
Total	54	100.0	100.0	

Source: Author field data,2020

4.2.13 Construction Delivery affects the Quality of Work Done

Table 4-6 indicates results on whether construction delivery affects the quality of work done by the organization, from the results of the research majority of the respondents 37.0% agreed, while 35.0% of the respondents disagree, 15.0% of the respondents indicated strongly agree and 13.0% indicated uncertain.

Table 4-6 Project delivery affects the quality of work

Response	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	19	35.0	35.0	35.0
Uncertain	7	13.0	13.0	48.0
Agree	20	37.0	37.0	85.0
Strongly agree	8	15.0	15.0	100.0
Total	54	100.0	100.0	

Source: Author field data, 2020

4.2.14 Good Construction Delivery Practices reduce Cost of Projects.

Table 4-7 shows results on whether good construction delivery practices on project reduce the cost of projects from the results of the research majority of the respondents 61.0% agreed, while 24.0% of the respondents strongly agree and 15.0% of the respondents indicated uncertain.

Table 4-7 Good construction delivery practices on project

Response	Frequency	Percent	Valid Percent	Cumulative Percent
Uncertain	8	15.0	15.0	15.0
Agree	33	61.0	61.0	76.0
Strongly agree	13	24.0	24.0	100.0
Total	54	100.0	100.0	

Source: Author field data, 2020

4.2.15 Lead Time Management affects the Quality of Work Done

Table 4-8 shows results on whether lead time management affect the quality of work done by organization, from the results of the research majority of the respondents 37.0% agreed, while 26.0% of the respondents disagreed, 20.0% of the respondents indicated uncertain, and 17.0% indicated strongly disagree.

Table 4-8 Lead time management affects the quality of work

Response	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	14	26.0	26.0	26.0
Uncertain	11	20.0	20.0	46.0
Agree	20	37.0	37.0	83.0
Strongly agree	9	17.0	17.0	100.0
Total	54	100.0	100.0	

Source: Author field data,2020

4.2.15 Influence of Lead Time Management on Performance

Table 4-9 Influence of Lead time management

Factor	Response %					Results Interpretation
	scale					
	SD	D	UC	A	SA	
	0	0				
Lead time management practices on quality	18	6	7	42	27	Results on whether good lead time management practices on project influences quality of projects, from the results of the research majority of the respondents 42.0% agreed, while 27.0% of the respondents strongly agree, 18.0% of the respondents indicated strongly disagree,7.0% indicated uncertain and 6.0% of the respondents indicated disagreed.
Construction delivery	0	72	11	17		Results on whether construction delivery affects the time taken to complete projects, from the results of the research majority of the respondents 72.0% disagreed, while 17.0% of the respondents agree and 11.0% of the respondents indicated uncertain.
Good construction delivery practices	0	8	2	73	17	Results on whether good construction delivery practices affects quality of projects , from the results of the research majority of the respondents 73.0% agreed, 17.0% of the respondents strongly agree, 2.0% of the respondents indicated uncertain and 8.0% of the respondents indicated disagree.
Project management	0	33	11	56		Results on whether project management affects the quality and time taken to complete projects , from the results of the research majority of the respondents 56.0% agreed, 33.0% of the respondents disagreed and 11.0% of the respondents indicated uncertain.
Lead time management practices on timely completion			13	61	26	Results on whether lead time management practices on projects reduces time taken to complete projects , from the results of the research majority of the respondents 61.0% agreed, while 26.0%% of the respondents strongly agreed and 13.0% of the respondents indicated uncertain.

Source: Author field data, 2020

4.2.16 Governments ability to help Local Contractors

Table 4.10 shows results on whether the Government is able to help Local Road Contractors to perform better on projects, from the results of the research majority of the respondents 80% strongly agreed, while 18.0% of the respondents disagreed and 2% of the respondents indicated uncertain.

Table 4-10 Governments ability to help Local road contractors

Response	Frequency	Percent	Valid Percent	Cumulative Percent
Uncertain	1	2.0	2.0	2.0
disagree	10	18.0	18.0	20.0
Strongly agree	43	80.0	80.0	100.0
Total	54	100.0	100.0	

Source: Author field data, 2020

4.2.17 Selection Criteria of successful Contractor.

Table 4.11 indicates results on the various criterion used in the selection of successful contracts, from the results of the research majority of the respondents on overview of selection criteria used 69% strongly agreed that there is a selection criterion in place, while 15% of the respondents were uncertain, 10% strongly agreed and 5.8% disagreed.

Table 4-11 Selection criteria

Factor	Response %					Total
	Scale					
	SD	D	UC	A	SA	
The selection criteria of the local contractors are transparent.		10	5	75	10	100
Call for bids is made public to all potential bidders		5		85	10	100
Selection of the best evaluated bidder is done based on the lowest price bidder			55	30	15	100
Awarding of contracts is based on the company capacity and technical expertise		10	3	67	20	100
Awarding of contracts is based on the lowest price bidder						0
Before awarding the contract, do the contracts committee carry out due diligence to confirm the existence of the contracted companies			8	87	5	100
The awarding committee follow the PPDA guidelines to award contracts		10	20	67	3	100
		35	91	411	63	600
		5,8%	15,2%	68,5%	10,5%	100,0%

Source: Author field data, 2020

4.2.18 Ways Government is able to Help Local Contractors

1. Government should encourage foreign contractors to partner with Local Road Contractors on most road construction projects so that they can enhance their skills from the partnerships.
2. All Local Road Contractors must be members of the Engineering Council of Zambia and National Construction of Zambia where they share ideas and skills on various road construction project.
3. The introduced 20% threshold on government road funded projects to be given to Local Road Contractors.
4. Award more tenders for Local Road Contractors,
5. Training of Local Road Contractors and
6. Offer credit finance to Local Road Contractors so that they can procure equipment required to carry out road construction projects.

4.2.19 Why Local Road Contractors abandon Projects

From the research results, the following were obtained:

1. Local Road Contractors lack professionalism in their operations as such they cannot handle complex jobs with regards to road construction and that's why most tenders are given to foreign contractors.
2. Local Road Contractors lack the financial capacity, human resource and equipment to carryout road construction and as such often abandon works before they even start.
3. Lack of sufficient support from government and high interest on borrow funds slapped by lending institutions such as banks make it difficult for Local Road Contractors to carry out projects that need huge capital injection.

4.2.20 Suggestions from Local Road Contractors

1. Government's role to encourage mentorship programmes in order to facilitate skills transfer to Local Road Contractors by foreign contractors.
2. The government should amend the National Council for Construction Act No. 13 of 2003 so that the National Council for Construction can also regulate and punish all the erring contractors that undertake works in the private sector.

3. The Government should urge the National Council for Construction to enhance its research in relation to the construction sector. The Government should ensure that the Citizens' Economic Empowerment Act No. 9 of 2006 and the Zambia Public Procurement Act No. 12 of 2008 are harmonized so as to facilitate consistency in the definitions of 'citizen' companies provided in the Acts.
4. The Government has the responsibility to ensure that cooperatives schemes among contractors are encouraged so that it is easier for them to access equipment and other requirements. It is also the Government's role to facilitate a construction bank that will enable contractors to access loans at reduced interest rates.

4.2.21 Factors that would increase the Performance of Local Road Contractors

1. Government supporting Local Road Contractors by awarding them with contracts
2. Make the business environment conducive for Local Road Contractors.
3. Consider high quality standard, excellent performance, time and financial management as prestigious strategies for competing effectively other than depending on lower pricing tendering system.
4. Local Road Contractors should change attitude by beginning to prioritize the contracts awarded to them first, before considering personal needs in order to be sustainable in business

4.3 Responses from Government Agencies

4.3.1 Gender

Figure 4-9 reveals that the male gender predominates with (70%) of respondents while (30%) indicated female.

