ST. MARY'S UNIVERSITY
SCHOOL OF GRADUATE STUDIES

PRACTICES AND CHALLENGES OF PROJECT QUALITY MANAGEMENT: THE CASE OF 40/60 HOUSING PROJECT IN ADDIS ABABA

BY

TIGIST BETE WORKU

JUNE, 2019

ADDIS ABABA, ETHIOPIA

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A THESIS SUBMITTED TO THE ST. MARY'S UNIVERSITY SCHOOL OF GRADUATES STUDIES IN THE PARTIAL FULFILMENT OF THE REQUEREMENTS FOR THE DEGREE OF MASTER OF ARTS (MA) IN PROJECT MANAGEMENT

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ACRONYMS AND ABBREVIATIONS

AASHDE	Addis Ababa Saving Houses Development Enterprise
CBE	Commercial Bank of Ethiopia
E.g.	(exempli gratia) Meaning "For Example"
EEA	Ethiopian Economic Association
FGD	Focus Group Discussions
I.e.	Id Est and means "in other words." "That is"
ISO	International Organization for Standardization
PERT	Program Evaluation and Review Technique
PM	Project Management
PMI	Project Management Institute
PQ	Project Quality
PQM	Project Quality Management
QMS	Quality Management System
SPSS	Statistical Package for the Social Sciences

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ABSTRACT

Quality management advances over the years through an evolution, which is influenced by the method of management of organizations. Quality is a key factor in any product or industry, in order to implement quality to any type of product or service it is important to employ the best quality management practices. Hence the aim of this study was to assess the project quality management practices and challenges of 40/60 housing projects that were active and under construction during the study. A comprehensive literature review was conducted to identify the current knowledge and there were a gap of knowledge in the area which studies the quality management aspects of the 40/60 housing projects in the implementers' perspectives. And five factors that were expected to have influence on the project quality management performance were selected (i.e. regular budget update, commitment of all participant, top management support, availability of trained resources and communication between project implementers). The study was conducted using a mixed method approach and convergent parallel mixed method design was employed to answer the research questions. Practices and challenges of project quality management and the level of implementation of the selected five factors were assessed and there were lack of adequate resource management, lack of continuous improvement, weak coordination with supplier, lack of quality management information between different sections of the project. From the selected factors that adversely affected the quality performances of projects were; the level of implementation of regular budget update (2.04), commitment of all participants (2.06), top management support (2.07), and availability of trained resources (2.11) which were below average level of implementation. Even though the effect of employing regular budget update, top management support, availability of trained resources, commitment form participants was believed to influence the project outcome positively, it is weakly implemented. Recommendations were made for 40/60 housing project implementers to ensure implementation of resource management, implementation of quality improvement tools and techniques such as check sheet and control charts to control the performance and improve regularly, budget management, to establish strong coordination with supplier, provide training for employees and implement top management support during the project implementation.

Key Words: Quality, project quality management, continuous improvement, quality management performance, housing project

CHAPTER ONE

1. INTRODUCTION

1.1. Background of the Study

According to Kerzner (2009), the past twenty years, have been a revolution in quality, and different improvements have been implemented in product quality as well as in leadership quality and project management quality. Kerzner further elaborates that customers are demanding higher levels of quality in recent time which indicates customers require a higher performance, fastest product development, a higher level of technological products, with fewer defects and lower contractor profit margins. The view of quality changes from the past to recent days, the change shows the different thoughts in the past and in recent years, in the past quality was perceived to be the responsibility of blue-collar; whereas in recent time it is considered everyone's responsibility including workers and direct labor employees working on white-collar workers, the indirect labor force, the floor, and the overhead staff; quality defects would have been hidden from the customers (and possibly management) in the past in contrast recently defects should be highlighted and brought to the surface for corrective action; increased quality thought to be the factor that increases project costs while recently it is believed that it actually improved quality, saves money and increases business opportunity.

When one thinks about quality there is a common saying as Rose (2005:3) underlines "Customers know it when they see it" and "Suppliers promise that their goods and services embody it" in both cases there is unclear understanding about what quality is and it leads to frustration to the implementer to determine what is expected to be delivered. Quality can be defined in different perspectives from the view of product: the features that the product possess can be considered a quality; in the view of defects: products are considered to be a quality product when they are defect free; the other view is the process of product manufacturing because the production process has a great impact on the outcome of the product itself; the customers view is another perspective to define quality in this view quality is measured by the customers requirement, need and expectation; and generally, quality as a system views the big picture with things interlinked together which means quality can be described with products, process, defects, and customers views, furthermore

quality can also be defined by other factors such as supplier, policies, organizations and other specific factors related to the specific situation.

Ethiopia is among the developing country and has shown rapid economic growth recently. The construction industry is one sector which plays an important role in economic growth as well as creating a well-established country, thus the government gave special attention to this sector, and launched different construction activities, the Addis Ababa Saving Houses Development Enterprise (AASHDE) is one of the construction activities particularly managed by the government involvement and construction companies to help the middle level dwellers, AASHDE launched the 40/60 housing project to the saving house programs which was established in July 2012, with the aim of building and distributing houses to the middle class segment of the city tenants, who can afford to save 40% of the cost of the houses, while the rest will be facilitated by a bank loan from the Commercial Bank of Ethiopia (CBE) hence the name of the project implicated that. Further the program of this type requires the customers to save 40 percent of the value of the houses within the five years and the government arranges a loan for the remaining 60 percent from the Commercial Bank of Ethiopia (CBE), and the loan will be paid for the bank upon receiving the house with the agreement made between the bank and the house owner (Nuru, 2014).

The need for giving special attention to the quality is important where there are massive constructions are undertaken by these contractors; it is essential knowing that the defects in the buildings could cause many problems to the city dwellers as well as government if not given the proper attention, such as physical damages and economic loss. Thus this study regarding the practices and challenges of the project quality management of the 40/60 houses would guide the implementers to improve the project quality management activities in a way to enhance the quality continuously and improve the project performance in general by pinpointing top managers and higher officials to know where there are implementation weakness and by showing the improvement opportunities.

1.2. Statement of the Problem

Project quality management is generally a part of other core project management areas such as project integration management, project scope management, project time management, project cost management, project human resources management, project communications management, project risk management, project procurement management, and project stakeholder

management, however, a project could be completed on schedule and within budget and yet not to be considered successful because of quality, (Christine, 2010:191) said "if the quality does not meet the customer's expectations, nothing else matters." Yet construction projects in Ethiopia failed to accomplish not only their quality also the triple constraints which are necessary for one project to be categorized as success; which is time, cost and scope (Werku & Jha, 2016).

The Ethiopian construction industry is characterized by a large number of micro-entrepreneurs, the majority of whom operate in the country's informal economy. Ethiopia's formal construction sector comprises of different national firms, as well as numerous major foreign civil engineering and construction companies, and the industry has a strong public and private expenditure on infrastructure which have led to Ethiopia's rapid economic development (Veitch, 2018).

Bearing in mind that the construction industry plays an important role in the country socio-economic development process, in which the importance largely has a direct and indirect impact on all economic activities and it is able to contribute to the national output which stimulates the growth of the other sectors. However, the performance of the construction industry, is constrained by different problems and challenges from which sub-standard quality of construction raw materials; which hinders the construction output, widespread corruption, huge cost and time overrun, lack of periodically amended rules and regulations of the industry, absence of construction industry policy; and lack of effective rules and regulatory mechanisms that help ensure compliance of various factors in the construction are to name a few (EEA, 2008).

Addis Ababa is the largest city in the country and has a large population size and it is even expected that the population will increase in the near future which implicated on the increase of the housing need from time to time and which creates the most complicated social problem in the city. For instance, when we take a look at the people registered for saving house namely 40/60 housing program even before the construction work started; numerous registered dwellers have paid more than the 40 percent amount which assures that there is a massive demand of the houses. And the project is special in that it is targeted at changing the image of the city as it is one aspect of the city's renovation program in addition to satisfying the housing needs of the inhabitants. Considering that the 40/60 housing program is one among the projects that are mainly aimed at building condominium housings that are up to 24 floors in length and build the city to be among

the major cities in the world it is essential that the building quality needs of serious consideration and due attention. To solve the housing problem with the city image building aim; the city administration had launched the 40/60 saving housing project on affordable prices for middle-class dwellers of the city (Yared, 2016).

According to (Eskedar, 2016), poor wastage management can be considered to be a cause for quality problem in the construction industry, further there was a quality problem when the client supplied materials for the 40/60 housing construction project, thus in 40/60 housing project the application of project quality management best practices which are suitable to the requirements of the project is important so that the project would be able to meet the customer's expectation with ensuring quality standards are met. Melaku (2017), aslo revealed that due to cost overrun of saving houses low quality housing handover to beneficiaries were captured. Though different studies had been conducted regarding the planning, scheduling, waste management, cost overrun and product quality concerning the saving house condominium projects; in the context of Ethiopian 40/60 housing project there is a gap in related researches which studies the quality of the projects in the implementers perspectives in which to help the implementers and decision makers to make informed decision for quality improvements. Therefore this study assessed the practices and challenges of project quality management in the case of 40/60 housing projects; 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 Question

The study was guided by the following key research questions:

→ What are the practices of the project quality management in 40/60 housing project?

→ What are the challenges of the project quality management in 40/60 housing project?

→ What is the level of top management support in the case of 40/60 housing project quality management implementation?

→ What is the level of implementation of regular budget updates in the 40/60 housing project quality management implementation?

→ What is the level of commitment of all participants in the 40/60 housing project quality management implementation?

→ What is the level of communication in the 40/60 housing project quality management implementation?

→ What is the level of availability of trained resources in the 40/60 housing project quality management implementation?

1.4. Objective of the Study

1.4.1. General Objective

The general objective of this research was to study the practices of project quality management and the challenges faced by the 40/60 housing project implementers and managers during the implementation of the project quality management practices and to assess the level of implementation of regular budget updates; commitment of all participants; top management support; communication and the availability of trained resources in the case of 40/60 housing project quality management implementation.

1.4.2. Specific Objectives

The main objectives of this research were to examine the current status of the project quality management practices and challenges faced during the implementation and to study how the sector manages the project quality and facilitate the use of project quality management focused on the construction industry specific to 40/60 housing projects. Thus the study specifically aimed:

→ To assess the level of implementation of top management support in 40/60 housing project quality management.

→ To assess the level of commitment of all participant in the project quality management of 40/60 housing project.

→ To assess the level of communication in the project quality management of 40/60 housing project.

→ To assess the level of regular budget update in the 40/60 housing projects quality management?

→ To assess the level of availability of trained resources in the project quality management of 40/60 housing project.

