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*Committed to Excellence*

**DEPARTMENT OF PROJECT MANAGEMENT**

**FACTORS AFFECTING THE PERFORMANCE OF  
LOCAL CONTRACTOR ON ROAD PROJECTS IN  
ETHIOPIA**

**BY:  
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**JUNE, 2022  
ADDIS ABABA, ETHIOPIA**

**ST. MARY UNIVERSITY  
SCHOOL OF GRADUATE STUDIES**

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LOCAL CONTRACTOR ON ROAD PROJECTS IN  
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**BY:  
MIHRET YAI**

**A THESIS SUBMITTED TO ST, MARY UNIVERSITY SCHOOL  
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THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF  
ARTS IN PROJECT MANAGEMENT**

**ADVISOR: MOHAMMED M. (Ass. Prof)**

**JUNE, 2022  
ADDIS ABABA, ETHIOPIA**

## **DECLARATION**

I declare that this thesis entitled "FACTORS AFFECTING THE PERFORMANCE OF LOCAL CONTRACTORS ON NEW ROAD PROJECTS IN ETHIOPIA" is the outcome of my own effort and study. All sources of materials used for the study have been duly acknowledged. I have produced it independently except for the guidance and suggestion of the research advisor. This study has not been submitted for any degree in this University or any other University.

**Candidate:**

**Mihret Yai**

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Signature

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Date

## **ENDORSEMENT**

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

Mohammed M (Ass. Prof)

Advisor

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Signature & Date

## BOARD OF EXAMINERS

This is to verify that the thesis prepared by MIHRET YAI entitled “FACTORS AFFECTING THE PERFORMANCE OF LOCAL CONTRACTORS ON NEW ROAD PROJECTS IN ETHIOPIA” and submitted in partial fulfillment of the requirements for the Degree of Master of Arts in project management. It complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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## ABSTRACT

*Most of construction projects delivered in Ethiopia, as evidences depict was not successfully executed. Several important participants in the construction industry, which has a significant impact on national economies, work to raise social living standards while also developing the construction sectors. Contractors, consultants, and owners are among the participants. Factors affecting every area of a construction project have an impact on each player's project performance. This study discovered and categorized a variety of parameters that influence contractor performance on road project. A well-structured questionnaire was used to harness information from construction stakeholders. The most common factors were evaluated by using the data collected through a survey conducted on construction project consultant, engineers, contractors, and owners. Everyone had unique thoughts on the subject, which enhanced the questionnaire. Data was analyzed using mean score and single factor analysis of variance. Most respondents agreed that financial difficulties faced by the contractor, labor shortages (of skilled, semi-skilled, or unskilled labor), and excessive owner change orders are the leading factors directly affecting contractor performance on construction projects. Changes in government regulations and laws, contractor violations of safety rules, and modifications to materials specifications ranked among the least important factors. Data from a survey of construction project, consultant engineers, contractors, and owners, were used to analyze the most prevalent reasons. Everyone had his or her own perspective on the issue, which added to the value of the survey. The majority of respondents believed that the contractors' financial issues, labor shortages (of qualified, semi-skilled, or unskilled workers), and excessive owner change orders are the most significant variables affecting contractor performance on construction projects. Changes in government regulations and legislation, contractor safety infractions, and material specification changes were among the least important reasons.*

**Keywords:** Contractor performance; road construction projects; ERA, Capital, Management skill, Organizational culture, Technical skill,

# CHAPTER ONE

## 1. INTRODUCTION

### 1.1. Background of the Study

A contract is an agreement between two or more parties to trade something of value that is legally binding. Construction is regarded as one of the industries that contribute to national prosperity (Ejaz et al., 2013). Building contracts, which are usually based on monetary transactions, impose contractual and legal responsibilities on both parties that are difficult or impossible to remove (Thomas and Ellis, 2007). A client hires a contractor to carry out a contract and complete a project within a particular period. However, some construction projects need resources that contractors cannot offer; in these circumstances, subcontractors are used.

As Cheng and Huang (2012) discovered, one of the most important aspects in contractor performance is how the contractor collaborates with subcontractors. Because the construction sector is becoming more competitive every day, every company must evaluate its performance (Kulatunga et al., 2005). Performance evaluation has evolved into an organization's language of progress (Rose, 1995). There can be no improvement in any firm until we measure its performance (Baldwin et al., 2001). Performance measurement, according to Neely (1998), is the process of quantifying previous activities, where measurement is the quantification process and past actions affect current performance.

We must evaluate contractor performance and the elements that influence it during the building process. A wide range of performance indicators may be used to explore and assess project performance, including time, cost, quality, client satisfaction, client changes, and health and safety (Cheung et al., 2004; DETR, 2000). Many researches have looked at the elements that influence contractor performance in developing countries. Construction delays in the United Arab Emirates have been blamed on a lack of labor skills, inadequate supervision and site management, ineffective leadership, and equipment failure, according to Faridi and El Sayegh (2006). Hanson et al. (2003) investigated the causes of client discontent in the South African construction sector and discovered that poor workmanship and contractor incompetence were the most common factors affecting project performance, and thus contractor performance.

Furthermore, Gharakhani et al. (2013) discovered that customer happiness is one of the elements influencing contractor performance and reputation. Zulu and Chileshe (2008) looked at contractor performance in Zambia and found it to be below expectations, claiming that there is little to be gained from local current projects that are not finished or are behind schedule. They concluded that bad contractor performance has a significant impact on competitiveness. The construction business, according to Enshassi et al. (2009), is complicated because it involves a significant number of parties such as owners (or clients), contractors, consultants, stakeholders, and regulators.

UNRWA (2006) found that local construction projects in Palestine suffered from poor performance, particularly poor contractor performance for a variety of reasons, including a lack of materials, excessive design and drawing amendments, poor coordination among respondents, ineffective monitoring and feedback, and a lack of leadership skills.

## **1.2. Statement of the Problem**

In Ethiopia's road construction sector, a number of factors influence contractor performance. Contractor performance is frequently the difference between a successful project, which shows excellent contractor skills and site management, and a failure, which represents the contractor's lack of expertise and poor worker communication skills. Several engineering strategies may be used to eliminate or improve any issue that has a negative or positive impact on contractor performance.

A construction project is commonly acknowledged as successful, when it is completed on schedule and within the agreed budget, with the highest quality and in the safest manner, in accordance with the specifications and to stakeholders' satisfaction. Delays occur in every construction project and the significant of these delays varies considerably from project to project. Construction delays are disruptive and expensive. The six significant factors found to be contributing to delays in building and civil engineering works are unforeseen ground conditions, poor site supervisions, low speed of decision making involving all project teams, client initiated variations, necessary variations of work, and inadequate contractor. **(Takim, R., & Akintoye, A. (2012), Mansfield, N. R., Ugwu, O. O. and Doran, T. (2004))**

Construction delay defined as “time over run either beyond completion date specified in a contract or beyond the date that parties agree upon for delivery of a project.” It is slipping over its planned schedule and is considered as common problem in construction projects. Delay in construction project completion is a global phenomenon that occurs in the construction industry and considered as one of the most common problems causing a multitude of negative effects on the project and its participating parties especially where the government projects are concerned and in the construction industry of Ethiopia is no exception **(Tilahun Sh. 2016)**

In Ethiopia, the construction industry is the highest recipient of government budget in terms of government development program. Consequently, public construction projects consume an average annual rate of nearly 60% of the government’s capital budget. Construction delays are occurring in every phase of a construction project and are common problems in construction projects in Ethiopia. The study shows that in Ethiopia only 8.25% projects have been finished to the original targeted completion date. The remaining 91.75% delayed 352% of its contractual time **(Worku H et al 2016)**

In Ethiopia, problems related to project performance has been a subject of concern and many road construction projects were not completed within estimated cost, time, quality and scope. It is common to see unfinished, terminated, abandoned and delayed projects, costs over the allocated budget and below the required quality.

Problems related to the performance of consultants have been identified as a major obstacle in managing projects on time, within the budget and to an acceptable quality standard. Moreover, the contractors’ performance on ongoing projects, it is often the case that performance has been less than expectation. This can cause substantial delays, escalation in costs and a challenge for the implementing authorities (ERA, 2014).

According to (Ofori, 2006), the construction sector in developing nations has failed to fulfill government, customer, and societal standards. The Ethiopian construction sector, like that of other developing nations, has many of the same difficulties and challenges that other developing countries face, but with more intensity. Given the crucial role played by the construction industry in Ethiopia and other developing nations, as well as the sector's poor performance in those countries, increasing the industry's performance should be a top priority.

Ethiopia Roads Authority is in charge of the management and construction of asphalt and gravel-surfaced roads in Ethiopia's capital. Since 1998 E.C., the authority has been in charge of executing and overseeing road development projects. Since its inception, the Authority has made significant progress in the expansion and new of city roadways.