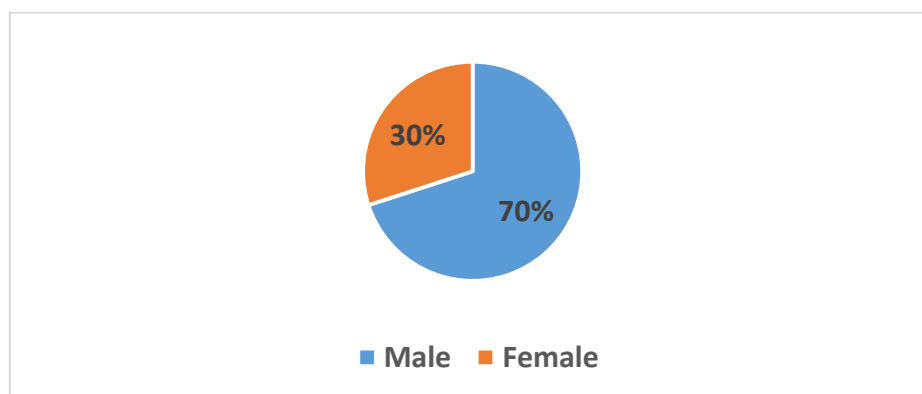


Figure 4-9 Gender distribution of respondents

Source: Author field data, 2020

4.3.2 Name of Organization

Figure 4-10 shows names of organization respondents belong, from the results of the research (30%) of the respondent indicated were from RDA, while another were from (30%) indicated NCC, (20.0%) were from NRFA, (10.0%) were from ZDA and another (10.0%) were EIZ.

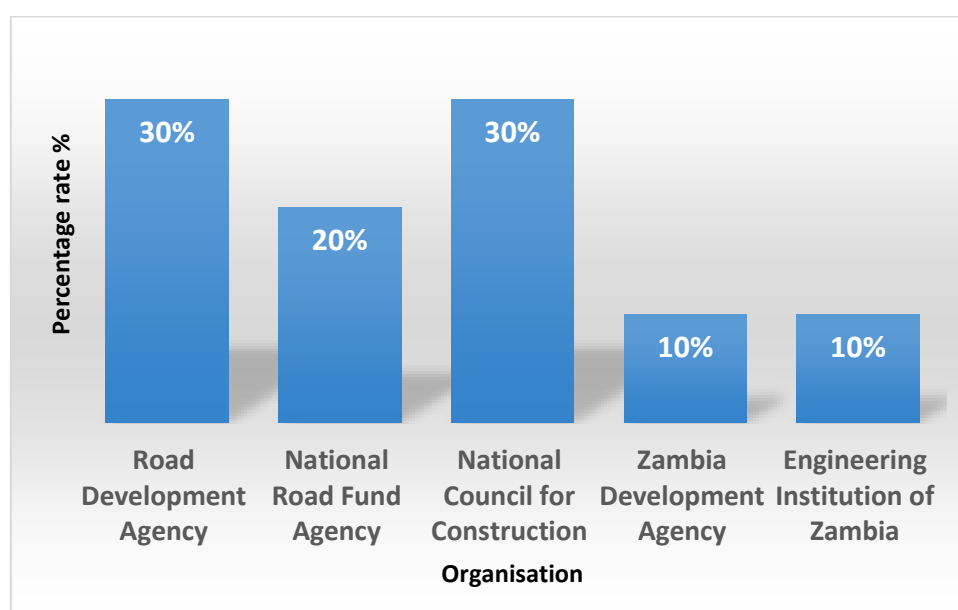


Figure 4-10 Name of Organisation

4.3.3 Status of Respondents in their Organisations

Figure 4-11 shows level or function in organization of the respondents, from the results of the research (30%) indicated were from management, while (30%) indicated technical, (20.0%) were directors, (10.0%) were from operations and another (10.0%) were from administration. Based upon the above analysis 90% constitute experienced staff, which is an indication that the data obtained from these workers can be relied on.

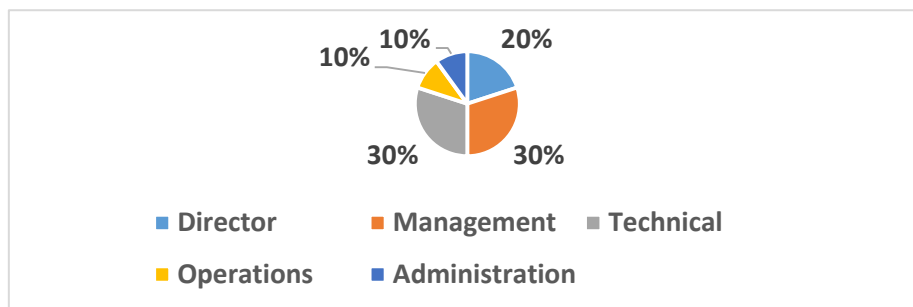


Figure 4-11 Respondents' status in their organisations

Source: Author field data, 2020

4.3.4 Respondents' Work Experience

Figure 4-12 indicates the years of experience of the respondents. From the results of the research (45.0%) of the respondent indicated more than 20 years, (20.0%) indicated 11-20 years, (15.0%) between 6-10 years (11.0%) indicated between 1-5 years and (7.0%) indicated less than 1 year. 5.9). Any respondent with 10 and above years of experience is considered to be knowledgeable in his / her discipline and therefore the data obtained from these respondents can be deemed to be reliable.

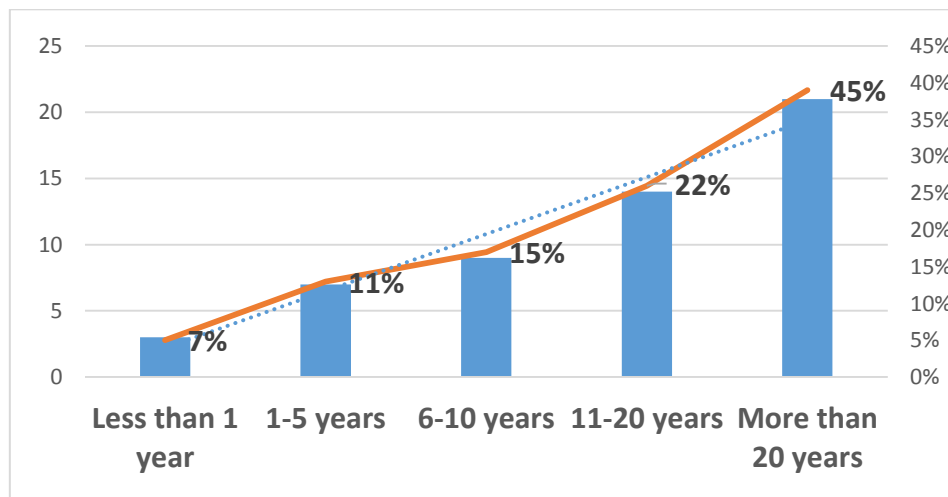


Figure 4-12 Years of experience

Source: Author field data, 2020

4.3.5 Views on Qualifications and Competence of Local Road Contractors by Agencies

Table 4-12 Views on Qualifications and competence of local road contractors by Agencies