1.5.   Significance of the Study

The findings of the study would contribute to the improvement of 40/60 housing project quality management process not only specific to the project and other condominium housing projects and construction projects in the industry should take the recommendations that are made from results for the improvement of quality management practices. The findings of the study are going to redound to the benefits of the customers as well as the project implementers considering that quality plays an important role in the overall project success. Thus contractors who apply the recommendation approach that was derived from the result of the study would be able to stimulate the quality management processes that are implemented in the industry. Top managers are guided on what shall be emphasized by project managers and technical managers in the project to improve the quality of management of 40/60 housing projects and to make informed decisions from the study results. The research could be used to establish further subsequent studies that can work with more comprehensive data sets and it would stimulate further research. The findings and recommendations of the study were very essential to policymakers because it took their attention to the areas that need corrective measures and needed improvements on their side. And the study also helped the researcher to understand the critical area of project management which is quality management and its processes within the 40/60 housing projects that other researchers have not explored before.

1.6.   Scope of the Study

Quality processes can be used to improve project performance in general. However, in reality projects failed to do so as per the customer expectation within the time and budget bound, thus the study aims at finding the best practices and challenges of project quality management so that top managers, technical managers, and project managers would master project quality

management and to have greater success in managing the 40/60 housing projects and other projects in the industry.

Projects undertaken by other sectors of the enterprise were not included in the study such as 20/80 and 10/90 housing projects. In addition, the study did not include all the staff of the organization working in administrative areas or in the areas that are not related to quality aspect of the project, instead only information on project quality management was collected from informants who have a role in the 40/60 housing project quality management practices and only currently active sites was covered by this research. Therefore study assessed only the quality management practices and challenges of projects specifically 40/60 housing projects based on active sites thus the study did not assess any other project management issues. Hence, this study only covered 40/60 housing project implementers mainly by focusing on those who are responsible for the overall project quality management practices of the 40/60 housing projects. In addition to studying the current practices, the study assessed the level of implementation of the selected variables on the dependent variable and on perceived project quality.

1.7. Limitations of the Study

The research methodology applied for this study was convergent parallel mixed research method in which the level of implementation of independent variables on the dependent variables was assessed without manipulating the variables. Thus, the study determines practices and not causes or reasons for why the dependent variable occurred or labeled poor or bad. In addition, the sample frame contained only the active projects which were in construction during the study; which may hide the facts about the practices of previously built houses. Customer satisfaction is the main factor to determine the quality of the products or services however, this study only assessed the quality management practice in the implementer's perspectives which would hide the quality aspect from the customer's perspective however the level of the selected variables implementation and the impact on perceived project quality was included in the study.

1.8. Ethical Considerations

According to the research ethics, there are key principles set out in the framework for research ethics to assure that the researcher requested authorization from the management of the

target company (40/60 Enterprise) before carrying out the research. A letter from St. Marry was given to the company before the data was collected. All information obtained in this research was strictly used for academic purposes and the respondents were assured of the confidentially of information given where necessary and the participants participated in the study voluntarily.

1.9.   Organization of the Research Report

This research is organized into five chapters. The first chapter deals with the basic components and subcomponents of the research which is an introductory part and it contains the background of the study, statement of the problem, research question, the objective of the research, significance of the study, the scope of the study, limitation of the study, and organization of chapters. The second chapter deals with the review of related literature which includes the following point's theoretical review, empirical review and conceptual framework. The third chapter deals with the research methodology mainly research approach and design, and data type and sources. The fourth chapter contains data analysis and interpretation. Finally, the report concludes with the fifth chapter which contains a summary, the conclusion of the study and recommendations that are made from the results.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

2.1. Theoretical Review

Considering that quality is about meeting the customer's need, it is crucial to any organizations existence in a way to obtain the loyalty of the customers, thus managing quality is an essential element for any given businesses because quality products help to sustain product quality and loyalty and reduce the risk and cost of reworks.

Theoretically, it is known that quality can be met through continuous improvement by assuring the quality plans are strictly implemented in a way to achieve the expected quality expectations and standards. Knowing that quality in construction plays a very crucial role in achieving customer's satisfaction as well as the durability of the construction work, the expected output depends on the quality metrics implemented. In addition to the main processes identified by PMI (2013), which are quality planning, quality assurance, and quality control; quality can be achieved through time by continuously improving the defects, and also training the employees who participate in the quality activities will improve the quality if it is supported with proper communication of the plan and activates to be performed throughout the project lifecycle.

2.1.1. Project and Project Management

PMI (2013) defined a project as it is a temporary endeavor which undertakes a series of activities to produce a unique product, service or result. Kerzner (2009) further elaborates that a project can be considered to be any series of activities and tasks which contains specific objective to be completed within pre-defined specifications, it has a defined start and end dates and consumes human and nonhuman resources (i.e., money, people, and equipment). Project Management, on the other hand, is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements stated by stakeholders. Project management process has mainly five process groups which are Project initiation, Project planning, Project execution, Project monitoring and control and Project closure (PMI, 2013). Considering project management required the skill

of directing, it is important to note that while there are similarities between project management and general management, the difference between the two is that project management is bounded with schedule and the temporary nature of the organization and the work being performed from general management (Christine, 2010).

2.1.2. Quality and Project Quality Management

Quality can be defined as creating a customer value, which stands to meet or exceed the customer expectations, in fact, quality can be achieved through integrating the organization unit working together (Knowles, 2011). ISO 9000 (2015) defines the quality of an organization's products and services determined by the ability to satisfy customers and the intended and unintended on relevant interested parties. Project quality management possesses the processes and activities such as quality policies, objectives, and responsibilities of the implementer organization in a way to meet the needs and requirements of the customers and stakeholders (PMI, 2013).

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 standards are mostly defined based on organizational values and standards (Chandana, 2017). A quality management process is introduced in a project towards quality planning, quality assurance, and quality control. Quality management enhances project management with a focus of meeting customers need, prevention of flaws and errors instead of inspection, assigning management responsibility, and continuous enhancement. Project quality management process includes three main components which are quality planning, quality assurance and quality control the processes would be further elaborated in 2.3.4. quality management processes. 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).

2.1.3. Practices of Project Quality Management

Quality control emphasizes testing of products to uncover defects and reporting to management who make the decision to allow or deny product release, whereas quality assurance attempts to improve and stabilize production (and associated processes) to avoid, or at least minimize, issues which led to the defect(s) in the first place. According to Solomon, Dominic & Felix (2016), quality management practice in the construction industry is a different feature that needs to be given maximum focus in any construction work and it requires a great effort to achieve and improve the required standard for a project which is well planned and organized, so as to obtain customer's satisfaction and meet their expectation, so that it provides value for money, and fit for purpose.

2.1.4. Quality Management Processes

According to PMI (2013), project quality management processes include three elements which are quality planning, quality assurance, and quality control. Quality planning according to PMI (2013:227) is the "process of identifying quality requirements and/or standards for the project and product and documenting how to demonstrate the product compliance" in accordance with the pre-defined quality standards. Quality planning can be established using scope baseline data, stakeholder register, cost performance baseline, schedule baseline, risk register, enterprise environmental factors, and other organization asset data's as an input. In addition in the planning process main requirements and standards was identified and the way to confirm the project quality compliance was documented, then quality assurance contains auditing quality requirements and results to ensure that the quality standards and operations are properly applied and in the quality control monitoring and recording of results are executed to assess the performance over the planned standards and recommend necessary changes to improve the quality (PMI, 2013).

Project quality management processes apply different tools and techniques to enhance the output of the process using the specific inputs that are to be taken as a baseline to prepare and deliver the expected output, for example, planning quality can be implemented using the project scope baseline, stakeholder register, and other inputs to deliver the quality plan. Figure 1 shows the detail of the project management overview and the necessary inputs, tools and techniques and the final output of the processes (PMI, 2013).
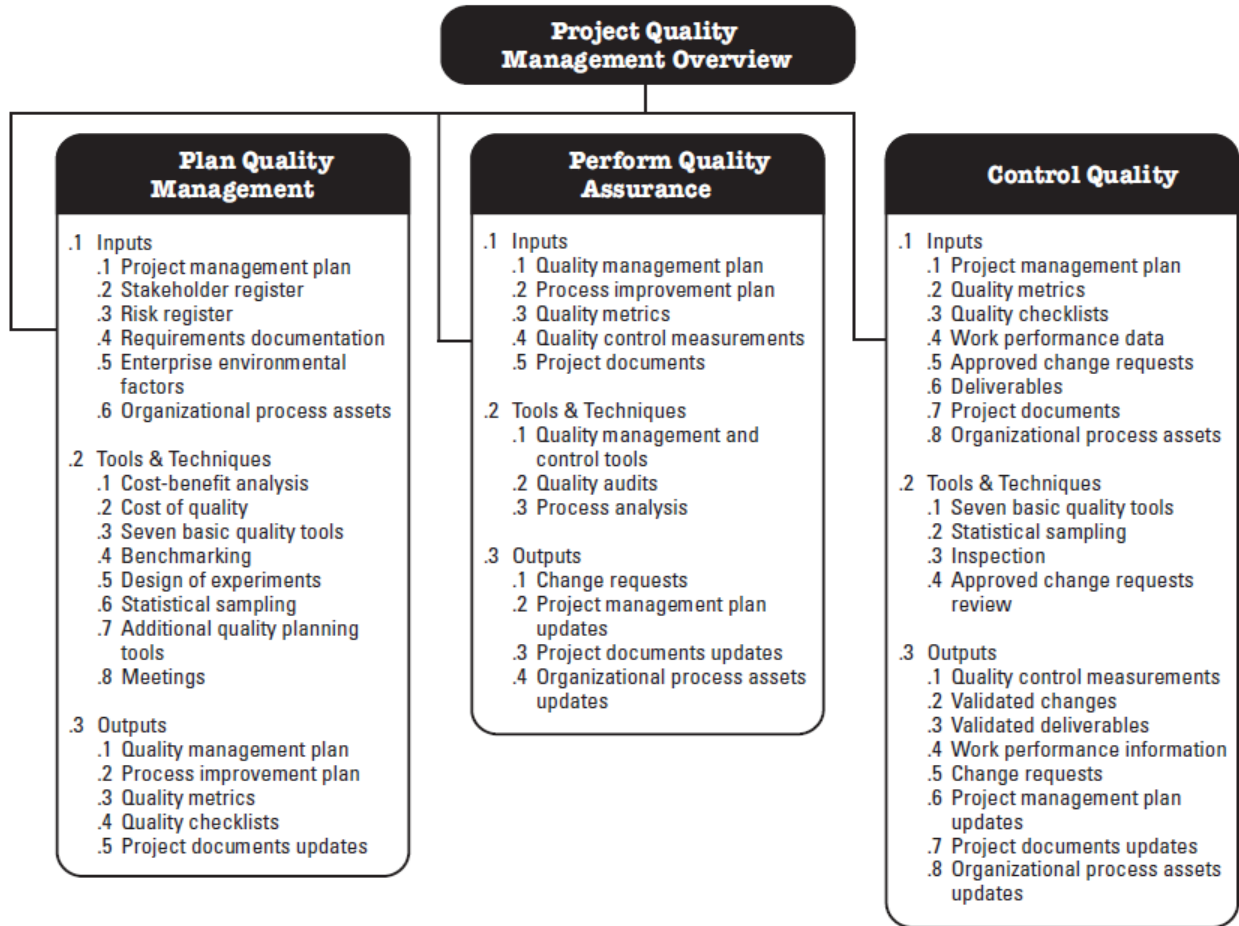
Project Quality Management Overview

