



ST. MARY'S UNIVERSITY COLLEGE
SCHOOL OF GRADUATE STUDIES

**FACTORS AFFECTING PERFORMANCE OF ROAD PROJECT IN DCE:
THE CASE OF DICHOTO -GALAFI JUNCTION -BELEHO ROAD
PROJECT**

BY

BIRUK ASSEFA

JUNE-2019

ADDIS ABABA, ETHIOPIA

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BIRUK ASSEFA (SGS/0394/2010A)

**A THESIS SUBMITTED TO ST.MARY'S UNIVERSITY COLLEGE, SCHOOL OF
GRADUATE STUDIES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE OF MBA IN PROJECT MANAGEMENT**

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SCHOOL OF GRADUATE STUDIES

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List of Abbreviations

DCE	Defense Construction Enterprise
KPIs	Key Performance Indicators
GDP	Growth Domestic Product
IBM	International Business Management
SPSS	Statistical Package For Social Science

ABSTRACT

Infrastructure projects, such as road constructions, are one of the most important projects in Ethiopia. Growth in this sector is critical for growth in national income as it is among the largest sectors that generates employment within the country as well as a key driver for economic development of Ethiopia. Ethiopian Roads Authority has administered many projects at the federal level involving local contractors on the projects. However, projects executed by contractors are facing critical problems with respect to different factors. There are several factors that are contributing to the performance problems of local contractors. Accordingly, this research attempts to identify the major causes or factors affecting the performance of DCE road project, which can serve as the way forward for future work in coping with this performance problem. A thorough literature review and desk study was done, through which a number of performance factors were identified in different construction industry scenarios. To obtain expert opinions from the sector, in total twenty six (26) factors with 04 main groups were identified and made part of the survey questionnaire and the survey was conducted with DCE head office and project staffs. The findings were that all the four factors; skilled manpower, organization structure, client support and timely available of construction resource have influence on performance of road construction in DCE. The conclusion is that skilled manpower, organization structure, client support and timely available of construction resource all had a positive influence on performance of the road construction in DCE. The recommendations is that training and skill up-gradation within construction firms and establishment of more middle level technical colleges in order to improve availability of skilled manpower. Construction firms also need to have a flexible dynamic organizational structure as existence of strong organizational structure was found to be the core from which the successful implementation of road construction projects was founded, client support in form of prompt payments and approvals, involvement of stakeholders, early land acquisition and project coordination are necessary to ensure enhanced performance of road in DCE to ensure timely, cost effective and quality completion of road project

Key words: ERA, DCE,

CHAPTER ONE

1. INTRODUCTION

1.1 Background of the study

Construction industry has complexity in its nature because it contains a large number of parties such as clients, contractors, consultants, stakeholders, shareholders, regulators and others. Construction industry makes significant contributions to the socio-economic development process of a country. Its importance emanates largely from the direct and indirect impact it has on all economic activities. It contributes to the national output and stimulates the growth of other sectors through a complex system of linkages. It is noted that about one-tenth of the global economy is dedicated to constructing and operating homes and offices (UNEP, 1996). UNEP further observes that the industry consumes one sixth to one half of the world's wood, minerals, water and energy. It contributes to employment and creates income for the population and has multiplier effects on the economy.

The construction industry has important contributions to the Ethiopian economy, as demonstrated by its share in the GDP. The sector has registered relatively higher growth as compared to the growth of GDP during this period. Over this period, there has been increased investment on the development and expansion of various infrastructure projects like roads, airports and residential and non-residential housing units (ERA, 2014).

Every government has a vision to improve the living standards and conditions of its citizen and, generally, this is achieved through development programs. It is an accepted assumption that a development program can be broken down into well-organized development projects and that if project activities are planned and implemented effectively the overall intended objectives and purpose of program will be achieved Nyika (2012).

The purpose of this study was to identify factors influencing performance of road project: case of Dichoto Galafi Junction-Elidhar-Belho Rigid pavement design and built road project. The

objectives of the study were to establish the influence of to assess the influence of skilled manpower on performance of road projects, to examine how organization structure influence performance of road projects, to establish the influence of client support on performance road project and to examine how timely available of construction material resource influence on the performance of road project.

1.2 Background of the Company

Defense Construction Enterprise was established in 2010 by Ethiopian ministry of council regulation NO 185/2010 as public enterprise and National Defense as supervising authority of the enterprise.

The purpose for which the enterprise is established is to engage in any construction activity mainly to satisfy the national defense construction and infrastructural development needs. Besides, to engage in the construction of roads, dams, irrigation infrastructure, Buildings and other construction related works in the country.

Henceforth it establishment, the enterprise had completed 20 roads, dam, irrigation, building and real estate projects which worth around birr 4.2 billion in the last five years. Currently, there are 33 construction projects under construction which worth around 8.1 billion. 11 of them are road projects. The enterprise annual income turnover is around 1.4 billion on average for the last seven years.

1.3 Background of the Projects

Ditchoto Galafi Junction - Elidar – Belho Rigid Concrete Road Project is located in the Afar National Regional State (ANRS), the North-Eastern part of Ethiopian. The Route starts at a junction point along Ditchoto - Galafi Road. The first and second control points are located in coordinate system at GPS reading 807942 mE, 1302478 mN (Ditchoto-Galafi Road junction) and 806623.464 mE, 1321709.428 mN (Dobi-Elidar Junction) respectively. This route is selected mainly to bypass the unstable section of the old route between Dobi village and Dichoto Elidar junction and terminates at Belho village at GPS reading 194325 mE, 1334588 mN (Zone 38P) in the Republic of Djibouti after traversing about a distance of 85.00 km. The total budget for the

project is 2,316,229,584.13 ETB and a contract time of 1170 cal. Days. To date accomplishment (as of January 2019) of the project is 1,532,039,920.88 ETB which is 66% of the contract amount, even if the time elapsed is 1100 days or 94.01%.

1.4 Statement of the problem

The responsibility of achieving success in the implementation of a construction project largely depends on the contractor's performance. However it has become a global trend that contractors are not performing to expectations of the clients that they serve and indeed many road contractors have failed in performance. Delays in project completion and poor performance in the construction industry has been experienced and has led to failure in achieving effective time and cost performance (Aftab, 2012). The performance of the participants involved and the product output is dependent on the promptness and regularity of payment (Ramachandra, 2013). Tawil (2013) observed that in Malaysia delay is a common occurrence particularly where the government projects are concerned. Three of the most critical 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). Ramachandra (2013) suggests that failure to pay in the construction industry may be put in three categories; delay in paying one or more certificates, reduction in value of certificates or invoices, and not paying at all. In Kenya, Nyika(2012) noted in a study that only 20.8 per cent of the projects were implemented on time and budget, while 79.2 per cent exhibited some form of failure. The major causes of failures were insufficient implementing capacity, poor project management, weak project design and political interference. Therefore, factors influencing performance of contractors are very critical to any construction firm. The above studies carried out on the factors influencing the performance of road construction projects; however none has carried out a specific study focusing on factors influencing performance of road project: case of Dichoto Galafi Junction-Elidhar -Belho Rigid pavement design and built road project.

Ethiopia as a country has witnessed a substantial increase in the number of stalled projects due to in appropriate project organization structures and ineffective leadership. There is evidence that the performance of the road construction project in DCE is poor in terms of the three triangles time, cost and quality performance and other related factors. According to the strategic plan of

the enterprise (2016), there is an average of 9.5% and 40% cost and time overrun respectively in the 9 of the completed road projects. There was also significant amount of reworks due to poor quality of constructions once the provisional acceptance had been undertaken. This is manifested by high maintenance costs, dissatisfied clients and even projects which are not functional.

The contract duration of the project was an 1170 calendar day including 120 Calendar days of mobilization. To date accomplishment (as of January 2019) of the project is 1,532,039,920.88 ETB which is 66% of the contract amount, even if the time elapsed is 1100 days or 94.01%.

Thus, this study aims to bridge this knowledgeable gap by evaluating factors influencing performance of road project: case of Dichoto GalafiJunction-Elidhar-Belho Rigid pavement design and built road project.

1.5 Research hypothesis and questions

1.5.1 Research questions

- ✓ To what extent of availability of **skilled manpower, organization structure, client support and timely availability of construction resources** influence on performance of road project in Dichoto GalafiJunction-Elidhar-Belho Rigid pavement design and built road project?

1.6 Objective of the Study

1.6.1 General objective

The purpose of the study was to explore factors affecting performance of road project: the case of Dichoto GalafiJunction-Elidhar-Belho rigid pavement design and built road project.

1.6.2 Specific Objectives

- ✓ To examine **availability of skilled manpower, organization structure, client support and timely availability of construction resources** influence on performance of road project in Dichoto GalafiJunction-Elidhar-Belho Rigid pavement design and built road project?

1.7 Significance of the study

The output of this study could contribute to the understanding of the critical challenges contractors are facing that inhibit their performance on projects in the road sector in Ethiopia and other developing countries. The findings may be used by government to provide the necessary incentives and regulations to ensure sustainable growth, capacity building and policy framework to regulate the construction industry toward achieving the expected goals. The outcome of the study may be useful to the DCE in providing an in-depth perceptive of the factors that inhibit their performance and therefore ensure that they improve in the organization of their finances and employ competent skilled manpower in order to improve on their profitability and reputation. The study may be useful for construction supervision consultants who may comprehend how their services impact performance of contractors in the road sector.

1.8 Scope of the and Limitation of the study

This research has been limited to skilled manpower, organization structure, client support, and timely available of construction material. Hence, the target respondents was department team leader, Project follow up Engineers, project manager, consultant and, senior site and office engineers who work at Dichoto GalafiJunction-Elidhar-Belho Rigid pavement design and built road project. The project has a contract amount of 2,316,229,584.13 ETB. The project is located in the Afar National Regional State (ANRS), the North-Eastern part of Ethiopia. Afar is characterized by an arid and semi-arid climate with low and erratic rainfall. Rainfall is bi-modal throughout the region with a mean annual rainfall below 500 mm in the semi-arid western escarpments decreasing to 95 mm in the arid zones to the east. Afar is increasingly drought prone. The route corridor is generally classified as flat to rolling with some mountainous and escarpments section. Wide depression areas are also located between escarpments where seasonal swamps with thick salty alluvial deposits are stretching in parallel orientation to escarpments.

The study were limited by unavailability of time as it is not able to include respondents outside the project and nearby road project which could have provided relevant information about the road projects completed in different parts of the country by different contractor. This leads to the

methodological limitation of small sample size where only project staff including consultant. The study has been envisaged from both contractor's and consultant perspective towards factor affecting the performance of project thus clients and consultants views also considered in the study.

1.9 Organization to the Study

The research is organized into four chapters. Chapter one contains the introduction to the research, statement of problem, study objectives, research questions, significance of the study, scope of the study and limitations. In chapter two literature reviews is presented on the various aspects concerning performance of road projects: skilled manpower and performance of road project, organizational structure and performance of road project, client support performance of road project and timely available of construction resource performance of road project. In chapter three the following topics are illustrated; research design, study population, sample and sampling procedure, data collection and data collection procedures, validity and reliability of research instruments and data analysis techniques. In chapter four the following topics are captured; data collection, analysis, presentation and interpretations. In chapter five the following topics are outlined; the summary of findings, conclusion and recommendations of the study.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

2.1. Theoretical Framework

2.1.1. Literature Related to Performance

Performance is one of the words which definition is very flexible as everyone have used different concept that suite the best and letting the context take care of the definition.

Salaheldin (2009) has a define performance as the degree to which an operation fulfills primary measures (performance objectives) in order to meet the needs of customers. Swanson (1995) has described performance as a valued, productive output of a system in the form of goods and services or works with units of performance describing the actual fulfillment of the goods and services relating to perform production, quality and or time.