Factor	Response %					Results Interpretation
	Scale					
	SD	D	UC	A	SA	
Qualified and competent local road contractors.	0	30	0	70	0	Results on whether there are enough qualified and competent local road contractors, from the results of the research majority of the respondents 70.0% agreed and 30% of the respondents strongly disagree.
Ability of Zambian local contractors	0	0	0	40	60	Results on whether there are a lot of road projects which the Zambian local contractors are not able to work on, from the results of the research majority of the respondents 60.0% strongly agreed, and 40.0% of the respondents agreed.
Does experience disadvantages local contractors	0	0		20	80	Results on whether competence and experience of foreign contractors disadvantages local contractors, from the results of the research majority of the respondents 80.0% strongly agreed and 20.0% % of the respondents agreed.
Accurancy in bidding costs	0	70	0	30	0	Results on whether local contractors cost the works they bid for accurately, from the results of the research majority of the respondents 70.0% disagreed and while 30.0% of the respondents agreed.
Efficient and effective	0	60	0	20	20	Results on whether Zambian local contractors are efficient and effective in their project execution, from the results of the research majority of the respondents 60% disagreed, while 20.0%% of the respondents strongly agreed and 20% of the respondents indicated agreed.
Project goals and objects	0	0	0	60	40	Results on whether on Zambian Local contractors are capable of meeting project goals and objects, from the results of the research majority of the respondents 60.0% indicated agree and 40.0% of the respondents indicated strongly agree.
Resource mangement	50	30	0	20	0	Results on whether Zambian Local road contractors manage their resources (financial, material & human resources) effectively, from the results of the research majority of the respondents 50.0% strongly disagreed, while 30.0% of the respondents disagree and 20.0% of the respondents indicated agreed.
Timely completion of projects	0	0	0	30	70	Results whether Zambian Local contractors finish projects on time if all resources and processes are available and cleared, from the results of the research majority of the respondents 70.0% strongly agreed, and 30.0% of the respondents agreed.
Construction delivery effect on performance	0		10	30	60	Results on whether construction delivery affects the performance of local Zambian road contractors, from the results of the research majority of the respondents 60.0% strongly agreed, while 30.0% of the respondent indicated agreed and 10.0% of the respondents indicated uncertain

Source: Author field data, 2020

4.3.6: Good Construction Delivery Practices on Project Reduce the Cost of Work Done

Table 4-13 indicates results on whether good construction delivery practices on project reduce the cost of work done, from the results of the research majority of the respondents 50.0% agreed, 40.0% of the respondents disagreed and 10.0% of the respondents indicated strongly agree.

Table 4-13 Good construction delivery practices

Response	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	4	40.0	40.0	40.0
Agree	5	50.0	50.0	50.0
Strongly agree	1	10.0	10.0	100.0
Total	10	100.0	100.0	

Source: Author field data, 2020

4.3.7 Lead Time Management affects the Quality of Work

Table 4-14 shows results on whether lead time management affects the quality of works by Local Road Contractors, from the results of the research majority of the respondents 60.0% strongly agreed, while 30.0% of the respondents agreed and 10.0% of the respondents indicated disagreed.

Table 4-14 Lead time management affects the quality of work

Response	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Agreed	6	60.0	60.0	60.0
Agree	3	30.0	30.0	90.0
Disagree	1	10.0	10.0	100.0
Total	50	100.0	100.0	

Source: Author field data, 2020

4.3.8 Good Lead Time Management Practices on Projects improves Timely Completion

Table 4-15 shows results on whether good lead time management practices on project improves timely completion of projects done by Local Road Contractors, from the results of the research majority of the respondents 50.0% agreed, while 40.0% of the respondents strongly agree, and 20.0% of the respondents indicated disagreed.

Table 4-15 Good lead time management practices on project improves timely completion

Response	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly agree	4	40.0	40.0	40.0
Agree	5	50.0	50.0	90.0
Disagree	1	10.0	20.0	100.0
Total	10	100.0	100.0	

Source: Author field data, 2020

4.3.9 Ineffective or Sloppy Lead Time Management Practices on project affect Performance of Projects done by Local Road Contractors.

Table 4-16 shows results on whether ineffective or sloppy lead time management practices on project affect performance of projects, from the results of the research majority of the respondents 70.0% strongly agreed, and 30.0% of the respondents agree.

Table 4-16 Ineffective or sloppy lead time management practices

Response	Frequency	Percent	Valid Percent	Cumulative Percent
Agree	3	30.0	30.0	30.0
Strongly agree	7	70.0	70.0	100.0
Total	10	100.0	100.0	

Source: Author field data, 2020

4.3.10 Construction delivery affects the time taken to complete projects by Local Road Contractors.

Table 4-17 shows results on whether project delivery affects the time taken to complete projects by Local Road Contractors. From the results of the research majority of the respondents 50.0% agreed, while 30.0% of the respondents disagree and 20.0% of the respondents indicated strongly agreed.

Table 4-17 Construction delivery affects the time

Response	Frequency	Percent	Valid Percent	Cumulative Percent
disagree	3	30.0	30.0	30.0
Agree	5	50.0	50.0	80.0
Strongly agree	2	20.0	20.0	100.0
Total	10	100.0	100.0	

Source: Author field data, 2020

4.3.11 Good Construction Delivery Practices on Projects reduce the time taken to complete Projects by Local Road Contractors.

Table 4-18 showed results on whether good project delivery practices on projects reduce the time taken to complete projects by Local Road Contractors, from the results of the research majority of the respondents 50.0% agreed, while 40.0% of the respondents strongly agree and 10.0% of the respondents indicated strongly disagreed.

Table 4-18 Good construction delivery practices on projects reduce the time taken

Response	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly disagree	1	10.0	10.0	10.0
Agreed	5	50.0	50.0	60.0
Strongly agree	4	40.0	40.0	100.0
Total	10	100.0	100.0	

Source: Author field data, 2020

4.3.12 Ineffective or Sloppy Construction Delivery Practices increase the time taken to complete projects by Local Road Contractors.

Table 4-19 shows results on whether ineffective or sloppy construction delivery practices increase the time taken to complete projects by Local Road Contractors, from the results of the research majority of the respondents 70.0% strongly agreed, and 30.0% of the respondents agree.

Table 4-19 Ineffective or sloppy construction delivery

Response	Frequency	Percent	Valid Percent	Cumulative Percent
Agree	3	30.0	30.0	30.0
Strongly agree	7	70.0	70.0	100.0
Total	10	100.0	100.0	

Source: Author field data, 2020

4.3.13 Lead Time Management affects the time taken by Local Road Contractors to complete projects.

Table 4-20 shows results on whether lead time management affects the time taken by Local Road Contractors to complete projects, from the results of the research majority of the respondents 40.0% agreed, while 40.0% of the respondents strongly disagree, and 20.0% of the respondents indicated strongly agreed.

Table 4-20 Lead time management affects the time taken

Response	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly disagree	4	40.0	40.0	40.0
Agree	4	40.0	40.0	80.0
Strongly agree	2	20.0	20.0	100.0
Total	10	100.0	100.0	

Source: Author field data, 2020

4.3.14 Good Lead Time Management Practices reduce the time taken by Local Road Contractors to complete projects.

Table 4-21 shows results on whether good lead time management practices reduce the time taken by Local Road Contractors to complete projects, from the results of the research majority of the respondents 50.0% agreed, 30% of the respondents strongly disagree and, 20.0% of the respondents indicated strongly agree.

Table 4-21 Good project lead time management practices

Response	Frequency	Percent	Valid Percent	Cumulative Percent
Agree	5	50.0	50.0	50.0
Strongly disagree	3	30.0	30.0	80.0
Strongly agree	2	20.0	20.0	100.0
Total	10	100.0	100.0	

Source: Author field data, 2020

4.3.15 Ineffective or Sloppy Project Lead Time Management Practices increase the time taken by Local Road Contractors to complete projects.