However, the corporation has faced difficulties in completing projects on time and to the anticipated quality level. Schedules and budgets are regularly missed, and deliverable technical requirements fall short of expectations. Scholars, on the other hand, suggest that in order to increase project performance, the causes for project success must first be discovered.

According to the research (ERA, 2016), project completion is one of the most essential components of successful projects, as it helps to reduce difficulties for all parties involved and opens up new opportunities to build connected initiatives. It also aids in the growth and profitability of the building sector. The first ten years of the Road Sector Development Program have revealed that the majority of road projects have resulted in cost and timing overruns.

Furthermore, according to a study conducted by (Zewdu Siraw, 2016), Addis Ababa City Roads Authority fell short of achieving what was planned in all Ethiopian calendar years between 2000 and 2005, with 80% of the projects experiencing time overrun, inefficient cost administration, and poor quality. As a result, it is critical to investigate the Factors Affecting the performance of Road Projects in Ethiopia Roads Authority in order to close the gaps described above.

Several factors affect contractor performance in the Ethiopia construction projects. Contractor performance is often responsible for either a successful project that reflects strong contractor skills and site management or a failure that reflects the contractor's lack of experience and weak communication skills among the workers. Any factor affecting contractor performance either negatively or positively can be avoided or enhanced using several engineering techniques. This study aims to identify the major internal factors affecting contractors' performance on new road projects constructed in Ethiopia.

### **1.3. Research Question**

The study will be guided by the following questions.

- Q1. What factors are affecting local contractors' performance in new road projects constructed in Ethiopia?
- Q2. What are the major constraints that challenge local contractors' performance in their manner of managing the project in terms of management, labor, resources etc.?
- Q3. What are the weaknesses of and major factors affecting contractor performance?

### **1.4. Objective of the Study**

#### **1.4.1. General Objective**

The general objective of this study is to find out the internal factors affecting local contractors' performance in new road projects constructed in Ethiopia.

#### **1.4.2. Specific Objectives**

This study aims to

1. Identify the major factors affecting local contractors' performance in new road projects constructed in Ethiopia.
2. To assess the relative importance of these factors from the contractors', clients', and consultants' perspective.
3. Identify the weaknesses of and major factors affecting local contractor performance.

### **1.5. Scope of the Study**

The scope of the thesis is limited to the internal factors related to Local contractors' performance of Grade 1 working on new road projects administered by ERA from July 2016 to June 2021 (5 years plan). The research was done in road projects in Somali regional state and Amhara regional state. Contractors, Client, and Consultants working on road projects carried out in the Somali and



Amhara regional states are considered for the study. The target respondents were professionals working on road construction projects.

## **1.6. Limitation of the Study**

The study has faced some challenges. The target respondents from the consultant and contractor were far away on a field work which makes it difficult to hand out the questionnaire. Thus, the questionnaire was sent via email. Few respondents were reluctant in providing critical information due to reprisal. The support letter from the school has played a vital role in obtaining the critical information. Last but not least, most of the respondents were unable to fill the questionnaire in one sitting and the challenge was overcome by frequent phone call exchanges with respondents.

## **1.7. Significance of the Study**

The main purpose of this research is to propose guidelines by which any organization dealing with a contractor may know what does and does not affect local contractor performance in road sector and thus what to do and not to do. This study can be used to help firms improve contractor performance: knowing what is wrong with contractor performance enables the appropriate reshaping of the relevant factors. Understanding that there are several viewpoints on contractor performance the contractor's, consultants, and owners will make it easier to determine which factors affect performance positively and negatively. A statistical analysis will be conducted on the factors that may affect contractor performance, revealing agreements and disagreements among groups concerning which factors have the ultimate effect. This study shows the differences among the working segments in Ethiopia road construction project regarding that issue.

## **1.8. Organization of the Paper**

The study is organized in the following ways: Chapter one contains a background to the study, the research problem, research objectives and questions, significance and scope of the study. Chapter two consisting review of related literatures those are theoretical, empirical review and conceptual framework, and so forth. Chapter three describes the research "methodology"

population, sample size with appropriate sampling method design that are used in the study. Chapter four includes the results from the study, analysis and integration of theory with empirical data. Finally, Chapter five includes the conclusions from the study, a summary of the findings and recommendations.

## **1.9. Definitions of Basic Terms and Concepts**

### **Contractor**

Independent entity that agrees to furnish certain number or quantity of goods, material, equipment, personnel, and/or services that meet or exceed stated requirements or specifications, at a mutually agreed upon price and within a specified timeframe to another independent entity called principal, or project owner.

### **Local contractors:**

Local contractors are contractors who perform construction works inside their country of origin.

### **Performance:**

The accomplishment of a given task measured against preset known standards of accuracy, completeness, cost, and speed. In a contract, performance is deemed to be the fulfillment of an obligation, in a manner that releases the performer from all liabilities under the contract.

### **Performance indicator(s):**

A particular value or characteristic used to measure output or outcome. These are parameters useful for determining the degree to which an organization has achieved its goals. A quantifiable expression used to observe and track the status of a process. The operational information that is indicative of the performance or condition of a facility, group of facilities, or site.

### **Performance management:**

The use of performance measurement information to help set agreed-upon performance goals, allocate and prioritize resources, inform managers to either confirm or change current policy or program directions to meet those goals, and report on the success in meeting those goals.

**Performance measurement:**

A process of assessing progress toward achieving predetermined goals, including information on the efficiency with which resources are transformed into goods and services (outputs), the quality of those outputs (how well they are delivered to clients and the extent to which clients are satisfied) and outcomes (the results of a program activity compared to its intended purpose).

**Infrastructure:**

Infrastructure is the basic physical and organizational structure needed for the operation of a society or enterprise, or the services and facilities necessary for an economy to function. It can be generally defined as the set of interconnected structural elements that provide a framework supporting an entire structure of development. It is an important term for judging a country or region's development.

## **CHAPTER TWO**

### **2. LITERATURE REVIEW**

#### **2.1. Theoretical Review**

The construction industry is truly the engine of national economy through which the total of physical development is achieved. The construction industry is a vital element of the economy and has a significant effect on the efficiency and productivity of other industry sectors. One cannot think of widespread investment in manufacturing, agriculture, or service sectors unless the construction results of infrastructure facilities are in place. In some of the developing countries, the growth rate of construction activity exceeds that of population and of GDP (Chitkara, 2004).

##### **2.1.1. Definition of Project**

A project is a group of tasks, performed in a definite time period, in order to meet specific set of objectives. It is likely to be a one-time, has a life cycle with a specific start and end date, and it has budget and likely to require the use of multiple resources, most of which may be scarce and have to be shared among others. It may require the establishment of a special organization or the crossing of traditional organizational boundaries (Harvey, 1999) and (Smith, 2003) define a project as a group of activities undertaken to meet one or more specific objectives. The project objectives could include solving a problem of potholes in the roads. Projects are often divided into smaller components or activities, usually based on technical and functional disciplines.

##### **2.1.2. Measures of Project Success**

According to the (PMBOK, 2013) Guide, since projects are temporary in nature, the success of the project should be measured in terms of completing the project within the constraints of scope, time, cost, quality, resources, and risk as approved between the project managers and senior management (PMBOK, 2013). For a project to be successful, it is essential to understand the project requirements right from the start and go for project planning which provides the right

direction to project managers and their teams and execute the project. A successful project is one that is delivered on time and managed within the budget.

The traditional view of project success is to accomplish all of the schedule, budget, and technical objectives as planned (Harvey, 2002). Ideally projects were considered totally successful if it gets completed on time, within budget and performs exactly to the designer's specifications. These three variables define the overall goals of a project; therefore, any project that is "on time, on budget, high quality" is declared a success. The difficulty, however, exists in their relationship to one another (Versuh, 2003).

### **2.1.3. Project Success Criteria**

Road project objectives in Ethiopia are beyond the traditional Golden Triangle of time, cost and quality. Project objectives vary along four dimensions: Different stakeholders have different objectives (client and contractors are not the only ones worth considering) and objectives change for each major phase in project life cycle and also they have a ranked dimension (Versuh, 2003).

Objectives vary with type of projects that could be different ownership and motive, necessity, opportunity, reputation and research. Trade-off among project objectives is usually necessary. According to (Versuh, 2003) some of the success criteria for the success of projects are the following.

- Cost and time should be included, especially if project is not completed. Since many of projects in AACRA are characterized by cost overrun and delays, the inclusion of this criterion is paramount for projects success.
- Meet initial project technical specifications. Quality is usually compromised and hence quality assurance, in our opinion, can only be made by adherence to initial specification.
- Meet project objectives or project contributes to strategic, tactical and operational goals of the consultant Client's/Contractor's company both financially and technically.
- Satisfaction of user, project team, contractor, client and organization and donor organizations.

