



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

**THESIS PROPOSAL**

**Assessment of Project Quality management Practices: the Case of Addis Ababa River Side  
Green Project**

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**JUNE, 2021**

**ADDIS ABABA, ETHIOPIA**

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OF ADDIS ABABA RIVER SIDE GREEN PROJECT**

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**THESIS SUBMITTED TO ST. MARY UNIVERSITY, SCHOOL OF  
GRADUATE STUDIES IN PARTIAL FULFILMENT OF THE  
REQUIREMENTS FOR THE DEGREE OF MASTER OF PROJECT MANAGEMNT**

**ADDIS ABABA, ETHIOPIA**

**JUNE 2021**

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## **DECLARATION**

I, the undersigned, declare that this thesis entitled “**Assessment of Project Quality management Practices: the Case of Addis Ababa River Side Green Project**” is my original work, and has not been presented by any other person for an award of a degree in this or any other University.

**BEALU GIRMA**

**Name**

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**ST. MARY’S UNIVERSITY**

**ADDIS ABABA, ETHIOPIA**

**JUNE 2021**

## **ENDORSEMENT**

This is to certify that this project work, “**Assessment of Project Quality management Practices: the Case of Addis Ababa River Side Green Project**” undertaken by BEALU GIRMA for the partial fulfillment of Master of project management at St. Mary University, is an original work and not submitted earlier for any degree either at this University or any other University.

**Research  
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**Dr. ABEBAW WAKE**

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**DATE**

## **ACKNOWLEDGMENT**

First of all I want to thank GOD for helping me for the successful completion of this research and bringing my desire to reality. Then I would like to express my gratitude and deep appreciation to my advisor, Dr. Abebaw Wake for his valuable comment, suggestions and advice during the period of preparing this thesis paper and also to saint marry University for giving me the chance to enroll the PM program.

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## Acronyms

QMPs.....	Quality management Practices
CCCC.....	China Communication Construction Company
SPSS.....	Statistical Package for Social Science
GTP.....	Growth And Transformation Plan
TQM.....	Total Quality Management
TRB.....	Transportation Research Board
PMI.....	Project Management Institute
PMBOK .....	Project Management Body of Knowledge
BRE.....	British Research Environment

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## **ABSTRACT**

This study considers the practices of construction quality management of the material on building construction sites. Quality management is a critical component of the construction industry. As such, the effectiveness of project execution is the organizations get to understand the major effects of techniques of quality management. A properly implemented quality management program can to take the flow with time of equipment and materials to the job site, and thus facilitate improved work face planning, productivity of labor is induced, the scheduled is better and minimum project costs. Quality management is an essential function in terms of productivity improvement in construction projects. It is defined quality management functions which include quality planning, quality assurance, quality control and quality improvement of a project. The main tools for the collection of data included questionnaires, and site visit were used to identify the annual requirement of the construction work. Simple descriptive analyses involving tables of the annual requirement of the construction quality were used in analyze the results from the questionnaire. Secondary sources of data were obtained from relevant literature that covered thesis related to the case study.

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of the study

Ethiopia's economy experienced strong, broad-based growth averaging 9.9% a year from 2007/08 to 2017/18, mainly construction, and services accounted for most of the growth. The government is implementing the second phase of its Growth and Transformation Plan (GTP II) which will run to 2019/20. GTP II aims to continue expanding physical infrastructure through public investments and to transform the country into a manufacturing hub (World Bank, 2019). The current and concerning issue now is quality output.

Every construction project is different with its own specific requirements, and way of operation which are followed by different challenges. In the implementation phase attaining the required quality is one of the big concerns of managers and beneficiaries. To achieve this quality management practices are employed in projects whether they vary from one project to another.

Quality is one of the main factors in the success of construction projects. Quality of construction projects, as well as project success, can be regarded as the fulfillment of expectations of the project stakeholder. Quality, cost and time have been recognized as the main factors concerning the client. However, for the majority of projects, the cost and time parameters are the main pre occupying factors for construction project. The quality in the construction industry is linked with client's satisfaction and the implementation of a quality management is a key tool in consistently and reliably managing the construction (Mane, 2015).

The implementation of QMP (quality management practices) practices is vital to minimize the cost of a project that are incurred due to delay and meeting the required specification. To address the issue of quality management practices on the case study company which is CCCC, the research will try to answer question to meet the goal or objectives. These questions are

- What is quality?
- What is quality management system?

There is no one singular, universally accepted definition of 'quality'. Over the years different scholars gave definition for quality (Garvin, 1984; Reeves and Bednar, 1994; Seawright and Young, 1996; Russell and Miles, 1998; Beaumont and Sohal, 1999; Sebastianelli and Tamimi, 2002; Ojasalo, 2006).

Quality, according to Juran, means that a product meets customer needs leading to customer satisfaction, and quality also means all of the activities in which a business engages in, to ensure that the product meets customer needs (management perspective)(Juran, 1974; 1988). In the case of Philip Crosby, an influential contributor to management and quality theory took a slightly different angle on quality. He defined “quality” not in terms of fitness, but in terms of requirements: those established for the product, and those of the consumer (sales perspective) Crosby (1979). And off course in our context the attainment of acceptable levels of performance from construction activities (construction perspective)

Quality management as the name indicates is all about managing quality in services and products. When it comes to managing projects, ensuring desired quality is the overall achievement. Project delivery should guarantee quality management. However, quality does not always mean perfection and high-quality products and services but maintaining consistency in quality across projects and different products and services. The quality to be sustained in a project is decided by the stakeholders, owners, and clients of the project. Quality management incorporates quality assurance, quality control and quality improvement.

Quality assurance is performed by a continuous and repetitive monitoring and appraisal of various facets of the project. Its purpose is to make sure that the work is made with at least the minimum acceptable levels of quality. It involves establishing project-related policies, procedures, standards, training, guidelines and systemic activities implemented in a quality system to fill quality requirements (Basu, 2004; Freeman-Bell & Balkwill, 1996; Aziz & Abdel-Hakam, 2016; Panuwatwanich & Nguyen, 2017). In construction, project managers and project consultants are responsible for the delivery of the work within the specified agreed up on costs and time as well as the necessary quality and supervision.

Quality standards are mostly defined based on organizational values and standards (Chandana, 2017).

The project in which my study is based on is Addis Ababa river side project which is initiated by the prime minister of Ethiopia Dr. Abiy Ahmed. The project is under taken by the china company CCCC and it is vital to meet the required quality. the project is located in the center of Addis Ababa, the capital city of Ethiopia with the area of 285767 m<sup>2</sup> The completion of this project will show the Ethiopia’s national image of opening to the outside world, embodies the key core values that are “national unity and harmonious symbiosis”, highlight the important position of Ethiopia’s national political core area, and become popular leisure tourist place. Therefore the research will explore a foreign company QMP working in Ethiopia. The project dispatched the Chinese feasibility study team in February 2019. The company that is responsible for the construction employed 1500 Ethiopian workers that are engaged in the construction of parking lot, embossed wall, rostrum, central rally plaza, and artificial lake; two belts: flower belts and active waterfront belt; finishing before the end of May 2020.

Almost all construction projects are undertaken having a predefined cost, completion time and quality. Common assessment of the success of construction projects is that they are delivered on time, to budget, to technical specification and meet client satisfaction. From the view point of cost, completion time and quality of the projects, the construction industry of Ethiopia is not at required level compared to the rest of the world. Among different factors that contribute to poor practices of construction industry of the country, the usage of inferior quality of formwork systems (Amare,2015) therefore it is important to see the quality management practices of the specified company in the specified project.

### **1.1.1 Research Gaps**

There is a wide body of literature exploring quality management practices in construction projects. Most of these studies have highlighted quality management in projects and recommended best practices. But, a majority of the studies exploring quality management in the construction industry have been conducted outside the country. The findings may not be applicable in the Ethiopia context due to political, economic, social, and technological factors that usually unique in each country.

According to Tim McClintock there are different tools and techniques useful in quality planning, assurance, and control, but the writer failed to explain them in a practical way. There is gap in knowledge regarding the quality assurance and control in Ethiopia building constructing industry and how these practices are linked to successful completion of projects. And the researches that are undertaken in the context of this country don't address thoroughly concerning quality assurance management. For example Many researches that are done based on Ethiopian construction on quality either have been in identifying the problems they face (Beshah,2011) or overall performance of projects (Tagesse,2017). In a research done by MelatGirma, the researcher identifies quality as one factor for measuring success but doesn't clarify on how we can achieve quality through the implementation of quality management. So these are the motivation behind the objective of this study.

Hence the concern of this research is to assess the implemented quality management practices in the Addis Ababa river side project that is under gone by the foreign company CCCC.

### **1.2. Problem Statement**

A problem faced by construction industry is poor quality standards. It is very common and serious problem as the expected quality is not complied in the construction projects. Failure in achieving required quality has also significant impact of project cost. It is stated that quality cost (non-conformance) in construction industry of USA contributed to 12% of total project cost. And studying quality performance of construction projects through case studies showed that quality

failures had resulted in rework which incurred extra cost approximately 2% to 12% of project cost while stated that quality rectification problems Contributed to approximately 3.4% to 6.2% of project cost (Oluyemi-Ayibiowu; 2019).