The performance definitions reviewed in this paper articulate the concept in achieving and accomplishing the planned targets. For instance, BNQP (2009) defines performance as “outputs and outcomes from processes, products and services that allow assessment and comparison relative to set goals, standards, past results, and other specifications””. For a long time, performance assessment has remained a problem for the construction industry. Various concepts and measures have been experimented to assess and measure performance of projects. Alarcon (1994) observed that most of these measures inhibit their assessment to preferred standards such as, time, cost or output. Contractors are required to evaluate performance and upgrade strategies to gain competitive advantage. To lift competitiveness, construction firms have to utilize performance evaluation mechanism to ensure sustainable performance.

2.1.2. Skilled Manpower and Project Performance

Individuals who are knowledgeable about specific construction skills gained from training or from practical experience in construction can be defined as skilled manpower (Medugu et al, 2011). Rafee (2012) noted that skilled manpower in the construction industry play a very critical function to the survival and growth of the sector as they are directly involved in construction

process. In Ethiopia there is an acute shortage of skilled manpower despite the many construction projects that the government is undertaking. Wang (2010) indicated in his report that labor shortage is a problem faced by many countries all over the world. In the construction industry framework, the purchasing power of the end user results quality work production. Hence, additional skilled workforce is needed. Medugu et al (2011) observed that where highly capable workforce is utilized, the effect of skilled manpower in the construction sector is very visible in its end products. This is because they are directly involved in early realization of construction projects completion since they handle the technical phase of such contract. Reduction in poor quality, low productivity, late project completion, cost and time overruns in projects is notable where trained skilled manpower is involved. Abiola (2004) believe that rework of defective or unsatisfactory work is mostly attributed to poor level of workmanship which normally results from involvement of unskilled manpower.

Skilled manpower also helps to raise efficiency, decrease of accidents, less management, increased organization stability. Trendle (2008) stated that there are several causes of labour shortages; increases in the demand for labour arising from continuing infrastructural expansion.

Hanim (2010) observed recruitment costs of foreign labour is high owing to payment for the tax, health check, security bond and medical costs leading to labour shortage in Malaysia. Sweis et al (2008) also indicated that shortage of manpower including skilled, semi-skilled and unskilled labour causes delays in construction projects. This is further endorsed by Sambasivan and Yau (2007) who carried out a research in Malaysia and established that labour supply is ranked number seven out of twenty eight causes of construction delay. It indicates that labour supply is the chief cause of delay in the construction industry in Malaysia.

The effect of availability of skilled manpower has been adequately reported in the literature with the ever rising pressure on construction contractors to execute projects of high quality, cost and on time (Medugu, 2011). The significance of more skilled manpower in the industry cannot be ignored as they have the possibility of reducing inefficiencies owing to poorly constructed projects. Bustani (2000) concluded that quality and availability of skilled labor force is considered a vital factor in the effectiveness of the construction sector. The problem of shortage of skilled manpower is a serious threat to the economic wellbeing of many nations around the world. Medugu et al (2011) mentioned that shortage of skilled manpower has effect on many

areas of construction activities and affect time, cost and quality of work. He noted that the shortage could adversely affect the realization of financial wealth for which such projects are planned. According to Dantong et al (2011), shortage of skilled manpower is not a shortage of workers; rather it is a shortage of sufficiently trained, skilled, and industrious workers available for particular type of work. Attar et al (2012) enumerated reasons attributed for shortage of skilled manpower as; lack of training and retraining, an aging labor force, and an industry that does not attract youth as potential manpower. Bustani (2011) pointed out that the quality and availability of skilled manpower is considered vital factor towards the efficacy of the construction sector. Reasons credited for shortages includes; aging of skilled manpower in the industry, reduction in the number of new entrants into skilled trades, poor financial support and ineffective state of professional education and training / retraining scheme in the country.

2.1.3. Organization Structure and Project Performance

Ethiopian construction industry is under pressure to get better productivity, reduce wastage of resources and to enhance certainty of its performance. Contractors should have the competence to utilize scientific and technological understanding of integrating diverse group contributors in an orderly manner. Individual efforts should be harmonized and compounded in the best means possible to achieve the objective of the company. Wolf (2002) observed that efficient organization structure has a positive impact in the implementation culture of a firm, it guides the firm's productivity, including performance process. Clemmer (2003) was of the opinion that organizational structure improves performance. Communication between staff of an organization is improved and lead to better performance of contractors. Walton (1986) associated structure to effectiveness, noting that organization restructuring is designed to boost not only the competence but also the productivity of the construction firm. Poor organization structure of many construction firms in the developing countries have contributed to low production of work and generally poor performance of the contractors. Organizations of both client and contractors should be well designed to alleviate these organization challenges. Task responsibility and decision making is given to individuals members and teams and arrangements are made to plan, direct, organize and control them (Armstrong & Stephens, 2008). Their organization structures must provide the frame in which organization processes achieve the best chance of achieving maximum performance in the interest of firms objective hence performance of construction industry.

Mintzberg (1983) states that organization structure defines how individuals and groups are organized or how their tasks are divided and coordinated. He defines the organization structure

as the sum of total in which its labor is divided into distinct tasks and then its coordination is achieved among these tasks. Task allocation should be carried out efficiently in order to improve contractor productivity. Ubani (2012) stated that organization structure is the framework adopted to manage the various activities of a construction project or other activities of an organization.

In an organization the manager establishes the schedule of activities to get the job completed, prepares job descriptions, and organizes staff into teams and allocates them to supervisors (Ganesh, 2013). He fixes schedules and establishes standards of performance. Defined work plans assist organization processes in achieving maximum performance in the interest of firm's objective hence performance of construction industry. Winfred (2011) reports that an appropriate managerial structure could support teams in management in attaining enhanced performance in the project by increasing in productivity. Individual members including teams should be involved in decision making enabling specific project objectives to be achieved at the end of each project. Yinghui and Cheng (2004) studied the impact of organizational structure on project performance which was limited to the construction site. Poor performance has been attributed to lack of proper coordination among staffs in road construction contracts.

2.1.4. Client Support and Project Performance

Latham (1994) maintains that clients have a substantial role to play in setting demanding standards and insisting upon improvements. The Business Round Table (1994) maintains that cost effectiveness has been enhanced when clients have exercised leadership and when there has been client/contractor co-operation. Client support includes the implementation of the role that a client is expected to play to ensure timely and cost effective completion of road projects which has a bearing on performance of contractors. Such roles include but are not limited to; provision of accurate project designs, budget allocation and prompt payments of interim progress payments, prompt issue of instructions to commence the construction work, prompt approvals of variations to the contract, early land acquisition of areas required for the construction of roads, ensuring stakeholder involvement, project supervision to ensure quality including achievement of value for money and timely taking over inspection and certification of works once project is completed.

To improve cost effectiveness requires clients to budget for the project as one of their main roles. The impact of design on contractor performance is universally acknowledged. Effective organization of the design process is crucial for the success of projects. This includes, among others, the development of an accurate design brief to confirm client requirements and integration of the work of designers, variations, which result in out of order operations (Lathan, 2004). Generally, construction projects will present several instances which bring about variations.

One of the most important client support role is the payment for work done by a contractor in a project initiated by the client. Both Siti and Rosli (2010) illustrate payments in the construction industry as “a monetary consideration for the contractors” performance for work done”. According to Kenyatta et al (2015) cash flow is undoubtedly the bloodline that drives projects in the construction industry. Any obstruction in its smooth flow may therefore lead to severe outcome. The conclusion of their study was that, non-payment to contractors in the form of late payments of one or more certificates, underpayment, intermittent payments and non-payment have resulted to cash flow challenges to contractors, late completion of projects, construction disputes and even liquidation. Kenyatta et al (2015) reviewed the case of Kundan Singh Construction International Limited bank of Africa Kenya Ltd, (2015) and another where the contractor borrowed project funds from commercial banks on the strength of the awarded contracts from the government. The contractor went in liquidation due to failure of the client to pay. Dissanayaka and Kumaran (1999) noted that the cost of providing adequate financing can be quite large and therefore governments or owners of projects should allocate more budgets to project to enable its completion since it cannot continue with inadequate financing, and would affect performance of contractors to meet planned targets.

Accurate project design is critical in project execution as it eliminates the need to vary the contract. The government is also responsible for approval of the project which facilitates contractor performance. The government approves the cost, the design and the different phases of the project being implemented. This also affects the project construction period. Variations in the scope of project naturally increase the cost of project and normally lead to both cost and time overruns. When the scope increases it requires the client to budget for the extra cost of increased work. This in itself has the potential to cause disputes, arbitration costs, litigation and project abandonment and claims on prolongation costs which lead to distortion of project budgets.

Insufficient support causes project costs overrun. Tran and Carmichael (2013) concluded that late and intermittent payments and/ or nonpayment can critically affect performance of contractors.

Tran and Carmichael (2013) concluded that late and intermittent payments and/ or non-payments can critically affect performance of the project. Fleming and Koppelman (2008), Ramachandra (2013), Uff (2009), Ansah (2011) and Ashworth (2012) observed that the character and the diverse types of contractual payments that might be delayed or defaulted by the employer may additionally be classified as interim, stage or milestone, advance payments, payment of retention monies and final payments. These factors influence contractor performance mainly in the road sector where the majority of the projects are financed by the government as the client. Kenya is undergoing infrastructural development where many construction activities are being carried out across the nation by the central and county governments as the major clients of construction activities. Excess time extra and additional cost on projects is prevalent on road projects which lead to poor performance of contractors. The government of Kenya has been increasing road construction budget since 2003, but unfortunately the issue of pending bills continues to plague the sector and it has not been possible to implement projects within the allocated budget. Anecdotal evidence in Kenya from newspaper reports and industry commentators seems to indicate that many contractors are facing insurmountable challenges as a result of late or non-payment default (Africa Building, 2013). From other research studies, the results indicated there was insufficient funding, while others indicated that there was intermittent funding while a little percentage indicated that there was sufficient funding. This implies that construction projects were poorly funded. On a similar note, it was reported in one of the local dailies, that the government owed contractors 19.39 billion shillings in pending bills (Business Daily, 2013).

2.1.5. Timely Availability of Construction Resources and Project performance

Timely Availability of Construction Resources The study sought to determine the extent to which timely availability of construction resources affect performance of road construction in Dichoto GalafiJunction-Elidhar -Belho Rigid pavement design and built road project. This is in line with the literature review where Fugar and Agyakwah-Baah (2010) who studied the causes leading to delay in construction projects in Ghana and established that that amongst the top ten factors, was shortage of materials.

2.2. Empirical Review

Shaban (2008) in his thesis on factors affecting the performance of construction projects in the Gaza Strip, found out that the most important factors agreed by the owners, consultants and contractors were: average delay because of closure and materials shortage, availability of resources as planned through project duration, leadership skills for project manager, escalation of material prices, availability of personals with high experience and qualification and quality of equipment and raw materials in project. Bui and Ling, (2010) in the study that was carried out in Vietnam on factors affecting construction project outcomes discovered that major enablers that lead to project success are foreign experts' involvement in the project, government officials inspecting the project and very close supervision when new construction techniques are employed. A factor which leads to poor performance is the lack of accurate data on soil, weather, and traffic conditions. Amusan, (2011) studied factors affecting construction cost performance in Nigerian construction sites. It was discovered from the analysis that factors such as contractor's inexperience, inadequate planning, inflation, incessant variation order, and change in project design were critical to causing cost overrun, while project complexity, shortening of project period and fraudulent practices are also responsible. Fetene, (2008) did a study on causes and effects of cost overrun on public building construction projects in Ethiopia. From the results it was found that 67 out of 70 public building construction projects suffered cost overrun. The rate of cost overrun ranges from a minimum of 0% to the maximum of 126% of the contract amount for individual projects. Iyer and Jha (2006) did a research on factors affecting cost performance evidence from Indian construction projects and found out that the project manager's competence and top management support are found to contribute significantly in enhancing the quality performance of a construction project. Nyangilo, (2012) did an assessment of the organization structure and leadership effects on construction projects' performance in Kenya, he found out that lack of appropriate project organization structures, poor management systems and leadership are the major causes of poor project performance. Gbadura and Oke, (2010) examined project management leadership styles of Nigerian quantity surveyors, on the general note, Nigerian quantity surveyors were found to be autocratic using Jerrell/Slevin measuring instrument while in the opinion of Nigerian construction professionals; they are more of task oriented in discharging their duties as construction project managers. Iyagba, Odusami and Omirin, (2003)

did a research on the relationship between project leadership, team composition and construction project performance in Nigeria. The tests of the hypotheses led to the conclusion that there was significant relationship between the project leader's professional qualification, his leadership style, team composition and overall project performance. No significant relationship was found between the project leader's profession and overall project performance.