Other criteria are also relevant even if they may not entertain much compromise. As (Harvey, 2002), personal growth, evaluation of quality of technical management process, separate product

evaluation in terms of maintainability, and durability are some other types of the success of projects. The definition of project success is subjective. However, it is related to the degree of achievement of the project success criteria stated above.

#### **2.1.4. Construction Project**

As (ChitKara, 2005) construction projects“ as high- value, time bound, and special construction missions with predetermined success objectives. Construction project development involves numerous parties, various processes, different phases and stages of work and a great deal of input from the public and private sectors (Wang, 1994).

#### **2.1.5. Who are the Construction Projects Participants?**

According to studies the following are among the active participants of any construction projects.

**Construction clients:** - Studies indicate that little attention is given to the clients in the construction industry and there is a paucity of research that allows one to better understand the key roles of clients. (Chuan, 2006) argue that poor project success may not necessarily be due to the incompetence of anyone else but the client’s actions before, during and after the project.

**Construction consultants:** -The nature of the tasks assigned by the clients to consultants varies (Chitkara, 2005) but generally consists of Project feasibility engineering investigations, coordination of designs and drawing works. They also estimate, plan; budge; prequalify construction agencies; and award contracts to the successful bidders; designing project organizations for executing works and developing standard operating procedures and systems; developing detailed construction plans; supervising works; including administration of contracts and controlling of project time, cost, quality and scope management. These are the activities that determine the future actions and success.

**Contractors:** - Construction contractors play an important role in the construction projects as they execute most of the construction works. A competent construction contractor is one of the indispensable conditions of a proper process and completion of a construction project according to (Xiaohong, 2011).

### **2.1.6. Capital in Construction Projects**

It is believed that funds play a crucial role in implementation and financing of projects, adequately funded road projects are completed on time and limited costs are involved. On the other hand, poorly funded road projects are more likely to delay in completion time; this exposes them to huge costs which might eventually lead to project success. concluded that availability of adequate funds a factor which affect success of road development projects in developing economies since most of them cannot be able to finance road projects on Other sources of funds for road construction projects include loans, donations, grants among others. (Kamau, 2013) further emphasizes that one of the main factors that affect road construction projects is lack of adequate finances to ensure successful implementation this causes delays of project completion, which attracts more costs and thus affect negatively on project success.

In addition, the most successful projects are adequately funded. He argues that with enough finances it is easier to come up with a strategic plan, which acts as a guide on how the activities of the projects were implemented and the cost that were involved. This also includes a time frame that dictates the time that each activity will take and the project implementers. These activities however cannot be successfully deliberated without an adequate allocation of finances (Gundry and Welsch, 2011).

### **2.1.7. Managerial Skills in Construction Projects**

Management as the act or skill of controlling and directing the affairs of a business, managerial skills are personality and traits that are utilized by the management to execute a task. The manner in which the management utilizes their skills and knowledge is critical in the implementation of projects. The management team in charge of making decisions and implementation policies for the implementation of road projects. Management is challenging tasks that require skills to accomplish. According to (Money, 2010) there are three sets of managerial skills that are needed to perform managerial roles; conceptual skills, human relations skills and technical skills. Conceptual skill can be described as the capability of the management to visualize the organization as a whole.

This skill enables the management to identify the causes of the problems and devise ways of solving such kind of problems. They are needed by the management team since they spend most of their time in planning, organizing and solving problems in the organization. Human relations skills are also called interpersonal skills. It is described as the capability to work with individuals. It aids the managers in understanding, communicating and working with employees. This enables them to lead, inspire and encourage the employees in project implementation. Technical skills are the capability to accomplish a task. These skills aid the management team to use various procedures and techniques in project execution (Rwigema, 2014).

The top management plays an essential role in facilitating implementation of road construction projects. Management of projects is not an easy task. It requires a competent and professional team of top management who has a relevant experience in management (Deakins, 2013). A competent management team is able to communicate effectively, plan and facilitate projects implementation.

(Mashud, 2010) recommended that top management should be able to manage their time effectively, through training, planning, delegating, aligning management strategies, organizing meetings and making maximum use of available time.

### **2.1.8. Organizational Culture**

As it is clearly, explained in (Parker and Bradley, 2011) organizational culture involves norms, values and beliefs that translate into behavior that guide social and psychological setting of an environment. Culture is characterized by sharing values, and principles between employees in the organization. It is a product of so many factors that entail strategy, employee productivity and management styles.

It also includes organizational vision, values, norms, symbols, systems, language, assumptions, beliefs and habits. Culture is considered as an important factor during projects implementation. It defines appropriate behavior on how the employees and the project implementers relate and interact during project implementation. The cultural setting of an organization may influence the employees' performance. A supportive culture unites and encourages the employees to work towards similar goals (Ahadzie, 2011).



The supportive role of the organizational culture in cultivating the norms and values is that motivates and encourages employees to work in the same direction. This contributes positively to organizational goals and objectives (Parker and Bradley, 2010). (Rwigema, 2014) maintains that project implementers should ensure that project construction activities are in line with the employees' functions and responsibilities. The top management should ensure that road construction needs are addressed by providing facilities and resources to support the process of implementation. Project implementers and the employees should have an open communication on project activities. This should include an integrated system of information sharing that allows sharing of information between project implementers and the employees.

This helps to mitigate communication costs and coordination of activities. The top management should also show allow flexibility through establishing and maintaining a good working relationship with the employees in order to create a platform that accommodates new ideas and delegation of authority. In addition, the top management should match employees' knowledge and skills with their duties and responsibilities to ensure that they realize their full potential to contribute to successful project implementation (Moore and Buttner, 2011).

### **2.1.9. Technical Skills**

Technical skills can be defined as knowledge and abilities that is needed to execute a task. Technical skills are the ability to perform role with the help of certain tools and equipment's, (Sambasivan, 2016). Such tools may be tangible or intangible. Employees having technical skills accomplish their roles more efficiently because they possess practical aspects and expertise, which in most cases is acquired through specialized training and development programs. An organization seeking to achieve successful projects should develop and maintain employees with technical skills and expertise to accomplish their tasks efficiently. This can save the project huge costs and contribute towards efficient flow of activities. (Iyer and Jha, 2015) contend that projects that perform have been associated with presence of a technical team and a lean and competent team of employees. Project implementers lead the organization in project implementation; this is an important role that requires the implementers to have technical skills to effectively guide employees towards implementation of projects. Organizations that exploit its employees' technical skills perform its functions efficiently, this helps to streamline coordination

of activities and work towards set goals and targets. (Karim and Marosszeky, 2011) posit that through continuous training and development programs, employees are able to sharpen their technical skills and expertise. These skills assist employees to easily solve technical problems and save the organization costs of hiring expertise. In so doing, this creates a platform to employees to exploit their innovation in providing products and services that add value to customers. In projects implementation, employees should be engaged in trainings to improve their skills in implementation and practical aspects of use of tools and equipment's that support project implementation (Zulu and Chileshe, 2010).

### **2.1.10. Road Construction in Ethiopia**

As it is found in (Rahel, 2016) road sector construction projects in Ethiopia have an influence on the development strategies of the country. The development strategies of a country achieved through successful road projects intended to improve accessibility of the rural area; lower costs associated with transport maintenance and open more areas for development activities. Road projects, involving large amount of capital, also contribute to the total economy through job creation and in a ripple effect to other business activities. According to (Rahel, 2016) despite the improvement seen in performance and productivity within the sector, there still remain problems of delay, cost overrun and poor quality of road construction projects. It is also identified that there is a need for further strengthening of institutional capacity, adoption of new construction technologies and modern project management principles, and additional regulatory reforms in order to maximize the efficiency of the Ethiopian road construction industry. To this end, the industry is expected to refine its processes for efficient delivery of projects in terms of time, quality and cost. Three perspectives can explain why road construction has been a domain of the state in Ethiopia. First, from an economic perspective, road infrastructure is a classic example of public good that is characterized by non-excludability. Consequently, the private sector has no interest in providing roads. Hence, road construction has been a domain of the Ethiopian state throughout its history.

Second from political perspectives, road infrastructure and accessibility of peripheral rural areas of central importance for the states monopoly on the legitimate use of physical force in the territory.

Third, in the context of Ethiopia's geography, patterns of settlement and economic activity, road transport plays a vital role in facilitating economic development as 95% of the movement of people and goods are still carried out by road transport. Road transport provides the means for the movement of peoples and agricultural products from rural to urban areas and movement of industrial goods, modern agricultural inputs and peoples from urban areas to rural areas. Road transport also provides means for the utilization of land and natural resources, improved agricultural production and marketing, access to social services, and opportunities for sustainable growth (ERA 2014).