A study was conducted by WubishetJekale to enhance understanding of low performance of public construction projects in Ethiopia by taking two case studies from public construction projects. The research clearly indicates that the performances of Public Construction Projects in both the case studies exhibited low accomplishment rates. Consequently, completion time suffered low performances for both the Case Studies. But, while Case Study I revealed low performances in cost overruns, Case Study II made known that low performances were strongly associated with quality related issues. Subsequently, the immediate objectives had also suffered in their performance.

In another study by Diresin 2016 shows that in most Addis Ababa condominium buildings which are constructed by the government there are many complaints about defects in the building elements of the house. One of the causes of this condition is due to poor workmanship during construction. This will affect the life of the occupants and also giving a bad image of the parties involved in the construction of condominium housing (Dires,2016)

Fekadu in 2007 under the title of Investigation of failure of the super structure of some buildings in the Addis Ababa, which focused on the existence of building failure at the construction site of different building projects only for superstructures; and Bedru in the year 2015 under the title of Construction Defects in Federal Government Office Building Projects in Addis Ababa for his MSc work. Similarly Abraham (2004) cited by Miressa (2017) showed to enhance understanding of low performance of public construction projects in Ethiopia by taking two case studies from public construction projects. The research indicated that the performances of public construction projects exhibited low accomplishment rates. Consequently, completion time, cost overruns and strongly associated with quality related issues contributed to low performances for both the case studies (Abraham, 2004).

It is a well known fact that many mega projects that are under taken in Ethiopia are done by foreign companies. Like the construction of the commercial bank of Ethiopia, the construction of nib bank, the construction of the greening projects that are under construction and some of them finished. We can take the construction of the Ethiopian renaissance dam which is under the responsibility of METEC. It is widely talked by different Medias that the project has been delayed and quality is compromised due to different factors.

All these studies show that there is an existing problem in the construction industry meeting the required quality.It begs the question why projects in Ethiopia fail to meet the criteria.

The reason why these projects don't meet expectations regarding quality can be argued that the ineffective planning of project control methods, the lack of professionals capability involved in the process, the lack of constant improvement in process implementation and financial constraints contribute as a huge factor. The fact that Today's projects are becoming more and more technically complex and logistically challenging makes construction vulnerable to setbacks in assuring quality unless the developing and implementing of new quality management practices.

Therefore this study assessed the practices and challenges of project quality management in the Addis Ababa green project; considering that the application of best practices of project quality management is important so that the project would be able to meet the customer's expectation as well as for the growth of the sector and the utilization of project quality management best practices also improves the overall project management performance. In addition, the study assessed the level of implementation of selected independent variables to the project quality management of the project and perceived project quality.

### **1.3 Research Questions**

In light of the above problem statement and objectives, the study will seeks to answer the following questions.

1. What are the practices of the project quality management in Addis Ababa greening project in CCCC?
2. What are the challenges of the project quality management in Addis Ababa greening project?

### **1.4 Objectives**

#### **1.4.1 General objectives**

The general objective of the research is to assess the quality management practices and major quality management challenges in Addis Ababa greening project

#### **1.4.2 Specific Objectives**

the specific objectives of this study are:

1. To assess the major quality management practices those are implemented in the Addis Ababa greening project.
2. Identify the major challenges of quality management practices in Addis Ababa greening project.
3. To further comment for future studies on how to improve quality management.



### **1.5. Significance of the study**

this research is important for the city administration by alerting the current status of the project regarding its quality. It will also benefit government statutory bodies and policy makers in terms of providing input for policy making to improve the overall state of construction concerning quality. The recommendation can be used as a stepping stone for other researchers to fill the knowledge gap or to further explore new approaches and ideas for quality assurance frame work.

The finding of the research whether be indicating the current practice in the company in question are excellent or lacking, it will give local contractors to take lesson to further improve their practices and be competitive. In summary the research is expected to:

- Contribute to the improvement of quality in projects
- Contribute to the advancement of better QMP
- Fairly asses the constraints in QM

### **1.6. Scope and Limitation of the study**

This study is limited to quality management practices and challenges on these practices of Addis Ababa greening project limited to primary phase 1 under gone by CCCC. Generally, the study is limited to examining the nature of process quality management in the project management process there by identifying the root causes of achieving project quality in the project construction within the last 2 years (2020-2021) and factors affecting the implementation of QMP. In this regards the study will address quality defects of the project, the cause of quality problems, the solutions under taken, and the overall project quality management practices of the project to achieve consumer satisfaction. This study is also limited to project contractor while actors in project implementation and management are also owner, consultant and among others due to limited financial capacity and shortage of time and lack of willingness.

The geographical boundary of the study area is in Addis Ababa around taitu road near to Sheraton Addis hotel, the thematic scope of the study is limited to gathering of data related to quality assurance practices and factors that can affect them. It is to the advantage of the researcher to do the research on this project since he is a major part of it. And hence gathering reliable data and detailed knowledge regarding the project is unquestionable.

Quality in this research is considered as per the contractor or the implementer's eye not as per customer satisfaction.

## **1.7 organization of the thesis**

This research consists of five main chapters as follows:

1. Chapter one: Introduction: this chapter shows background of the study, statement of the problem, objectives of research, research questions, justification, significance and scope and limitations of the research.
2. Chapter two: Literature review: this chapter shows a detail review from concepts and definitions to identify the main factors affecting QAP. It will constitute of theoretical frame work and conceptual frame work that will help us achieve by guiding the data collection methods.
3. Chapter three: Research methodology: this chapter shows the methodology used in this research in order to achieve the required objectives and to answer the research questions.
4. Chapter four: Result analysis and discussions: this chapter shows result, description and discussion of research results.
5. Chapter five: Conclusions and recommendations.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This section covers review literature of different scholars and authors that have been reviewed in the area of quality management. It deals with both theoretical and practical findings of various researchers concepts related to projects, project quality management process, quality assurance, quality assurance tools and Techniques and factors affecting QMP. It deals with the review of related literature gathered from different secondary sources such as published books, articles and related websites. In this regard, efforts were exerted to include as much significantly related literatures as possible by reviewing available documents that exhibits points, targeting at the attainment of the research objectives.

It is important to understand the end products or the deliverables and the process employed to get them so as to implement QMPs that can assure the quality in construction projects. In order to understand the implementation process of QMPs in construction industry, it is important to navigate the present theory on the quality practices processes included in this study. The current theory focuses on the overall concepts of quality practices in the construction project and project management structures.

This section will be composed of two frameworks.

1. Theoretical literature review: - this section will define what is meant by Quality from different literatures and more specifically in the construction context. And hence quality assurance and control are part of project quality management, definitions and aspects of quality management will be briefly discussed in this section. Those aspects are quality planning, quality assurance, quality control and quality improvement. Furthermore specifically quality assurance and control in construction will be explored to the extent of available literature.
2. Empirical literature review: - The empirical literature provides empirical evidences of quality management in construction projects. Additionally, at the end of this section the conceptual framework of this study is presented.

#### **2.2 Theoretical Literature Review**

##### **2.2.1 What is Quality?**

The term quality means different things to different people. Some takes it to be the characteristics of a product or service that bear on its ability to satisfy a need. Whilst others take it as the degree to which a product exceeds a customer's requirements and expectations. On the other hand, others think it is the attainment of prescribed standards. (Quality Digest Magazine, 2013)

The international organization of standard for standardization (ISO DIS 9000.2000), formally defines quality as the degree to which a set of inherent characteristics fulfils the requirement.

In the situation of quality assurance, quality is not a statement of excellence in a comparative sense. It is just a short cut for desired quality that should be laid down as clearly as possible. The producer, on the other hand an attempt to attain the desired quality at an optimum cost while the customer requires confidence in the producer's ability deliver and firmly maintain quality.

However, quality in construction is more difficult to explain. Firstly, the product is not a mechanical unit but a piece of work with specific characters. An example would be a building has different components that make up the whole body. Each of these components has a specific character and quality is viewed in terms of the procedures and materials that are used to achieve it. In other aspect the construction cost and time delivery will depend on how well the designing of the building and the required detailed specification and end results.

The quality of the finished works will be controlled by ways of inspecting and testing as construction process. For example the quality of the concrete used in the site are first inspected and tested before it can be used. And after the concrete that already passed sample test will ultimately be tested again to check whether it attained the required strength. Due to poor workmanship and not following the specified steps it can pass the quality test and yet still not attain the desired end result. The importance of implementing quality assurance and control can't be stressed enough, because the errors that occur in construction can't be reversed and will cost a lot of money. It is up to the management to employ quality assurance and control and diligently oversee it.