2.3. Conceptual framework

The conceptual framework in this study was used to show various variables that affect the performance of construction projects.

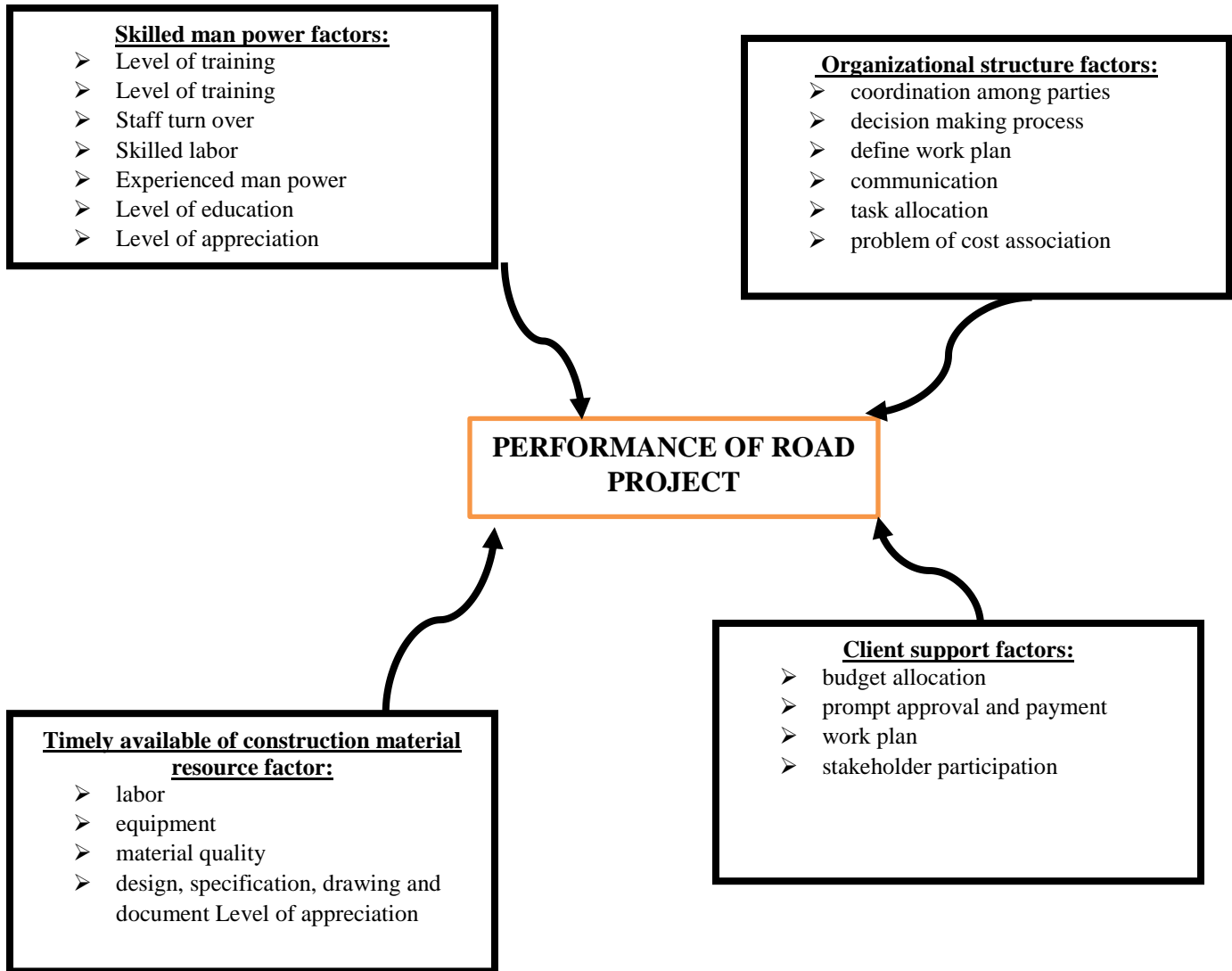


Figure 2-1 – Conceptual Frame Work

Source; my own by referring the literature review

CHAPTER THREE

3. RESEARCH DESIGN AND METHODOLOGY

3.1. Research Design

This section describes the procedures undertaken to achieve the research objectives. The succeeding section provides a general description of the strategy adopted for the research, as well as justification of the methodology

This research investigates and assesses factors affecting the performance of road project in; case of Dichoto GalafiJunction-Elidhar-Belho Rigid pavement design and built road project. This study adopts both quantitative data collection methods. Quantitative researches provide both an in-depth look at context, processes, and interactions and precise measurement of attitudes and outcomes.

The researcher use explanatory type of research method, because it were attempt to describe the actual rate of performance and the variables or factors affecting construction project performance in Dichoto GalafiJunction-Elidhar-Belho Rigid pavement design and built road project. The researches were obtained quantitative data in nature.

3.2. Target Population, sample design and sampling frame

The target populations for the study were employees at Dichoto GalafiJunction-Elidhar-Belho rigid pavement design and built road project.

Table 3-1- Target Population

S.N	Target population	Number of Employee
1	Dichoto GalafiJunction-Elidhar-Belho Rigid pavement design and built road project.	40
2	Near By Road Project Staffs	15
3	Head office road staff	10

4	Consultant at project office	15
5	Procurement Department at head office	8
6	Planning and Business Development Department at head office	4
7	Construction Equipment Management Department at head office	7
8	Supply, finance and support department at head office	25
Total		124

3.2.1. Sampling Design

A sample of respondents were drawn from the Dichoto GalafiJunction-Elidhar-Belho Rigid pavement design and built road project. The study use random sampling technique to select the sample, where 37.7 % of the target population is taken to arrive at a sample size of 48 respondents. The technique allows a researcher to use cases that have the required information with respect to the objectives of the study (Kothari, 2004). The study were deemed managers, team leaders, senior officers in the Dichoto GalafiJunction-Elidhar-Belho Rigid pavement design and built road project to be knowledgeable on factors affecting construction projects performance in Dichoto GalafiJunction-Elidhar-Belho Rigid pavement design and built road project.

3.2.2. Sampling Frame

Table 3-2- Sampling Frame

S.n	Target population	Sample of Employee	%
1	Dichoto GalafiJunction-Elidhar-Belho Rigid pavement design and built road project.	15	12.5%
2	Near By Road Project Staffs	6	6.3%
3	Head office road staff	4	7.5%

4	Consultant at project office	6	6.3%
5	Procurement Department at head office	3	6.3%
6	Planning and Business Development Department at head office	1	7.5%
7	Construction Equipment Management Department at head office	3	3.8%
8	Supply, finance and support department at head office	10	12.5%
		48	100.0%

3.3. Sources and Tools of Data Collection

This study use primary data sources. Primary sources of data were questionnaire, where as to identify the factors affecting the performance of road project various literature reviews was taken.

3.3.1 Method of Data Collection

3.3.1.1 Questionnaire

Questionnaires were distributed to managers, team leaders, and senior officers. This target group is selected as respondents because they are deemed to be knowledgeable about factors affecting the performance of road construction projects in Dichoto Galafi Junction-Elidhar-Belho Rigid pavement design and built road project and could provide important perspective on various factors that affecting the performance of road turnover in the project.

The research evidence was gathered by using both close-ended and open-ended questionnaires. Mixed questionnaires have many merits; the most important of this advantage is its considerable flexibility (McNabb, 2005).

In order to be able to select the appropriate method of analysis, the level of measurement must be understood. For each of measurement, there are /is an appropriate method/s that can be

applied and not others. In this research, ordinal scale has been used. Ordinal scale is a ranking or a rating data normally uses integers in ascending and descending order. Hence, the questionnaires were structured based on those used by Iyoha and Faboyede (2011), and Sharif (2010). The respondents have been asked to indicate their level of agreement on a five point Likert scale with the following ratings.

Table 3-3 Rating scale

Item	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Scale	(1)	(2)	(3)	(4)	5

On this scale a score of 5 or 4 indicates that the item is perceived to be essential while a score of 3 or 2 indicates that the item is perceived to be fairly important, but not essential, while a score of 1 indicates that the item could be disregarded for being unimportant. Similar scales have been used by Courtis (1992) and Iyoha and Faboyede (2011) and is found suitable. With respect to the open ended questionnaires the respondents will be asked to provide open ended responses to the questions that require opinion and if they have opinions they feel the researcher would find useful.

3.4. Method of Data Analysis

Analysis of data included sorting, cleaning and organization of data from the questionnaires. The study generated quantitative data. The information was then coded and entered into a spreadsheet and analyzed using Statistical Packages for Social Sciences (SPSS) Version 20 and was analyzed using descriptive statistics. The main quantitative techniques used is linear multiple regression coefficient to test the level of significance of each independent variable against dependent variable. Quantitative data was presented in tables and explanation presented in prose. Responses with common themes or patterns were grouped together into coherent categories.

The research were used multiple regression analysis to establish the strength of the relationship between dependent and independent variables.

The regression equation is:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \alpha \dots \dots \dots \text{Equation 3}$$

Where: Y is the dependent variable (performance of Road project),

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

$\beta_1, \beta_2, \beta_3,$ and β_4 are the slopes of the regression equation,

X_1 is skilled manpower

X_2 is organization structure

X_3 is client support

X_4 is timely available of construction resource

α is an error term normally distributed about a mean of 0 and for purpose of computation, the α is assumed to be 0.

3.5. Data Coding

For the ease of the analysis codes have been using while analyzing responses in SPSS 20. The codes have been given a per the questionnaires order. All the coding's used in the SPSS 20 analysis has been attached in Appendix B.

3.6. Validity of the Instruments

To ensure validity of the research instrument, the questionnaires is prepared in advance and pre-tested using a small number of respondents, randomly selected from target respondents. This assist in removal of any ambiguities hence focused the questionnaire to collect data relevant to the study. In addition, the researchers give the questionnaire for expert opinion to ensure validity of the data collection instrument. This involved going through the questionnaire in relation to the set objectives and making sure that they contain all the information that can enable answer these objectives.

3.7. Reliability of the Instruments

Reliability is referred as the extent to which a test, measurement procedure or a questionnaire generates common outcomes on repeated trials. Shortly it is the consistency or stability of scores across raters or over time (Sandelowski, 2000). Similarly (Hooley et al. 2008) has mentioned that reliability is the degree to which the measures yield stable results and are free from error i.e. the

measurement procedure stability. If a procedure or measurement device stably assigns similar score to objects or individuals with common values, the components is assumed reliable. Reliability involves the reproducibility or consistency of scores test i.e., the degree to which one can expect similarly stable individual's deviation scores across testing situations on parallel or verifying components. Reliability is adopted in this study by ensuring that no question is answered twice by the same respondent and all respondents have answered all the questions in the questionnaire. Cronbach's alpha is also be used to check their reliability and to know internal consistency among the given items. The pilot study involved the sampled respondents. Reliability analysis was subsequently done using Cronbach's Alpha which measured the internal consistency by establishing if certain item within a scale measures the same construct. Gliem and Gliem, (2003) had indicated a value of 0.7 to be an acceptable reliability coefficient but lower thresholds are sometimes used in literature (Rousson, Gasser & Seifer, 2002), thus forming the study's benchmark. Cronbach Alpha was established for every objective; skilled man power had the highest reliability ($\alpha= 0.756$), followed by Organization structure ($\alpha=0. 710$), the Client support ($\alpha=0. 0.769$), and finally timely availability of construction resource ($\alpha=0.748$). This illustrates that all the variables were highly reliable as their reliability values exceeded the prescribed threshold of 0.7.