## **2.2. Empirical Review**

### **2.2.1. Factors Affecting Success of Projects**

Various researchers have studied different types of projects and identified different factors affecting successfulness of projects. The factors that affect the road construction projects success is the following below will present various factors contributing for cost overrun, project delays and quality problems as identified by number of studies made in various countries.

#### **2.2.1.1. Cost Over Runs**

Cost Overrun is the expression, which is used to represent the variance between the original approved cost and the final cost deserved. Anything done to a project, including time overrun would be reflected in the cost.

Different studies have revealed that there are various factors responsible for cost overrun of Construction projects (Le-Hoai, 2008) ranked the three top causes of cost overruns in Vietnam as material cost increase due to inflation, inaccurate quantity take - off, and labor cost increase due to environment restriction. (Kaliba, 2009) concluded that cost escalation of construction projects in Zambia are caused by factors such as inclement weather, scope changes, environment protection and mitigation costs, schedule delay, strikes, technical challenges and inflation. Al- (Juwait, 2002) listed the following as factors that causes cost overrun on construction projects in Saudi Arabia; effects of weather, number of projects going on at the same time, social and cultural impacts, project location, lack of productivity standards in Saudi Arabia, level of

competitors, supplier manipulation, economic stability, inadequate production of raw materials by the country, absence of construction cost data. In another study on construction projects in Nigeria, conducted by (Okpala and Aniekwu, 1988). it was found that architects, consultants and clients agreed that shortage of materials, finance and payment of completed works and poor contract management were the most important causes of cost overruns. Mansfield, (Ugwu and Doran, 1994) studied the success of transportation infrastructure projects in Nigeria and concluded that material price fluctuations, inaccurate estimates, project delays and additional work contributed most to cost overruns. During a review of public sector construction projects in Nigeria, (Dlakwa and Culpin,1990) revealed that the three main reasons for cost overruns are “fluctuations in material, labor and plant costs, construction delays and inadequate pre-planning.

### **2.2.1.2. Delays**

Researches in developing countries especially Africa have made progress in determining the causes behind project delays. (ABJ Journal of advanced research, 2016) , (Kaliba, Muya, and Mumba,2009) described in their study that, the major causes of delay in road construction projects in Zambia were delayed payments, financial deficiencies on the part of the client or contractor, contract modification, economic problems, material procurement, changes in design drawings, staffing problems, equipment unavailability, poor supervision, construction mistakes, poor coordination on site, changes in specifications, labor disputes, and strikes.

In Uganda, (Agaba, 2009) attributes delays in construction projects to poor designs and specifications, and problems associated with management and supervision. In their study, (ElRazek, Bassioni and Mobarak, 2008) discovered that delayed payments, coordination difficulty, and poor communication were important causes of delay in Egypt. Studies outside the African continent seem to also have identified almost similar causes. (Sambasivan and Soon, 2007) and (Alinaitwe, 2008) established that poor planning, poor site management, inadequate supervisory skills of the contractor, delayed payments, material shortage, labor supply, equipment availability and failure, poor communication and rework were the most important causes of delays in the Malaysian Construction Industry. (Kouskili and Kartan, 2004) identified the main factors affecting cost and time overrun as inadequate/inefficient equipment, tools and plant, unreliable sources of materials on the local market, and site accidents. Hence, the list of

causes confirms above agree with the findings of (AbdMajid and McCaffer, 1998) who concluded that if such causes are effectively dealt with, then time overrun can effectively be mitigated.

### **2.2.1.3. Quality of Projects**

Quality is one of the important key success indicators of a construction project which may cause cost overrun and time delays (Heng Li, vol.18 (4) 2000). Quality can be defined as the level of conformance of the final deliverable to the customer's requirements. One cause of usual project failure is that quality is overlooked or sacrificed so that a tight deadline can be met. It is very helpful to complete a project on time, only to discover that the thing delivered will not work properly (PMI 2008).

Researchers have explored various factors affecting quality of projects fundamentals of which are discussed below. Special attention is once more given for identifying the factors influencing construction projects.

The quality is a key function in all infrastructure development environments like cost and time. It becomes one of the vital factors in any construction project (Heng Li, vol.18 (4) 2000).

Quality is affected by shortage of materials, equipment, design changes, error in cost estimation and lack of budget. The other factors affecting quality are deficiencies in scheduling, inappropriate planning and unclear evaluation standards (Ibironke, 2011). The significance of these factors depends on type of projects, working environment and local culture.

In construction projects, lack of quality results in delays, cost overrun and unsafe structure (FIDIC Quality of Construction - Online). There are three types of costs associated with quality. First one is appraisal cost: the cost of testing and inspection, second one is failure cost: the cost of rework and third one is prevention cost: the cost of maintenance and better design (J. L. Ashford, Management of Quality in Construction - Online). Many researches have been carried out both in developed and developing countries to investigate the factors that have a substantial effect on the quality of construction projects.

## **2.2.2. Factors Affecting Success of Roads Construction in Ethiopia**

According to (Turkey Wakjira, 2012) the major factors that causes cost overrun in Ethiopian especially in road construction projects is said to be material price escalation. Claims due to late removal of obstructions, failure to give possession of site, late issue of drawings, widening of road section at some towns and change in alignment, scope change, changes in quantity (inaccurate quantities), unforeseen ground condition, construction of additional length and additions (variations). (Turkey Wakjira, 2012) said that, price escalation /price adjustment, variations, right of way, claims and design problems (design risk) are identified as major factors leading to cost overrun. It was also noted that consequential delays related to design modification has contributed to excessive cost overrun, the costs being quantified as time extension cost. Most of the factors such as variations, scope changes, design problems and unforeseen ground conditions are related to lack of clarity and comprehensiveness of documents (survey, design, tender and contract documents) used in the process and poor planning, unable to plan the projects in all dimensions.

(Zerfu, 2009) also stated that poor design and technical specifications were among the major factors for the challenges faced by the Ethiopian Roads Authority (ERA) in road construction projects. The other factors such price escalation; claims, right of way problem and failure to give possession of site are related to economic factor and improper planning respectively. Hence it is essential to address the issues related to right of way before mobilization of the contractor to the site and taking into account factors such as price escalation, location of the project, material and labor availability during the engineering estimate and properly forecast the escalation trend.

(Turkey Wakjira, 2012) in his study of the risk factors leading to cost overrun in Ethiopia federal road construction projects and its consequences examined the effects of cost on the delivery of construction projects in the country. The result of the desk study indicated that out of 30 new and rehabilitation road construction projects investigated, 24 projects (80%) suffered cost overrun in their execution.

Based on the literature review, this study selected 15 factors for their similarities with the Ethiopia environment and its social, economic, and political conditions. The authors considered that previous studies may also have an impact on the performance of construction projects in

Ethiopia. For this reason, these factors were used to carry out the survey for the collection of quantitative data. The 15 selected factors have been classified into two main categories. The first category is internal factors, which depend on the internal conditions of the project. This means that these factors can be controlled by the construction project manager (PM). The factors in the second category are external factors those that depend on the external conditions of the project and are beyond the PM's or contractor's control. These factors are unpredictable, and management actions have not been able to prevent their occurrence. This study will mainly focus on the 7 category factors that constitute internal factors.

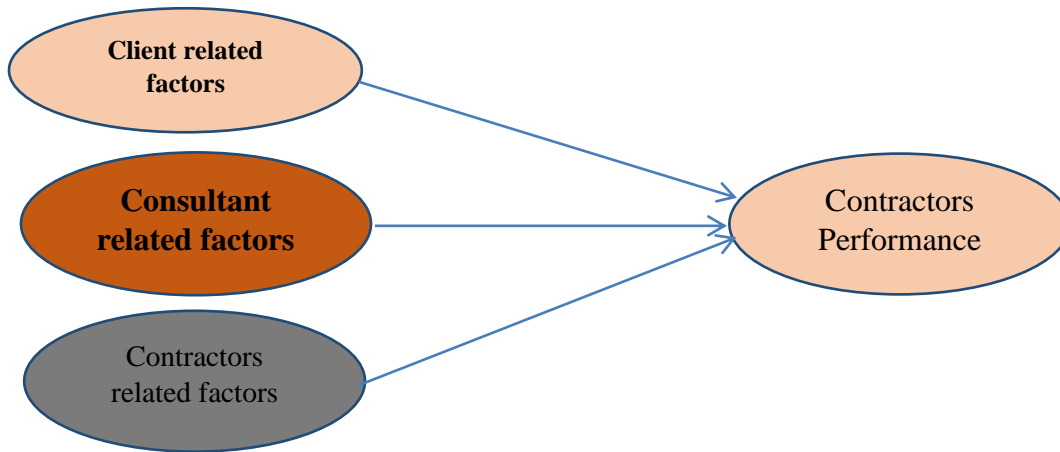
### **2.3. Conceptual Framework**

As (Deribsa, 2018), the independent variables are factors that we change in an experiment to ensure clear observations and measurement. The dependent variables on the other hand are the factors that we observe or measure by varying the independent variables. Dependent variables are named after the fact that they depend on the level and intensity of the independent variables.