### **2.2.2 Project quality management**

Quality management as the name indicates is all about managing quality in services and products. When it comes to managing projects, ensuring desired quality is the overall achievement. Project delivery should guarantee quality management. Quality must be integrated into the design process by giving attention to early stages of the construction life cycle, thus eliminating the need for bulk inspections which leads to operational cost reduction when shifting from a reactive to a proactive mode of quality management (Kaiser & Raisinghani, 2011).

According to Crawford the overall aim of quality management is to satisfy the customer, conform to requirements, ensure fitness for purpose, and to ensure the product for use. Project model looks at quality management as set of activities or tasks that are required to ensure the project satisfies all the needs for which it was undertaken based on documented in the state of work and includes a focus on quality management from the perspective of product, processes, and the people needed to make quality an effective and efficient aspect of successful project completion (Crawford, 2002).

Moreover PMBOK Guide explains that “Project Quality Management includes the processes and activities of the performing organization that determine quality policies, objectives and responsibilities so that the project will satisfy the needs for which it was undertaken. It implements the quality management system through policy and procedures with continuous process improvement activities conducted throughout, as appropriate” (PMBOK, 2008:189).

PMBOK explains Project quality management comprises of quality planning, quality assurance, quality control.

### **2.2.2.1 What is quality planning**

“PMBOK” defines quality planning as the process for "identifying which quality standards are relevant to a project and determining how to satisfy them": In other words, it means planning how to fulfill process and product (deliverable) quality requirements: "Quality is the degree to which a set of inherent characteristics fulfill requirements". By planning the quality one has to respect some principles, and these are:

- Customer satisfaction comes first: Quality is defined by the requirements of the customer
- Prevention over inspection: It's better to avoid mistakes than to inspect the result and repair the defects.
- Management responsibility: Costs of quality must be approved by the management
- Continuous improvement: Becoming better is an iteratively structured process.

### **2.2.2.2 What is quality assurance?**

Quality assurance is performed by a continuous and repetitive monitoring and appraisal of various facets of the project. Its purpose is to make sure that the work is made with at least the minimum Acceptable levels of quality. Where us, (ISO 9001:2000) also defined quality assurance as a part of quality management focused on providing confidence that quality requirement is fulfilled.

Despite all the wealth of site experience throughout the past years, one out of ten building contracts still leads to client’s dissatisfaction and complains against contractors. Researchers made by the (British Researches Establishment) in the United Kingdom indicate that 40% of building defects occur during the construction phase (BRE, 1982).

In most cases these defects happen because of

- Poor workmanship
- Misinterpretation of drawing and specification
- Not clearly specified requirement
- Lack of supervision
- Lack of proper planning

- Poor communication between the existing stakeholders

### **2.2.2.3 What is Quality control?**

The PMBOK refers to quality control as the technical aspect of quality management. Project team members who have specific technical expertise on the various aspects of the project play an active role in quality control. They set up the technical processes and procedures that ensure that each step of the project provides a quality output from design and development through implementation and maintenance. Each step's output must conform to the overall quality standards and quality plans, thus ensuring that quality is achieved (PMI, 2008).

According to Zenebe (2017), Quality control involves monitoring specific project results to determine if they comply with relevant quality standards and identifying ways to eliminate causes of unsatisfactory results. It should be performed throughout the project. Project results include both product results such as deliverables and management results such as cost and schedule performance. Quality control is often performed by a Quality Control Department or similarly titled organizational unit, but it does not have to be. The project management team should have a working knowledge of statistical quality control, especially sampling and probability, to help them evaluate quality control outputs. Among other subjects, they should know the differences between:

- Prevention (keeping errors out of the process) and inspection (keeping errors out of the hands of the customer).
- Attribute sampling (the result conforms or it does not) and variables sampling (the result is rated on a continuous scale that measures the degree of conformity).
- Special causes (unusual events) and random causes (normal process variation).
- Tolerances (the result is acceptable if it falls within the range specified by the tolerance) and control limits (the process is in control if the result falls within the control limits).

### **2.2.3 Quality management in construction**

Quality Management Systems can provide a solution for several ancient issues in construction companies. It can also constitute a good opportunity for restructuring and modernization, as well as changes in traditional ways that have been accepted without indepth analysis. Principally, the QMP in the construction housing industry refers to quality planning, quality assurance and quality control. For the implementation of quality management in construction housing projects, the concepts of quality planning (identification of quality standards), quality assurance (evaluation of overall project performance) and quality control (monitoring of specific project results) in the quality management processes were defined by (PMI, 2000).

According to (Rumane, 2011), construction project quality management is defined as the fulfillment of owner's needs per defined scope of works within a budget and specified schedule to satisfy the owner's requirements. Every project has elements that are unique that means no

two projects are identical. It is always the owner's desire that his project be unique and better. To a great extent, each project has to be designed and built to serve a specified need. Construction projects are more customized than a routine and repetitive business (Rumane, 2011). This shows that a comprehensive and proper quality management practice that encompass all the components and participants in the construction activities need to be addressed for successful implementation of a practical plan to ensure that the required standards of quality construction will be achieved.

A well-implemented QMP will impact all sectors in the company. According to (Fixsen et al., 2001), implementation is defined as a specified set of activities designed to put into practice an activity or program of known dimensions. According to this definition, implementation processes are purposeful and are described in sufficient detail such that independent observers can detect the presence and strength of the "specific set of activities" related to implementation. In addition, the activity or program being implemented is described in sufficient detail so that independent observers can detect its presence and strength. The principles of Quality Management Systems regarding quality include the establishment of policies and objectives by Construction Company to manage resources, the delegation of responsibilities, roles and authority to personnel, and the development of a company's structure among the personnel. The empirical literature provides pragmatic support of quality management practices in construction projects.

Nowadays for solving quality problems and to meet the needs of the customer, construction companies have adopted QMP in their activities. Hence, this section is concerned with other studies conducted on in similar discipline. One of the earlier empirical studies conducted in the QM area by (Saraph et al., 1989) have used data obtained from 162 managers of 20 manufacturing and service industries collected in the region of USA to identify the CSFs of TQM. They identified eight factors: top management leadership, role of quality department, training, product design, supplier quality management, process management, quality data reposting, and employee relations. For empirical review purpose this study selected the study conducted by (Agbenyega, 2014), which focuses on quality management practices of construction firms in Ghana. The study emphasis on solving the potential barriers, which are to be the main measures to be taken, namely: management commitment, communication between managers and employees, employee involvement, detailed and logical work program, regular inspection, quality audit report, lack of training and education of team members and review and analysis. The other study conducted by Birhanu, who identified that lack of effective supervision, communication, management of commitment, proper equipment and materials available for 16 uses, inefficient resource management and problems with contractors are some of the challenges to the attainment of project quality (Birhanu, 2014).

The research conducted on "Quality Management in Construction Projects" in Malaysia, is also considered for empirical review of this study. This Malaysian researcher explores preliminarily the practices of quality management, management commitment in quality management, and quality management implementation problems in construction projects in the context of

Malaysian construction industry. The findings of the study indicate that the state of quality management in construction projects in Malaysia needs to be strengthened and there are problems in relation to quality management implementation that require attention. The identified problems by the scholars are more or less similar even though there is variation due to their practical context of the projects. Hence, these variables are also considered in my study to consider in the context of the housing construction projects.

#### **2.2.4 Quality assurance in construction**

QA in construction projects is one part of quality management system. QA involves establishing project-related policies, procedures, standards, training, guidelines and systemic activities implemented in a quality system to fill quality requirements (Basu, 2004; Freeman-Bell & Balkwill, 1996; Aziz & Abdel-Hakam, 2016; Panuwatwanich & Nguyen, 2017). Having specific procedures, clear policies, standards, training, guidelines and systems designed to maximize employee performance in facilitating a business' strategic objectives correlates with project success by directing attention, motivating and maintaining an efficient quality-management system (Arditi & Gunaydin, 1997; Nyakala, 2017). These training, guide lines and systems backed up by constant tests In lab and site. In practice, field engineers conduct construction materials testing and inspect construction processes. Specifically, materials' testing refers to the pre-qualification process for materials (e.g., certified material product list, commercial quality product) and sampling and testing at the source, at the plant, or on the jobsite.

It is the believe of different researchers that unless the contractors in construction are active in involving in improving the productivity through an organized quality management system, the efforts of the individuals in the company will be unrecognizable (Arditi & Gunaydin, 1997; Basu, 2004; Bierman). In Ethiopia, project managers and project consultants are responsible for the overall construction success related to delivering infrastructure projects within the approved costs and time as well as the necessary quality and supervision. For any built-environment project to improve its competitive abilities in the construction industry, it should be able to determine the cost of poor quality and its impact on productivity and profitability (Ahmed, 2015). Therefore, contractors cannot view quality as an expensive process, an expensive product, or time consuming, but rather as quality assurance that can improve their competitive capabilities in the marketplace (Mofokeng & Thwala, 2012: 713; Kruger, Ramphal & Maritz, 2014).