Plan Quality Management

.1 Inputs
  .1 Project management plan
  .2 Stakeholder register
  .3 Risk register
  .4 Requirements documentation
  .5 Enterprise environmental factors
  .6 Organizational process assets

.2 Tools & Techniques
  .1 Cost-benefit analysis
  .2 Cost of quality
  .3 Seven basic quality tools
  .4 Benchmarking
  .5 Design of experiments
  .6 Statistical sampling
  .7 Additional quality planning tools
  .8 Meetings

.3 Outputs
  .1 Quality management plan
  .2 Process improvement plan
  .3 Quality metrics
  .4 Quality checklists
  .5 Project documents updates

Perform Quality Assurance

.1 Inputs
  .1 Quality management plan
  .2 Process improvement plan
  .3 Quality metrics
  .4 Quality control measurements
  .5 Project documents

.2 Tools & Techniques
  .1 Quality management and control tools
  .2 Quality audits
  .3 Process analysis

.3 Outputs
  .1 Change requests
  .2 Project management plan updates
  .3 Project documents updates
  .4 Organizational process assets updates

Control Quality

.1 Inputs
  .1 Project management plan
  .2 Quality metrics
  .3 Quality checklists
  .4 Work performance data
  .5 Approved change requests
  .6 Deliverables
  .7 Project documents
  .8 Organizational process assets

.2 Tools & Techniques
  .1 Seven basic quality tools
  .2 Statistical sampling
  .3 Inspection
  .4 Approved change requests review

.3 Outputs
  .1 Quality control measurements
  .2 Validated changes
  .3 Validated deliverables
  .4 Work performance information
  .5 Change requests
  .6 Project management plan updates
  .7 Project documents updates
  .8 Organizational process assets updates

Figure 2.1: Project quality management overview. Adopted from PMI (2013).

2.1.5. Total Quality Management

Total Quality Management can be defined as a continuous involvement and effort made by top management to enhance the procedures and the system to ensure greater quality products supply by eliminating errors. In Total Quality Management, top managers play an important role, therefore, introducing and applying total quality management programs require a great amount of planning, research and training employees and individual including managers who play their role in the quality management system. Considering that budget allocation is the responsibility of top managers in every project based on the organization's situation. In addition to the training, the top managers must communicate the benefits of quality management to all other participants who have a role in the quality of the projects and communicate the activities and tasks which aids in accomplishing the expected result (Solomon, Obodoh, & Onoh, 2016).

2.1.6. Quality Management Standards

Quality standards are defined as a document that provides guidelines, specifications requirements and characteristics that can be used regularly to guarantee that products, services, materials, and processes are fit for purpose. Quality Standards are incorporated in quality planning and it is used to identify which quality standards are required to meet the project or product objectives and which standards are relevant to meet the expectation of the product (Rose, 2005). Standards provide organizations with a shared goal so that the procedures and requirements to meet the expectations of their stakeholders can be common throughout the organization. Standards present specific descriptions, terminology and they offer an objective to the convincing basis for organizations and consumers to communicate and perform business (ASQ, 2015).

2.1.7. Critical Factors Affecting Quality Performance

2.1.7.1. Top Management

According to   WebFinance Inc (2019), top management is the highest ranking executives such as chairman/chairwoman, chief executive officer, managing director, president, executive directors, executive vice-presidents, in the construction case of 40/60 housing project, project managers, branch managers, managing directors from the enterprise of the 40/60 housing project, and they are responsible for the entire project. In addition, top management interprets the policy formulated by the board-of-directors into goals, objectives, and strategies, and projects into a shared vision of the future works, they make decisions that affect everyone in the organization and are held entirely responsible for the success or failure of the project in general. Al-Mamary, Shamsuddin, & Aziati (2014) further elaborated that organizations have two dimensions which are end-user training and top management support whereas the top management support includes the level of support provided by managers for the organization.

2.1.7.2. Commitment

Cambridge University Press (2019), defines commitment as a willingness to give your time and energy to something that you believe in, or a promise or firm decision to do something: which means project implements must make a commitment to implement the project for the full project lifecycle in order to meet the project requirements. In order to win project participants commitment

it is vital to properly plan the project goals, tasks, timelines, and target dates; using tools such as PERT or Gantt chart, by allowing participants to give their input and to make them understand what they are agreeing on the drawn goals and objectives and what is expected from them so that they would contribute in a committed manner (Salle, 2013). According to Wysock (2014), it is essential to have a motivated team members for the project success and by aligning individual's interest and meeting their professional improvement needs it is possible to gain commitment from the team members.

2.1.7.3. Employee Training

In the modern competitive environment, employees need to continuously improve their knowledge and acquire new skills to do their jobs better. This will benefit both them and the organization they are working in, by facilitating the way they do their jobs. Training can be defined as an educational process which involves the improvement of skills, concepts, changing of attitude and gaining more knowledge to enhance the performance of the individuals. Employee training is defined by MbaSkool (2019) as a program that is designed to increase the technical skills, knowledge, efficiency, and value creation to do any specific job in a much better way.

2.1.7.4. Communication and Interaction

Communication is defined as a process by which information is exchanged between individuals through a common system of symbols, signs, or, therefore, interaction is a mutual or reciprocal action or influence between the parties that the information will be exchanged (Merriam Webster, 2019). According to PMI (2013), communication should be planned properly otherwise insufficient communication plan may cause problems such as late message delivery, delivery of a message to the wrong audience, and unsatisfactory communication to the stakeholders and misunderstanding or misinterpretation of the message communicated through the participants.

2.2. Empirical Review

The study by Solomon, Obodoh, & Onoh (2016) revealed the factors that positively influence quality in building construction work, the effect of not adhering and the benefits of adhering to the quality standard for building construction work. According to the research, effective communication with the project team/client is the major factor that influences quality

positively in building construction work. It fosters an open and trusting environment for effective, efficient and quality construction works. Other factors includes commitment to quality, good attitude towards quality, effective/efficient quality planning, adequacy/completeness of design and documentation, effective/efficient construction method, engaging qualified persons for construction work, effective/efficient teamwork, use of quality construction material, supervision of construction workers, motivation, training and seminar on quality management, use of proper equipment for construction work, and adherence to statutory regulations. Structural failure and bad workmanship are the major effects of not adhering to the quality standard for building construction works while litigation was ranked least, improved quality of construction product/result ranked the highest benefit of adhering to quality while an increase in workers morale (Artisans/labourers) ranked the least. Furthermore, the study elaborated on the approach to construction quality plan should be fully established in a construction quality management plan at the pre-construction stage of any project and which must be understood by all parties.

A study conducted by Seyoum (2018) revealed the challenges of low-cost housing regarding quality on 20/80 condominium housing in Addis Ababa; the study investigated the perspective of customers and results indicated that the level of product quality from inhabitants were more than 51% of the inhabitants were not satisfied with the quality of the houses they are living in, rather they were forced to maintain the houses from time to time because of poor quality and the breakage of the housing parts such as door handles door locks and sanitary materials and other parts of the house.

Melaku (2017) on his study showed that housing construction cost management had been constrained by different variables among them inadequate planning, scheduling, material cost inflation, poor site management and supervision, excess quantity during construction and added work were some variables in which the housing projects had been constrained with, the projects not only constrained in cost perspectives rather this implicate that there is also a gap in quality management practices considering that poor planning and site management resulted in poor quality caused by cost minimization strategy. Furthermore, Melaku (2017), revealed that one of the consequences of cost overrun of the housing program was low-quality handover to beneficiaries.

Hassina (2016) in her study indicated that the issues regarding the planning were: there were no participation of associated parties with the project planning stages; the overall project

scope was not defined adequately; resources were not scheduled clearly; stock of materials were not supplied by the client; the planning was not differentiated based on the site conditions and the major focus was given to the cost instead of project completion, which impacted the project success considering that the scope and time needed to be planned in advance and strictly implemented to fulfill the project goal as they are taken key element for project success (Melaku, 2017).

Anup, Kumar, & Saqhi (2015) stated that setting policies and procedures for quality management has its own value on the success of the QMS, without the dedication of top management and proper communication the expected qualities may not be achieved. Anup et al (2015) further revealed that in their study QMS had been constrained from factors such as inadequate technical expertise, employees feel QMS imposed too much of paperwork which leads to the unwillingness of the employee's to implement the quality management activities.

The empirical study by Jha & Iyer (2006) showed that top management support and their competence; the interaction between project participants; owners' competence; and monitoring and feedback by project participants are the factors having positive contributions to achieving the desired quality level in a construction project. In addition to the aforementioned influencing, variables quality can be achieved through time by continuously improving the defects, and also training the employees who participate in the quality activities also improves the quality if it is supported with proper communication of the plan and activates to be performed during the 40/60 project lifecycle. Jha & Iyer (2006) in their study analysed that by increasing top management support, the likelihood of enhancing the performance will increase by 15% from its current level; and by a unit increase in the interaction between project participants the probability of producing very good quality would result in a 12% increase from current level, which can also be associated with the philosophies of quality experts that top management support and communication are essential ingredients of quality outputs. According to Tzempelikos (2015), study top management involvement facilitates the relationship between top management commitment and quality output which will create a positive relationship with performance. Furthermore, Jha & Iyer (2006) established in their study that, in the construction industry the role of management is more important than the workforce itself in achieving quality.

Employee training is conducted with the aim of communicating the information and instructions with employees so that they can improve their performance through learning and they will be productive, efficient and profitable in the overall performance of their job (Heathfield,

2018). Hence the availability of trained resources would have a positive impact on the performance of the project quality. And it is commonly known that the commitment of all parties to the project is essential to the project performance in general. For this study purpose, the aim of the research is to study about the practices and challenges of project quality management in the selected project, therefore, the independent variables in figure 2.2 are considered to show the level of implementation of each independent variable on the intermediate variable and dependent variable which is project quality management.

Jha & Iyer (2006) tested and found that top management support and interaction between project participants or communication have a positive relationship with project quality performances; and the other independent variables were not statistically significant in their study, however in this study the level of implementation of commitment of all participants; the level of regular budget updates and availability of trained resources was assessed with the dependent variable, since in the case of saving house projects in Ethiopia, it is common to hear that the contractors complain about budget issue because the budget is not entirely on the contractors hand to manage as they wanted it, and the contractors reported in media that they do not get essential amount of budget when they require it. The other variable was that the availability of trained resources; considering that the 40/60 housing projects will provide a shelter to numerous dwellers in the city, the availability of those trained resource would contribute to the project success in quality aspects as well as in time delivery thus the variables was used to show the overall practice of the selected project in a way to show the implementation of the independent variables on the project quality management.