So, as illustrated below and explained in (Kamau, 2013) capital is a broad term that can describe the financial assets of a business or an individual. Management skills can be defined as certain attributes or abilities that an executive should possess in order to fulfill specific tasks in an organization. They include the capacity to perform executive duties in an organization while avoiding crisis situations and promptly solving problems when they occur. On the other hand, Company's organizational culture refers to a company mission, objectives, expectations and values that guide its employee. Moreover, technical skill is about the abilities and knowledge needed to perform specific tasks.

As illustrated below, the dependent variables which is assumed can be affected by the independent variables mentioned above are time, cost and quality. The figure below illustrates the relationship between dependent and independent variables and the characteristics or variables that determines each of them.

## 2.4 Conceptual Framework



**Figure 1: Conceptual Frameworks**

This is also captured in the conceptual framework which is an organized relationship between the independent variables and dependent variable. The conceptual framework of the study develops from different authors findings (kual, 2014; Meaza 2015; Markus and Tanis (2010); David (2016), Divya.R and S.Ramya (2015), and others).

The figure shown in above indicates that, factors which are related to client, consultant and contractor are directly related to the performance of the contractors. If client, consultant and contractor show low performance, then low performance will be occurring.



## CHAPTER THREE

### 3. Research Methodology

The study compiled a list of probable criteria affecting contractor performance to create a well-structured questionnaire that addressed the majority of the primary concerns. There were 45 possible performance indicators in all, which were divided into three categories:

- ✓ Labor (L), Materials (M), and Equipment (E) are the input factors (IF) (E)
- ✓ Contractor, Owner, and Consultant in the Internal Environment (IE)
- ✓ Weather and government regulations are examples of exogenous factors (EF).

Because of the significant role that contractors play in the construction process, the researchers created a survey questionnaire to assess contractors', consultants', and owners' perceptions and opinions about the relative importance of contractor performance factors, as well as to measure differences in collective perspectives and any possible popular misconception or prejudice that clearly indicates agreement or disagreement between these parties. A random sample of consultants, contractors, and owners working on road construction projects in Ethiopia received the questionnaire.

The questionnaire responses were then gathered and evaluated using software. The frequency of answers from consultants, contractors, and owners were rated (see Appendix A). In our studies, we utilized SPSS software and employed a one-way ANOVA (which compares two or more group means to see if there are any significant differences), a one-sample test (T-test), and a post hoc test (or a Tukey test, a single-step multiple comparison statistical test used in conjunction with an ANOVA to find means that are significantly different from each other). These were run on the averages of the three groups' replies for each performance indicator to see whether there were any notable differences in the respondents' perceptions.

Personal interviews were done to explain the replies, which led to a discussion of the findings. Experts from Clients, Consultants and Contractors were interviewed.

The scope of this study comprises construction sector, particularly new road projects. Because of the vast volume of this sector, it would have been almost impossible to rate contractors'

performance characteristics according to all parts of the population through a census. All consultants, contractors, and owners in ERA who were actively participating in road construction projects at the time of the research are included in the population.

To ensure that every aspect of the population had an equal chance of being included, the researchers adopted a basic random sampling method. Given the relatively large community of consultants, contractors, and owners, this method was chosen most acceptable.

There were 54 consultants' surveys returned, 44 contractors' questionnaires, and 47 clients' questionnaires. The respondents were asked to rate the frequency of the performance characteristics indicated in the questionnaire, which was built from a list of factors gathered by the researchers. The respondents rated the severity of the factors affecting contractor performance on a five-point Likert scale (a psychometric scale often used in questionnaire-based research). The scale and the weights given to each response are shown in Table 1.

Table3.1. Frequency weighting scale in the research survey

Frequency Scale

Continual	Frequent	Occasional	Rare	Never
5	4	3	2	1

### 3.1. Inclusion and Exclusion Criteria

Participants included in this study are all local contractors who perform new road construction projects in Ethiopia from July 2016 to June 2021 (5 years plan). All local performing upgrading road construction projects were taken as exclusion criteria.

## CHAPTER FOUR

### 4. DATA PRESENTATION, ANALYSIS AND INTERPRETATION

#### 4.1. Introduction

In this chapter data presentation, analysis and discussions of findings are elaborated. 145 experts were randomly selected from Consultants, Clients and Contractors and questionnaires were distributed. All questionnaires were obtained from the field. The data was collected using self-administered questionnaire. As follows the analysis and discussion presented.

#### 4.2. Presentation and Analysis of Quantitative Data

##### 4.2.1. Demographic Data

**Table 4.1: Demographic characteristics**

Gender	Frequency	percent
Male	88	61%
Female	57	39%
Academic Background		
Diploma	11	7.30%
Degree	81	55.60%
M.A	53	37.10%
Experience		
1 to 4 years	32	21.90%
5 to 8 years	40	27.80%
9 to 12 years	46	31.80%
>12	27	18.50%

Survey data 2022

As the table 3 above, indicated that male respondents accounted 60.9% while female respondents are 39.1%. When we see their academic background, 7.3% of the respondents were diploma holders, 55.6% were degree holders and 37.1% were MA holders. When we see their duration of

employment of the respondents in different positions in projects, 21.9% of the respondents stayed 1 to 4 years, 27.8% of the respondents served 5 to 8 years, 31.8% of the respondents had an experience of 9 to 12 years and 18.5 % of the respondents have above 12 years of experience. The statistical data shows most of the population of the sample were young and high level of education.

#### **4.2.2 Presentation of the Factors Affecting the Performance of Local Contractors**

Taking the average scores of the reported data for all respondents, the contractor performance characteristics were ranked. The resulting averages and corresponding ranks are presented in Appendix (A).

All average values greater than 3 are termed "acceptable results" and are authorized as indicators of contractor performance; the matching performance result is a crucial factor in contractor performance for the particular group. The values are listed in descending order by their averages, starting with the highest average among the groups' responses.

- ✓ The consultants' responses classified the following three performance factors as the most critical:
  1. Shortage of labor (i.e., skilled, semiskilled, and unskilled labor)
  2. Poor planning and scheduling of projects by contractors
  3. Contractors' financial difficulties
- ✓ The contractor claimed that the following were the critical top three performance factors:
  1. Too many change orders from owners
  2. Contractors' financial difficulties
  3. Owners' financial constraints
- ✓ The owners viewed the following three performance factors as the most critical:
  1. Contractors' financial difficulties
  2. Contractors' use of unacceptable construction techniques
  3. Owners' financial constraints

**Table 4.2: Factors Affecting Contractor's Performance**

<b>Factors</b>	<b>Consultant Average</b>	<b>Owners Average</b>	<b>Contractors Average</b>	<b>Overall average</b>
<b>Labor</b>				
Shortage of manpower (skilled, semi-skilled, unskilled labor)	4.1481	3.7872	3.8864	3.9517
Presence of unskilled labor	3.537	3.7872	3.2273	3.5241
conflict between labor				
<b>Material (M)</b>				
Shortage of material	3.3889	3.5745	3.75	3.5586
Delay in materials delivery	3.6667	3.4894	3.5909	3.5862
Materials price fluctuations	3.2963	3.4043	3.186	3.2986
Modifications in materials specifications	3.0377	3.2979	2.9318	3.0903
<b>Equipment (E)</b>				
Shortage of equipment	3.6852	3.4255	3.3864	3.5103
Failure of equipment	3.4444	3.3617	2.7955	3.2207
Insufficient equipment	3.5556	3.5106	3.0227	3.3793
<b>Contractor</b>				
Lack of contractor's administrative personnel	3.6852	3.4043	3.25	3.4621
Shortage of technical professionals in the contractor's organization	3.8113	3.617	3.6744	3.7063
Insufficient coordination among the parties by the contractor	3.8704	3.6596	3.5227	3.6966
Delay in mobilization	3.4074	3.3404	2.8636	3.2207
Safety rules and regulations are not followed within the contractor's organization	3.4074	3.2766	3.0455	3.2552
Incompetent technical staff assigned to the project	3.7037	3.4043	3.6818	3.6
Improper technical study by the contractor during the bidding stage	3.5926	3.7021	3.7727	3.6828
Poor planning and scheduling of the project by the contractor	4.1296	3.7826	3.8182	3.9236
Improper handling of the project progress by the contractor	3.7778	3.5106	3.5814	3.6319
Ineffective quality control by the contractor	3.6481	3.8085	3.5455	3.669
Use of unacceptable construction techniques by the contractor	3.8148	3.8936	3.4773	3.7379
Financial difficulties faced by the contractor	4.0926	3.9787	4.1591	4.0759
Delays in contractor's payments to subcontractors	3.7222	3.7021	3.4091	3.6207