#### **2.2.5 Quality Control in Construction**

Project Quality control in construction is the process of verifying that the project is built to plan, that the tolerances allowable by industry standard and engineering practices have been met and that the finished project meets with quality standards of the project as inspected by the involved stakeholders. A good quality control system should have the to consider; select what to control, set standards that provide the basis for decisions regarding possible corrective action, establish



the measurement methods used, compare the actual results to the quality standards, act to bring nonconforming processes and material back to the standard 22 based on the information collected, monitor and standardize measuring devices, include detailed documentation for all processes (Chang, 1999).

There are different quality planning tools and techniques

- **Cost benefit analysis:** analysis the cost benefit analysis is similar to cost benefit ratio. The cost and benefits are measured to analyze the trade offs of providing quality.
- **Cost of quality:** cost of quality (COQ) includes all the costs that conform to the required quality of the project, including the cost to ensure conformance to requirements as well as the cost of non-conformance, and finding the right balance. Modern quality management philosophy emphasizes preventing mistakes rather than detecting them later because the cost of nonconformance is very high.

The following are associated with quality:

- **Prevention costs** are associated with keeping defective products away from the customer. Examples include quality training, quality planning, reliability engineering, or data analysis.
- **Appraisal costs** are associated with checking the product to make sure it is conforming, such as inspection, testing, calibration, studies, or surveys.
- **Failure costs** can be categorized in a couple of ways:
  - **Internal:** non conformance that is found while the product is still within the performing organization is called internal failure costs, and includes rework or scrap.
  - **External:** non conformance that is found when the product has been given to the customer is called external failure costs, and includes repair or returns.
- The cost of non conformance can be divided in to direct and indirect
  - Direct: direct failure costs include scrap, warranty cost, rework, engineering changes, liability insurance, or inventory costs.
  - Indirect: indirect costs include fewer sales, lost customers, increased costs to get customers back, decreased team moral, or decreased project efficiency.

### **Additional planning tools**

- **Brainstorming** is a technique for gathering information, where multiple unfiltered inputs and ideas are solicited and captured for later analysis and decision making.
- **Force field analysis (FFA)** is a technique for analyzing by grouping characteristics or factors that are for (pros) and against (cons) the idea.

- **Nominal group technique (NGT)** is an enhancement of brainstorming that adds mechanism for ranking ideas. It is based on the assumption that a nominal group (one that has agreed to work as a team) will produce better results than a group engaging in traditional brainstorming. NGT collects anonymous input from group members and encourages discussion of all input. Then each member prioritizes the input items. The items are further prioritized based on their cumulative score.

## 2.2 Empirical Review of Literature

From the perspective of a construction company, quality management in construction projects should mean maintaining the quality of construction works at the required standard so as to obtain customers' satisfaction that would bring long term competitiveness and business survival for the companies. Further, the adoption of quality in construction industry has been promoted in some literature. The application of ISO standards has received much attention from researchers. ISO certification is nowadays a trend in most industries including construction industry.

According to study by Mallawaarachchi, for the implementation of quality management in project management, the concepts of quality planning (identification of quality standards), quality assurance (evaluation of overall project performance) and quality control (monitoring of specific project results) in the quality management processes are importance. Among those, quality assurance (QA) and quality control (QC) are mostly used in construction. The quality control procedure in construction projects is based on tender documents, specifications, working drawings etc., therefore, the pre tender stage quality and standards of the work should be properly maintained. Therefore it is important to maintain quality control of the building projects from the inception of its design stage up to the completion of construction including the maintenance period. Quality Assurance (QA) is a program covering activities necessary to provide quality in the work to meet the project requirements (Mallawaarachchi, 2015).

QA involves establishing project related policies, procedures, standards, training, guidelines, and system necessary to produce quality. QA provides protection against quality problems through early warnings of trouble ahead. Such early warnings play an important role in the prevention of both internal and external problems". On the other hand Quality Control (QC) is the specific implementation of the QA program and related activities. Effective QC reduces the possibility of changes, mistakes (Mallawaarachchi, 2015).

As bezawit cited (Beshah, 2011) Ethiopia was the 68th member of the international organization for standardization (ISO). The need for quality control in Ethiopia was recognized since 1972 making the establishment of Ethiopian standards institute. At national level, the government of

Ethiopia considered quality as a development infrastructure starting from 1940s when agricultural products export began to expand (Bezawit, 2020).

QMP certification was a very expensive and tedious process for Ethiopian industries, because there were no system certified organizations which can certify local companies. In February 2009, quality and standard authority of Ethiopia (now called Ethiopian Conformity Assessment Enterprise) obtained system certification and localized the processes. Now the Ethiopian Conformity Assessment Enterprise is giving internationally accepted certificate to not only Ethiopian construction companies but also for any other companies. Ethiopian Quality Standard Agency is also giving training and technical support on QMP (Beshah, 2011). Through analyses of the Ethiopian Quality Award (EQA) self-assessment report evaluation, generally, quality management practices in Ethiopia was found to be low in all the tenets 17 including leadership, policy and strategy, resources management, process management, customer satisfaction, business performance, and impact on society (Beshah & Kitaw, 2014).

Among these factors, policy and strategy is the most critical problem area despite the least weight given by the EQA. Comparatively, the service industries quality management practice is weaker than that of the manufacturing industries as measured by all the quality parameters. Beshah and Kitaw (2014) also suggested that the quality promoters, particularly the government should give special attention to the service industries quality. However, both manufacturing and service industries should be supported to lay down their day-to-day activity on a long-term strategy and also to improve the root causes for the poor quality management practice.

Joy stated in his study on factors influencing quality of construction projects, the major factors that affect quality; material, labor, financial issues, conformance to codes and standards, top management support, management factors, selection of contractor, selection of designer design, co-operation of parties, contract documents and lack of communication (Joy, 2014).

According to Tim McClintock there are different tools and techniques useful in quality planning, assurance, and control, but the writer failed to explain them in a practical way. There is gap in knowledge regarding the quality management in Ethiopia building constructing industry and how these practices are linked to successful completion of projects. And the researches that are undertaken in the context of this country don't address thoroughly concerning quality management. For example Many researches that are done based on Ethiopian construction on quality either have been in identifying the problems they face (Beshah,2011) or overall performance of projects (Tagesse,2017). In a research done by Melat Girma, the researcher identifies quality as one factor for measuring success but doesn't clarify on how we can achieve quality through the implementation of quality management practices.

Further Birhanu in his study on his he identified that lack of effective supervision, communication, management of commitment, proper equipments and materials available for use, quality assurance team lead the process, staff turnover, skilled turnover, Inefficient resource management and problems with contractors are some of the challenges he identified to the attainment of project quality (Birhanu, 2014).

A research under gone by Betework (2019), stated that top management support, commitment of project participants. Communication, regular u budget update and availability of trained resources are the determinants of project quality management on achieving the desired quality.( BeteWork ,2019)

A study by Obare, Kyalo, Mulwa&Mbugua (2016: 420) points out that the quality cost model, the evaluation of quality management practices, customer focus, teamwork, employee empowerment, education and continuous improvement influence project success. In addition, Fotopoulos &Psomas (2009) also assert that performing check-up, analysis, and corrective actions seemed to obtain customer's satisfaction. Martin and Lewis (2014) indicate that an effective communication system between project team leaders and management is crucial for the success of construction projects Jarkas and Younes (2014: 61) stipulate that, in situations where management commitment is ineffective, these should be revised, or new control actions be implemented, thus enabling continuous improvement in construction projects.

And hence this study is conducted based on the following hypothesis that QMP are affected by the following factors.

- Qualified and experienced personals
- Quality of material and equipment
- communication
- Top management support

And here are the challenges that quality management faces

- Lack of management support
- Lack of continuous supervision
- Financial constraints
- Lack of communication

### **2.2.1 Conceptual Framework**

The construction industry like any other industry has been constrained with challenges that affect the performance and output of the project. Identifying potential critical factors that affect the

project quality assurance of the Addis Ababa greening project before the commencement of projects will ensure project quality at the completion of project because by knowing the factors that have an impact on the project implementers and responsible entities can apply preventive activities and implement approaches that would improve the overall process in a way to satisfy the project goal and meet customers satisfaction. However, identifying the potential critical factors alone will not eliminate the problem of quality practices rather it will provide a large extent of help to project team to improve such positive factors and strictly adhere to project specifications to reduce errors. The conceptual framework shows the underlying process applied to guide this study. Hence, in this study, the conceptual framework was adapted from the study above empirical literatures and the variables are derived from them. Figure 2.1 illustrates the level of implementation of those independent variables on the project assurance.