The research, therefore, studied the practices and challenges of quality management in the selected project by considering the following elements; implementation of the core project quality management processes that are quality planning, quality assurance, and quality control and improvement and quality standards implementation. In addition to the aforementioned elements the variables listed hereafter were taken as independent variables which were thought to be factors influencing the project quality management; the independent variables were top management support, the commitment of all project participants, communication, regular budget updates and availability of trained human resources.

2.3. 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 management of the 40/60 housing projects 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 by Jha & Iyer (2006); modified in a way to suite this study. Figure 2.2 illustrates the level of implementation of those independent variables on the project quality management.
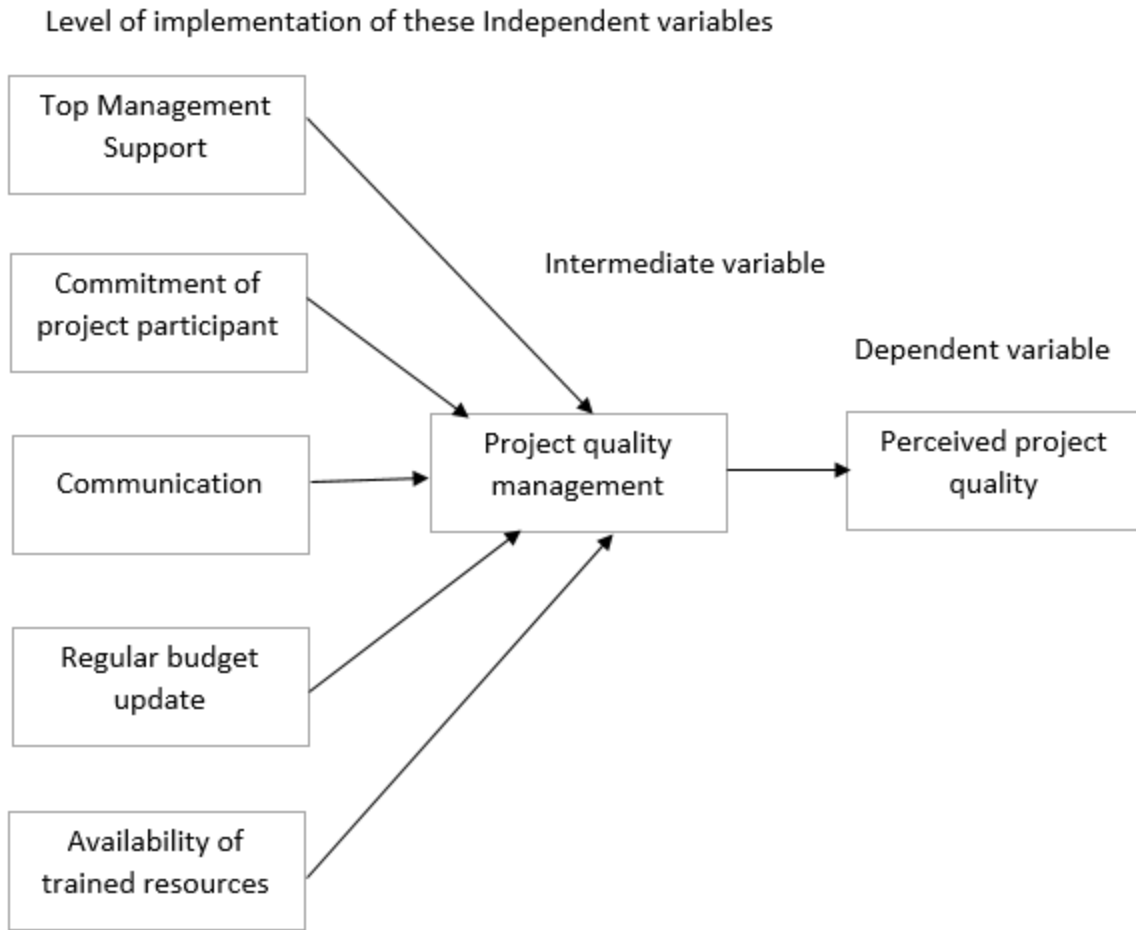
Level of implementation of these Independent variables

Figure 2.2: Conceptual framework of the study. Adapted from Jha & Iyer (2006)

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1. Research Approach and Design

3.1.1. Research Approach

The research approach implemented for this study, was mixed method research approach which allowed the researcher to answer the research questions qualitatively and quantitatively using different quantitative and qualitative data sources, data collections and analysis methods. By mixing both quantitative and qualitative research and data, the study was explored in breadth and depth of understanding, while balancing the weaknesses inherent to using each approach by itself.

3.1.2. Research Design

According to Zikmund, Babin, Carr, & Griffin (2009), a research design is used as a master plan which specifies the methods and procedures for collecting and analyzing the required information furthermore a research design is used as a framework or plan of action for the research to be performed. The research approach applied for the research guided to the mixed method research design and the convergent parallel design was appropriate to the study. The research design was used to develop more complete understanding of the research problem by obtaining different but complementary data from both the survey questionnaire and interview questions, this method was used for validation purpose. Both the qualitative and quantitative data were collected concurrently and analyzed independently then the results were summarized and interpreted in combination.

This convergent parallel design was appropriate for answering the research questions raised in the study. In addition to describing the event as it was, the aforementioned independent variables were tested against the intermediate and dependent variable to show the level of implementation of the variables with the intermediate and dependent variable; I.e. what is the level of top

management support in project quality management of 40/60 housing project; what is the level of communication/interaction between all participant in project quality management of 40/60 housing project; what is the level of commitment of all participants in project quality management of 40/60 housing project; what is the level of availability of trained resources in project quality management of 40/60 housing project and what is the level of regular budget update in project quality management of 40/60 housing project. And the perception of participants of regular budget updates on project quality; top management support on project quality; commitment of all participants on project quality; availability of trained resources on project quality and communication/ interaction between project implementers on project quality.

3.2. Data Type and Source

3.2.1. Data Type

There are mainly two general types of data which are quantitative and qualitative and both are equally important however based on the research questions and objective one can use either or both of them to demonstrate effective and important value to the research; thus the research applied quantitative and qualitative data.

3.2.2. Data Source

The data sources used for this research was mainly primary data which was collected from project quality management participant of 40/60 housing project through survey questionnaire and interview questions, and secondary documents such as articles and books are used for understanding the current knowledge, theory and to develop a conceptual framework for the study.

3.3. Target population and Sample

3.3.1. Target Population

Zikmund et al. (2009) outlined the importance of target population for the sampling process as follows when the outset of the sampling process is implemented, the target population must be carefully defined so that the appropriate sources from which the data are to be collected can be

identified, and to implement the sample in the field, tangible characteristics should be used to define the population.

In the context of 40/60 project to study the project quality management implementation aspect the target population was project implementers, there was totally eleven active sites during the study which were under construction, namely Bole Bulbula, Asco, Emperial, Ehil Negd, Tourist Negd, Summit, Bole Ayat 2, Bole Ayat site 4, Meri Loki, Bole Ayat 1 and Bole Arabsa. Participants who were involved in quality practices was mainly site inspectors, site engineers, electrical inspectors, sanitary inspectors, resident engineers, coordinators, project managers, production inspectors, branch manager/ department head, senior contract and building expert, junior contract and building expert, beginner contract and building expert, infrastructure engineer, electrical and sanitary engineers totally 676 professionals are the overall target population. For the qualitative purpose higher managers such as branch managers; mainly there were 4 branches which included all the eleven sites and top managers from the Addis Ababa Savings and Houses Development Enterprise was the target population.

3.3.2. Sample

3.3.2.1. Sample Size Determination

According to Zikmund et al. (2009), sampling involves a procedure that allows drawing conclusions based on measurements of a portion taken out of the population, moreover "sample is a subset from a larger population" thus by following a certain statistical procedures, a researcher may avoid the selection of every item in a population because the "results of a good sample should have the same characteristics as the population as a whole".

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.

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n = Desired sample size

N =Total population size

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

$$n = \frac{676}{1 + 676(0.05)^2}$$

$$n = \frac{676}{2.69} = 251.301$$

$$n = \sim 251$$

The sampling technique employed for this study was proportionate stratified random sampling since the sample population was categorized by strata in nature. The sample for each branch was as shown in Table 3.1.

Table 3.1: Sampling using a proportionate stratified random sampling technique

Sections Name	No. of Population	Sample
Branch 1	175	65
Branch 2	205	76
Branch 3	113	42
Branch 4	183	68
Total	676	251

The research approach which was applied for this study was mixed approach, therefore, for the qualitative approach specific sampling technique was not required since the targeted population size for this part are few in number; all individual members were included in the study. Such as branch managers and top managers from the Addis Ababa Savings and Houses Development Enterprise.

3.3.2.2. Sample Selection Procedure

Sampling decision involves how to select the sampling units, Zikmund et al. (2009). There are different types of sampling techniques however in this study, proportionate stratified random sampling technique was employed. Once the strata were defined (as indicated in table 3.1), to

select samples from each stratum; simple random sampling technique was applied (Zikmund et al., 2009). Simple random sampling is one of the sampling technique in which we select a group of subjects which is called a sample for study from a larger group of population, in this sampling every individual was selected entirely by chance and each member of the population has an equal opportunity of being a chosen to be included in the sample. For the qualitative data, top managers such as branch managers, directors and higher officials of the enterprise were employed in the study as participants.

3.4.   Data Collection Methods and Tools

Knowing that the use of a convergent parallel mixed method design requires the use of specific forms of data collection related to the process. These data collection approach can include focus group discussion, or surveys. The different techniques present several advantages as they provide a multi-layered approach for data collection that gives a broader view of the information. For example, a survey can provide statistics about an event while also illustrating how people experienced that event (Janine, 2018). Considering that quantitative data collection methods rely on random sampling and structured data collection instruments that fit diverse experiences into predetermined response categories. They produce results that are easy to summarize, compare, and generalize. Thus the researcher used the survey method to collect primary data using questionnaire survey method thus the questionnaire survey was collected from the sample which was 251 informants in number, and the top managers were interviewed using the structured interview guide. The questionnaire applied for this research was adapted from (Salil, 2016) and (Tigest, 2017).

3.5.   Data Analysis and Presentation

3.5.1. Data Analysis

Data analysis is the type of analysis in which we use reasoning to understand the data which have been gathered. This means data analysis mainly involves determining consistent patterns and summarizing the relevant details discovered in the study. There are different statistical analyses such as portraying a simple frequency distribution; complex multivariate analyses approaches, such as multiple regression (Zikmund et al, 2009).