3.8. Ethical Consideration

Ethics is an important aspect in any research. The researcher made sure that ethics of the research were followed. Respondents participated in the study willingly. Confidentiality and discretion was observed. The respondents were informed about the objectives of the study with a promise that collected data will only be utilized for academic purposes.

CHAPTER FOUR

4. DATA ANALYSIS AND PRESENTATION

Introduction

This chapter provides explanations for data collection such as distribution of the questionnaire, collection of responses and subsequent analysis of the data acquired through the responses from professionals and staffs who are working in road projects of Defense Construction Enterprise.

The principal purpose is to identify the factors affecting the performance of selected road projects in the construction industry especially in DCE and to find out the way how to enhance the performance of these projects.

A questionnaire survey has been conducted to gather the required information from staffs at head office and project of DCE. The selected road project managers are Tarmaber – Meleyaya – Sefedmeda road Project manager, Afdera Bidu Gravel road project manager, Afdera-Irabi junction-Ertale Junction-Ahmed Ela Road Project manager , Mekelle –Dangolat – Samri - Finarwa Road Project manager and Dicheto-Galafi Rigid Pavement Road project manager.

A total of 48 questionnaires were sent to the selected sample of respondents which comprise of 15 from head office staffs and the rest 33 are from project sites of the selected five road projects. A sample of the questionnaires is attached in Appendix A.

4.1. Analysis Questionnaires Response Rate

A total of 48 questionnaires were sent to the two groups of respondents in the company. Out of 48 questionnaires, 45 questionnaires were collected on person for the head office staffs and through different Medias for the project staffs. Out of the returned 15 are from head office staffs and 30 from project site staffs. The table below shows the breakdown of responses from the two sample groups.

Table 4-1: Respond Rate

Group	Questionnaires	Questionnaires'	Percentage
Head Office Staffs	15	15	100%
Project Staffs	33	30	93.75%
Total	48	45	93.75%

4.2. Respondents Demographic Information's

I. Gender

The following figure shows the gender composition of respondents as per the collected responses. Accordingly, 62.2% respondents are male and 37.8% are female. It means most of the respondents are male.

II. Age and Educational Background Composition

The following table shows respondent's age composition and educational background and the total percentage they possess. Accordingly, majorities (48.9 %) of the respondents were aged between 31 and 40 years and 35.5 % are above 41 years. In case of educational background/level of respondents, majorities (48.9 %) are first degree holder and the rest are diploma and second degree holder.

III. Position and Experience of respondents

The following table shows respondent's position in DCE and their work experience on road projects and the total percentage they possess. Accordingly, majority (44.4 %) of the respondents were senior engineer mostly working on sites. In case of respondents experience on road projects, majorities (46.6 %) have 5-10 years of experience while 19.9% have more than 10 years' experience.

Table 4-2: Background information

Background information		Frequency	Percent
Gender	male	28	62.2
	female	17	37.8
Respondent Age	20-30	7	15.6
	31-40	22	48.9
	41-50	11	24.4
	Greater than 50	5	11.1
Education level	Diploma	7	15.6
	Degree	22	26.7
	Post Graduate	16	35.5
Respondent positon	Senior engineer	20	44.4
	Project manager	5	11.1
	Supporting staff	5	11.1
	operator	10	22.2
	Equipment Department	5	11.1
Experience	<5	15	33.3
	5-10	21	46.6
	10-15	7	15.5
	>15	2	4.4

4.3. Factors influencing performance of road project in DCE road project

The research data from the questionnaire was used to find out how the respondents rated the influence of skilled manpower, organization structure, client support and timely availability of resource on performance of road project in DCE.

4.3.1. Availability of skilled man power in road project

The respondents were asked to indicate their level of agreement with the following six cost related factor and their influence on the performance of road projects in DCE. The response was

rated on a five-point scale on which 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=strongly agree, and the findings are presented in table 4.3 below.

Table 4-3: Availability skilled manpower

No	Skilled Manpower and Project	Code	N	Mean
1	Availability of skilled & semi-skilled labour helps to expedite the achievement of project goals hence performance of contractors.	S1	45	2.0889
2	Lack of semi & skilled labour delays or stalls altogether the performance	S2	45	3.6222
3	Skilled labour provides quality performance of construction projects.	S3	45	3.7333
4	Skilled labour saves wastefulness of resources during construction of roads	S4	45	3.3333
Average				3.194425

From the study, it was noted that majority of the respondent strongly agreed that skilled labour provides quality performance of construction projects as shown by a mean of 3.733, Skilled labour saves wastefulness of resources during construction of roads as shown by a mean of 3.33, Lack of semi & skilled labour delays or stalls altogether the performance as shown by a mean of 3.62. Majority of respondents also agreed that Availability of skilled & semi- skilled labour helps to expedite the achievement of project goals hence performance of contractors altogether as shown by a mean of 2.0889.

4.3.2. Extent of availability of skilled manpower in road project

The study sought to determine the extent to which challenges on skilled manpower influence road construction projects. The results are shown in Table 4.4.

Table 4-4: Extent of availability

No	Extent of availability	Code	N	Mean
1	Shortage of manpower	S5	45	3.5778
2	Lack of financial resources	S6	45	3.2667
3	Cost of manpower development	S7	45	3.1333
4	Lack of appreciation to the role of manpower development	S8	45	3.9111
5	Lack of training programme	S9	45	3.6889
6	High labour turnover	S10	45	3.7333
7	Low level of education	S11	45	3.1111
Average				3.4889

From the study, most of the respondents indicate the following challenges as having significant influence on skilled manpower in road construction projects. Lack of appreciation to the role of manpower development as shown by a mean of 3.911, high labor turnover as shown by a mean of 3.733, Lack of training program as indicated by a mean of 3.689, Shortage of manpower as shown by a mean of 3.578, Lack of financial resources as indicated by a mean of 3.267, and Low level of education as shown by a mean of 3.11.

4.3.3. Proper organization in road project

The research was conducted to establish how organization structure of road contractors influenced their performance on construction projects. The results are shown in Table 4.5.

Table 4-5: Proper Organization in road project

No	Quality Related Factors	Code	N	Mean
1	Poor performance has been attributed to lack of proper coordination among stakeholders in roads construction contracts	O1	45	3.2889
2	Coordination among departmental heads in a construction firm improve firm productivity	O2	45	3.5111
3	Individual members and teams should be involved in decision making	O3	45	3.7556
4	Task allocation should be carried out efficiently in order to improve contractor productivity hence performance.	O4	45	3.3556
5	Construction related performance problems includes costs associated with delays, claims, wastages and	O5	45	3.5556
6	Effective communication and fast information transfer between managers and participants help to accelerate the road construction process and performance	O6	45	3.8444

7	Defined work plans assist organization processes in achieving maximum performance in the interest of	O7	45	3.6444
Average				3.5651

From the research findings, the mean value of more than 3.33 indicated that majority of the respondents strongly agreed that task allocation should be carried out efficiently in order to improve contractor productivity, construction challenges involve expenses related to delays, claims, wastages and repair. Coordination among departmental heads in a construction firm improve firm productivity, fast and effective communication transfer among managers and participants speed up road construction process and hence performance of road contractors , defined work plans assist organization processes in achieving maximum performance in the interest of firms objective hence performance of construction industry, individual members and teams should be involved in decision making, Majority agreed that poor performance has been attributed to lack of proper coordination among stakeholders in roads construction contracts as shown by a mean of 3.289.

4.3.4. Client involvement in road project

The study sought to establish the extent to which client support influence construction of roads projects. The results are shown in Table 4.6.

Table 4-6: Client involvement

No	Leadership Related Factors	Code	N	Mean
1	Prompt payments and approvals facilitates timely project completion	C1	45	3.3556
2	Stakeholders involvement aids in smooth project implementation	C2	45	3.5333
3	Irregular funds disbursements project delays and/ or stalling	C3	45	3.2000

4	Insufficient support causes project costs overrun, disputes, arbitration costs, litigation and project abandonment	C4	45	3.1778
Average				3.316

From the research findings, majority of the respondents strongly agreed that Stakeholders involvement aids in smooth project implementation as shown by a mean of 3.533, Majority of the respondents also agreed that Prompt payments and approvals facilitates timely project completion as shown by a mean of 3.35, Irregular funds disbursements project delays and/ or stalling as shown by a mean of 3.2 and that Insufficient support causes project costs overrun, disputes, arbitration costs, litigation and project abandonment as shown by a mean of 3.1778.

4.3.5. Timely availability of resource in road project

The study sought to establish the extent to which timely availability of resource influence construction of roads projects. The results are shown in Table 4.7.

Table 4-7: Timely availability of resource in roads project

No	Timely availability of resource	Code	N	Mean
1	Insufficient supply of labour (skilled and unskilled) in road project has led to delays and increase in construction costs	T1	45	3.2889
2	Inadequacy of modern equipment and allocation of equipment affects construction projects	T2	45	3.6444

3	Unavailability of better quality material in in road project led to poor project performance	T3	45	3.4444
4	Client's emphasis on quick design and construction (Inadequate design and construction times stipulated; inadequate delivery times) has led to project performance	T4	45	3.5333
Average				3.477

From the research findings, majority of the respondents strongly agreed that Inadequacy of modern equipment and allocation of equipment affects construction projects as shown by a mean of 3.644, Majority of the respondents also agreed Client's emphasis on quick design and construction (Inadequate design and construction times stipulated; inadequate delivery times) has led to project performance as shown by a mean of 3.533, Unavailability of better quality material in in road project led to poor project performance as shown by a mean of 3.444 and Insufficient supply of labour (skilled and unskilled) in road project has led to delays and increase in construction costs as shown by a mean of 3.2889.

4.4. Multiple Linear regression analysis

Multiple regression assumptions:

1. The relationship between the IVs (predictor variables – skilled manpower, organizational structure, client support and timely availability of construction resources) and the DV (Outcome variables – performance of road projects in DCE) is linear.
2. There is no multicollinearity in the data. This is essentially the assumption that the predictors are not too highly correlated with one another. This assumption is checked through Collinearity diagnostics.

3. The values of the residuals are independent. This is basically the same as saying that the observations (or individual data points) to be independent from one another (or uncorrelated). This assumption is tested through the Durbin-Watson statistic.
4. The variance of the residuals is constant. This is called homoscedasticity, and is the assumption that the variation in the residuals (or amount of error in the model) is similar at each point across the model. In other words, the spread of the residuals should be fairly constant at each point of the predictor variables (or across the linear model).

Table 4-8: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.508	1.131			0.001
1 Skilled man power	0.481	0.228	0.231	2.110	0.002
2 Organizational structure	0.347	0.127	0.217	2.732	0.003
3 Client support	0.416	0.115	0.316	3.617	0.001
4 Timely availability of construction resource	0.267	0.103	0.125	2.592	0.000

- a. Dependent Variable: performance of road projects in DCE

From the above regression coefficient table a multiple regression analysis so as to determine the factors influencing performance of road project in DCE. Multiple regression analysis was used to test the influence the variable in project performance. The study used statistical package for social sciences (SPSS V 20) to code, enter and compute the measurements of the multiple regressions.

From the computed data the established regression equation was

$$Y = 1.508 + 0.481X_1 + 0.347 X_2 + 0.416 X_3 + 0.267 X_4$$

Where Y= Performance of road project

X1= Skilled Manpower

X2= Organization Structure

X3= Client Support

X4= timely available of resource

Using the above regression equation it was revealed that holding skilled manpower, organization structure, client support and timely available of resource constant at zero, the performance of road project in DCE would be at 1.508. The findings show that the four factors were ranked in descending order their influence on the performance of road project: skilled man power factor lead fist and client support factor comes second, organizational factor comes in third place and finally timely availability of construction material or resource factor comes in the last place.

Table 4-9 Coefficient of Determination

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	.889 ^a	.79	.736		.32561

Adjusted R squared is coefficient of determination which illustrates the variation in the dependent variable as a result of change in the independent variable. From the study, in the value of adjusted R squared was 0.736 indication that there a was variation of 73.6 percent on performance of road construction in DCE as a result of change in skilled man power, organization, client support and timely available of construction resource at 95 percent confidence interval. This indicates that 73.6 percent change in performance of road project in DCE could be accounted to skilled manpower, organization structure, client support and timely variable of construction resource. This implies that the four factors are very critical to the road construction sector and the above regression equation is limited to the four factors.