Table 4-22 shows results on ineffective or sloppy project lead time management practices increase the time taken by Local Road Contractors to complete projects, from the results of the research majority of the respondents 60.0% strongly agreed, 30.0% of the respondents agreed and 10.0% of the respondents indicated uncertain.

Table 4-22 Ineffective or sloppy project lead time management practices

Response	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly agree	6	60.0	60.0	60.0
Agree	3	30.0	30.0	90.0
Uncertain	1	10.0	10.0	100.0
Total	10	100.0	100.0	

Source: Author field data, 2020

4.4 Major problems facing Local Road Contractors

The major problems presented from the research results facing Local Road Contractors are:

- (i) The lack of necessary skills and technical experience by Local Road Contractors to carry out certain road projects which require technical experience and specific skills to be successfully completed.
- (ii) Majority of Local Road Contractors do have the financial capacity to sustain a road construction project where they have to start works before receiving funding for that particular projects. This also includes the machinery and human resource.
- (iii) The inability to secure declaration such as bank guarantees,
- (iv) Inadequate approach, insufficient knowledge and experience required for the preparation of responsive bids and
- (v) Failure to meet the turnover requirement

4.5 Solutions proposed to help address the issues of Local Road Contractors in Zambia

- (i) The National Council for Construction to carry out a research to identify possible ways such as training the contractors with project management skills, develop quality management system and control.
- (ii) Local Road contractors should change attitude by beginning to prioritize the contracts awarded to them first, before considering personal needs in order to be sustainable in business.

4.6 Role institutions play in addressing the issues of Local Road Contractors in Zambia

- (i) The National Council for Construction should encourage mentorship programmes in order to facilitate skills transfer to Local Road Contractors.
- (ii) Local Road Contractors should be trained on how to prepare responsive bids and,
- (iii) Local Road Contractors should partner with foreign contractors for them to gain the much-needed required skills set for the jobs.

4.7 Factors to increase the performance of Local Road Contractors

- (i) Initial planning and controlling is essential to the client in order to have proper action plan, procurement plan and budget plan prepared before starting of project.
- (ii) Payment schedules must be agreed by the parties involved.
- (iii) Good communication channel must be used by the contracting parties for easy flow of information to avoid delays.
- (iv) On the part of the contractor, adequate knowledge in project management principles, tools and techniques in managing construction project is essential in order to reduce delays.
- (v) Contractors should have good site managers for the smooth execution of works.
- (vi) They should plan their works properly and provide the entire schedule to clients for smooth flow of their staff to meet the current trends in project management.

4.8 Effects of Construction Delivery and Lead Time Management

The effects of delays are a result of factors which are not identified and resolved. Numerous factors can result in cost and time management in various types of projects, and client satisfaction will decrease if the cost of a project or schedule exceeds the planned budget (Kaliba et al., 2009).

The outcomes of construction delivery schedule overruns have been identified as follows:

- (i) Time overrun: A project experiences schedule overrun if the stipulated completion time is exceeded. Schedule overrun implies late delivery or completion based on the specified time that has been agreed by all the parties involved in the construction project (Sunjka & Jacob, 2013).
- (ii) Planning of the work over the anticipated duration (programme) in relation to its requirements with full appreciation of the resources needed and resources available; planning for utilization sets the basis or yardstick (plan) against which progress can be monitored and assessed.
- (iii) Progressing which follows the programming of the work and compares the work undertaken against the plan allowing the redistribution of resources, if necessary, to hurry up the work if it's falling behind the plan.

4.9 Hypothesis Testing using Regression and Correlation Analysis

This section is a presentation of the results of the tested hypotheses; four hypotheses were tested.

4.9.1 Significant relationship between Construction Delivery and Timely Completion of Projects by the Local Road Contractors in Lusaka

The following hypotheses were tested:

H_0 : There is no significant relationship between construction delivery and the timely completion of project by the Local Road Contractors in Lusaka.

H_1 : There is significant relationship between construction delivery and the timely completion of projects by the Local Road Contractors in Lusaka.

Using bivariate analysis – Pearson's rho, the following are the results.

Table 4-23 significant relationship between construction delivery and timely completion

		Construction delivery	Timely completion of project by Local Road Contractors
	Pearson Correlation	1	0.43
Timely completion of projects	p-value		0.09
	N	54	54

The results as tabulated in table 4-23 indicates that there is a positive relationship ($r=0.43$) between construction delivery and timely completion of project by the Local Road Contractors at 1% level of significant. This indicates that there is a relationship between construction delivery and timely completion of project by Local Road Contractors were the p-value was ($p=0.009 < 0.01$). Therefore, there is a significant relationship between construction delivery and timely completion of project by the Local Road Contractors.

4.9.2 Significant Relationship between Construction Delivery and the Quality of Work done by the Local Road Contractors in Lusaka.

The following hypothesis was tested:

H_0 : There is no significant relationship between construction delivery and the quality of work done by the Local Road Contractors.

H_1 : There is significant relationship between construction delivery and the quality of work done by the Local Road Contractors. The result in the table below (4-24) indicates a negative relationship ($r = -0.148$) exist between construction delivery and quality of work done by Local Road Contractors. However, at 5% level of significant, the H_0 was weak indicating a negative ($r=0.148$) this shows there was slightly significant but not significant relationship. Therefore, there is a weak relationship between construction delivery and quality of work done by Local Road Contractors but not statically significant because, $p=0.378$.

Table 4-24 significant relationship between construction delivery and quality of work

		Construction delivery	Quality of work done by Local Road Contractors
	Pearson Correlation	1	-0.148
Quality of Work done by Local Road Contractors	p-value		0.378
	N	54	54

Source: Author field data, 2020

4.9.3 Significant relationship between Lead Time Management and the Quality of Work done by the Local Road Contractors

The following hypothesis was tested:

H_0 : There is no a significant relationship between lead time management and the quality of work done by the Local Road Contractors.

H_1 : There is significant relationship between lead time management and the quality of work done by the Local Road Contractors.

Using bivariate analysis – Pearson's, the following are the results

Table 4-25 significant relationship between lead time management and quality of work

		Quality of work done by the local road contractors	Lead time management
	Pearson Correlation	1	0.420**
Lead time management	P-value		0.008
	N	54	54

***.* Correlation is significant at the 0.01 level (2-tailed).

Source: Author field data, 2020

The results as tabulated in table 4.25 indicates that there is a positive relationship ($r=0.420$) between lead time management practices and the quality of work done by the local road contractors at 1% level of significant. This indicates that there is a relationship between lead time management practices and the quality of work done by the local road contractors were the p-value was ($p=0.008$;< 0.01). Therefore, there is a significant relationship between lead time and the quality of work done by the local road contractors.

4.9.4 Association between Lead Time Management and the Timely Completion of Projects by the Local Road Contractors in Lusaka

The following hypothesis was tested:

H_0 : There is no significant relationship between lead time management and the timely completion of projects by the Local Road Contractors in Lusaka.

H_1 : There is a significant relationship between lead time management and the timely completion of projects by the Local Road Contractors in Lusaka.

Using bivariate analysis – Pearson's, the following are the results.

Table 4-26 significant relationship between lead time management and the timely completion projects

		Timely completion of projects by the local road contractors in Lusaka	Lead time management
	Pearson Correlation	1	-0.098
Lead time management	Sig. (2-tailed)		0.547
	N	54	54

Source: Author field data, 2020

The results as tabulated in table 4-26 indicates that there is a negative relationship ($r=-0.098$) between lead time management and the timely completion of projects by the Local Road Contractors in Lusaka. However, the relationship was not statistically significant at 5% level of significant ($p=0.547, >0.01$). Therefore, the researcher failed to reject the H_0 and H_1 was accepted, there was a relationship between Lead time management and the timely completion of projects by the Local Road Contractors in Lusaka but not statistically significant.