<b>Factors</b>	Consultant Average	Owners Average	Contractors Average	Overall average
Number of new projects/year	3.5	3.1915	3.0909	3.2759
Employee attitudes	3.4074	3.1702	3.3636	3.3172
Employees motivation	3.4815	3.2979	3.3636	3.3862
Application of health and safety factors in organization	3.2963	3.1739	3.1163	3.2028
<b>Owner</b>				
Delays in site preparation	3.7963	3.4681	3.3023	3.5417
Project complexity	3.4815	3.3404	3.3488	3.3958
Delay in contractor's claims settlements	3.5	3.3617	3.5227	3.4621
Work suspension by the owner	3.6667	3.3404	3.7955	3.6
Too many change orders from owner	3.963	3.8085	4.2045	3.9862
Slow decision making from owner	3.8148	3.8298	3.8409	3.8276
Inference by the owner in the construction operations	3.7963	3.4255	3.4091	3.5586
Delay in progress payments by the owner	3.8519	3.8298	3.6364	3.7793
Financial constraints faced by the owner	3.8333	3.8723	4.0455	3.9103
Insufficient coordination among the parties by the owner	3.5	3.7234	3.6591	3.6207
<b>Consultant</b>				
Ambiguities and mistakes in specifications and drawings	3.6296	3.8298	3.7727	3.7379
Poor qualification of consultant engineer's staff assigned to the project	3.8148	3.8511	3.6136	3.7655
Delay in the approval of contractor submissions by the engineer	3.7222	3.5532	3.3864	3.5655
Poor coordination by the consultant engineer with the parties involved	3.7593	3.4043	3.3409	3.5172
Slow response by the consultant engineer regarding testing and inspection	3.6111	3.383	3.4545	3.4897
Slow response by the consultant engineer to contractor inquiries	3.7407	3.4255	3.5227	3.5724
<b>Exogenous Factors (EF)</b>				
Weather				
Severe weather conditions on the job site	3.4074	3.4468	3.3182	3.3931
<b>Government regulations</b>				
Difficulties in obtaining work permits	3.1481	3.4681	3.3864	3.3241
Changes in Government regulations and laws	2.9815	3.2766	2.9773	3.0759

### 4.3 Discussion of the Results

The following discussion will highlight the most important factors in contractor performance as decided by the three parties and by the experts during the post-results interviews.

- ✓ Contractor financial issues were rated as the most significant element impacting contractor performance in Ethiopia road projects by the owners, the second most important by the contractors, and the third most important by the consultants. The majority of expert interviewees said that the contractor's financial issues are a natural byproduct of the industry's competitive character, and that this competitive market either increases contractors' revenue or causes them to lose a lot of money. Furthermore, most local contractors, particularly residential builders, are tiny, independent businesses with little resources and expertise, and they frequently underbid competitors to gain contracts, demonstrating the market's competitive nature. Local contractors also have limited access to loans. These elements, when combined, are a recipe for cash flow issues, which can lead to financial challenges. Both the contractors and the consultants backed up the owners' assertion that the contractors were having financial issues by rating it second and third, respectively. Moreover, by rating too many modification orders from owners as the most significant contractor performance reason and owners' budgetary restrictions as the third most important contractor performance component, the contractors effectively blamed their financial troubles on the owners. Winning contracts and assisting contractors during construction are both influenced by economic factors.
- ✓ For the contractors, too many modification orders from owners was the most critical performance concern, while for the consultants, it was the fourth. Excessive modification orders, according to many experts, have a big impact on the financial performance of construction projects as well as their progress: they can cause delays, which can lead to financial and legal issues. Modification orders may make or break a project; if the change is erroneous or inadequately analyzed, it can do major harm; on the other hand, it can safeguard the project against future difficulties and save money. According to several of the expert respondents, the typical cost of building modification orders is between 5 and 10% of the initial project budget. Slow decision making by owners is ranked as the fifth most important

performance element by the contractors, indicating that modification orders are a big performance driver.

- ✓ Furthermore, as seen by the unusually high ranking (seventh) assigned to the "ambiguities and faults in specifications and drawings" performance factor, contractors blame consultants in part for the substantial change orders. However, we find that both the consultants and the owners place a portion of the responsibility for numerous change orders on the contractors' employment of undesirable procedures, rating this factor fifth and fourth, respectively.
- ✓ One of the most crucial reasons, according to both owners and experts, is poor project planning and scheduling by contractors. Many studies have revealed that poor communication and planning in construction projects, as well as a failure to coordinate activities, have a significant impact on business performance and create project delays. The relative high rankings provided by both consultants and owners to performance variables linked directly and indirectly to "poor planning and scheduling of the project by the contractor" demonstrate the crucial relevance of this element, as noted in Table 2.

**Table 4.3: Highly Ranked Factors Relevant to Poor Planning and Scheduling**

	Performance Cause	Ranked by consultant	Ranked by owner
1	Shortage of technical professional in the contractor's organization	11th	17th
2	Insufficient coordination among the parties by the contractor	5th	16th
3	Ineffective quality control by the contractor	24th	9th

- ✓ Contractors identified labor scarcity as the fourth most critical performance component, consultants as the first most important factor, and owners as the seventh most essential factor. Because dealing with worker shortages or untrained workers on construction sites causes many project delays, which affect contractor performance in every way, manpower shortages (of skilled, semi-skilled, and unskilled workers) have been a serious performance factor affecting contractors working on road construction projects (e.g., financially, legally, and reputation-wise). Road construction boom has coincided with a labor shortage, resulting in



higher costs and increasing the financial pressure on contractors. This explains contractors' reliance on low-wage, inexperienced labor, as well as the consultants' and owners' high praise for the contractor's "poor project planning and scheduling" and "incompetent technical employees allocated to the project," respectively.

### **4.3.1 Difference in Perception among the Three Groups**

To see if there were any significant variations in the groups' opinions of the relevance of the contractor performance variables, a one-way variance analysis was done on the means of the three groups' replies. The P values at which a hypothesis of equal mean values across various groups could be rejected were determined using the mean values for the three groups, the F statistics, and the P values at which a hypothesis of equality of mean values across different groups could be rejected (see Appendix A). The analysis revealed statistically non-significant differences among the respondent groups for the following factors:

1. Slow decision making by owner
2. Severe weather conditions on the job site
3. Project complexity
4. Delay in materials delivery
5. Contractors' financial difficulties

The results of our ANOVA analysis (see figs. 2 to 6) show that the means of the different groups are not significantly different from one another (Measured F's = 0.01, 0.184, 0.374, 0.412, 0.419) while the tabular critical F value at the 0.05 level for 2° and 144° of freedom is approximately (2.30), indicating a strong agreement among the three groups. Further analysis through the Duncan Multiple Range Test, Scheffe's test, or Tukey test is necessary to detect where the mean differences lie, since the differences are negligible.

Merging the above result with the highest ranking factors according to the mean of the averages of the three groups (see table 4.2.2) - "contractors' financial difficulties," "owners' financial constraints," and "shortage of manpower (skilled, semi-skilled, unskilled labor)" reveals that "contractors' financial difficulties" is, by consensus, the leading contractor performance factor in the Ethiopia road construction sector (see Fig. 2). In addition, we note a strong agreement among

the respondents regarding the four lowest-scoring factors - severe weather conditions on the job site (see Fig. 3), project complexity (Fig. 4), delays in materials delivery (see Fig. 5), and slow decision making by owners (Fig. 6)