4.5. Summary of Major Findings

- Respondents of the study comprised contractors, consultant and client (owners) of the road construction projects.

- The response rate of 93.75% was considered more than adequate for the study. The outcome indicated that the road construction industry is male dominated, implying an imbalance in gender representation. The respondents had considerable experience in the road construction sector having been involved in many projects and were well educated with majority holding a degree level and above, implying that the information obtained from them was very credible.
- The study investigated factors influencing performance of road projects in DCE in Case of Dichoto Galafi Road Project, in particular influence of skilled manpower, organization structure, client support and Timely availability of construction material. From the findings of the research, there was an indication that 73.6 percent of factors influencing performance of road project in DCE was due to skilled manpower, organization structure, client support and Timely availability of construction material at 95 percent confidence interval.
- This implies that the four factors are very critical to the road project in DCE. skilled man power had highest influence on performance of road project in DCE while timely available of construction resource had the least influence. The sub-sections that follow summarize the findings of the study based on the objectives of the research.

4.5.1. Skilled Man Power

- The study established that availability of skilled man power enabled the construction company to achieve overall goals of the company as skilled employees delivered quality work. Skilled employees perform quality work and can increase the number of clients quickly than any other organization and availability of skilled man power enhanced the performance of road project in DCE and vice versa.
- Lack of semiskilled and skilled labor causes significant project delays and sometimes leads many road construction projects to stall or be abandoned altogether thereby adversely affecting the performance of road project in DCE.
- The research also noted that the following challenges have a significant influence on skilled manpower in road construction in DCE; Shortage of manpower, lack of financial resources and high labour turnover, low level of education, lack of appreciation to the role of manpower development, lack of training program and high cost of manpower development. Further the study noted that skilled manpower is important, makes a firm competitive, and improves the road project performance in DCE..

4.5.2. Organizational structure

- The research revealed that there existed strong relationship between organization structure and the road project performance in DCE.

- Tasks allocation should be carried out efficiently in order to improve DCE's productivity hence performance of road project.
- Coordination among departmental heads in a construction firm improves DCE's productivity.

4.5.3. Client support

- The study further noted that stakeholder involvement aids in smooth project implementation.
- On the other hand, the government needs to play its client support role adequately to ensure successful implementation of the projects.

4.5.4. Timely availability of construction resource

- The respondents indicated that unavailability of better quality material in arid and semi-arid areas leads to poor project performance and that client's emphasis on quick design and construction (Inadequate design and construction times stipulated; inadequate delivery times) has led to road project performance in DCE to a very large extent.
- These are presence of unskilled labourers; shortage of technical professionals in the DCE's'; improper technical study by the DCE during the bedding stage; and lastly, ambiguities and mistakes in specifications and drawings; among the various factors that cause time overrun include inadequate tools and equipment.

4.6. Discussion of the findings

The discussion of the findings was guided by the four objectives of the study as discussed in the sub sections that follow.

4.6.1. Skilled manpower and road project performance

The study noted that skilled manpower in the road construction sector is inadequate. The availability of skilled & semi- skilled labour helps to expedite the achievement of project goals and hence performance road project in DCE. Skilled labour provides quality performance of construction projects and saves wastefulness of resources during construction of roads. Lack of semi & skilled labour delays or stalls road construction projects altogether. The findings are in congruence with the research by Hanim (2010) who found that shortage of skilled manpower cause delays in road construction projects.

The research also noted that the following challenges have a significant influence on skilled manpower in road construction project in DCE; Shortage of manpower, lack of financial resources and high labour turnover, low level of education, lack of appreciation to the role of manpower development, lack of training program and high cost of manpower development. Further the study noted that skilled manpower is important, makes a firm competitive, and improves road project performance in DCE. The findings concur with the research by Trendle (2008) that indicated skilled employees perform quality work and can increase the number of clients quickly in an organization.

4.6.2. Organizational Structure and road project performance

The research revealed that there existed strong relationship between organization structure and performance of road project in DCE. Tasks allocation should be carried out efficiently in order to improve contractor productivity hence performance. Coordination among departmental heads in a construction firm improves firm productivity. The findings are in line with the research by Armstrong and Stephens (2008) who indicated that organization structures must provide the framework in which organization processes have the best chance of achieving maximum performance in the interest of firm's objective hence performance of construction industry. This

is also supported by a study done by Maduenyi (2015) on impact of organization structure on contractor performance.

Further the study established that fast and effective communication transfer among managers and participants speed up road construction process. Defined work plans assist organization processes in achieving maximum performance in the interest of firm's objective hence performance of construction industry. Individual members and teams should be involved in decision making and that poor performance has been attributed to lack of proper coordination among stakeholders in road construction in DCE. The findings agree with the research by Stephens (2008) that a strong organizational structure offers a comprehensive management training plan that is easier to create and execute to help maintain a strong managerial core.

4.6.3. Client support and road project performance

The study also revealed that construction projects were majorly financed by both donors and the Ethiopian government; most of the construction projects were poorly funded. Client support helped to ensure prompt payments and approvals which facilitate timely project completion. Insufficient client support causes project cost overruns, disputes, arbitration costs, litigation and project abandonment. Irregular funds disbursements lead to project delays and/ or stalling. The study further noted that stakeholder involvement aids in smooth project implementation. Construction project costs were accurately and professionally prepared. The findings also correlate with the research by Latham (1994) that clients have a substantial role to play in setting demanding standards and insisting upon improvements. The findings further confirms with the research by Thomas and Ellis (2007) that contractor is contracted by a firm to execute a contract and complete the project within a specified timeline. On the other hand, the government needs to play its client support role adequately to ensure successful implementation of the projects.

4.6.3. Timely availability of construction resource

The respondents indicated that unavailability of better quality material in areas leads to poor project performance and that client's emphasis on quick design and construction (Inadequate design and construction times stipulated; inadequate delivery times) has led to project performance to a very large extent. These findings are in line with the literature review where Sweis (2013) found that amongst the top ten factors four were related to the construction items.

These are presence of unskilled labourers; shortage of technical professionals in the contractors' organization; improper technical study by the contractor during the bedding stage; and lastly, ambiguities and mistakes in specifications and drawings; and Ameh and Osegbo (2011) who established that among the various factors that cause time overrun in Nigeria include inadequate tools and equipment.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1. Conclusion

The performance of local contractors in the road sector has much significance in developing countries like Ethiopia; hence, their performance in the road construction industry has many impacts on the industry also. Therefore, carrying out a research in this area will have a paramount importance. Identification of factors affecting the performance of road projects is a prerequisite to minimize or to avoid their poor performance and to enhance their capacity in the construction industry. The aim of this research as indicated in Chapter one is to identify factors affecting the performance of road projects in DCE.

From the results obtained in the analysis of the questionnaire survey and the following major conclusions have been drawn:

- A. The study established that skilled man power enable the construction company to achieve overall goals of the company as skilled employees delivered quality work. Thus the study concludes availability of skilled man power enhanced the performance of DCE in the road construction sector. The study revealed that coordination among departmental heads in DCE improve DCE's productivity, fast and effective communication transfer among managers and participants speeds up road construction process and performance in DCE.
- B. .The study therefore concludes that strong organizational structure enhance the performance of DCE in the road construction sector.
- C. The research findings noted that one role of client support is to ensure involvement of stakeholders and/or project beneficiaries throughout the project cycle, as it was considered paramount in achieving project success. The study also confirmed that prompt payments and approvals is considered very crucial in facilitating timely project completion and that insufficient support causes project costs overrun, disputes, arbitration costs, litigation and project abandonment. The study therefore concludes that

availability of client support enhanced the performance of DCE in the road construction sector.

- D. Insufficient supply of labor (skilled and unskilled), unavailability of better quality material and client's emphasis on quick design and construction (Inadequate design and construction times stipulated; inadequate delivery times) in arid and semi-arid areas has led to delays and increase in construction costs.

5.2. Recommendation

From the study of the research paper; the following major recommendations are forwarded;

1. There is need to encourage growth of manpower skills through training and skill up-gradation within DCE as skilled manpower was found to be an asset, which pays over the long term. There is also need to develop mechanism that will aim at alleviating high cost associated with training of engineers and technicians in DCE. This should be done in view of the current shortages of skilled man power. There is need for more middle level colleges while ensuring that the existing technical colleges are retained and not converted to universities as has been the case. .
2. Construction firms need to have a flexible dynamic organizational structure. This is the basis of the revelation that existence of strong organizational structure forms the core from which the successful implementation of road construction projects can be grounded.
3. DCE should have a clear strategic plan and appropriate, flexible organizational structure which is compatible with the needs of the organization. Recruitment should be based on qualification and experience basis; also there should be clear specific process of upgrade and bonuses based on progress reports.
4. Clear policies on stake-holder/client involvement must be put in place. This is based on revelation that stakeholder/client involvement enhanced the implementation of road construction projects. There is need for equal effort and involvement of the government, DCE and the project beneficiaries, to enhance ownership and successful implementation of road construction project in DCE.

5. From the recommendations obtained from the study, clients need to improve on the speed of approval of interim payments, variations to the contract, evaluation of claims by the DCE and also prompt resolution of disputes in the contract, if DCE performance is to be enhanced.
6. In order to alleviate problems associated with delayed payments, there should be effective funding of project by the client to avoid unnecessary time overruns which eventually lead to cost overruns and delayed completion of road project in DCE which have a bearing on poor performance of road in DCE.
7. These are presence of unskilled laborers; shortage of technical professionals in the DCS' organization; improper technical study by the DCE during the bedding stage; and lastly, ambiguities and mistakes in specifications and drawings are factors that cause time overrun in DCE include inadequate tools and equipment.

REFERENCE

- Abbasnejad, B., & Moud, H.I. (2013). Construction Delays in Iranian Civil Engineering Projects: An Approach to Financial Security of Construction Business, *Life Science Journal*, 10(2), 2632-2637
- Abiola, R.O. (2004). Productivity Improvement in Project Organization. *Journal of the Nigerian Institute of Quantity Surveyors*, 46(5): 17-22.
- Adams, J. (2008). Measuring The Effect Of Project Management On Construction Outputs: A New Approach, *International Journal of Project Management*, 18 (78), 327-335.
- Aftab, H. M., Ismail, A. R. & Ade, A. A. A. (2012). Time and Cost Performance in Construction Projects in Southern and Central Regions of Peninsular Malaysia. *International Journal of Advances in Applied Sciences*, Vol. 1, (1), 45-52.
- Akinsulire, O. (2002). *Financial Management*. Lagos: Leemol Nigeria Ltd.
- Akintunde I. (2003). *Nigerian Construction Industry: Past, Present, Problems and Prospects*. In I. Akintunde, Ibadan University Printery.
- Alarcon, L.F. (1994). Tools for the Identification and Reduction Waste in Construction Projects. In Alarcon, Luis, (Ed.) *Lean Construction*, A.A.Balkema, Netherlands 1997.
- Alinaitwe, H.M., Mwakali, J.A and Hansson, B. (2007). Factors affecting the productivity of building craftsmen studies of Uganda, *Journal of Civil Engineering and Management*, Vol. xiii N0 3, 169-169.
- Allens, A.R. (1994). *Quality Management in the Construction Phase of the Traditional Procurement System in South Africa: The Case of the Western Cape*, University of Cape Town in Cape Town, Western Cape, South Africa.
- Ansah, S. K. (2011). Causes and Effects of Delayed Payments by Clients on Construction Projects in Ghana. *Journal of Construction Project Management and Innovation*, 1(1), 27 - 45.
- Ameh, O.J, Osegbo, E.E. (2011). Study of Relationship between Time Overrun and Productivity on Construction Sites. *International Journal of Construction Supply Chain management*, 67(1), 56-67.