It is necessary to make use of the collected data which is considered to be raw data which must be processed to put for any application and decision making. Data analysis helps in the

interpretation of data and take a decision or to answer the research question. Data analysis starts with the collection of data followed by data processing and sorting it. Processed data helps in obtaining information from it as the raw data is non-comprehensive in nature. The data collected to show the current situation using structured questionnaire was analyzed using descriptive analysis methods that were used to show the current practices and challenges; while to show the level of implementation of the independent variable on the dependent variables ordered logistic regression analysis model was applied. Ordinal logistic regression was used to commonly predict an ordinal dependent variable with one or more independent variables. Even though there are numerous types of regression models, the choice of the model depends on the type of data to be used for the dependent variable; hence ordinal logistic regression models were used to show the relationship between a set of predictors and an ordinal response variable; in which the response should at least have three groups which have a natural order such as high, medium and low. Furthermore, the data obtained through the structured interview was analyzed qualitatively using thematic analysis by pinpointing, examining and recording the pattern or theme in the collected data.

3.5.1.1.   Econometrics Analysis Ordered Legit Model

For this study the ordinal logit model was 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).

When a dependent variable has more than two categories and values of each category have a meaningful sequential order where a value is indeed higher than the previous one we can use ordered legit model in order to measure level of project quality management and level of project quality (Green, 2000). When the response variable or regress and can have more than two outcomes and very often these outcomes are ordinal in nature. That is they cannot be expressed on

interval scale. Frequently in survey type research, the responses are on Likert type scale such as strongly agree, agree, medium, disagree or strongly disagree as indicated in Appendix of the questionnaire designed for this study. Part of the purpose of this study is to identify the relationship between (project quality management performance rating on various indicators and the tendency to improve Perceived project quality of the project was analyzed as follows:

$$Y^*i = x_i\beta + \varepsilon_i \quad , \text{ for } i = (1\ldots, 5) \qquad\qquad (1)$$

Where; i ($i = 1\ldots, 5$) represents individual's response on project quality performance rating to be either very high, high, medium, low, or very low

x_i : is a vector of exogenous variable (excluding the constant)

β : is vector of unknown parameters to be estimated

ε : is the random disturbance term assumed to standard logistic

Let j ($j = 1,2,3,4, 5$) and δ j denotes the Perceived project quality level and the value 1 is given to very low, 2 low, 3 medium , 4 high, 5 very high. These unknown thresholds are assumed to partition the propensity j-1 intervals. The unobservable latent variable y^*i is related to the observable ordinal variable Y_i by δ j with a response mechanism of the following mechanism:

$$Y_i = j \, , \, if \, \delta \ j-1 < Y_i * < \tau j, \, for \, j=1, 2,\ldots, J \qquad\qquad (2)$$

In order to ensure the well-defined intervals and natural ordering of observed severity, the thresholds are assumed to be ascending in order, such that $\tau 0 < \tau 1 < \ldots\ldots < \tau J$ where $\tau 0 = -\infty$ and $J = +\infty$. The probability expressions take the form:

$$\pi ij = (yi=j|Xi) = \Lambda (\tau j - Xi\beta) - \Lambda (\tau j-1 - Xi\beta) \qquad\qquad (3)$$

Where $(\cdot)$ represent the standard logistic cumulative distribution function and πij is the probability that individual i sustains with high level J. The standard logistic distribution function,

$(t) = \frac{1}{1+e^{-t}}$; applying the transformation in equation 3, the probability takes the following form:

$$\pi ij = Pr \, (yi=j|Xi) = \underline{(\tau j - Xi\beta)} - \underline{exp \, (\tau j-1 - Xi\beta)} \qquad\qquad (4)$$

$(1 + (\tau j - Xi\beta)) \ ((1 + (\tau j-1 - Xi\beta))$

In equation 4, the parameter β are constrained to be the same across all alternatives thus, resulting in a monotonic impact of the exogenous variables on probability levels. Any enhancement to the systematic component in the ordered outcome system was required addressing the assumption of restricting β parameters.

Very often these responses are coded as;

$$Y_i = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8 X_8 + \beta_9X_9 + \beta_{10}X_{10} + \beta_{11}X_{11} + \beta_{12}X_{12} + {}_+ \mathcal{E}_i$$

$$Y_i = \beta_0 + \beta_i x_i + \varepsilon$$

Where Y_1 indicates the level of project quality management performance with direct relation to the tendency level to Perceived project quality;

X_i : indicates the factors that are expected to affect the Perceived project quality such as regular budget update, commitment of all participants, top management support, availability of trained resources and communication between project implementers.

3.5.2. Data Presentation

According to In & Lee (2017), data presentation methods are determined based on the data format; the method of analysis to be used and the information to be emphasized. Wrongly presented data fails to clearly convey information to readers and reviewers as intended. Even when the same information is carried out, depending on what specific information is going to be emphasized different methods of presentations can be applied. Thus the choice of proper data presentation must be given weight.

Considering that data analysis starts with the collection of the data then data processing and finally sorting it. Processing the data helps in gaining information from it as the data collected in the first hand was raw and it was not easily comprehensive in nature. Presenting the data includes the pictorial representation of the data by using graphs, charts, maps, and other methods. These methods help in adding the visual aspect to data which makes it much more easily and quickly understandable. Based on the data analysis, interpretations were made for both qualitative and quantitative data to come up with a certain conclusion. Therefore the finding was presented in the form of tabular and graphs in order to help the reader understand easily. After the data have been processed and analyzed the data was interpreted using Statistical Package for the Social Sciences (SPSS). The qualitative data gathered using interview questions were presented in sentences and phrases in understandable form; moreover, thematic analysis was employed as needed in the

discussions accordingly on the information obtained from the survey questionnaire and structured interviews.

The reliability test was checked using SPSS to check the reliability of the questionnaire for each category of the questionnaire survey. The alpha coefficient for each question categorized by items was 0.964, 0.792, 0.876 and 0.716 which were all greater than 0.7 and the overall alpha value was 0.846, thus it was generally considered acceptable, suggesting that the items have relatively high internal consistency.

CHAPTER FOUR

4. RESULTS AND DISCUSSION

A total of 251 questionnaires sets were distributed to respondents who participated in project quality management aspect of the 40/60 housing project of the saving house enterprises, these included active 11 sites which were categorized in 4 main branches which were during construction; thus the data were collected by participating all branches. By conceptualizing these phenomena, the review of 217 fully filed questionnaires was collected and endeavored in this chapter as follows.

According to (Braun & Clarke, 2008) thematic analysis should be seen as a foundational method for qualitative data analysis. Therefore for this study, the data collected through interview questionnaire were analyzed using thematic analysis by identifying, analyzing and reporting patterns within the data. Top managers were interviewed for this study purpose using the structured interview from which, 4 of the managers were from each of the four branches, one manager from the 40/60 housing program, one from the Addis Ababa saving houses development enterprise, and one selected manager from the contractor's side with a total of 7 top managers.

4.1. Respondents' Profile

In this section, the general information of the respondents will be presented in a diagram and tabular format. Educational background of participants, the gender of the participants and positions of the participants are represented using a column chart for ease of understanding thus the diagrams presents the analysis of the aforementioned elements.
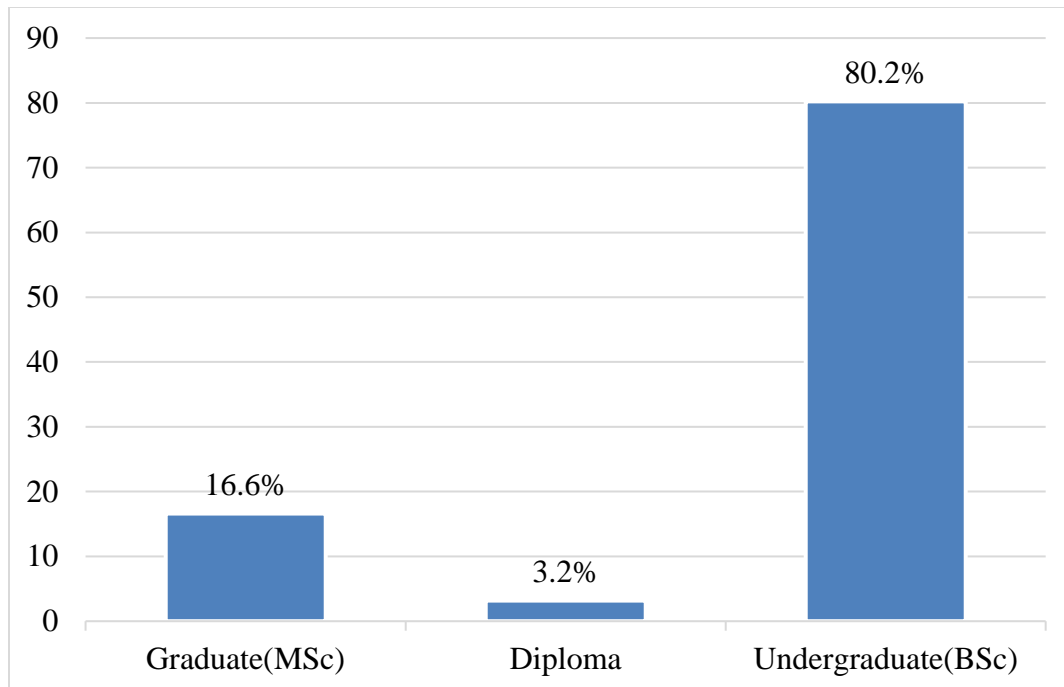
Figure 4.1: Respondents' educational background

Analysis of the respondents regarding the respondents educational background as seen in figure 4.1 revealed that the majority of the respondents were BSc (undergraduate) level which was 174 (80.2%) of the participants, 36 (16.6%) of the respondents were MSc (Graduate) level and the Diploma holders were 7 (3.2%). The findings revealed that all of the participants were highly educated which showed that the majority of the 40/60 housing project quality management participants were first degree holders, graduate level and only a few of them were diploma level.