4.9.6 Regression Analysis Results

The study conducted a multiple regression analysis to determine the relationship between independent variables and the dependent variable. The reasons for using multiple regression analysis is because it helps to determine the correlation between two or more variables.

4.9.7 Coefficient of Determination

The coefficient of determination clarifies the extent to which changes in the dependent variable can be explained by the change in the independent variables. The two independent variables studied were construction delivery and lead time.

Table 4-27 Model Summary, R square

Model	R	R Square	Adjusted	R Std. Error of the
			Square	Estimate
1	0.784 ^a	0.585	0.575	0.542

Source: Author field data, 2020

The R square was 0.585, and the adjusted R square was 0.575. Since the Adjusted R square was 0.575 this indicates that there was evidence that the data used in analyzing the relationship between the independent variables and dependent were closely related as it above 5% level of significant.

Table 4-28 ANOVA^a

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	14.243	3	3.561	5.354	.000 ^b
1 Residual	9.532	6	0.268		
Total	23.775	9			

Source: Author field data, 2020

Analysis of Variance (ANOVA) was used to establish whether there was relationship between the independent variables and dependent variable. Therefore (p-value) 0.0001 in the study which was less than 0.05 in the model is statistically significant in predicting how the independent variables construction delivery and lead time and dependent variables are related. The F test critical was at 5% level of significance. Therefore, the F test calculated from the ANOVA in the table above was 5.354, which is greater than the F critical (0.268). This shows that the overall model was significant.

Table 4-29 Regression Analysis of the determinants of construction delivery by local road contractors - Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	0.149	0.743		0.219	0.814
Construction delivery	0.462	0.21	0.453	0.251	0.154
Lead time	0.265	0.168	0.169	1.327	0.182
Timely completion of projects	0.057	0.25	0.033	0.283	0.756
Quality of works.	0.634	0.118	0.695	5.949	0.001

Source: Author field data, 2020

The regression model is as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \alpha$$

Where:

Y is the dependent variable (cost of works),

β_0 is the regression coefficient/constant/Y-intercept,

$\beta_1, \beta_2, \beta_3, \beta_4$ are the slopes of the regression equation,

X_1 is the Lead time

X_2 is the Timely completion of projects

X_3 is the quality of work done

X_4 is the construction delivery

α is an error term at 95% confidence level. The regression was:

$$Y = 0.149 + 0.265X_1 + 0.462X_2 + 0.057X_3 + 0.634X_4$$

The above equation established that taking all factors into account (construction delivery, lead time, timely completion of projects and quality of work done) was constant at zero, construction delivery would be 0.149. The findings further indicate that taking all other independent variables constant, a unit increase in lead time to a 0.462, results in increase construction delivery.

The overall regression model was significant thus the p-value was 0.148 which was more than 0.05. It was also indicated in the study that a unit increase in quality of work done by Local Road Contractors 0.634 has an effect increase in construction delivery. The p-value was 0.001 and thus the relationship was significant. The result from the study indicates that quality of work done by Local Road Contractors, contributed to the construction delivery. The study conducted a multiple regression analysis so as to determine the influence of the independent variables on construction delivery. The reasons for using multiple regression analysis is that it helps to determine the correlation between two or more variables.

The two factors that showed significant effect on construction delivery are timely completion of projects with $p=0.168$ timely completion of projects with the p-value of 0.25 ($p < 0.05$). Furthermore, the Pearson Correlation Coefficient computed and tested at 1% significance level indicated that there is a strong positive relationship ($r=0.716$) between quality of work done Local Road Contractors and construction delivery. The relationship was statistically significant at 1% level ($p=0.000, <0.01$).

CHAPTER FIVE

DISCUSSION

5.1 Overview

This chapter presents the discussion on the “effect of construction Delivery and Lead Time on the Performance of Local Road Contractors”.

5.2 Discussion of findings

This study aimed to establish whether construction delivery and lead time have an effect on the performance of Local Road Contractors in Lusaka district.

The results from the construction industry showed that the industry is masculine inclined as the majority of the research respondents were male, but the research did have a fair representation of both male and female gender.

The research analysis had 90% constitute of respondents from experienced staff, which is an indication that the data obtained from these workers can be relied on.

Results on whether organization recognizes importance of project management on local road contracts, from the results of the research majority of the respondents agreed, while others the strongly agree and few of the respondents indicated uncertain.

Results on whether organization documented and consistently used project management practices or standard, from the results of the research majority of the respondents the majority agreed as that is what has been helping to run projects effectively.

Results on whether lead time management practices on projects reduces time taken to complete projects, from the results of the research majority of the respondents agreed and confirmed further this also helps in meeting project goals and objectives which is one of the benefits of construction delivery to any given project.

Their views on whether the contractor’s use multi lead time management practices, from the results of the research majority of the respondents agreed and further results indicated this to be a common opinion.

Good construction delivery practices on project reduce the organization cost of projects from the results of the research majority of the respondents agreed and indicated further that construction delivery affects the costs of work done by the organization.

Results on whether lead time management affect the costs of work done by organization, from the results of the research majority of the respondents (37.0 agreed, while 26.0% of the respondents disagreed, 20.0% of the respondents indicated uncertain, and 17.0% indicated strongly disagree.

Results on whether good lead time management practices on project influences quality of projects, from the results of the research majority of the respondents 42.0% agreed, while 27.0% of the respondents strongly agree, 18.0% of the respondents indicated strongly disagree, 7.0% indicated uncertain and 6.0% of the respondents indicated disagreed.

Results on whether construction delivery affects the time taken to complete projects, from the results of the research majority of the respondents 72.0% disagreed, while 17.0% of the respondents agree and 11.0% of the respondents indicated uncertain.

Results on whether good construction delivery practices affect quality of projects, from the results of the research majority of the respondents 73.0% agreed, 17.0% of the respondents strongly agree, 2.0% of the respondents indicated uncertain and 8.0% of the respondents indicated disagree.

Results on whether project management affects the quality and time taken to complete projects, from the results of the research majority of the respondents 56.0% agreed, 33.0% of the respondents disagreed and 11.0% of the respondents indicated uncertain.

Results on whether lead time management practices on projects reduces time taken to complete projects, from the results of the research majority of the respondents 61.0% agreed, while 26.0% of the respondents strongly agreed and 13.0% of the respondents indicated uncertain. The research also looked at whether the Government is able to help Local Road Contractors to perform better on projects, from the results of the research majority of the respondents 80% strongly agreed that government plays a major role. Government can further help in ensuring fair bidding of contractors so as not to disadvantage local constructors.

The Government agencies gave views by strongly agreeing that construction delivery affects the time taken to complete projects. Good construction delivery practices on projects reduce the time taken to complete projects. They ascertained that Lead time management affects the time taken to complete projects and that it reduced the time taken.

Further results on ineffective or sloppy construction delivery practices increasing the time taken to complete projects this they strongly agreed.

The study found that most Local Road Contractors lack working capital and as such they fail to bid for large road contracts. This results to most tenders being given to foreign contractors. This includes financial, human resource and fixed assets to carryout works as a result the inability to secure bank guarantees. They also lack the adequate approach, sufficient knowledge and experience required to prepare responsive bids.