Figure 2.1:- conceptual frame work

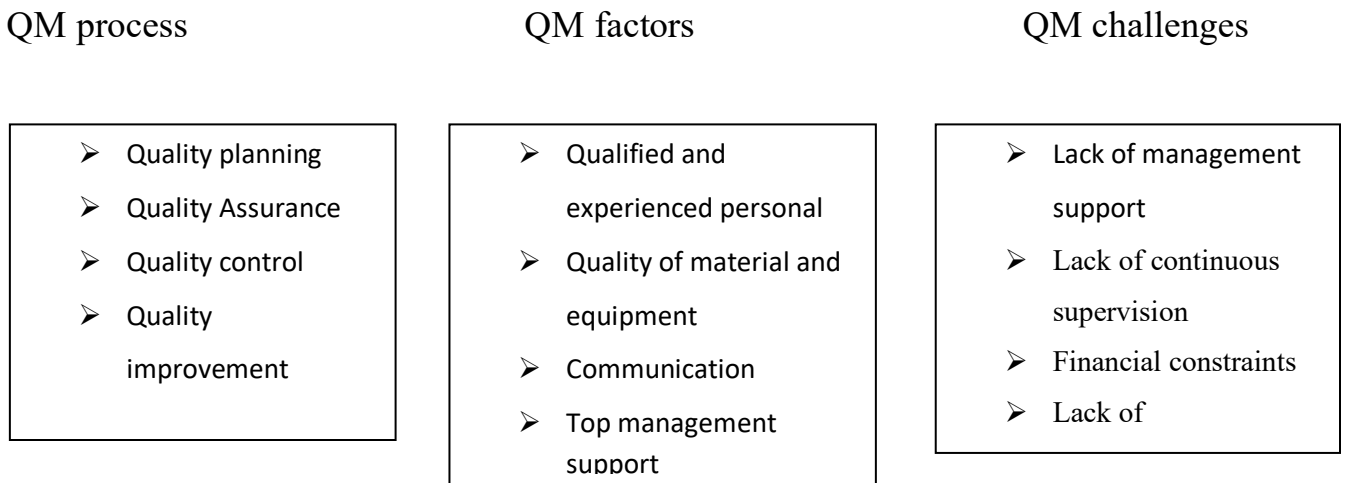


Figure 2.1: Conceptual framework of the study

## 2.4. Summary

The construction in Ethiopia at the current state is going in a fast rate, although it has a long way to go. The mega projects and many business centers that are being constructed are a testament for that. But as it is seen in other developing countries it is faced with stifling problems.

In the well developed countries it is well seen different delivery methods with advance technological and effective management skills are put into effect that allowed them to be successful in their Projects. These diverse options have not yet been sufficiently assimilated into the local construction scene in Ethiopia since most respondents admitted to working within the traditional medium of project delivery. As per this facts this research aims to perform an assessment whether the practices of QM in a foreign company {CCCC} resonates to the local ones and further dig in the factors that influence QM.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1. Introduction**

This chapter of the research explains and justifies the methods and means in which the objectives of the study will be met. Steps that will be used to gather all relevant information are presented in detail. It also presents research instruments and strategy that will be employed in the study. It finally presents the sample size, data collection approaches and method for the analysis of the data gathered.

#### **3.2 Research Design**

According to Fox W. & Bayat, M.S. (2007) the advantages of descriptive research are effective to analyze non-quantified topics and issues; the possibility to observe the phenomenon in a completely natural and unchanged natural environment; the opportunity to integrate the qualitative and quantitative methods of data collection. Thus, this study will employ descriptive research design to assess project quality control and assurance practices that are in practice in CCCC and causal research design to assess factors that affect QMP.

#### **3.3. Research Approaches**

As Creswell & Plano Clark (2007) argues that that no one studies is purely quantitative or qualitative and that each method has many of the same elements. The quantitative approach was important to gather more data, especially those data having numerical nature. The other approach was qualitative approach which is important to collect information that has qualitative nature and useful to conduct and in depth investigation of the issue at hand. Thus, the mixed approach is important to assess opinions and attitude of different respondents and to gather data related to factors that influence QMPs. According to Mark (2009), as cited in Aida (2015) mixing qualitative and quantitative approaches gives the potential to cover each method's weaknesses with strengths from the other method. Therefore, this study will employ both qualitative and quantitative methods (mixed approach).

#### **3.4. Sampling Techniques and Population Sample design**

To select the respondents for the questionnaire a purposive sampling technique was employed. This sampling method is chosen for it allowed the researcher to focus on a limited number of informants that were selected purposively from the project based on convenience to get the required information to carry out the study in order to get optimal insight. The respondents were selected based on their experience, information and area of work they have about project implementation.

The project is located in the center of Addis Ababa, the capital city of Ethiopia with the area of 285767 m<sup>2</sup>. The completion of this project will show the Ethiopia's national image of opening to the outside world, embodies the key core values that are "national unity and harmonious symbiosis", highlight the important position of Ethiopia's national political core area, and become popular leisure tourist place.

The population for the study includes all the employees of the contractors, the consultants and the client which is the Ethiopian government. Since it is difficult to gain information from the client side the study will only involve in the contractor and the consultants. 1500 Ethiopian employees are working in the contractor side. Out of these employees only 5 engineers and 3 surveyors are there. The study needs information that is reliable and timely response and also due to budget constraints only these local employees will be taken in to account. As for the Chinese employees in the company, there are 147 workers including top level management.

A purposive sampling technique will be used since the required data needs specific knowledge.

For this research, the formula provided by Yamane (1967) was used to determine the sample size with 95% confidence level and with 0.05 margin of error.

$$n = \frac{N}{1 + Ne^2}$$

Where: n = Desired sample size

N = Total population size

e = Accepted error limit (0.05) on the basis of 95 percent degrees of confidences

$$n = \frac{56}{1 + 155(0.05^2)}$$

$$n = \frac{56}{1.38}$$

$$n = 49$$

**Table 3.1: Distribution of Sample size in the target area**

number	Target Group	Total population	Target	Sample size
1	Chinese managers	10	10	10
2	Chinese site engineers	137	38	31
3	Local employees	1500	8	8

### **3.5. Sources of data and Data Collection Method**

Primary data sources like questionnaires, field observation and interviews will be used in order to realize the target group. The primary sources of data were employees (professionals) on project. All quantitative data's will be gathered through questionnaires and secondary data's from the company while the qualitative data's are gathered through interviews. The study relied on Secondary data sources that are gained from the company backlog, similar research done on the same and related topics, articles.

### **3.6. Data Collection Tools/Instruments**

Semi-structured interview and questionnaires were administrated as survey instruments to the project manger of the contractor and project managers of consultants. The main tools that will be to gather the primary data from the primary sources mainly include questionnaire, interview guides and experiences of the researcher. Regarding the questionnaire; primary data will be collected using self-administered semi-structure questionnaire composed of close-ended and open-ended questions. The methodology for the work consists of four step form. The first step is quality planning, second step is quality control; third step is quality assurance and last step quality improvement. Questionnaires have been prepared considering quality aspects( quality assurance and control) and factors affecting these aspects and the interviews of project manager was conducted since the responses contributes to the understanding of current project quality assurance practices and problems the projects encountered.

The first phase of data collection will be the establishment of the study framework which includes the survey and secondary data. The survey framework includes the identification of all relevant documentation and formulation of questions for the interviews and questioners. The second phase pilot test will be done on the questioners by distributing questions to verify the clarity and include any comments before distributing to the total target. And the final version of questioner distributed to respondents and finally collected the data. Likewise interview will be used in gather more of in-depth qualitative data from the key informant of the project.

### **3.7. Validity and Reliability**

The validity of questioners developed for this study will be checked before distributing the final questionnaires to the respondents by friends and project personnel and the advisor of the researcher and pilots will be done to check the validity. The final version of the questioners will be distributed after incorporating all the comments and feedbacks obtained from different professionals.

Reliability analysis will be carried using cronbach's alpha and in principle cronbach's alpha of 0.7 is acceptable for internal consistency of data obtained from respondents. It is expressed as a number between 0 and 1 where the higher the score of Cronbach alpha, the more reliable the generated scale when the closer the alpha coefficient is to 1.0, the grater the internal consistency



and the reverse is true. Therefore, the reliability will be checked based on the data process on SPSS.

### **3.8. Methods of Data Analysis**

After collecting all required data using the above mentioned instruments from the identified sources, both qualitative and quantitative methods of data analyses will be applied. The data obtained from the questionnaire respondents used to assess the quality management practices and challenges will be analyzed using SPSS (Version 20). After organizing, coding, and defining variables, responses of the cases will be entered into the software. Then for analysis descriptive methods will be used. And results will be presented using tables and figures.

### **3.9. Data Analysis and Interpretation**

In order to summarize the result and to communicate the result descriptive statistics will be used based on the collected data. Charts, tables and graphs will be use to analyze the existing QMP in the case study. For our casual research design regression analysis will be used. Basically In regression analysis there is an independent and dependent variables and here are the assumptions.