Figure 4.2: Respondents' gender

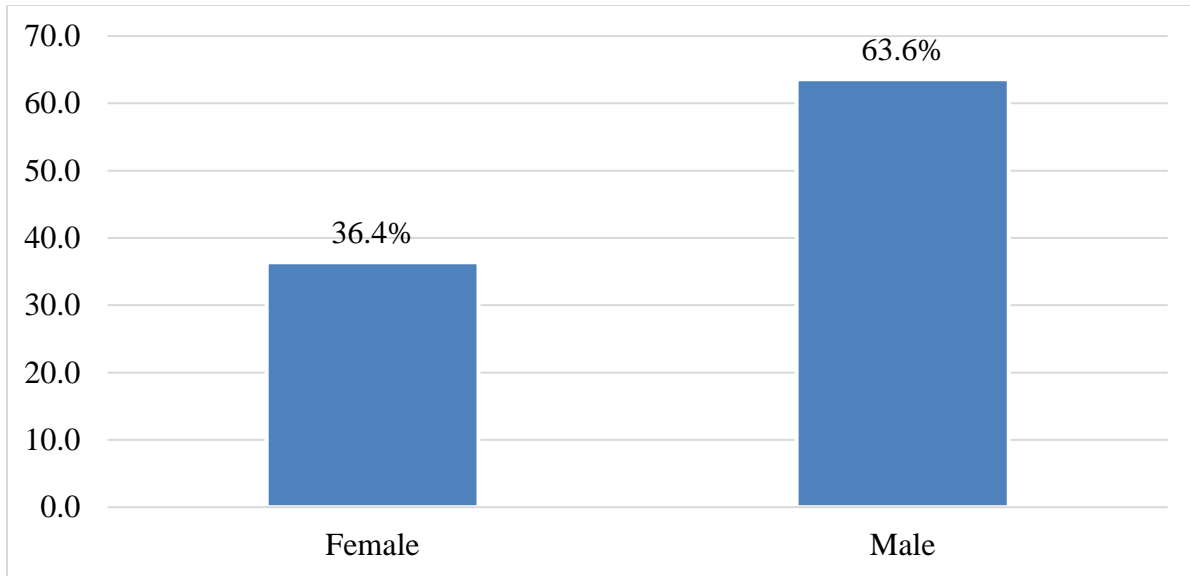Women and men contribute in different ways to the creation of scientific, technological and social knowledge in different sectors, as seen in figure 4.2 the gender of the participants showed that majority of the respondents were male which was 138 (63.6%) and 79 (36.4%) were female the findings revealed that there was a male dominance of participation in the project quality management system.
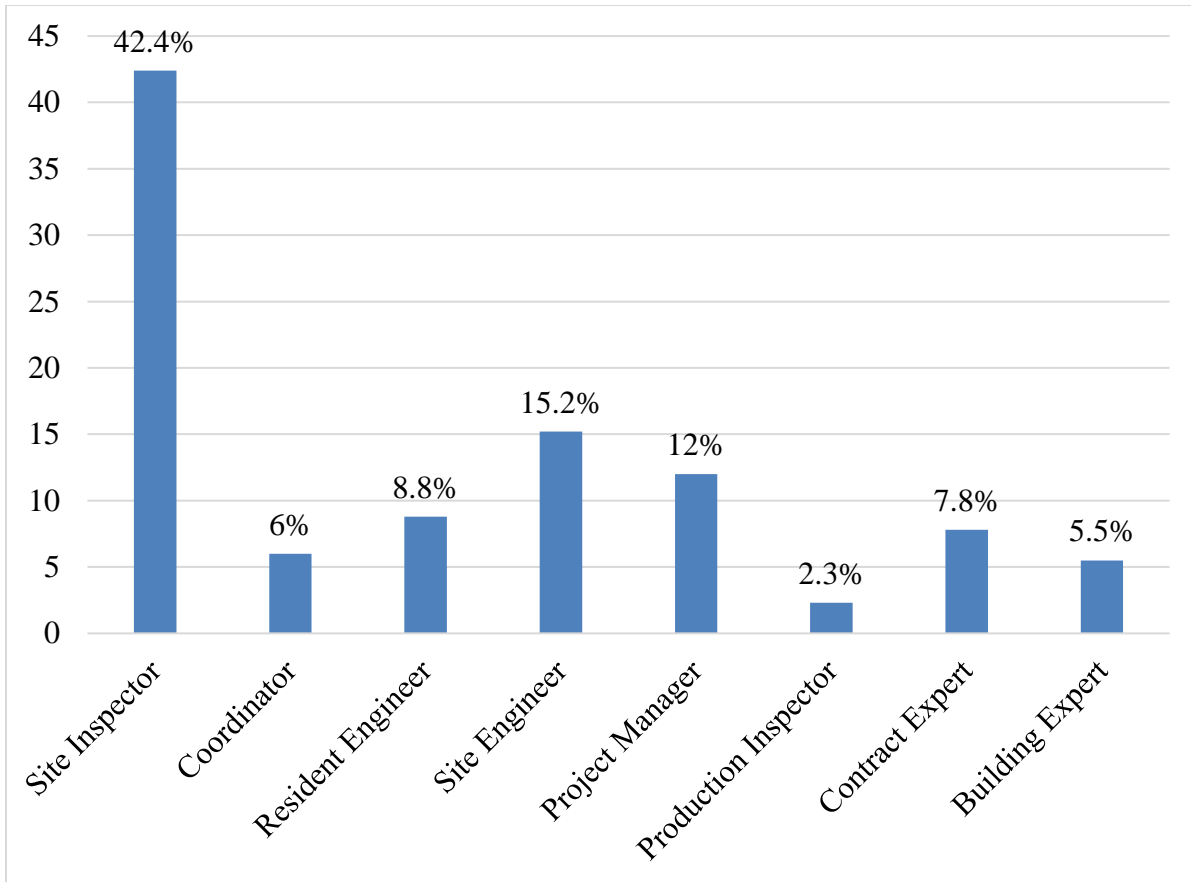
Figure 4.3: Respondents' work position

The analysis seen in figure 4.3 showed that 92 (42.4%) of the respondents were participating as a site inspector in the 40/60 housing project, 33 (15.2%) were site engineers, 26 (12%) was Project managers, 19 (8.8%) were resident engineer, 17 (7.8%) were contract experts, 13 (6%) were coordinators, 12 (5.5%) were building experts and the remaining 5 (2.3%) were production inspectors.

Under the general information, the following tables represent the experience of the participants, implementation of the formal quality management system, duration of implementation, no implementation of the quality management system, factors that could provide the motivation to start quality management system and perception of quality respectively.

Table 4.1: Respondents' professional experience

	Frequency	Percent	Valid Percent	Cumulative Percent
0-5years	138	63.6	63.6	63.6
6-10years	46	21.2	21.2	84.8
11-25years	18	8.3	8.3	93.1
>25years	15	6.9	6.9	100.0
Total	217	100.0	100.0	

The respondents work experience as shown in table 4.1 showed that the respondents work experience was 138 (63.6%), 46 (21.2%), 18 (8.3%) and 15 (6.9%) with 0-5, 6-10, 11-25 and greater than 25 years of experience; the analysis showed that the majority of the participants were experienced between 0-5 years.

4.2. Quality Management Practices and Challenges

The following tables represent the survey questions regarding the practices and challenges of the quality management system during the 40/60 housing project implementation, the participants were asked to respond with their level of agreement on each question during the project implementation.

Table 4.2: Implementation of a formal quality management system

		Frequency	Percent	Valid Percent
Valid	Yes	173	79.7	79.7
	No	44	20.3	20.3
	Total	217	100.0	100.0

The analysis of formal quality management system implementation showed in table 4.2 that the majority of the respondent replied to the formal implementation of a quality management system in the implementation of the 40/60 housing project, 173 (79%) answered yes and the

remaining 44 (20.3%) answered no to the formal implementation of a quality management system during the implementation of the housing project.

Table 4.3: Duration of implementation of quality management system

	Frequency	Percent	Valid Percent	Cumulative Percent
0-5years	168	77.4	77.4	77.4
6-10years	5	2.3	2.3	79.7
Other	44	20.3	20.3	100.0
Total	217	100.0	100.0	

The analysis in table 4.3 showed that the duration of the implementation of the formal quality management system to those who responded yes to formal quality management implementation revealed that the 168 (74.4%) had applied a formal quality management system between 0-5 years which also indicated that the majority of the participants had applied a formal quality management system during the implementation of 40/60 project for 0-5 years, 5 (2.3%) respondents replied 6-10 years of application of formal quality management system during the implementation of the project while the remaining 44 (20.3%) respondents did not agree with the formal quality management implementation during the project implementation.

Table 4.4: No implementation of a quality management system

	Frequency	Percent	Valid Percent	Cumulative Percent
lack of knowledge on implementation	3	1.4	1.4	1.4
implementation of quality management system is expensive	14	6.5	6.5	7.8
the company has thrived without such a system	27	12.4	12.4	20.3
Other	173	79.7	79.7	100.0
Total	217	100.0	100.0	

For the respondents who did not agree with the formal implementation; table 4.4 showed the analysis for the possible causes for no implementation of a quality management system as follows, 27 (12.4%) responded that the company thrived without such a system, 14 (6.5%) responded implementation of quality management system is expensive, and 1.4% (3) responded lack of knowledge on implementation and 173 (79.7%) were respondents who agreed with formal quality management implementation. From the analysis in table 4.2 and table 4.3 the findings showed that formal quality management system was implemented during the project implementation for 0-5 years considering the AASHDE launched the 40/60 housing project in July 2012, (Nuru, 2014), the project overall lifecycle was 7 years up to now, thus formal level of project quality management were deployed for 5 years which showed that there were formal implementation for more than average duration of the project.

Table 4.5: Factors that could provide the motivation to start quality management

	Frequency	Percent	Valid Percent	Cumulative Percent
Pressure from competitors	32	14.7	14.7	14.7
Demanding Customers	30	13.8	13.8	28.6
Your company's Chief Executive/Manager	30	13.8	13.8	42.4
Need to reduce costs and improve performance	80	36.9	36.9	79.3
International standards	41	18.9	18.9	98.2
Other	4	1.8	1.8	100.0
Total	217	100.0	100.0	

The analysis about possible motivation factors that could cause to start the quality management seen in table 4.5 showed that 80 (36.9%), 41 (18.9%), 30 (13.8 %), 30 (13.8 %), 32 (14.7%) and 4 (1.8%) replied as need to reduce costs and improve performance, international standards, pressure from competitors, demanding customers, company's chief executive/manager

and other respectively. This revealed that the majority of the participants had an understanding of quality management in a way it could help reduce costs and improve performance.

Table 4.6: Perception of quality

	Frequency	Percent	Valid Percent	Cumulative Percent
Elimination of defects	89	41.0	41.0	41.0
A tool to increase profits	50	23.0	23.0	64.1
A competitive advantage	72	33.2	33.2	97.2
Other	6	2.8	2.8	100.0
Total	217	100.0	100.0	

Table 4.6 showed that the 89 (41.0%), 72 (32.2%), 50 (23.0%) and 6 (2.8%) perceived quality as elimination of defects, competitive advantage, a tool to increase profit and other respectively, respondents who responded to other specified that as they perceived quality as cost minimization method. The finding revealed that the majority of the respondents perceived quality as the elimination of defects, which supports the perception of quality products to be defects free (Rose, 2005).