- Ayangade, J.A, Wahab, A.B and Alake, O. (2009). An Investigation of the Performance of Due Process Mechanism in the Execution of Construction Projects in Nigeria. *Engineering Dimension*. 11(1):1-7.
- Armstrong M. and Stephens T. (2008). *Management a leadership*. Expert- Grada.
- Ashworth, A. (2012). *Contractual Procedures* (6 ed.). Pearson Education Limited.
- Assaf S. A, Bubshait A. A., Atiyah S., & Al-Shahri, M., (2011). The Management of Construction Company Overhead Costs, *International Journal of Project Management*, 19(67), 295-303.
- Assaf, S.A., Al-Hammad, A., & Ubaid, A. (1996). Factors Affecting Construction Contractors' Performance, *Building Research and Information*, 24(3), 63-159.
- Attar, A.A., Gupta, A.K. and Desai, D.B. (2012). A study of various factors affecting labour productivity and methods to improve it. *IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE)*, 1(3): 11–14.
- Ayangade, J.A, Wahab, A.B and Alake, O. (2009). An Investigation of the Performance of Due Process Mechanism in the Execution of Construction Projects in Nigeria. *Engineering Dimension*. 11(1):1-7.
- Babbie, E. (2002). *The Practise Of Social Research* (10th Ed). Wadsworth Publishing Company: Thomson Belmont CA.
- Badu, E., Edwards, P., & Owusu-Manu, D. (2012). Trade Credit And Supply Chain Delivery In The Ghanaian Construction Industry: Analysis of Vendor Interactions With Small To Medium Enterprises. *Journal of Engineering, Design and Technology*, 10 (3), 360-379.
- Baldrige National Quality Programme. (2009). *Baldrige Award Criteria*. Retrieved. Baldrige National Quality Programme Website: www.quality.nist.gov
- Baldwin, A., McCaffer, R. and Osman, I.I. (2001). *Project Performance in a Contracting Organization: Analysis, Evaluation And Development*, CIB World congress, Willington, New Zealand. Borg, W. & Gall, M. D. (2009). *Educational research: An introduction*. (5th ed.). New York: Longman.
- Bourne, L. and Walker, D. H. T. (2005). Visualizing and Mapping Stakeholder Influence. *Management Decision*, 43 (5): 649 - 660.
- Bundi, L. (2011). *Challenges in the Management of Procurement Services Within Kenya Rural Roads Authority*. Unpublished MBA project. University of Nairobi.
- Bustani, S.A. (2000). Availability and Quality of Construction Craftsmen and Artisans in the Nigerian Construction Industry. *Journal of Construction Technology and Management*, 3(1):91-103.

- CBK. (2015, 5 23). Banking Sector Performance and Developments Report - 1st Quarter of 2015. Performance and developments in the Kenyan banking sector for the quarter ended 31st March 2015. Retrieved 5 23, 2015, from <https://www.centralbank.go.ke/>.
- Cheung, S.O., Suen, H. C. H., & Cheung, K. K. W. (2004). PPMS: a Web-based Construction Project Performance Monitoring System, *Automation in Construction*, 13(78), 361-376
- CIDB. (2010). Delayed Payments in the Construction Industry. Johannesburg: Construction Industry Development Board of South Africa.
- Clemmer, J. (2013). *The Leader's Digest: Timeless Principles for Team and Organization Success*, Published by TCG Press.
- Cooper, R. D. & Schindler, S. P. (2003). *Business Research Methods* (8th ed.). New York: McGraw-Hill/Irwin.
- Creswell, J. W. (2003). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Thousand Oaks: Sage Publications, Inc.
- Dadzie, J. Abdul-Aziz, A.R. and Kwame, A. (2012), Performance of Consultants on Government Projects in Ghana: Client and Contractor Perspectives. *International Journal of Business and Social Research*. Kumasi
- Dansoh, A. (2005). Strategic Planning Practice of Construction Firms in Ghana. *Construction Management & Economics* Taylor & Francis Group Ltd.
- Dantong J.S.D, Lekjeb R.S. & Dessah, E (2011). Investigating the Most Effective Training for Construction Craftsmen that will Optimize Productivity in the Nigeria Construction Industry.
- Danuri, M. S., Munaaim, C. M., Rahman, A. H., & Hanid, M. (2006). Late and Non - Payment Issues in the Malaysian Construction Industry- A Contractor Perspective. *Sustainable Development through Culture and Innovation, The Joint International Conference on Construction Culture, Innovation and Management (CCIM)*, 613623.
- Dissanayaka, S.M., & Kumaraswamy, M.M. (1999). Comparing Contributors to Time and Cost Performance in Building Projects, *Building and Environment*, 34(78), 31-42.
- Donaldson, T., & Preston, L. E. (1995). The Stakeholder Theory of The Corporation: Concepts, Evidence And Implications. *Academy of Management Review*, 20(1), 65 - 91.
- Egan, J. (1998). *Rethinking Construction: Report of the Construction Task Force on the Scope for Improving the Quality and Efficiency of UK Construction*, Department of the Environment, Transport and the Regions, London.

- Ejaz, N., Hussain, J., Shabbir, F., Shamim, M.A., Naeem, U.A., Tahir, M.F., Ahmad, N., & Frooq, Q.U. (2013). Assessment of Most Critical Success Factors for Mega Construction Projects in Pakistan, *Life Science Journal*, 10(10), 255-261.
- FIDIC. (2006). *Quality of Construction*. Retrieved August 30, 2006, from FIDIC: www.fidic.org
- Fleming, Q. W., & Koppelman, J. M. (2008). Performance based payments (PBPs). *PM World Today*, 10(4).
- Freeman, R. Edward (1984). *Strategic Management: A stakeholders approach*. Boston; Pitman. ISBN 0-273-01913-9.
- Friedman, A. L., & Miles, S. (2002). Developing stakeholder theory. *Journal of Management Studies*, 39 (1), 1-21.
- Gliem, J., & Gliem, R. (2003). Calculating, Interpreting and Reporting Cronbach's Alpha Reliability Coefficient for Likert-Type Scales. *Midwest Research to Practice Conference in Adult, Continuing and Community Education*.
- Grogan, T. (1995). Energy Special Report: Forecast 95. *Journal of New Energy Reform*, 234(4), 43-46.
- Hanim, A. (2010). Labour shortage affecting oil palm plantations. *The Star*. Retrieved from <http://biz.thestar.com.my/news/story.asp?file=/2010/2/9/business/5637194&sec=business>
- Hanson, D, Mbach, J., & Nkando, R. (2003). Causes of Client Dissatisfaction In The South African Building Industry And Ways Of Improvement: The Contractors' Perspectives, In CIDB, South Africa.
- Harris, F. & McCaffer, R. (2005). *Modern Construction Management (5th ed.)*. London: Blackwell Publishing
- Hatami, F. and Behsan, H. (2012). Evaluation and Investigation of Risk Organization in Iranian Construction Industry, *Life Science Journal*, 9(4), 387-399.
- Henry, A.L. (1994). *The Factors Associated with Insolvency Among Contractors in the South African Construction Industry: a Case Study of the Western Cape Region*. University of Cape Town in Cape town, Western Cape, South Africa.
- Hillman, A. J., & Keim, G. D. (2001). Shareholder Value, Stakeholder Management, And Social Issues: What's the Bottom Line? *Strategic Management Journal*, 22(90), 125 - 139.
- Hong, X. and Proverbs, D. (2003). Factors influencing contractor performance: An International investigation. *Engineering, Construction and Architectural Management*. 10(5), 322-332.

- Jones, T. M. (1995). Instrumental Stakeholder Theory: A synthesis Of Ethics and Economics. *Academy Of Management Review*, 20(2), 404 - 437.
- Kahura, T. (2014). Factors Influencing Effective And Efficient Delivery Of Road Construction Projects In Kenya: A Case Of Nairobi County. (Unpublished MA project, University of Nairobi).
- Kangari, R. (2005). Built Environment, Wolverhampton University. Analysis of ClientSatisfaction Factors in Construction Industry, *Journal of Organization in Engineering*, 11(78), 36-44.
- Kenyatta Obegi., Ahmad O. A., Mbiti T.K. (2015). *International Journal of Soft Computing and Engineering (IJSCE) ISSN: 2231-2307, Volume-5 Issue-4.*
- Kothari, C. R. (2007). *Research Methodology: Methods and Techniques.* New Delhi.
- Kulatunga, U., Amaratunga, R.D.G., & Haigh, R. (2005). Performance Measurement Applications within the UK Construction Industry: A Literature Review, in: 5thInternational Postgraduate Conference in the Built and Human Environment, the Lowry, Salford Quays, UK.
- Kumaraswamy, M. (2006). Exploring the Legal Aspects of Relational Contracting, *Journal of Professional Issues in Engineering Education and Practise*, 132(1), 342.
- Kundan Singh Construction International Limited v Bank of AfricaKenya Ltd & another (2015).
- Latham, M. (1994) *Constructing the Team.* London, HMSO
- Lobelo, L. (1996). "An Investigation into Factors Associated with Insolvencies Amongst Civil Engineering Contracting Firms in South Africa". University of Cape Town in Cape Town, Western Cape, South Africa.
- Long, C. S., P. Perumal, and M. A. Ajagbe, (2012a). The Impact of Human Resource Management Practices on Employees' Turnover Intention: A Conceptual Model. *Interdisciplinary Journal of Contemporary Research in Business*, 4(2): 629-641.
- Long, C. S., Ajagbe, M. A., N. M., Khalil, and E. S. Suleiman, (2012b). The Approaches to increase Employees' Loyalty: A Review on Employees' Turnover Model *Australian Journal of Basic and Applied Sciences*, 6(10): 282-291.n Project Performance Monitoring System, *Automation in Construction*, 13(78), 361. 376.
- Maduenyi, M. (2015). International Conference on Africa Development Issues (CU_ICAD) 2015: Social and Economic Models for Development Track.

- Maritz, M. J., & Robertson, D. C. (2012). What are the legal remedies available to contractors and consultants to enforce payment? *Journal of the South African Institution of Civil Engineering*, 54(2), 27-35.
- Marx, H. J. (2014). Results of the 2014 Survey of the CIDB Construction Industry Indicators. University of the Free State.
- Mbaabu, M. (2012). Lack of Quality In Construction – Economic Losses, Lisbon, 508515, European Symposium on Management, Quality and Economics in Housing and Other Building Sectors 2001
- Medugu, N. I., Rafee Majid, M., Bustani, S. A., Bala, K., Abdullahi, U., & Mbamali, I. (2011). Craft Skills: Availability in the Nigerian Construction Industry: Perception of Contractors and Consultants. *Craft Skills Availability in the Nigerian Construction Industry: Perception of Contractors and Consultants. The IUP Journal of Infrastructure*, 9(3), 63-73.
- Mintzberg, H. (1983). *Designing effective Organizations*. Prentice-Hall, Inc. New Jersey
- Mugenda A.G, (2003). *Research methods, Laba graphic services: Nairobi*.
- Mugenda, O. and Mugenda, A., (1999). *Research Methods Quantitative and Qualitative Approaches*, Nairobi Acts Press, 49
- Musa M. H. (2012). Effects of total Quality Management on Performance of Companies in Kenya: a Case of Interbuild Company Limited. (Unpublished MBA project. Kenya Institute of Management).
- Neely, A. (1998). *Measuring Business performance*, Economist books, London.
- Nyamwaro, E. M. (2011). *Analysis of Challenges Facing Project Implementation: A Case Study of Ministry of Roads Projects*. (Unpublished MBA project. University of Nairobi).
- Nyika, D. (2012). An Analysis of the Causes of Failures in the Implementation of Projects in Kenya. Available from URL <http://erepository.uonbi.ac.ke:8080/xmlui/handle/123456789/15012>.
- Nwude C. (2010). Working Capital Management in Nigerian Agro- Allied Firms. *The Nigerian stockbroker*, Vol.G No 6, Jul- December, 5-22.