The most common problems facing Local Road Contractors is the lack of necessary skills and technical experience to carry out certain projects which require technical experience and specific skills to be successfully completed. Majority of Local Road Contractors don't have the required financial capacity, where they can initiate the start of works before receiving funding. Other issues include being unable to secure Bank Guarantees, inadequate approach, insufficient knowledge and experience required for the preparation of responsive bids and failure to meet the turnover requirement.

Effects of delays can be as a result of factors which are not identified and resolved. Numerous factors can result in cost and time management in various types of projects, and client satisfaction will decrease if the cost of a project or schedule exceeds the planned budget (Kaliba et al., 2009).

On significant relationship between construction delivery and the quality of work done by Local Road Contractors, the result indicates a negative relationship ($r=-0.148$) exist between construction delivery and quality of work. However, at 5% level of significant, the H_0 was weak indicating a negative ($r=0.148$) this shows there was slightly significant but not significant: "Therefore there was a weak relationship between construction delivery and quality of work done by Local Road Contractors" but not statically significant because, $p=0.378$.

Based upon significant relationship between lead time management practices and the quality of work done by the Local Road Contractors, the results as tabulated in table indicates that

there is a positive relationship ($r=0.420$) between lead time management practices and the quality of work done at 1% level of significant. This indicates that there is a relationship between lead time and the quality of work done by the Local Road Contractors were the p-value was ($p=0.008$; < 0.01). Therefore, there is a significant relationship between lead time management practices and the quality of work.

On significant relationship between construction delivery and the timely completion of projects by the Local Road Contractors in Lusaka. The results indicated that there was a negative relationship ($r=-0.098$) between construction delivery and the timely completion of projects by the Local Road Contractors in Lusaka. However, the relationship was not statistically significant at 5% level of significant ($p=0.547$, >0.01).

Therefore, the researcher failed to reject the H_0 and H_1 was accepted, there is a relationship between construction delivery and the timely completion of projects by the Local Road Contractors in Lusaka.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This chapter presents the conclusion and recommendations on the effect of construction delivery and lead time on the performance of local Road Contractors.

6.2 Main findings

The research summed proposed ways Government is able to help Local Road Contractors which are:

- (i) Government should encourage foreign contractors to partner with Local Road Contractors on most road construction projects so that they can enhance their skills from the partnerships;
- (ii) All Local Road Contractors must be members of the Engineering Council of Zambia and National Construction of Zambia where they share ideas and skills on various road construction project;
- (iii) The introduced 20% threshold on Government road funded projects to be given to local road contractors;
- (iv) Award more tenders to Local Road Contractors;
- (v) Training of Local Road Contractors and
- (vi) Offer credit finance to local contractors so that they can procure equipment required to carry out road construction projects.

The research results further identified the following as reasons to why local road contractors are having challenges in the construction industry:

- (i) Local Road Contractors lack professionalism in their operations as such they cannot handle complex jobs with regards to road construction and that's why most tenders are given to Foreign Contractors;
- (ii) Local Road Contractors lack the financial capacity, human resource and equipment to carryout road construction and as such often abandon works before they even start;

- (iii) Lack of sufficient support from Government and high interest on borrow funds slapped by lending institutions such as banks make it difficult for local contractors to carry out projects that need huge capital injection;
- (iv) The lack of necessary skills and technical experience by Local Road Contractors to carry out certain road projects which require technical experience and specific skills to be successfully completed;
- (v) Majority of Local Road Contractors do have the financial capacity to sustain a road construction project where they have to start works before receiving funding for that particular projects. This also includes the machinery and human resource;
- (vi) The inability to secure declaration such as bank guarantees;
- (vii) Inadequate approach, insufficient knowledge and experience required for the preparation of responsive bids; and
- (viii) Failure to meet the turnover requirement.

The following are the suggestions from the research on how the Government can play role in the industry to assist Local Road Contractors:

- (i) Encourage mentorship programmes in order to facilitate skills transfer to Local Road Contractors by foreign contractors;
- (ii) The government should amend the National Council for Construction Act No. 13 of 2003 so that the National Council for Construction can also regulate and punish all the erring contractors that undertake works in the private sector;
- (iii) The Government should urge the National Council for Construction to enhance its research in relation to the construction sector. The Government should ensure that the Citizens' Economic Empowerment Act No. 9 of 2006 and the Zambia Public Procurement Act No. 12 of 2008 are harmonized so as to facilitate consistency in the definitions of 'citizen' companies provided in the Acts;
- (iv) The Government has the responsibility to ensure that cooperatives schemes among contractors are encouraged so that it is easier for them to access equipment and other requirements. It is also the Government's role to facilitate a construction bank that will enable contractors to access loans at reduced interest rates;
- (v) Government should support Local Road Contractors by awarding them with contracts;

- (vi) Make the business environment conducive for local contractors;
- (vii) Consider high quality standard, excellent performance, time and financial management as prestigious strategies for competing effectively other than depending on lower pricing tendering system; and
- (viii) Local Road Contractors should prioritize works for contracts awarded to them before considering personal needs in order to be self-sustaining in the road sector industry.

6.2 Recommendations

The recommendations listed below are based on the findings. These are addressed to the University, Local Road Contractors, Government and the need to do further studies on any gaps which were left out during the study.

- (i) The study recommends that Local Road Contractors should strive to ensure effective management of time, cost and quality in road construction industry.
- (ii) Local Road Contractors in Zambia operate currently cannot compete with foreign contractors who have the technical skills, financial, industry experience and machinery. Therefore, government should help to make the business environment conducive for Local Contractors in order for them to compete favourable with Foreign Contractors.
- (iii) Government should make the business environment conducive for local contractors in order for them to compete favourably with foreign contractors.
- (iv) Government to amend the National Council for Construction Act No. 13 of 2003 to include regulation of contractors and making erring contractors accountable for their sub-standard work and those that abandon works before completion.
- (v) Contractors classified as incompetent should be identified for training to promote the concept of empowerment of local contractors. This can ensure the maintenance of a high standard of roads and help with competition amongst the Local Road Contractors.
- (vi) Government through its partners and stakeholders should provide financial schemes for the Local Road Contractors to access loans, equipment and raw materials and the necessary technical support for them to compete favourable with foreign contractors.

- (vii) Local Road Contractors should prioritize works on the contracts awarded, before considering personal needs in order to be sustainable in business.
- (viii) Local Road Contractors must ensure extra effort should be made to plan all work operation activities regarding the project.
- (ix) All modalities relating to project delivery should be put in place by government and concerned professional bodies to guide against fraud and the relevant authority like NCC (National Council of Construction) should ensure that standards for construction of roads are maintained.
- (x) All Clients, be it government, should evaluate the quality performance of contractors before awarding a contract.
- (xi) NCC in designing quality management of projects should focus on; commitment to quality service, specifications of works, coordinating and checking of work schedules, conducting reviews and inspections.
- (xii) Government should help to make loans more accessible. This can be through putting up flexible conditions and lower interest rates. Contractors that default in terms of payment due, should be made to pay additional money that accrues above the initial interest value of the loan where contractors have obtained loans to finance the project.