Table 4.7: Quality management practices

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
Quality plan	32(14.7)*	43 (19.8)	33(15.2)	69(31.8)	40(18.4)	3.19	1.347
Quality plan communication	14(6.5)	57(26.3)	54(24.9)	67(30.9)	25(11.5)	3.15	1.129
Quality assurance	27(12.4)	53(24.4)	39(18.0)	69(29.5)	34(15.7)	3.12	1.288
Quality control	35(16.1)	47(21.7)	33(15.2)	74(34.1)	28(12.9)	3.06	1.313
Quality improvement	3(1.4)	74(34.1)	39(18.0)	78(35.9)	23(10.6)	3.20	1.070
Quality policies	21(9.7)	52(24.0)	47(21.7)	67(30.9)	30(13.8)	3.15	1.213
Quality improvement coordinating body	31(14.3)	77(35.5)	53(24.4)	48(22.1)	8(3.7)	2.65	1.138
Quality improvement tools and techniques	6(2.8)	106(48.8)	38(17.5)	57(26.3)	10(4.6)	2.81	1.008
Continuous improvement	7(3.2)	75(34.6)	69(31.8)	50(23.0)	10(7.4)	2.97	1.002
System for quality planning	40(18.4)	20(9.2)	61(28.1)	91(41.9)	5(2.3)	3.00	1.161
System for quality control	2(0.9)	50(23.0)	34(15.7)	116(53.5)	15(6.9)	3.42	.950
Quality planning procedures	7(3.2)	45(20.7)	54(24.9)	104(47.9)	7(3.2)	3.27	.935
Quality control procedures	13(6.0)	48(22.1)	54(24.9)	98(45.2)	4(1.8)	3.15	.984
Quality improvement procedures	5(2.3)	54(24.9)	67(30.9)	84(38.7)	7(3.2)	3.16	.915
Equipped employees	26(12.0)	95(43.8)	46(21.2)	38(17.5)	12(5.5)	2.61	1.079
Availability of human resource	17(7.8)	60(27.6)	73(33.6)	49(22.6)	18(8.3)	2.96	1.073

32(14.7) 32= frequency 14.7= percent (%), the same applies for all table*

The analysis for project quality management processes revealed the following mean results for quality plans are prepared before starting job (3.19), quality plan is communicated to all project team (3.15), quality assurance activities are implemented regularly (3.12), quality control activities are implemented regularly (3.06), quality improvement activities are implemented regularly (3.20) and quality policies are agreed upon by decision makers (3.15) respectively which showed that the quality management processes were implemented with average level of implementation. The analysis for continuous improvement revealed the following mean results; for quality improvement coordinating body (quality steering committee) (2.92), quality improvement tools and techniques are widely used (2.81) and company practices continuous improvement in all of its processes (2.97). The result showed that there is a minimal level (below average) of continuous improvement implementation during the 40/60 housing implementation. The analysis for system and procedures showed the following results; for there is a system for quality planning (3.00), there is a system for quality control (3.42), quality planning procedures are implemented (3.27), quality control procedures are implemented (3.15) and quality improvement procedures are implemented (3.16) thus there was a system and procedures for quality management system however, it was implemented with an average level of implementation. Resource management analysis revealed the mean result as follows employees are well equipped to tackle problems (2.61) and required human resources is available for the project (2.96). The result showed that the resource management mean value was more than average however, it had a minimum level of implementation.

Table 4.8: Quality management challenges

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Deviation
Adequate preparation	53(24.5)*	92(42.4)	22(10.1)	26(12.0)	24(11.1)	2.43	1.266
Adequate resource	24(11.1)	90(41.5)	29(13.4)	54(24.9)	20(9.2)	2.80	1.200
Availability of cheap consultancy	20(9.2)	86(39.6)	72(33.2)	35(16.1)	4(1.8)	2.62	.926
Cheap training programs	31(14.3)	78(35.9)	62(28.6)	24(11.1)	22(10.1)	2.67	1.159

Adequate awareness	19(8.8)	103(47.5)	39(18.0)	45(20.7)	11(5.1)	2.66	1.060
Effective measurement criteria	13(6.0)	105(48.4)	35(16.1)	55(25.3)	9(4.1)	2.73	1.037
Adequate quality management information	34(15.7)	88(40.6)	65(30.0)	26(12.0)	4(1.8)	2.44	.956
Strong coordination with supplier.	20(9.2)	85(39.2)	74(34.1)	34(15.7)	4(1.8)	2.62	.921

53(24.5)* 53= frequency, 24.5 = percent (%), the same applies for all table

The analysis of quality management challenges revealed the mean results as follows; there is adequate preparation (budget, sponsor) (2.43), there is adequate resource (2.80), cheap consultancy programs are available (2.62), training programs are cheap (2.67), employees have adequate awareness of the importance of their contribution to the quality objectives (2.66), there are effective measurement criteria (2.73), there is adequate quality management information between different sections of the selected project (2.44) and there is strong coordination with supplier (2.62). The finding showed that there was a lack of preparation regarding budget and sponsor, there were resource shortage, consultancy and training programs for quality management system were perceived as expensive/costly, quality management information was not transparent between different section of the project, and there were weak coordination with supplier of the project, however, employees have an awareness of the importance of their contribution to quality objectives to some extent.

4.3. Level of Implementation of Selected Variables

To show the level of implementation of a regular budget update, commitment of all participants, top management support, availability of trained resources and communication/interaction between project participant the mean and standard deviation were calculated using SPSS as shown in table 4.9.

Table 4.9: The level of implementation of selected variables

	N	Mean		Std. Deviation
	Statistic	Statistic	Std. Error	Statistic
Level of Implementation of Budget Update	217	2.04	.059	.868
Level of Implementation of commitment of participant	217	2.06	.052	.773
Level of Implementation of top management support	217	2.07	.060	.889
Level of Implementation of availability of trained resources	217	2.11	.052	.762
Level of Implementation of communication between project implementers	217	3.47	.071	1.041

As shown in Table 4.9 the mean value of regular budget update was (2.04) which showed that the level of implementation of regular budget update during the project implementation was below the average level of implementation. The mean result of the analysis for commitment was (2.06) which showed the level of commitment of participant was a low level of commitment. The analysis of the level of top management support shows that the mean was below average (2.07) which showed there were a low level of top management support. The analysis of the level of availability of trained resources revealed that the mean value was below average (2.11) which showed that there was a low level of availability of trained resources. The mean value of the analysis for the level of communication/interaction between project implementers were above average (3.47) which showed that there was a moderate level of communication between project implementers.

4.4. Level of Quality Management Performance

Table 10: Level of quality management

Level of Quality management performance	Mean
Project quality management performance rating	2.29
Project quality management with Perceived Project quality	3.53

Respondents were questioned to rate the performance of the project quality management system (performance status/ Rating), and the result showed that the mean value for quality performance was 2.29 which showed below average performance rating. Respondents were also questioned how much does project quality management affects project quality and the mean value for the perceived value of project quality with respect to project quality management mean value was (3.53) that which was above average and the result showed that the respondents believed project quality management affects project quality.

4.5. Model Results

The following table presents the regression analysis output of the SPSS analysis for the testing model of each dependent variable.

Table 4.11: Model result information for selected variables

	Model fitting Sig.	Goodness of fit Sig	Test of parallel line Sig
Regular budget update	0.012	0.576	0.320
Commitment of all participants	0.013	0.750	0.517
Top management support	0.018	0.757	0.769
Availability of trained resources	0.005	0.380	0.187
Communication between project implementers	0.024	0.002	0.001
Perceived project quality	0.003	0.702	0.663

The model fitting information for regular budget update's statistical significant value was 0.012 which is less than 0.05 thus the result showed that the model fit well to the data, the goodness of fit value was 0.576 (Pearson) which was greater than 0.05 the result revealed that our model was adequate. The model fitting information for commitment of all participant's statistical significant value was 0.013 which is less than 0.05 thus the result showed that the model fit well to the data, the goodness of fit value was 0.750 (Pearson) which was much greater than .05 the result revealed that our model was adequate. The model fitting information for top management support's statistical significant value was 0.018 which is less than 0.05 thus the result showed that the model fit well to the data, the goodness of fit value was 0.757 (Pearson) which was much greater than 0.05 the result revealed that our model was adequate.

The model fitting information for availability of trained resource's statistical significant value was 0.005 which was much less than 0.05 thus the result showed that the model fit well to the data, the goodness of fit value was 0.380 (Pearson) which was much greater than 0.05 the result revealed that our model was adequate. The model fitting information for communication between project implementers' statistical significant value was 0.024 which was less than 0.05 thus the result showed that the model fit well to the data, the goodness of fit value was .002 (Pearson) which was much less than 0.05 the result revealed that our model was not adequate. The model fitting information for project quality's statistical significant value was 0.003 which was less than 0.05 thus the result showed that the model fit well to the data, the goodness of fit value was 0.702 (Pearson) which was much greater than .05 the result revealed that our model was adequate.

4.6. Regression Analysis

Table 4.12 Level of implementation of selected variables and Project quality management

		Coefficient	Std. Error	Sig.
Regular Budget Update on PQM				
Threshold	[QMSPerformance = 1]*	-.568	.256	.026
	[QMSPerformance = 2]	1.534	.277	.000
	[QMSPerformance = 3]	1.963	.291	.000
	[QMSPerformance = 4]	3.646	.419	.000
Location	[howrbugqms=1]**	2.105	.614	.001
	[howrbugqms=2]	.172	.395	.664
	[howrbugqms=3]	.703	.406	.083
	[howrbugqms=4]	.411	.327	.209
	[howrbugqms=5]	0[a]	.	.
Commitment of Participant on PQM				
Threshold	[QMSPerformance = 1]*	-.517	.255	.043
	[QMSPerformance = 2]	1.583	.278	.000
	[QMSPerformance = 3]	2.015	.293	.000
	[QMSPerformance = 4]	3.706	.420	.000
Location	[howcomqms=1]**	2.240	.640	.000
	[howcomqms=2]	.243	.389	.532
	[howcomqms=3]	.746	.403	.064
	[howcomqms=4]	.528	.329	.109
	[howcomqms=5]	0[a]	.	.
Top Management Support on PQM				
Threshold	[QMSPerformance = 1]	-.952	.233	.000
	[QMSPerformance = 2]	1.154	.238	.000
	[QMSPerformance = 3]	1.588	.253	.000
	[QMSPerformance = 4]	3.264	.392	.000
Location	[howtopmqms=1]	1.615	.620	.009
	[howtopmqms=2]	.312	.349	.371

	[howtopmqms=3]	-.024	.399	.953
	[howtopmqms=4]	-.492	.333	.140
	[howtopmqms=5]	0[a]	.	.

Availability of Trained Resources on PQM

Threshold	[QMSPerformance = 1]	-.573	.256	.025
	[QMSPerformance = 2]	1.543	.277	.000
	[QMSPerformance = 3]	1.978	.292	.000
	[QMSPerformance = 4]	3.679	.422	.000
Location	[howtrainedresqms=1]	2.202	.596	.000
	[howtrainedresqms=2]	.428	.384	.265
	[howtrainedresqms=3]	.709	.406	.081
	[howtrainedresqms=4]	.245	.331	.460
	[howtrainedresqms=5]	0[a]	.	.

Link function: Logit.

a. This parameter is set to zero because it is redundant.