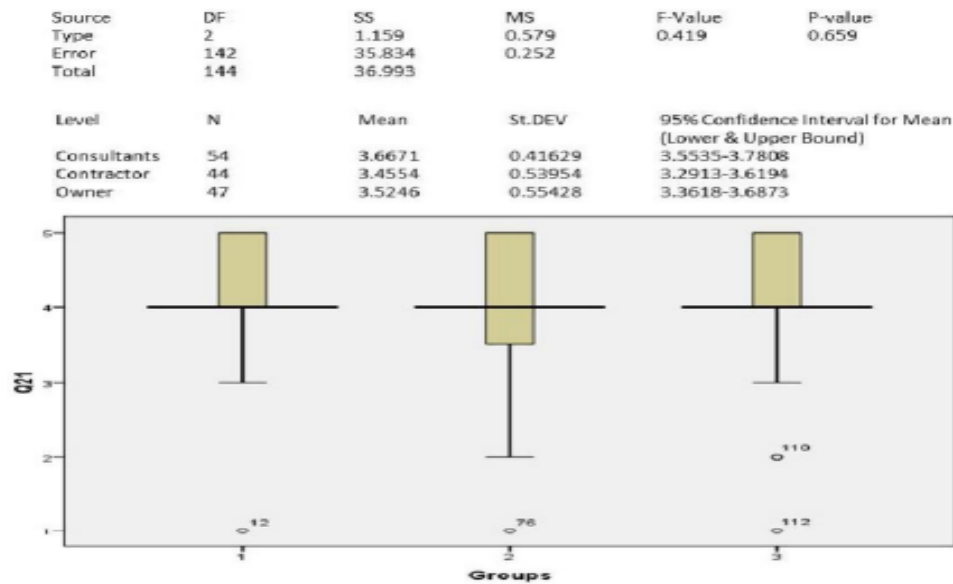


Figure 2: One-way ANOVA for “Financial difficulties faced by the contractor”

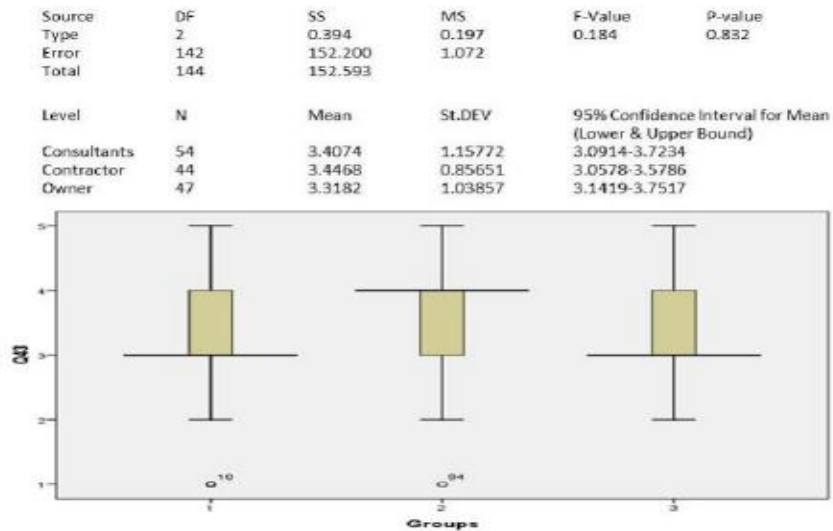
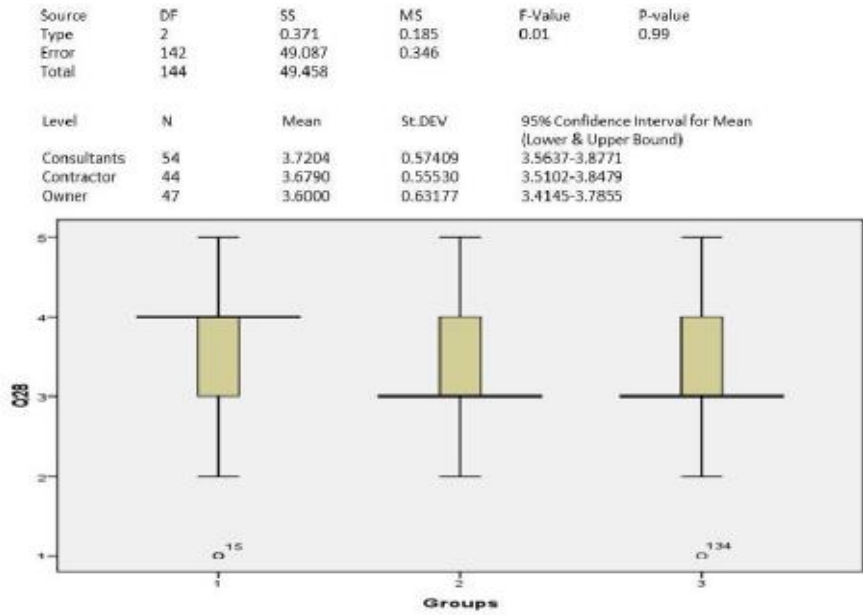
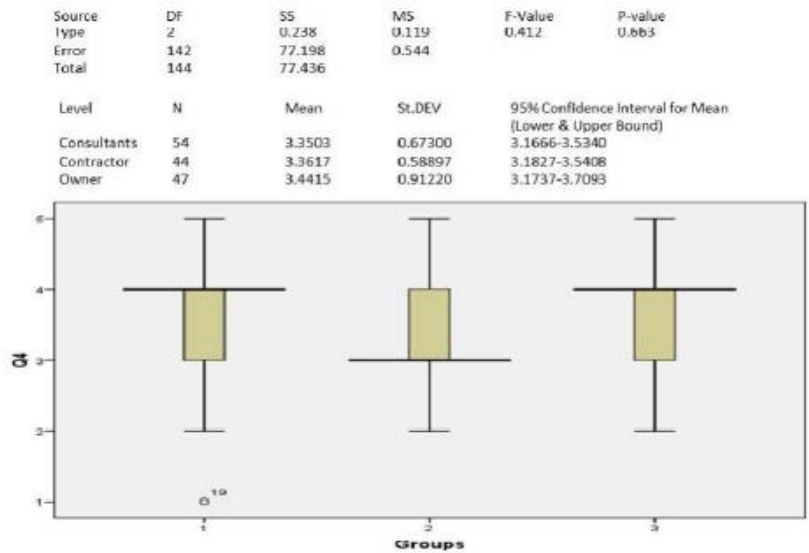


Figure 3: One-way ANOVA for “Severe weather conditions on the job site”



**Figure 4: One-way ANOVA for “Project complexity”**

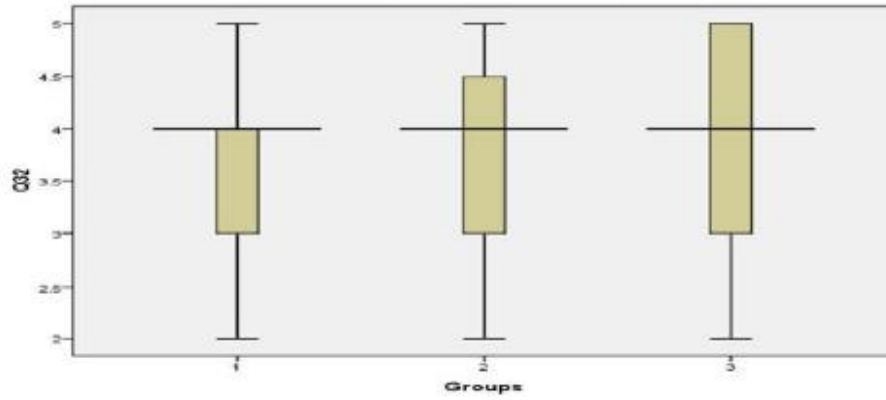


**Figure 5: One-way ANOVA for “Delay in materials delivery”**

Source	DF	SS	MS	F-Value	P-value
Type	2	0.371	0.185	0.01	0.99
Error	142	49.087	0.346		
Total	144	49.458			

Level	N	Mean	St.DEV	95% Confidence Interval for Mean (Lower & Upper Bound)
Consultants	54	3.7204	0.57409	3.5637-3.8771
Contractor	44	3.6790	0.55530	3.5102-3.8479
Owner	47	3.6000	0.63177	3.4145-3.7855



**Figure 6: One-way ANOVA for “Slow decision making from owner”**

## CHAPTER FIVE

### 5. CONCLUSION

The outcomes of this research are discussed below, concentrating on the most important performance factors.

The most critical performance issue is "financial challenges," which arises from the contractor's internal environment. The severity of this element is agreed upon by all three groups of respondents, making it one of the most important performance criteria in road construction project. "Owners' financial constraints" was ranked third most important performance factor by both owners and contractors; it was ranked fifth by the mean of the overall averages of the three respondent groups, indicating that the financial factor has a significant impact on all parties in the construction industry. "Too many modification orders" is seen as the most critical performance factor by contractors and the fourth most important by consultants within the owner's internal environment. According to the mean of the average rating of all three responder groups, this performance aspect was regarded as the second most important. According to the total average means of the three responder groups, none of the performance criteria relating the consultant's internal environment are important.

Changes in government rules and legislation, as well as harsh weather conditions on the job site, were scored lowest by all three parties. There are no significant variations in perceptions of these performance criteria among respondents. In Ethiopia, neither the government nor the weather have a significant impact on contractor performance during road construction projects. The majority of government rules have little impact on the road projects, particularly contractors, because Ethiopia's weather is rarely harsh. Because contractors have minimal contact with the government other than to get licenses and permissions for construction at the early and late stages of projects, and because the weather is mostly steady, those elements have little impact on contractors' performance.