- Ofori, G., Ai Lin, E., & Tjandra, I. (2012). Construction Industry Development Initiatives: Lessons for Ghana from Overseas. *International Conference on Infrastructure and Development* (pp. 12-17).
- Ofori, T. (2014). Factors affecting Ghanaian Contractors. *Construction Industry Development Initiatives*. Kumasi: College of Arch. and Planning, Kwame Nkrumah University of science and Technology.
- Ogbebor, P.O. (2002). Enhancing Indigenous Construction Industry as a National Goal in Nigerian Development. In I., Akintunde, *Nigerian Construction Industry: Past, Present, Problems and Prospects*, Ibadan: Ibadan University Printery, p.230-239.
- Onuka, A.O.U., Ajayi and Kassim O. (2012). Reflects of Manpower Development on Workers Job Performance. *European journal of Educational Studies*. 4(3),pp 423432.
- Oseni F. A (2002). Need to Revive Our National Development Plans. In I., Akintunde, *Nigerian Construction Industry: Past, Present, Problems and Prospects* (p.1755).Ibadan: Ibadan University Printery.
- Palaneeswaran, E., Kumaraswamy, M., Ng, T., & Lam, K. (2007). Reinforcing Lowest Priced-Based Contractor Selections-a Reinvention Perspective, *Proceedings of Symposium: Building across Borders Built Environment Procurement, CIB W092 Procurement Systems*. Hunter Valley, Australia, 23-26 September, pp. 192-200.
- Pilcher, R. (1992). *Principles of Construction Management* (3rd ed.). England: McGrawHill.
- ProInvest. (2011). *Critical Review of the Kenyan Construction Industry*. Nairobi. Retrieved 1 26, 2015, from www.iqskkenya.org/The-Kenyan-Construction-Industry.
- Proverbs, D.G. (1998). *A Best Practice Model For High-Rise In Situ Concrete Construction Based On French, German and Uk Contractor Performance Measures*, PhD Thesis, University of Wolverhampton, Wolverhampton.
- Rafee M.M. (2012). Craft Skills availability in the Nigerian Construction Industry. *Journal of the Nigerian Association of Engineering Craftsmen*, Vol. 7; 8-12.
- Rahman, A.R. (2013). Significant Factors Causing Cost Overruns in Large Construction Projects in Malaysia, *Journal of Applied Sciences*, 13(2), 286-293. Publisher: Asian Network for Scientific Information.
- Ramachandra, T. (2013). *Exploring Feasible Solutions to Payment Problems in the Construction Industry in New Zealand*. Auckland University of Technology. Auckland: AUT.
- Rose, K.H. (1995). A PM model, *Quality Progress*, 56(78), 63-66.

- Sambasivan, M. and Yau W.S., (2007). Causes and Effects of Delays in Malaysian Construction Industry, *international Journal of project management*, 25(5) (2007) pp517-526.
- Siti, J. S., and Rosli, R. A. (2010). Contractor's Right of Action for Late Or Non-Payment by the Employer. *Journal of Surveying, Construction & Property*, 1(1), 65-95.
- Sweis, G., Sweis, R., Hammad, A.A. and Shboul, A. (2008). Delays in construction projects: The case of Jordan. *International Journal of Project Management* 26(6): pp. 665- 674.
- Tao, L., and Kumaraswamy, M. (2012). Unveiling Relationships between Contractor Inputs and Performance Outputs, *Construction Innovation*, 12(1), 86-98.
- Tawiah, O. (1999). Factors Affecting the Performance of Ghanaian Owned Construction Firms. Thesis submitted to the Department of Building Technology, Kwame Nkrumah University of Science and Technology. Kumasi.
- Tawil, N. M., Khoiry M .A, Arshad, I. , Hamzah, N. , Jasri, M. F. & Badaruzzaman, W. H. W. (2013). Factors Contribute To delay Project Construction in Higher Learning Education, Case Study UKM, *Research Journal of Applied Sciences, Engineering and Technology*, 5 (11), 3112-3116.
- The Business Roundtable (1994). CICE. The Next Five Years and Beyond. New York, The Business Roundtable.
- Thomas, H., & Ellis, R.J.R. (2007). What is a Contract? Interpreting Construction Contracts. \UNRWA (2000). Projects Completion Reports, UNRWA, Gaza.
- Tran, H., and Carmichael, D. G. (2013). A contractor's classification of owner payment practices. *Engineering, Construction and Architectural Management*, 20(1), 2945.
- Tran Q. and Tian Y. (2013). Organizational Structure: Influencing Factors and Impact on a Firm, *American Journal of Industrial and Business Management*, Vol. 3 No. 2, pp. 229-236
- Trendle, B. (2008). Skill and labour shortages - definition, cause and implications. Department of Education, Training, and the Arts. Retrieved from <http://resources/employers/pdf/wp54-skilllabour-shortages.pdf>
- Ubani E. C. (2012). Evaluating The Effects Of Organizational Structure On The Effective Delivery of Civil Engineering Projects, *Interdisciplinary Journal Of Contemporary Research In Business*. Vol 4, No 6
- Uff, J. (2009). *Construction Law* (10 ed.). London: Thomson Reuters UNRWA, (2007). Projects completion reports, UNRWA, Gaza UNRWA, (2006). Projects Completion Reports,

- UNRWA. Usman, N.D; Inuwa, I.I; Iro, A.I and Dantong, J.S. (2012). Training of Contractors Craftsmen for Productivity Improvement in the Nigerian Construction Industry. *Journal of Engineering and Applied Science*, Volume 4, December 2012.
- Vulink, M. (2004). *Technology Transfer in the Construction Industry of Ghana*. Department of Technology and Innovation Policies, Technische Universiteit Eindhoven, Eindhoven.
- Walton C.R. (1986), A Vision-Led Approach to Management Restructuring. *Organisational Dynamics*, 14(4), 5-17
- Wang, E. (2010). *Introduction to Environmental Impact Assessment*. Routledge, London.
- Winfred, A. (2011). Introducing a Subject Matter Expert–Based Utility Analysis Approach to Assessing the Utility of Organizational Interventions Such as Crew Resource Management Training, *The International Journal of Aviation Psychology*, Volume 21, Issue 2, 201.
- World Bank. (2004). *Infrastructure Assessment, Finance, Private Sector Infrastructure Group, Middle East and North Africa*.
- World Bank. (2011). *World Bank group Infrastructure strategy update- issues and concept note (CODE 2011-0030/1, June 15, 2011)*
- Xiao, H. and Proverbs, D. (2003). Factors influencing contractor performance: an International investigation. *Construction and Architectural Management*, 10(5), pp322-332.
- Yinghui B and Cheng. Eng G. (2004). *The Impact of Organizational Structure on Project. Performance; html; (the impact Organizational Structure Project)*

APPENDICES

: Questionnaire

ST.MARY'S UNIVERSITY

School of Graduate Studies

FACTOR AFFECTING PERFORMANCE OF ROAD PROJECT: THE CASE OF DICHOTO JUNCTION~ELIDHAR~BELHO RIGID PAVEMENT DESIGN AND BUILT ROAD PROJECT

Survey questionnaire on FACTOR AFFECTING PERFORMANCE OF ROAD PROJECT

Dear Respondent!

We refer to the above subject matter and hereby confirm that I am second year MA in **Project Management** student of the above name institution, carrying out term paper for academic purposes. All responses given in this regard will be handle district confidence.

Your understanding and co-operation are being solicited for providing all necessary information needed to accomplish the objective of this study.

Prepared by:- Biruk Assefa

Section A: General Information

1. What is your Gender?

Male Female

2. Position

Team leader Project manager
 Site engineer Office engineer

3. Age in years:

20 – 30 31 – 40
 41 – 50 Greater than 50

4. Indicate your Level of Education

Diploma Degree Post Graduate

5. Experience in the road sector:

<5 5-10 10-15 >15

Section B: Skilled Manpower and Project Performance

6. Indicate the level of agreement on influence of availability of skilled manpower on performance of contractors in road projects. React on the items provided by using the likert scale given. Please tick (√) appropriately: 1=Strongly Disagree (SD) (1); 2=Disagree (D); 3= Neutral (N); 4= Agree (A); 5=Strongly Agree (SA)

S.NO	Descriptions	SD (1)	D (2)	N (3)	A (4)	SA (5)
1.1	Availability of skilled & semi-skilled labour helps to expedite the achievement of project goals hence performance of contractors.					

<i>S.NO</i>	<i>Descriptions</i>	<i>SD (1)</i>	<i>D (2)</i>	<i>N (3)</i>	<i>A (4)</i>	<i>SA (5)</i>
1.2	Lack of semi & skilled labour delays or stalls altogether the performance					
1.3	Skilled labour provides quality performance of construction projects.					
1.4	Skilled labour saves wastefulness of resources during construction of roads					

7. How significant are the following challenges on skilled manpower in road construction projects you have been involved? Please tick (√) appropriately: React on the items provided by using the likert scale given. Please tick (√) appropriately: 1=Strongly Disagree (SD) (1); 2=Disagree (D); 3= Neutral (N); 4= Agree (A); 5=Strongly Agree (SA)

<i>S.NO</i>	Challenges in skilled manpower	<i>SD (1)</i>	<i>D (2)</i>	<i>N (3)</i>	<i>A (4)</i>	<i>SA (5)</i>
1.1	Shortage of manpower					
1.2	Lack of financial resources					
1.3	Cost of manpower development					
1.4	Lack of appreciation to the role of manpower development					
1.5	Lack of training programme					
1.6	High labour turnover					

<i>S.NO</i>	Challenges in skilled manpower	<i>SD (1)</i>	<i>D (2)</i>	<i>N (3)</i>	<i>A (4)</i>	<i>SA (5)</i>
1.7	Low level of education					

SECTION C: Organization Structure and Project performance

8. Indicate your level of agreement to the statement below relating to organization structure and its influence on contractors performance in Road Construction Projects. Please tick (√) appropriately: React on the items provided by using the likert scale given. Please tick (√) appropriately: 1=Strongly Disagree (SD) (1); 2=Disagree (D); 3= Neutral (N); 4= Agree (A); 5=Strongly Agree (SA)

<i>S.NO</i>	Description	<i>SD (1)</i>	<i>D (2)</i>	<i>N (3)</i>	<i>A (4)</i>	<i>SA (5)</i>
1.1	Poor performance has been attributed to lack of proper coordination among stakeholders in roads construction contracts					
1.2	Coordination among departmental heads in a construction firm improve firm productivity					
1.3	Individual members and teams should be involved in decision making					
1.4	Task allocation should be carried out efficiently in order to improve contractor productivity hence performance.					
1.5	Construction related performance problems includes costs associated with delays, claims, wastages and					

<i>S.NO</i>	Description	<i>SD (1)</i>	<i>D (2)</i>	<i>N (3)</i>	<i>A (4)</i>	<i>SA (5)</i>
	rework					
1.6	Effective communication and fast information transfer between managers and participants help to accelerate the road construction process and performance					
1.7	Defined work plans assist organization processes in achieving maximum performance in the interest of firms objective hence performance of construction industry					

SECTION D: Client Support and Project Performance

9. Indicate the level of agreement on influence of client support on construction of roads projects. React on the items provided by using the likert scale given. Please tick (√) appropriately: React on the items provided by using the likert scale given. Please tick (√) appropriately: 1=Strongly Disagree (SD) (1); 2=Disagree (D); 3= Neutral (N); 4= Agree (A); 5=Strongly Agree (SA)

<i>S.NO</i>	Challenges in skilled manpower	<i>SD (1)</i>	<i>D (2)</i>	<i>N (3)</i>	<i>A (4)</i>	<i>SA (5)</i>
1.1	Prompt payments and approvals facilitates timely project completion					
1.2	Stakeholders involvement aids in smooth project implementation					
1.3	Irregular funds disbursements project delays and/ or stalling					

<i>S.NO</i>	Challenges in skilled manpower	<i>SD</i> (1)	<i>D</i> (2)	<i>N</i> (3)	<i>A</i> (4)	<i>SA</i> (5)
1.4	Insufficient support causes project costs overrun, disputes, arbitration costs, litigation and project abandonment					