Linear regression analysis is based on the following set of assumptions:

- 1. Assumption of linearity.** There is a linear relationship between dependent and independent variables.
- 2. Assumption of homoscedasticity.** Data values for dependent and independent variables have equal variances.
- 3. Assumption of absence of co linearity or multi co linearity.** There is no correlation between two or more independent variables.
- 4. Assumption of normal distribution.** The data for the independent variables and dependent variable are normally distributed

For this study the ordinal logit model will be applied; according to Gujarati (2004), ordinal logit model is used where the dependent variable has more than two outcomes usually these outcomes are ordinal in nature; which mean they cannot be expressed on an interval scale. Frequently, in survey-type research, the responses are on a Likert-type scale, such as “strongly agree”, “agree”, “neutral”, “disagree” or “strongly disagree.” Or the responses in grading survey may be “Excellent,” “Very good,” “Good,,” “Relatively good”, “Pass” or “Fail”. Very often these responses can be coded as 1 (excellent), 2 (very good), 3 (good), 4 (relatively good), 5 (pass) and 6 (fail). These are ordinal scales in that there is clear ranking among the categories but we cannot say that 1 (excellent) is twice 2 (very good) or 3 (good) is three times 1 (excellent).

The raw data of the questioner will be coded and analyzed using Microsoft excels and/or (SPSS) computer program for statistical analysis to facilitate the interpretation of the data. Both qualitative and quantitative methods of data presentation will be used. In order to present the data in a simple form so as to draw the conclusion directly by viewing at the data.

## CHAPTER FOUR

### DATA PRESENTATION, ANALYSIS AND INTERPRETATION

#### 4.1 Introduction

In this chapter the results of the study will be discussed that are derived from the questionnaires and the interviews that were formulated to achieve the desire objective.

To accurately and adequately present the survey data certain steps were followed. First vetting the data to exclude irrelevant information's was done. Meaning the questionnaires' that are done appropriately was gathered for processing. A coding scheme was developed and data imputed into the Statistical Package for Social Scientists version 25 (SPSS) for descriptive statistical analysis. Code 1 was assigned to the lowest level of agreement while code 5 was assigned to the highest level of agreement with the respective statement.

The descriptive analysis and statistical calculation was done in order to interpret raw data into useful information. Descriptive data was analyzed using frequencies and percentages to find the views of the respondents on quality management practices of construction projects. The result of the analysis was presented in tables and charts.

To summarize all the relevant data starting from the personal information of the respondents to the challenges of quality management have been presented in this chapter.

#### 4.2 Response Rate

A total of 55 questionnaires' were distributed to sample population who are the workers of the contractor CCCC. This includes engineers that are local and foreign nation that participated in the Addis Ababa greening project. After the data have been collected, out of the 56questioners 49 were returned. That gives a response rate of 87.5%.

There are now higher expectations for survey response rates. Response rates approximating 60% for most research should be the goal of researchers and certainly are the expectation of the Editor and Associate Editors of Journals. For survey research intended to represent all schools and colleges of project management, a response rate of  $\geq 80\%$  is expected (Fincham, 2008).

**Table.4.1 ResponseRate**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	returned	49	87.5	87.5	87.5
	non returned	7	12.5	12.5	100.0
	Total	56	100.0	100.0	

## 4.2 Respondents Profile

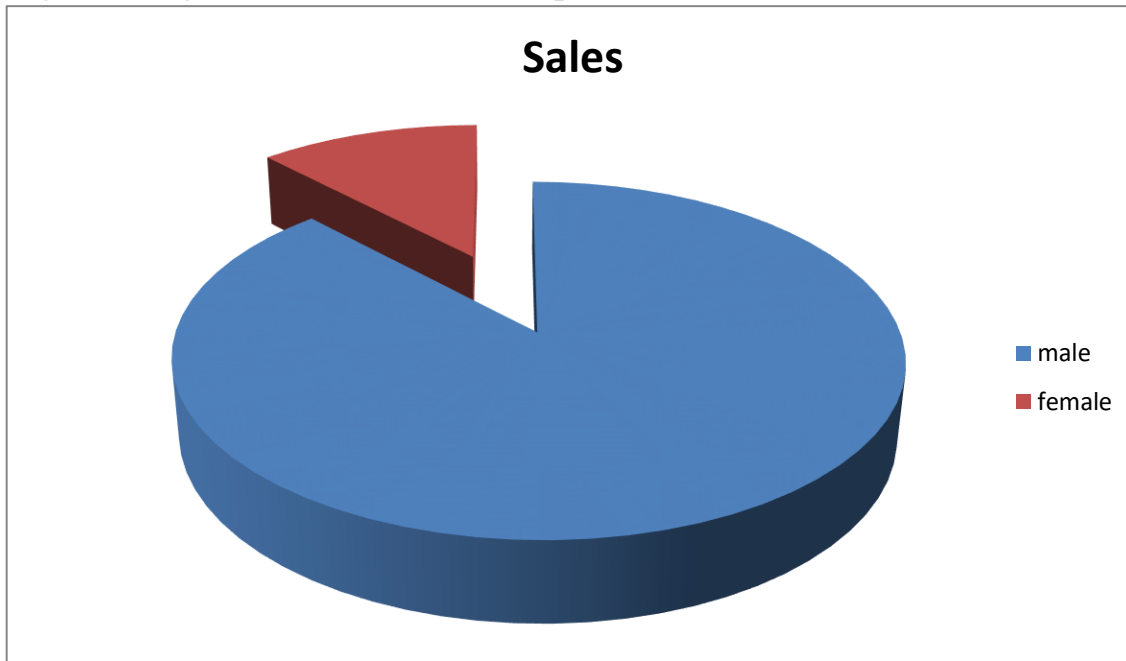
### 4.2.1 Gender disposition

The table and the pie chart below shows the demographic statistics of the genders of the respondents. Participants were asked to indicate their gender by selecting the appropriate option provided (male or female). Accordingly only 6 (12.3%) of the respondents were female while the remaining 87.7% were male. This shows most of the workers are male.

**Table 4.2 gender**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	43	87.8	87.8	87.8
	female	6	12.2	12.2	100.0
	Total	49	100.0	100.0	

Figure 4.1: gender distribution of respondents



### 4.2.2 Educational Background

From the analysis on educational background of the respondents, it was found that only 5 respondents (10.2%) have College Diploma, respondents (69.4%) are undergraduate degree, the rest 8 respondents (20.4%) have graduate degree /masters and above. This profile shows that majority of the respondents have undergraduate degree or first degree level.

**Table 4.3 education background**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	post graduate	10	20.4	20.4	20.4
	undergraduate	34	69.4	69.4	89.8
	diploma	5	10.2	10.2	100.0
	Total	49	100.0	100.0	

### 4.2.3 Role and Experiences

The positions of each respondent are categorized in to three different levels. These are contractor, consultant and project owner. But for these study because of reasons mentioned in the limitation section of the research only the contractor's side information is gathered.

**Table 4.4 experience**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-5 years	8	16.3	16.3	16.3
	5-10 years	30	61.2	61.2	77.6
	16-20 years	4	8.2	8.2	85.7
	21 and above	7	14.3	14.3	100.0
	Total	49	100.0	100.0	

In the above table it shows that none of the respondents have an experience in the range of 10 to 15 years. But 16.3 % have experience up to 5 years, 61.2% have up to 10 years, 8.2 % have up to 20 years and 14.3 have 21 and above experience.

### 4.3 Quality management planning practice

1. Have you participated in the primary project designing process before implementation starts?

**Table 4.5 project design**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	8	16.3	16.3	16.3
	no	41	83.7	83.7	100.0
	Total	49	100.0	100.0	

The of the theory of policy as statement of starting, promote consistency across projects, explain organizational view of quality and provide specific guideless for changing which was suggested by Kerezen is disproven as most of the respondents responded to the question, is quality management policy in your organization?

According to the interview with head of the project who is the manager, quality planning starts when specification of material by the consulting company in charge with a joint venture. The document which aims to ensure compliance of constructions with the minimum requirements for design, procurement procedures, construction and quality of materials set down by the Ministry.

Only few of the respondents participated in the planning of the quality management system. Out of the 49 respondents only 7 of the top managerial position engineers participated in formulating the policy. Based on the interview that was conducted the company have quality policy that is constructed before the project started.

## 2. How important do you think the quality management plan is to your construction projects?

Based on the question that was asked most of the respondents answered that it is very important to have quality management plan in construction project. This shows that for a project to be successful and meet the desired standard one must have quality management plan.

**Table 4.6 quality management plan**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	moderate	13	26.5	26.5	26.5
	high	15	30.6	30.6	57.1
	very high	21	42.9	42.9	100.0
	Total	49	100.0	100.0	

### **4.3.1 Content of the Quality Plan**

Based on secondary data that was gathered after the interview was conducted revealed that the quality management plan consists of the following listed standards.. The result shows that the project is briefly described with sufficient documents and quality objectives. The organization provides continuous quality tests with specific instructions and procedures. But regarding in improving the existing quality plan it failed tremendously. Respondents think it lacks continuous improvement while only (18.45%) thought it has improved. The quality management plan consist the following different aspect

1. Brief description of project
2. List of contract documents and drawings
3. Project quality objectives
4. Responsibilities and authorities of project staff
5. Inspection and test plans, or list thereof;
6. list of project-specific procedures, work instructions and inspection

But it lacks in the area of Site organization chart, with named personnel if known and Frequency of updating the quality plan. So what is the implication of these facts? Identifying these items might require updates to the project management plan or schedule, which emphasizes the evolving nature of the plan and project documents. The plan, like other components created during the planning phase, is written by the project manager with input from stakeholders. When planning for quality on a project follow the corporate quality policies that are in place. If a corporate quality policy does not exist, the project team should create one for the project. The project team might even need to adapt an existing policy to better suit the nature of the project.