Labor appears to be the most major input component. Consultants identified the labor shortage (skilled, semi-skilled, and unskilled) as the most pressing issue, while contractors placed it fourth, and owners ranked it seventh. All sides placed equipment and materials as low priorities.

In sum, Contractors' financial issues, manpower shortages, and an excessive number of change requests from owners were the key factors hurting their performance in Ethiopia. We emphasize that the major influences on contractor performance are connected to the internal environment of the system, notably for contractors, and to the input elements pertaining to labor for the owners. Meanwhile, equipment and materials, particularly external elements, have a minor or non-existent impact on contractor performance throughout road projects.

## Appendix (A)

<b>Factors</b>	<b>Overall average</b>	<b>PValues</b>	<b>FValues</b>
<b>Labor</b>			
Shortage of manpower (skilled, semi-skilled, unskilled labor)	3.9517	0.133	2.043
Presence of unskilled labor	3.5241	0.041	3.27
conflict between labor			
<b>Material (M)</b>			
Shortage of material	3.5586	0.309	1.184
Delay in materials delivery	3.5862	0.663	0.412
Materials price fluctuations	3.2986	0.538	0.623
Modifications in materials specifications	3.0903	0.215	1.555
<b>Equipment (E)</b>			
Shortage of equipment	3.5103	0.343	1.078
Failure of equipment	3.2207	0.005	5.439
Insufficient equipment	3.3793	0.018	4.157
<b>Contractor</b>			
Lack of contractor's administrative personnel	3.4621	0.092	2.425
Shortage of technical professionals in the contractor's organization	3.7063	0.571	0.563
Insufficient coordination among the parties by the contractor	3.6966	0.145	1.959
Delay in mobilization	3.2207	0.016	4.239
Safety rules and regulations are not followed within the contractor's organization	3.2552	0.183	1.721
Incompetent technical staff assigned to the project	3.6	0.165	1.825
Improper technical study by the contractor during the bidding stage	3.6828	0.644	0.0442
Poor planning and scheduling of the project by the contractor	3.9236	0.16	1.855
Improper handling of the project progress by the contractor	3.6319	0.275	1.302
Ineffective quality control by the contractor	3.669	0.316	1.16
Use of unacceptable construction techniques by the contractor	3.7379	0.104	2.295
Financial difficulties faced by the contractor	4.0759	0.659	0.419
Delays in contractor's payments to subcontractors	3.6207	0.173	1.779
Number of new projects/year	3.2759	0.066	2.777
Employee attitudes	3.3172	0.408	0.903
Employees motivation	3.3862	0.627	0.468
Application of health and safety factors in organization	3.2028	0.649	0.434
<b>Owner</b>			
Delays in site preparation	3.5417	0.061	2.856
Project complexity	3.3958	0.689	0.374

<b>Factors</b>	<b>Overall average</b>	<b>PValues</b>	<b>FValues</b>
Delay in contractor's claims settlements	3.4621	0.66	0.417
Work suspension by the owner	3.6	0.093	2.413
Too many change orders from owner	3.9862	0.123	2.13
Slow decision making from owner	3.8276	990	0.01
Inference by the owner in the construction operations	3.5586	0.087	2.488
Delay in progress payments by the owner	3.7793	0.475	0.748
Financial constraints faced by the owner	3.9103	0.441	0.824
Insufficient coordination among the parties by the owner	3.6207	0.424	0.863
<b>Consultant</b>			
Ambiguities and mistakes in specifications and drawings	3.7379	0.602	0.509
Poor qualification of consultant engineer's staff assigned to the project	3.7655	0.412	0.893
Delay in the approval of contractor submissions by the engineer	3.5655	0.224	1.512
Poor coordination by the consultant engineer with the parties involved	3.5172	0.05	3.059
Slow response by the consultant engineer regarding testing and inspection	3.4897	0.451	0.801
Slow response by the consultant engineer to contractor inquiries	3.5724	0.24	1.439
<b>Exogenous Factors (EF)</b>			
Weather			
Severe weather conditions on the job site	3.3931	0.832	0.184
<b>Government regulations</b>			
Difficulties in obtaining work permits	3.3241	0.241	1.439
Changes in Government regulations and laws	3.0759	0.294	1.233



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# APPENDICES

## Appendix I: Questionnaire

Dear Sir/Madam

This questionnaire is prepared to solicit information from purposely-selected participants. The information is required for the academic research entitled “Factors Affecting the performance local contractors on road projects in Ethiopia ” which is being conducted as partial fulfillment of MBA in project management by Mihret at Saint Mary’s university. The main objective of the research is to examine the main factors affecting the performance of local contractors on road construction project. Your response, in this regard, is highly valuable and contributory to the outcome of the research. All feedback will be kept strictly confidential, and utilized for this academic research only.

### GENERAL INSTRUCTIONS

Please kindly indicate your answer by putting this mark (√) in the boxes provided

Thank you for your time in advance!!

### Section I: Demographic Data

1. Gender of the respondent

Male  Female

2. Academic Backgrounds:

Diploma  First Degree  
 Master’s Degree and  Above Other

3. State your role in the project you are working in currently/the position you have in

Project managers  Contract administrator  
 project team leaders  Supervisors  Engineers  
 consultants  contractors

4. Working experiences in Road Construction (Years):

1-5  5-10  > 10

## Section II: Main questions

Instruction: - For the close ended questions in table forms, please use the following Key words to answer. And put this mark (√) on the corresponding tables/boxes.

S.A = Strongly Agree (5)

A = Agree (4)

N = Neutral (3)

D.A = Dis Agree (2)

S.D.A = Strongly Dis agree (1)

Part I: Measurement of the Independent Variables absence

Please kindly indicate the extent to which you agree or disagree with the following factors influencing success of projects on Addis Ababa city road authority

	<b>Factors</b>	S.A(5)	A (4)	N(3)	D.A(2)	S.D.A(1)
<b>1</b>	<b>labor</b>					
1.1	Shortage of manpower (skilled, semi-skilled, unskilled labor)					
1.2	Presence of unskilled labor					
1.3	conflict between labor					
1.4	Employee attitudes					
1.5	Employees motivation					
<b>2</b>	<b>Material (M)</b>					
2.1	Shortage of material					
2.2	Delay in materials delivery					
2.3	Materials price fluctuations					
2.4	Modifications in materials specifications					
<b>3</b>	<b>Equipment (E)</b>					
3.1	Shortage of equipment					
3.2	Failure of equipment					
3.3	Insufficient equipment					

<b>4</b>	<b>Contractor</b>					
4.1	Lack of contractor's administrative personnel					
4.2	Shortage of technical professionals in the contractor's organization					
4.3	Insufficient coordination among the parties by the contractor					
4.4	Delay in mobilization					
4.5	Safety rules and regulations are not followed within the contractor's organization					
4.6	Incompetent technical staff assigned to the project					
4.7	Improper technical study by the contractor during the bidding stage					
4.8	Poor planning and scheduling of the project by the contractor					
4.9	Improper handling of the project progress by the contractor					
4.10	Ineffective quality control by the contractor					
4.11	Use of unacceptable construction techniques by the contractor					
4.12	Financial difficulties faced by the contractor					
4.13	Delays in contractor's payments to subcontractors					
4.14	Number of new projects/year					
4.15	Application of health and safety factors in organization					
<b>5</b>	<b>Owner</b>					
5.1	Delays in site preparation					
5.2	Project complexity					
5.3	Delay in contractor's claims settlements					
5.4	Work suspension by the owner					
5.5	Too many change orders from owner					
5.6	Slow decision making from owner					
5.7	Inference by the owner in the construction operations					

5.8	Delay in progress payments by the owner					
5.9	Financial constraints faced by the owner					
5.10	Insufficient coordination among the parties by the owner					
<b>6</b>	<b>Consultant</b>					
6.1	Ambiguities and mistakes in specifications and drawings					
6.2	Poor qualification of consultant engineer's staff assigned to the project					
6.3	Delay in the approval of contractor submissions by the engineer					
6.4	Poor coordination by the consultant engineer with the parties involved					
6.5	Slow response by the consultant engineer regarding testing and inspection					
6.6	Slow response by the consultant engineer to contractor inquiries					
<b>7</b>	<b>Exogenous Factors (EF)</b>					
7.1	Weather					
7.2	Severe weather conditions on the job site					
7.3	Government regulations					
7.4	Difficulties in obtaining work permits					
7.5	Changes in Government regulations and laws					

End of questionnaire

**Thank you for your time taken in filling this questionnaire.**