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APPENDICES

Appendix 4- Categorization of Contractors in Zambia

CATEGORISATION OF CONTRACTORS		
CODE	Type of Category	CONSTRUCTION ACTIVITY
B		General Building and Housing
		Construction of residential, commercial and Industrial buildings – single and multi storey, together with various associated installations and external works
C		General Civil Engineering Works
		Bridges and other related ancillary works, Precast & Pre-stressed Concrete works, Piling & Foundation Engineering, Structural Steel Engineering Works, Piping, Fabrication and sheet metal, Fencing, Steel fixing, Construction of Harbors, Ports and other related works, Public Health, Engineering Works (Incl. Water, Drainage & Sewerage infrastructure), Dams and Earthworks, Irrigation systems and associated water works, Bore-hole Drilling and other related works including, Railway Construction and Maintenance
R		General Roads and Earthworks
		Bituminous Surfacing & Paving Applications, Drainage Structures, Off-carriageway Rehabilitation & Maintenance, On-carriageway Rehabilitation & Maintenance, and Road Furniture, signage & markings, Quarrying,
M	Specify Sub-Category	Mining Services - Construction Works within the Mining Areas. <i>Choose ONE Sub-Category from the list below and clearly circle it in ink:</i>
	B	Mining – Building and Housing
	C	Mining – Civil Engineering Works (Including Scaffolding)
	R	Mining – Roads and Earthworks Works
	E	Mining – Electrical, Instrumentation & Telecommunication (Including Installation of CCTV, Access Control, and Fire Detection systems)
	ME	Mining – Mechanical Engineering Works
	M	Mining – Quarrying (Including blasting, crushing and drilling)
E		General Electrical and Telecommunications
		Power Generation, Heavy current transmission & distribution power lines Street and Area Lighting, Solar and Wind Energy Installations, ICT and Communication Infrastructure, Installation of CCTV, Access Control, and Fire Detection systems, Civil works to power stations, sub-stations, communication systems, Telecommunication network installations (including towers, etc.)
ME		Mechanical Engineering Works
		Mechanical Works including Piping and associated works, Steel Fabrication and Sheet Metal Works, Rigging, Air-conditioning and Mechanical ventilation, Refrigeration and Cold rooms, Boiler Installations and Steam Distribution, Central Heating, Centralized Hot Water generation, Compressed Air, Gas and Vacuum Installations, Conveyors and Material Handling installations, Acid Plants including Acid Proofing and Rubber lining, lift elevator installation, Fire Fighting Installations, Installation of Cyclones, Other installations and maintenance works of mechanical nature Construction and installation of continuous process systems, involving chemical works metallurgical works, Oil and Gas wells, Acid Plants, Metallurgical Machinery, equipment and apparatus, and works necessary for the beneficiation of metals, minerals, rocks petroleum and organic substances and other chemical processes.
S	Category Type	Specialist Works (<i>Specialist Contractors will not be allowed to register in any other categories</i>)
	Sa	Bricklaying Works
	Sb	Plumbing Works Painting Works
	Sc	Painting Works
	Sd	Borehole Drilling Works
	Se	Electrical Works
	Sf	Quarrying and Crushing Works
	Sg	Air Conditioning, Mechanical and Refrigeration Installations
	Sh	Flooring (tiling and /or Terrazzo) works

Source: (National Council for Construction, 2019)

Appendix 5 - Grade Categories of Contractors

MINIMUM TURNOVER REQUIRED

Minimum Annual Turnover in any one year during the past 5 years (Certified and/or Invoiced) should be 50% of the minimum limit on contract value of the grade and category applied for.

	GRADES							
CATEGORY	1	2	3	4	5	6	A	B
Category B	K27.5m	K12.5m	K6.5m	K4.5m	K0.00	K0.00	-	-
Category C	K30m	K15.0m	K10.0m	K6.5m	K0.00	K0.00	-	-
Category R	K75m	K30.0m	K15.0m	K10.0m	K0.00	K0.00	-	-
Category M	K75m	K17.5m	K15.0m	K6.5m	K0.00	K0.00	-	-
Category E	K75m	K20.0m	K15.0m	K6.5m	K0.00	K0.00	-	-
Category ME	K75m	K20.0m	K15.0m	K6.5m	K0.00	K0.00	-	-
Category S	-	-	-	-	-	-	K3.375m	K0.00

Source: (National Council for Construction, 2019)

Appendix 6 - Zambia 5 Year Annual Budget Summary

ZAMBIA ANNUAL BUDGET - SUMMARY							
	2016	2017	2018	2019	2020	5-Year Total	5-Year Av.
GRAND TOTAL (K'Million)	53 140,00	64 510,30	71 600,00	86 800,00	106 000,00	382 050,30	76 410,06
Economic Affairs (K'Million)	13 247,24	20 132,62	17 258,33	20 651,09	21 833,35	93 122,63	18 624,53
Economic Affairs (Share of Budget)	25%	31%	24%	24%	21%	24%	25%
Road Infrastructure (K'Million)	6 629,94	8 644,50	8 660,31	6 501,67	10 552,61	40 989,03	8 197,81
Road Infrastructure (Share of Budget)	12%	13%	12%	7%	10%	11%	11%
* % rounded to nearest whole number							

Source: Author

THE EFFECT OF CONSTRUCTION DELIVERY AND LEAD TIME ON THE PERFORMANCE OF LOCAL ROAD CONTRACTORS IN LUSAKA DISTRICT, ZAMBIA.

Dear Respondent,

I am conducting a research entitled “Assessing the Effect of construction Delivery and Lead Time on the Performance of Local Road Contractors in Lusaka District, Zambia.” This questionnaire is the instrument of data collection for the required information.

To conduct this research, it is necessary to acquire data, analyse it and draw conclusions. Therefore, you have been selected to take part in a survey in order to provide valuable information that will be used. Your participation will contribute to the findings which will subsequently contribute to Local Road Contractor performance in Zambia.

Please note that your response will remain anonymous. Your participation in this survey is highly valued and you are free to withdraw at any time. The personal and organizational information gathered in this questionnaire will be used for scholastic purposes only. Your personal information will only be used for communication purposes to provide you with the summary of results on request.

Instruction: Please fill in the blank spaces provided, or tick where necessary.

The questionnaire will not take more than 40 minutes to complete.

Local Road Contractors- Questionnaire

The purpose of the research was to establish whether Construction delivery and lead time have an effect on the performance of Local Road Contractors in Lusaka.

Kindly be assured that the information you will provide will be treated with the strictest confidence and will be solely for academic purposes and will be kept confidential.

SECTION A: BACKGROUND INFORMATION

1.	Indicate your experience working in your organization	Less than 1 year	1-5 years	6-10 years	11-20 years	More than 20 years
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Director	Management	Operations or Logistics	Technical	Administration
2.	Indicate your level or function in your organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		College Diploma	Graduate	Postgraduate	PhD	
3.	Indicate your highest academic qualification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.	Indicate your age					
		Male	Female			
5.	Indicate your Sex	<input type="checkbox"/>	<input type="checkbox"/>			
		Less than K5,000,000	K5,000,000 to K10,000,000	K10,000,001 to K20,000,000	More than K20,000,000	
6.	Indicate the value of contracts per year	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Up to 10	11- 50	51-100	More than 100	
7.	Number of employees in the company? (permanent)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8.	Average Number of temporal employees employed per project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	Average number of road contracts per year?					

Please indicate your preferred answer with an X in the appropriate box. Your answers should be based on your knowledge of project management, project delivery and lead time management practices in your organization. The project management, project delivery and lead time management practices are measured on a 5-point Likert scale. Your extent of agreement or disagreement with the statements below are based on 1= Strongly Disagree, 2= Disagree, 3 = Uncertain, 4= Agree and 5 = Strongly Agree.