Section E: Timely available resource and Project Performance

10. How significant are the following challenges on timely available resource in road construction projects you have been involved? Please tick (√) appropriately: React on the items provided by using the likert scale given. Please tick (√) appropriately: 1=Strongly Disagree (SD) (1); 2=Disagree (D); 3= Neutral (N); 4= Agree (A); 5=Strongly Agree (SA)

<i>S.NO</i>	Description	<i>SD</i> (1)	<i>D</i> (2)	<i>N</i> (3)	<i>A</i> (4)	<i>SA</i> (5)
1.1	Insufficient supply of labour (skilled and unskilled) in road project has led to delays and increase in construction costs					
1.2	Inadequacy of modern equipment and allocation of equipment affects construction projects					
1.3	Unavailability of better quality material in in road project led to poor project performance					
1.4	Client’s emphasis on quick design and construction (Inadequate design and construction times stipulated; inadequate delivery times) has led to project performance					

Appendix B– Coding’s

No.	Code	Factor	Group
1	S1	Availability of skilled & semi- skilled labour helps to expedite the achievement of project	Skill man power related factor
2	S2	Lack of semi & skilled labour delays or stalls altogether the performance	
3	S3	Skilled labour provides quality performance of	
4	S4	Skilled labour saves wastefulness of resources during construction of roads	
5	S5	Shortage of manpower	
6	S6	Lack of financial resources	
7	S7	Cost of manpower development	
8	S8	Lack of appreciation to the role of manpower	
9	S9	Lack of training programme	
10	S10	High labour turnover	
11	S11	Low level of education	
12	O1	Poor performance has been attributed to lack of proper coordination among stakeholders in roads	Organizational structure Related Factors
13	O2	Coordination among departmental heads in a construction firm improve firm productivity	
14	O3	Individual members and teams should be involved in decision making	
15	O4	Task allocation should be carried out efficiently in order to improve contractor productivity hence	
16	O5	Construction related performance problems includes costs associated with delays, claims,	
17	O6	Effective communication and fast information transfer between managers and participants help to accelerate the road construction process and	
18	O7	Defined work plans assist organization processes in achieving maximum performance in the interest of firms objective hence performance of	
19	C1	Prompt payments and approvals facilitates timely	Client support related factor
20	C2	Stakeholders involvement aids in smooth project	
21	C3	Irregular funds disbursements project delays and/	

22	C4	Insufficient support causes project costs overrun, disputes, arbitration costs, litigation and project	
23	T1	Insufficient supply of labour (skilled and unskilled) in road project has led to delays and increase in construction costs	Timely available resource Factors
24	T2	Inadequacy of modern equipment and allocation of equipment affects construction projects	
25	T3	Unavailability of better quality material in in road project led to poor project performance	
26	T4	Client's emphasis on quick design and construction (Inadequate design and construction	

Appendix C - Cronbach's Alpha Test Result and Multiple regression analysis

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.756	.743	26

Item Statistics

	Mean	Std. Deviation	N
Availability of skilled & semi- skilled labour helps to expedite the achievement of project goals hence performance of contractors will affect the performance of road project in DCE	2.0889	.66818	45
Lack of semi & skilled labour delays or stalls altogether the performance will affect the performance of road project in DCE	3.6222	.71633	45
Skilled labour provides quality performance of construction projects will affect the performance of road project in DCE	3.7333	.65366	45
Skilled labour saves wastefulness of resources during construction of roads will affect the performance of road project in DCE	3.3333	.60302	45
Shortage of manpower will challenge skilled man power in DCE	3.5778	.58344	45
Lack of financial resources will challenge skilled man power in DCE	3.2667	.61791	45

Cost of manpower development will challenge skilled man power in DCE	3.1333	.89443	45
Lack of appreciation to the role of manpower development will challenge skilled man power in DCE	3.9111	.51444	45
Lack of training programme will challenge skilled man power in DCE	3.6889	.59628	45
High labour turnover will challenge skilled man power in DCE	3.7333	.57997	45
Low level of education will challenge skilled man power in DCE	3.1111	.64745	45
Poor performance has been attributed to lack of proper coordination among stakeholders in roads construction contracts will affect the performance of road project in DCE	3.2889	.72683	45
Coordination among departmental heads in a construction firm improve firm productivity will affect the performance of road project in DCE	3.5111	.69486	45
Individual members and teams should be involved in decision making will affect the performance of road project in DCE	3.7556	.52896	45
Task allocation should be carried out efficiently in order to improve contractor productivity hence performance will affect the performance of road project in DCE.	3.3556	.60886	45
Construction related performance problems includes costs associated with delays, claims, wastages and rework will affect the performance of road project in DCE	3.5556	.72474	45
Effective communication and fast information transfer between managers and participants help to accelerate the road construction process and performance will affect the performance of road project in DCE	3.8444	.70568	45

Defined work plans assist organization processes in achieving maximum performance in the interest of firms objective hence performance of construction industry will affect the performance of road project in DCE	3.6444	.57031	45
Prompt payments and approvals facilitates timely project completion will affect the performance of road project in DCE	3.3556	.64511	45
Stakeholders involvement aids in smooth project implementation will affect the performance of road project in DCE	3.5333	.54772	45
Irregular funds disbursements project delays and/ or stalling will affect the performance of road project in DCE	3.2000	.54772	45
Insufficient support causes project costs overrun, disputes, arbitration costs, litigation and project abandonment will affect the performance of road project in DCE	3.1778	.61381	45
Insufficient supply of labour (skilled and unskilled) in road project has led to delays and increase in construction costs will affect the performance of road project in DCE	3.2889	.54864	45
Inadequacy of modern equipment and allocation of equipment affects construction projects will affect the performance of road project in DCE	3.6444	.71209	45

Unavailability of better quality material in in road project led to poor project performance will affect the performance of road project in DCE	3.4444	.50252	45
Client's emphasis on quick design and construction (Inadequate design and construction times stipulated; inadequate delivery times) has led to project performance will affect the performance of road project in DCE	3.5333	.54772	45

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Availability of skilled & semi- skilled labour helps to expedite the achievement of project goals hence performance of contractors will affect the performance of road project in DCE	87.2444	34.007	.467		.736
Lack of semi & skilled labour delays or stalls altogether the performance will affect the performance of road project in DCE	85.7111	32.756	.588		.727
Skilled labour provides quality performance of construction projects will affect the performance of road project in DCE	85.6000	35.836	.233		.751
Skilled labour saves wastefulness of resources during construction of roads will affect the performance of road project in DCE	86.0000	37.864	-.018		.765

Shortage of manpower will challenge skilled man power in DCE	85.7556	34.643	.452		.739
Lack of financial resources will challenge skilled man power in DCE	86.0667	33.836	.539		.733
Cost of manpower development will challenge skilled man power in DCE	86.2000	31.255	.604		.721
Lack of appreciation to the role of manpower development will challenge skilled man power in DCE	85.4222	36.795	.165		.754
Lack of training programme will challenge skilled man power in DCE	85.6444	35.507	.314		.747
High labour turnover will challenge skilled man power in DCE	85.6000	34.291	.510		.736
Low level of education will challenge skilled man power in DCE	86.2222	34.813	.374		.743
Poor performance has been attributed to lack of proper coordination among stakeholders in roads construction contracts will affect the performance of road project in DCE	86.0444	33.043	.541		.730
Coordination among departmental heads in a construction firm improve firm productivity will affect the performance of road project in DCE	85.8222	35.422	.264		.750

Individual members and teams should be involved in decision making will affect the performance of road project in DCE	85.5778	37.159	.101		.758
Task allocation should be carried out efficiently in order to improve contractor productivity hence performance will affect the performance of road project in DCE.	85.9778	34.249	.487		.736
Construction related performance problems includes costs associated with delays, claims, wastages and rework will affect the performance of road project in DCE	85.7778	35.449	.245		.751
Effective communication and fast information transfer between managers and participants help to accelerate the road construction process and performance will affect the performance of road project in DCE	85.4889	37.483	.013		.766
Defined work plans assist organization processes in achieving maximum performance in the interest of firms objective hence performance of construction industry will affect the performance of road project in DCE	85.6889	37.856	-.013		.764
Prompt payments and approvals facilitates timely project completion will affect the performance of road project in DCE	85.9778	36.886	.101		.759
Stakeholders involvement aids in smooth project implementation will affect the performance of road project in DCE	85.8000	36.164	.247		.750
Irregular funds disbursements project delays and/ or stalling will affect the performance of road project in DCE	86.1333	35.800	.304		.747
Insufficient support causes project costs overrun, disputes, arbitration costs, litigation and project abandonment will affect the performance of road project in DCE	86.1556	37.816	-.014		.765

Insufficient supply of labour (skilled and unskilled) in road project has led to delays and increase in construction costs will affect the performance of road project in DCE	86.0444	35.043	.423		.741
Inadequacy of modern equipment and allocation of equipment affects construction projects will affect the performance of road project in DCE	85.6889	35.765	.214		.753
Unavailability of better quality material in in road project led to poor project performance will affect the performance of road project in DCE	85.8889	38.919	-.172		.770
Client's emphasis on quick design and construction (Inadequate design and construction times stipulated; inadequate delivery times) has led to project performance will affect the performance of road project in DCE	85.8000	35.936	.282		.749

Assumption Analysis of multiple regression

Assumption #1: The relationship between the IVs and the DV is linear. Scatterplots show that this assumption had been met.

Assumption #2: There is no multicollinearity in your data. Analysis of collinearity statistics show this assumption has been met, as VIF scores were well below 10, and tolerance scores above 0.2

Coefficients							
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF

	(Constant)	1.508	1.131			0.001		
1	Skilled man power	0.481	0.228	0.231	2.110	0.002	0.34	1.54
2	Organizational	0.347	0.127	0.217	2.732	0.003	0.50	2.55
3	Client support	0.416	0.115	0.316	3.617	0.001	0.26	1.25
4	Timely availability of construction resource	0.267	0.103	0.125	2.592	0.000	0.22	2.11

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. Change	
1	.889 ^a	.79	.736	.32561	.79	7.331	1	43	.010	1.713

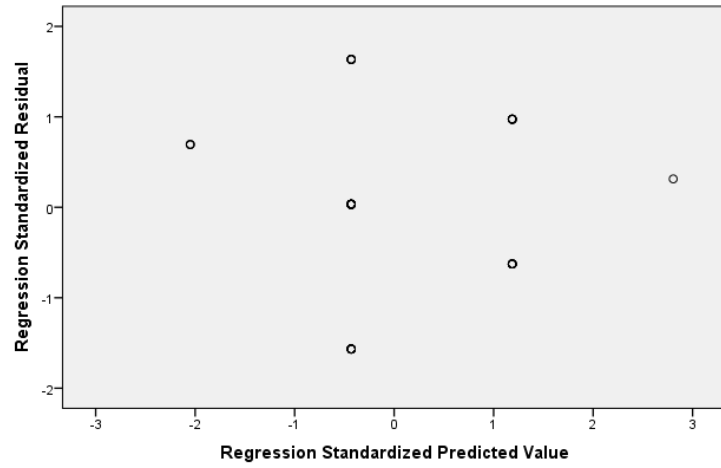
a. Predictors: (Constant), Skilled man power, Organizational structure, Client support, Timely availability of construction resource

b. Dependent Variable: performance of road projects in DCE.

Assumption #4: The variance of the residuals is constant. Our plot of standardized residuals vs standardized predicted values showed no obvious signs of funneling; suggesting the assumption of homoscedasticity has been met.

Scatterplot

Dependent Variable: Performance of road projects in DCE



DECLARATION

I, the undersigned, declare that this thesis is my original work, prepared under the guidance of Temesegen Belayneh (Dr.). All sources of material used for this thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institutions for the purpose of earning any degree.

Biruk Assefa Negeya

Name

Signature

St. Mary's University College, Addis Ababa

May, 2019

ENDORSEMENT

This thesis has been submitted to St. Mary's University College, School of Graduate Studies for the examination with my approval as a university advisor.

Advisor

Signature

St. Mary's University College, Addis Ababa May, 2019