As it was explained in the literature review there are different types of tools and techniques that can be used in the planning of quality and out of `them the company employed the following tools and techniques.

1. Benchmarking
2. Design of Experiments
3. Quality Audits
4. Inspection
5. Statistical Sampling

Quality planning tools help organization collect and analyze data for employees to easily understand and interpret information. Quality Management models require extensive planning and collecting relevant information about end-users. Customer feedbacks and expectations need to be carefully monitored and evaluated to deliver superior quality products.

#### 4.4 Quality Assurance Practices

This section of the study discusses the desirable measures for effective quality assurance practices in CCCC. To do this, the respondents were presented with two questions and 5 sub questions. These items are identified based on the literature from other similar projects and understanding quality assurance in construction projects, the following table summarizes the responses of the target respondents on factors included in quality assurance.

Table 4.7 quality assurance practices

<b>tools</b>	<b>No of response</b>	Strongly agree	agree	Moderately agree	Slightly disagree	Strongly disagree
Select the appropriate quality system requirements for each contract	49		3(6.5%)		8(16%)	38(77.5%)
Clearly specify the quality system requirements in tender and contract	49	1(2%)			42(85.71%)	6(12.29%)
Evaluate and select subcontractors on their ability to satisfy specified requirements	49	1(2%)			29(59.18%)	19(38.82%)
Monitors the works and the implementation of the quality system	49	32(65.3%)	12(24.5%)		5(10.2%)	
Collect, reviews and control the quality record	49	20(40.8%)	19(38.82%)		10(20.38%)	

#### 4.5. Factors Affecting Quality management

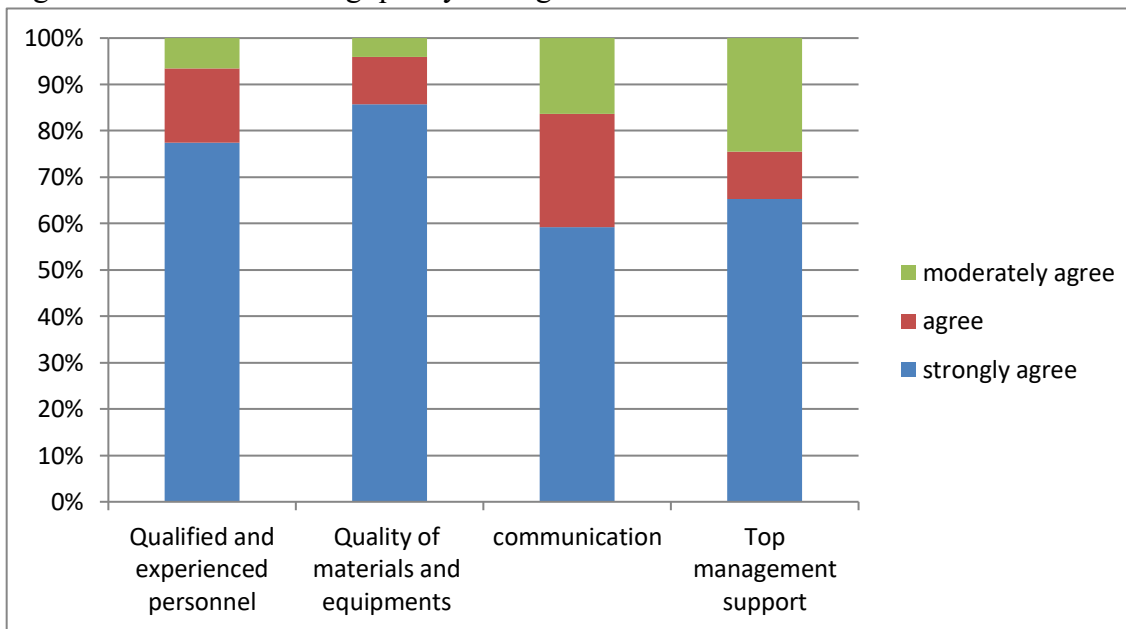
This section of the study assesses the factors that influence quality management in CCCC surveyed based on the literature reviewed list of factors. The respondents were presented with four variables on which are supposed to influence quality management to rank from ‘strongly agree’ (5) to ‘strongly disagree’ (1). The result of the responses is presented in the table below:

Table 4.8 factors affecting quality management

factors	No of response	Strongly agree	agree	Moderately agree	Slightly disagree	Strongly disagree
Qualified and experienced personnel	49	38(77.5%)	8(16%)	3(6.5%)		
Quality of materials and equipments	49	42(85.71%)	5(10.2%)	2(4.09%)		
communication	49	29(59.18%)	12(24.48)	8(16.34%)		
management support	49	32(65.3%)	5(10.2%)	12(24.5%)		

From above table materials and equipments used in the project construction(95.2), qualified and experiences personnel(93.5%), communication(83.66%) and top management support(75.5 %) ranked 1st, 2nd, and 3rd respectively are estimated the three most important factors in that affect quality management of Addis Ababa greening project undertaken by CCCC.

Figure 4.2 Factors affecting quality management



#### 4.6. Challenges in Project Quality Management

The respondents were asked if they encounter problems as highlighted in the literatures for the implementation of quality management is concerned. The researchers identified certain



challenges of quality management and were presented to the respondents and the responses are presented below.

Table 4.9 challenges of quality management

factors	No of response	Strongly agree	agree	Moderately agree	Slightly disagree	Strongly disagree
Lack of management support	49	29(59.18%)	7(14.28%)	13(26.54%)		
Lack of continuous supervision	49	25(51.02%)	7(14.28%)	15(34.7%)		
Financial constraints	49	22(44.9%)	10(20.41%)	15(34.9%)		
Lack of communication	49	35(71.43%)	6(12.24%)	8(16.33%)		

From the above table, the first three major problems in the order of their rank were lack of communication (83.67%), lack management support (73.46%), and each financial constraints and lack of continuous supervision are (65.31%). This shows that financial constraint is not as an issue as the others which was quite a surprise to the researcher.

#### 4.7. Quality management Improvement

Below this, the table shows that the quality management practices that are exercised in the company on the specific project is mostly maintained and to some extent decreased as the work execution is done. But the extent of its improvement isn't as it is expected to be. Only 20.4 % agreed it is improving.

##### 4.1.1 Quality Improvement

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	improved	10	20.4	20.4	20.4
	maintained	21	42.9	42.9	63.3
	decreased	12	24.5	24.5	87.8
	stopped	6	12.2	12.2	100.0
	Total	49	100.0	100.0	

#### **4.8. Discussion**

In light of the data obtained through the three data collection tools (questionnaires, interviews and documents reviews), the following major points of discussions have been identified and discussed as follows.

There is no separate Quality management policy separately in the Organization unlike in the literature most studies recommend that to have separate quality policy in the organization which help as guiding principle to undertake the whole process of quality management. Kerezen(2003) described quality policy is instrumental in creating the organization's standing and quality image since it is statement of principles stating what throughout the organization and across the project and Tonnen (2002) stated that the main advantages of this approach over conventional planning systems are that it combines strategic objectives with tactical daily management, covers all functions in a company and increases quality goals' consensus.

Quality management tools are important factors for the implementation of quality management in construction projects, where identification of quality standards, evaluation of overall project performance and quality control monitoring of specific project results in the quality management processes were defined by PMI (2000).

In the study majority of the respondents agrees that there is an astounding performance measurement to control quality (87.9%) in primary construction project.

A research under gone by Betework (2019), stated that top management support, commitment of project participants. Communication, regular u budget update and availability of trained resources are the determinants of project quality management on achieving the desired quality.( BeteWork ,2019)

Joy stated in his study on factors influencing quality of construction projects, the major factors that affect quality; material, labor, financial issues, conformance to codes and standards, top management support, management factors, selection of contractor, selection of designer design, co-operation of parties, contract documents and lack of communication (Joy, 2014). And as per this research it found that materials and equipments used in the project construction (95.2%), qualified and experiences personnel (93.5%), communication (83.66%) and top management support (75.5 %) are the factors that affect quality.

## CHAPTER 5

### SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter has three sections. The first section presents summary of major findings, the second section presents conclusion of the study derived from findings and the last section deals with recommendation that were made on basis of the findings.