	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
10. My firm has qualified and experienced Project Managers managing projects					
11. My organisation recognises the importance of project management on road contracts.					
12. My organisation has documented and consistently used project management practices or standard					
13. My organisation has a shared culture of “construction delivery”.					
14. There have been projects that my firm abandoned before completion in the past three years					

	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
15. My firm abandoned projects before completion in the past three years due to occurrence and impact of late and over-budget milestones.					
16. My firm abandoned projects before completion in the past three years due to exceeding deadline					
17. My firm abandoned projects before completion in the past three years due to poor quality on our side.					
18. My firm abandoned projects before completion in the past three years as the Project did not recover a measurable return on investment for the company & the client					
19. My firm abandoned projects before completion in the past three years due to Lack of top management support					
20. My firm abandoned projects before completion in the past three years due to not having metrics to measure project outcomes					
21. My firm abandoned projects before completion in the past three years due to Unclear project tasks and objectives					
22. My firm abandoned projects before completion in the past three years due to Lack of communication between management and the project manager					
23. My firm abandoned projects before completion in the past three years due to Lack of coordination between client and project team					

	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
24. Correct Estimation is one of the benefits of construction delivery to any given project.					
25. Efficiency & Effectiveness is one of the benefits of construction delivery to any given project.					
26. Productivity & Profitability is one of the benefits of construction delivery to any given project.					
27. Meeting project goals & objectives is one of the benefits of construction delivery to any given project.					
28. Managing financial, material and labour resources is one of the benefits of construction delivery to any given project.					
29. Completing projects on time is one of the benefits of construction delivery to any given project.					
30. My firm ensures it performs on all road projects it is contracted to perform					
31. My project managers and key staff are appraised based on construction delivery					
32. My firm has detailed project plan for contracts					
33. The project plans are communicated to all staff and people involved in company projects					
34. My firm's procurement buy materials in line with the project schedule					

	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
35. We experience material delays because of my organisation's processes					
36. The company has multiple contracts as the main contractor					
37. The company has multiple contracts as the sub-contractor					
38. The company tries as much as possible to reduce project delivery time on the project it works on					
39. There is always a smooth workflow in the project the organization works on					
40. There are proper controls in projects to avoid delays					
41. Some processes are expedited to avoid delays.					
42. The company uses multi lead time management practices					
43. Project delivery affects the costs of work done by your company					
44. Good construction delivery practices on project reduce the organization cost of projects					
45. Ineffective or sloppy project delivery practices on project increase the organization cost of projects					

	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
46. Project management affect the costs of work done by your company.					
47. Good lead time management practices on project reduce the organization cost of projects					
48. Ineffective or sloppy lead time management practices on project increase the organization cost of projects					
49. Cconstruction delivery affects the time taken to complete projects by my company					
50. Good construction delivery practices reduce the time taken to complete projects by my organization					
51. Ineffective or sloppy projects delivery practices increases the time taken to complete projects by my organization					
52. Project lead management affects the time taken to complete projects by my company.					
53. Good lead time management practices on projects reduces time taken to complete projects by my organization					
54. Ineffective or sloppy lead time management practices on projects increases the time taken to complete projects by my organization					
55. There are several projects which have been either abandoned or cancelled by the client for failure to meet the requirement or laid down procedures by local contractor(s)					

	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
56. The Government is able to help Local Road Contractors to perform better on projects					
57. What ways					
58. There is professionalism of the service provided by Local Road Contractors in implementing road projects					
59. There are many reasons why many Local Road Contractors abandon the projects before completion					
60. Give some examples here:					
61. Give some suggestion on solutions that can help address the issues of Local Road Contractors in Zambia					
62. Give some factors that would increase the performance of Local Road Contractors					

Dear Respondent,

I am conducting a research entitled **“Assessing the Effect of construction Delivery and Lead Time on the Performance of Local road Contractors in Lusaka District, Zambia.”** This questionnaire is the instrument of data collection for the required information.

To conduct this research, it is necessary to acquire data, analyse it and draw conclusions. Therefore, you have been selected to take part in a survey in order to provide valuable information that will be used. Your participation will contribute to the findings which will subsequently contribute to local road contractor performance in Zambia.

Please note that your response will remain anonymous. Your participation in this survey is highly valued and you are free to withdraw at any time. The personal and organizational information gathered in this questionnaire will be used for scholastic purposes only. Your personal information will only be used for communication purposes to provide you with the summary of results on request.

Instruction: Please fill in the blank spaces provided, or tick where necessary.

The questionnaire will not take more than 40 minutes to complete.

SECTION A: BACKGROUND INFORMATION

		Male	Female				
1.	Indicate your Sex	<input type="checkbox"/>	<input type="checkbox"/>				
2.	Name of Organisation					
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.	Level or function in organisation	Director	Management	Technical	Operations	Logistics	Administration
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4.	How long have you been working with the company? (in Years)					

Please indicate your preferred answer with an X in the appropriate box. Your answers should be based on your knowledge of project management, project delivery and lead time management practices in Local Road Contractors. The project management, project delivery and lead time management practices are measured on a 5-point Likert scale. Your extent of agreement or disagreement with the statements below are based on 1= Strongly Disagree, 2= Disagree, 3 = Uncertain, 4= Agree and 5 = Strongly Agree.

	Strongly disagree	Disagree	Uncertain	Agree	Strongly
5. There are enough qualified and competent Local Road Contractors.					

	Strongly disagree	Disagree	Uncertain	Agree	Strongly
Comments:.....					
6. There are a lot of road projects which the Local Road Contractors are not able to work on.					
Comments:.....					
7. The competence and experience of Foreign Contractors disadvantages the Local Contractors.					
Comments:.....					
8. The Local Road Contractors cost the works they bid for accurately.					
Comments:.....					
9. Local Road Contractors are efficient and effective in their project execution.					

	Strongly disagree	Disagree	Uncertain	Agree	Strongly
Comments:.....					
10. Local Road Contractors are capable of meeting project goals and objects.					
Comments:.....					
11. Local Road Contractors manage their resources (financial, material & human resources) effectively.					
Comments:.....					
12. Local Road Contractors finish projects on time if all resources and processes are available and cleared.					
Comments:.....					
13. Project delivery affects the costs of work done by Local Road Contractors.					
Comments:.....					
14. Good construction delivery practices on project reduce the cost of projects done by Local Road Contractors.					

	Strongly disagree	Disagree	Uncertain	Agree	Strongly
Comments:.....					
15. Ineffective or sloppy project delivery practices on project increase the cost of projects done by Local Road Contractors.					
Comments:.....					
16. Project lead management affects the costs of work done by Local Road Contractors.					
Comments:.....					
17. Good lead time management practices on project reduce the cost of projects done by Local Road Contractors.					
Comments:.....					
18. Ineffective or sloppy lead time management practices on project increase the cost of projects done by Local Road Contractors.					

	Strongly disagree	Disagree	Uncertain	Agree	Strongly
Comments:.....					
.....					
19. Construction delivery affect the time taken to complete projects by Local Road Contractors.					
Comments:.....					
.....					
20. Good construction delivery practices on projects reduce the time taken to complete projects by Local Road Contractors.					
Comments:.....					
.....					
21. Ineffective or sloppy project delivery practices increase the time taken to complete projects by Local Road Contractors.					
Comments:.....					
.....					
22. Project lead time management affects the time taken by Local Road Contractors to complete projects.					
Comments:.....					
.....					

	Strongly disagree	Disagree	Uncertain	Agree	Strongly
23. Good project lead time management practices reduce the time taken by Local Road Contractors to complete projects.					
Comments:.....					
24. Ineffective or sloppy project lead time management practices increase the time taken by local road contractors to complete projects.					
Comments:.....					
25. What do you think are the major problems facing Local Road Contractors?					
26. What solutions can you propose to help address the issues of Local Road Contractors in Zambia?					
27. What role can institutions like yours play in addressing the issues of Local Road Contractors in Zambia?					

	Strongly disagree	Disagree	Uncertain	Agree	Strongly
.....					
28. What other factors would increase the performance of Local Road Contractors 					

Thank you for your cooperation.