#### 5.1. Summary of the Finding

Based on the results of the study carried out the major summary of finding of the study shows that:

- CCCC has a written quality policy but that are formulated with joint venture of the consulting company. Most of the activities identified as quality plan content on the guiding of other literature project quality document are in one way or another included in their project work.
- The overall project planning process is with a direct participation of the implementers starting from planning phases. But the level of involvement is mostly at implementation, follow up and the controlling.
- inspection seem as the common practices to most of the projects which count for 93.88 % followed by statistical sampling 89.79 % were confirmed as quality management tools and technique respectively.
- materials and equipments used in the project construction(95.2), qualified and experiences personnel(93.5%), communication(83.66%) and top management support(75.5 %) ranked 1st, 2nd, and 3rd respectively are estimated the three most important factors in that affect quality management of Addis Ababa greening project undertaken by CCCC.
- Defining purpose of the project (91.4%) and collects reviews and controls the quality records that the supplier is conducted (93.1%) are the major variables affect quality assurance of the project.
- The quality management practices that are exercised in the company on the specific project is mostly maintained and to some extent decreased as the work execution is done. But the extent of its improvement isn't as it is expected to be. Only 20.4 % agreed it is improving.
- The major problems in the order of their rank were lack of communication (83.67%), lack management support (73.46%), and each financial constraints and lack of continuous supervision are (65.31%). This shows that financial constraint is not as an issue as the others which was quite a surprise to the researcher.

## 5.2. Conclusion

Directing a construction project towards quality with low cost and time is a greater concern today. It is because quality is required to meet project requirements of the owners, constructors and other parties involved with a greater satisfaction. Moreover, poor quality could lead to unnecessary cost to the organization where it could create costs due to failure, appraisal and prevention. Hence, it creates a necessity to introduce the concept 'quality' into building process throughout its whole life phases. Implementing proper quality management plan is important at the project inception where, quality drawings, quality standards and constructability of design may lead to enhance the project quality. However, the commitment and the support of the management are important to continue the process. The awareness and training provides a base to collaborate all parties into the process, in which the collaboration of such all parties in quality management process is essential to lead towards construction project success.

The following conclusion, which is made from the research findings, could help to give insight to Flintstone real estate Construction Company in relation to the management 's responsibility in implementing and practicing QMS.

- This finding is self-assertive to conclude that the leadership support to the mission and vision of the QMP provides a quality culture that could motivate the project team in overall project environment in the company.
- The findings also allow one to conclude that the foreign company CCCC top management is committed in the implementation and practice of QMP.
- It can be concluded that the good management made the company to be competent in the construction market.
- It can be concluded that the practice of activities related to overall improvements within the organization is done unsatisfactorily.
- Regarding to using different techniques of quality assurance the company failed. it can be concluded that the company was only moderately able to recognize the processes needed for the QMP and their application throughout the project activities by identifying and realizing the processes and establish the interaction between them.
- Additionally regular and periodic construction site supervision and inspection were the most important measure to improve quality of primary construction projects. The next important measure is implementing a comprehensive quality control mechanism starting from the planning phase and continuing into the end of the project implementation phases.
- The project quality management is challenged by various factors mainly; lack of communication, insufficient management support, financial constraints and continuous supervision.

### **5.3 Recommendations**

The following recommendation is given to enhance the level of management responsibilities within Flintstone real estate construction projects.

- It is recommended that people operating within the QMP need to be evaluated for performance and continued competency.
- There should be an encouragement to continually utilize a process approach, focusing efforts on planning, procedure, provision for effective documentation, document control, and effective corrective actions.
- For improving the accessibility of accurate and reliable data both company need to understand what data is and why its reliability is important and therefore they need to work on effective collection and management of data. It is recommended that these company need to collect data through various methods. Hence based on the accurate and reliable data the company needs to establish clear procedures for managerial decisions which can improve the quality and impact of their decisions would be efficient.
- The company's quality management improvement is low and hence there should be an effort to amend this.
- The challenges that arise in a project should be tackled as a team and this team should be involved in the planning process of quality management. In which the case study company failed to do since only top 7 officials were involved in the formulation of the quality policy.
- The strong side of the company which are consistency in inspection , financial capacity and benchmarking should continue

### **5.4. Future Studies**

The practice of quality project management based on the project management skills and knowledge is in its early stages in Ethiopia and only few researches were conducted that are relevant to project management in general specially to quality management. For in-depth understanding further research should be made on other contributing factors on project quality management performance, and project quality. Furthermore, additional investigation on the quality management of other types of commercial and industrial building projects is required.

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**St. Mary's University**  
**Post Graduate program**  
**Department of project Management**  
**M.A thesis on quality assurance**

**APPENDIX A: QUESTIONNAIRE ST. MARY'S UNIVERSITY SCHOOL OF GRADUATE STUDIES**

Bealu Girma,

St. Mary's University,

Phone number: +251920595322,

Addis Ababa, Ethiopia.

Dear Respondent,

**SUBJECT: REQUEST FOR RESEARCH DATA**

I am a graduate student at St. Mary's University. In partial fulfillment for the award of a Master of Arts Degree in Project Management, I am carrying out a research study on the '**Assessment of Project Quality Control and Assurance Practices: "The Case of Addis Ababa River Side Green Project"**'

You have been identified as one of the people that could be of assistance with the research and I thus request your participation in the research. Essentially, you would be required to complete a questionnaire. You will be treated anonymously and your responses will be treated with utmost confidentiality. The information you provide will be used only for academic purposes.

Yours Faithfully,

Thank you in advance

我是圣玛丽大学的研究生。为了部

### Research Questionnaire

Kindly answer the following questions by writing a brief answer or ticking “√” in the boxes provided.

#### PART A: Background Information

1. What is your gender?

Male

Female

2. What is your position in the organization?

Contractors

Consultant

Project owners

3. Which is your highest level of education?

Post Graduate

Undergraduate

Diploma

Certificate

Any other (specify).....

4. How long have you been in this industry?

- 1 to5years
- 5 to10years
- 11 to15years
- 16 to20years
- 21 years and above

**PART II:**This part of questionnaire covers Quality management practices, Quality control tools and challenges in Addis Ababa greening project.

**A. Quality Management & process**

1. Have you participated in the primary project designing process before implementation starts? 1 .Yes 2. No
2. If yes at which stage? 1. Planning .2.Implementation 3. Controlling  
4. All stage
3. How important do you think the quality management plan is to your constriction projects?  
1.Very low 2. Low 3. Moderate 4. High  
5. Very high

**B. Quality Management Tools and Control**

4. Is there a way to measure actual performance? 1.Yes  
 2. No
5. Do you use any quality management tools? 1.Yes  
 2. No
6. If yes, which method you use in your project?

7. Please express your opinion on the following quality management factors that affect performance of construction projects;

The scale rating description: 5 = very strongly Agree, 4= strongly agree, 3= moderately agree, 2= slightly Disagree, 1= strongly Disagree

no	Quality factors	Rating				
		5	4	3	2	1
1	Qualified and experienced personal					
2	Quality of material and equipment					
3	Communication					
4	Top management support					

### C. Quality Assurance

9. Is the purpose of the projects defined in the first instance?

1. Yes  2. No

10. Do you consider the following factors in your quality assurance mechanism?

(a) Selects the appropriate quality system requirements for each contract.

1. Yes  2. No

(b) Clearly specifies the quality system requirements in tender and contract documents.

1 Yes  2.No

(c) Evaluates and selects subcontractors on their ability to satisfy specified requirements.

1.Yes  2. No

(d) Monitors the works and the implementation of the quality system.

1.Yes  2. No

(e) Collects, reviews and controls the quality records that the supplier is contracted to provide.

1.Yes  2. No

#### **D. Quality Management Challenges**

11. What are the main challenges and obstacles of quality management in the project in your opinion?

Description: 5 = very strongly, 4= strongly, 3= Moderate, 2= Less, 1= very less

no	Quality factors	Rating				
		5	4	3	2	1
1	Lack of management support					
2	Lack of continuous supervision					
3	Financial constraints					
4	communication					

12. Does the company solve these challenges? 1.Yes 2. No

13. How the organization's quality management practice look like?

1. It is improved  2. It is maintained  3.It is decreasing  4. It is stopped

Other, Please specify\_\_\_\_\_

## **APPENDIX B: KEY INFORMANT INTERVIEW GUIDE**

1. Would you tell me your current position in your organization, level and type of your education and experience on project management?

2. What is your general experience in your organization in project implementation and management with reference to time, budget and quality of outputs?

3. Do you have project quality management system in your organization?

4. What are the policy and procedure of CCCC concerning quality?

5. Do you have a quality manager separately? What are the major responsibilities? Or do other departments participate on the preparation of the quality plan? Other department staff responsible for contracts, purchasing, logistics, etc.

6. How do you control the quality of material and work? Who is responsible?

7. Does CCCC team conduct regular supervision? How frequent?

8. Do you have training on project management? Especially on project quality management?

9. How do you see management commitment and priority for project Quality implementation and management?

10. How are projects quality maintained? What are the measures you take to control quality of projects?

11. How and in what ways are project quality related issues communicated?
12. What are the challenges you face in project quality implementation and management in your primary hospital construction?
13. What do you think must be fulfilled for successful project quality implementation and management in general?

Thank You for Your Participation