*** QMSPerformance =1-4 (Very low, Low, Medium and High); ** howrbugqms=1-5 (Very low, Low, Medium, High and Very high)***

For further understanding the regression analysis was applied for the selected variables; the analysis for regular budget update revealed the following information; As shown in table 4.11 the level of implementation of regular budget update was statistical significant value for very low (1) level of implementation; for 1 unit increase in level of implementation of regular budget update (i.e. going from 1 to 2) we expect 2.11 increase in the ordered log odds of being a high-level of quality management system, 0.17 (2 to3), 0.70 (3 to 4) and 0.41 (4 to 5) respectively.

The regression analysis for commitment of all participant revealed the following information; as shown in table 4.11 the level of implementation of commitment of all participants were statistical significant value for very low (1) level of implementation; for 1 unit increase in level of implementation of commitment of all participants (i.e. going from 1 to 2) we expect 2.24 increase in the ordered log odds of being a high level of quality management system, 0.24 (2 to3), 0.75 (3 to 4) and 0.53 (4 to 5) respectively.

As shown in table 4.21 the level of implementation of top management support was statistical significant value for very low (1) level of implementation; for 1 unit increase in level of

implementation of top management support (i.e. going from 1 to 2) we expect 1.62 increase in the ordered log odds of being a high level of quality management system, 0.31 (2 to3), -0.02 (3 to 4) and -0.49 (4 to 5) respectively.

The regression analysis for availability of trained resources revealed the following information; as shown in table 4.25 the level of availability of trained resources were statistical significant value for very low (1) level of implementation; for 1 unit increase in level of implementation of commitment of all participants (i.e. going from 1 to 2) we expect 2.20 increase in the ordered log odds of being a high level of quality management system, 0.43 (2 to3), 0.71 (3 to 4) and 0.25 (4 to 5) respectively.

The regression analysis for communication between project implementers revealed the model testing of the communication between project implementers and project quality management showed that the model was not significant. Moreover, the result of the test of the parallel line showed that the result contradicts with the current theory which is the level of communication between project participants has significant value on project quality management on this study.

Table 4.13: Project quality management and Perceived project quality

		Coefficient	Std. Error	Sig.
Project quality management on perceived project quality				
Threshold	[QMSPerformance = 1]*	-.919	.234	.000
	[QMSPerformance = 2]	1.193	.241	.000
	[QMSPerformance = 3]	1.629	.257	.000
	[QMSPerformance = 4]	3.360	.399	.000
Location	[howqmsprjqulty=1]**	2.160	.609	.000
	[howqmsprjqulty =2]	.351	.351	.317
	[howqmsprjqulty =3]	-.188	.410	.648
	[howqmsprjqulty =4]	-.355	.330	.282
	[howqmsprjqulty =5]	0ᵃ	.	.

Link function: Logit.

a. This parameter is set to zero because it is redundant.

*QMSPerformance =1-4 (Very low, Low, Medium and High); ** howqmsprjqulty =1-5 (Very low, Low, Medium, High and Very high)*

As shown in table 4.33 the level of Perceived project quality were statistical significant value for very low (1) level of implementation; for 1 unit increase in level of implementation of project quality management system (i.e. going from 1 to 2) we expect 2.16 increase in the ordered log odds of being a high level of Perceived project quality, 0.35 (2 to3), -0.19 (3 to 4) and -0.35 (4 to 5) respectively.

Additionally, the findings of the structured interview guide were used to verify the findings of the quantitative results with the qualitative and to have more in-depth knowledge of the practice and challenges of project quality management of the 40/60 housing project as follows. The respondents were graduate and undergraduate level with 10 years and above experience, all of the seven top managers interviewed were male and with the branch manager, 40/60 housing enterprise program manager, manager for the contractor and the Addis Ababa saving house enterprise director position respectively. The branch managers were questioned for the formal implementation of quality management and the challenges during the implementation; they noted

that the behavior of the project makes the implementation of the formal quality management system very hard, knowing that there were more than one legal bodies (stakeholders) who participated in the project thus project quality management system were implemented partially, and the national standard called Ethiopian Building Code Standard was implemented. The manager's perception about quality was the tool to increase defects, tool to improve project quality, and also it was perceived to be a tool to finish the project within schedule, scope, and budget accordingly.

Respondents were questioned why there were resource shortages and why employees were not trained to implement quality management, and they replied that the housing program is a saving house which is handled by the government mainly and there was delay of payment to contractors which lead to a shortage of resources, and it also impacted the employees training to implement the quality management best practices, however the respondents noted that employees who participated in the quality management system have a background of engineering and constructions and they took the basics of the necessity of the quality management system in their formal education. Respondents noted that due to the nature of the project there was no single entity to be responsible for the construction of the houses, it was not possible to implement external benchmarking, however as per the contractors they perform internal benchmarking in a way they took the lesson learned from previously built houses to improve the next house.

Respondents were questioned about the challenges during implementation of project quality management, and they responded that due to a number of participants in the project; there was weak coordination between project implementers and stakeholders; they mentioned that the client and the contractors meet mostly for the payment related issues. There was weak information between project participants about quality management. Due to the nature of the project that had many stakeholders and the client of the project have the power to manipulate the project output even wrongly, the respondents noted that the top manager of the client could knowingly disrupt the quality of the project by changing the materials to be implemented due to corruption problems. The finding showed that there was a week system for quality management practice and controlling mechanisms; there was the power of individuals over the system.

CHAPTER FIVE

5. SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1. Summary

The principal purpose of this study was to study the practices and challenges of project quality management for the 40/60 housing project in Addis Ababa during the implementation of the project, and also to assess the level of implementation of regular budget updates; commitment of all participants; top management support; communication and the availability of trained resources in the case of 40/60 housing project quality management implementation and to assess the level of implementation of project quality management and Perceived project quality. The research approach applied for this research was a mixed type of research, and for sample, selection proportionate stratified random sampling technique was employed. The study applied a mixed type approach and convergent parallel mixed method design to answer the research questions. A total of 251 respondents who participated in quality management of the project were selected and 217 of them presented their response fully for the questionnaire survey. For the interview part, a total of 7 respondents were interviewed and totally 224 respondents have participated in the study. The findings revealed that there was a moderate level of implementation of project quality management processes and procedures however, there were challenges regarding continuous improvement where the mean results were below average for quality improvement coordinating body (quality steering committee) (2.92), quality improvement tools and techniques are widely used (2.81) and company practices continuous improvement in all of its processes (2.97) which showed there was a gap in the implementation of continuous improvements. For the level of implementation of the selected variables for regular budget update (2.04), commitment of participant (2.06), top management support (2.07), availability of trained resources (2.11), communication between project implementers (3.47) were the mean results which revealed that there were minimum level of implementation of the selected variables except for communication. The researcher suggests that resource management should be given better consideration, build accountability in all aspect of the project, and provide training programs about quality management for employees.

5.2. Conclusion

ISO 9001 (2015) defines quality management system (QMS) as a set of policies, processes, and procedures that are required for planning and execution (production/development/service) in the core business area of an organization (i.e., areas that can impact the organization's ability to meet customer requirements). This study analyzed the different core processes of quality management practices, challenges faced during implementation, From the analysis of the result of the respondents" responses and literature review the following conclusions are drawn:

The result of the project quality management processes revealed that the core processes of project quality management (i.e. planning, controlling, assurance, and continuous improvement) were highly implemented; and there were system for quality management and procedures for quality planning, controlling and improvement were implemented highly; on the other hand resource management and continuous improvement were less implemented, therefore if proper resource management and continuous improvements are employed during the project implementation, the project quality management performance along with project quality can be improved by enabling employees to tackle problems when they arise and continuously improving quality. The findings also revealed that even though some quality management processes were deployed; due to the lack of continuous improvement, and limitation on the implementation of regular budget update, commitment of all participant, top management support and availability of skilled manpower, the responses show that project quality management performance was at a low rating (status). The 40/60 housing project quality management were challenged with the following constraints; lack of preparation (no budget, no sponsor), lack of resources, employees lack an awareness of the importance of their contribution to the quality objectives, lack of effective measurement criteria, lack of quality management information between different section of the project, and quality management system was perceived to consume costly consultancies and costly training programs, as well as, there were weak coordination with supplier.

Moreover, this study also provided empirical evidence on the levels of contribution and the level of implementation of regular budget updates, level of commitment of all participants, the level of top management support, level of availability of trained resources and level of communication between project implementers; and there were high communication between project implementers, however for the four variables (i.e. regular budget update, commitment of

all participants, top management support and availability of trained resources) were slightly implemented even though the respondent replied as they believed it would impact the level of quality management performance.

Generally the findings of the research reveals that there was a medium level of implementation of quality management during the implementation of 40/60 housing project, however, due to the minimal level of continuous improvements and the availability of trained resources, the project could not fully benefit from the best practices that are considered in different literature as good quality management practices. It is evident that the use of tools and techniques and different methodologies that applies for the specific project have an overall effect on the project quality performance. The findings also showed that quality management practitioners in the study agreed with the effects and that the implementation of project quality management processes along with the implementation of regular budget updates, top management support, commitment of all participants and availability of trained resources affects the project quality management performance, however, communication/interaction between project implementers were not considered to affect the quality management performance in this study . Though it may be in slight contrast to the research findings the similarity is that top management support and communication/interaction between project implementers has an effect on project quality management performance.

5.3. Recommendations

Based on the findings of this study, the following recommendations are drawn for the enterprise in order to improve the quality management performance of at 40/60 condominium house project.

$\rightarrow$ The finding of the empirical analysis shows that resource management has less level of implementation during the 40/60 housing project implementation. Therefore it is recommended that resource management should be given better consideration throughout the project lifecycle, by enabling employees' sufficient equipment to cope up with the quality management problems and providing required skilled manpower for each quality management processes.

→ The finding shows that even though the quality management improvement activities were implemented during the project implementation phase, there was a gap in continuous improvement practice of quality management in all the processes. Therefore quality improvement tools and techniques such as check sheet and control chart should be applied, the company should employ continuous improvement in all of its processes, and there should be quality improvement coordinating body (e.g. quality steering committee).

→ The analysis shows that there was a lack of preparation in budget and resources thus the enterprise should apply strict budget management and resource management during the project implementation. Employees also should be given awareness about their contribution to quality objectives, and it is advised that training programs about quality management should be given for the 40/60 housing project quality management implementers and consultancy regarding the quality management of similar housing project is recommended.

→ Establishing strong coordination with the supplier and transparent information sharing with responsible quality management implementers is recommended.

→ It should be noted that the assessment result reveals the level of implementation of regular budget update, commitment of all project participant, availability of trained human resources were weakly implemented even though it is believed that they would impact the outcome of the quality management performance; it is found on the analysis that each variable was contributing factor to project quality management performance. Therefore it is recommended that regular budget updates should be made, each project participants should be given awareness on their contribution so that they will contribute to the project and be committed, and necessary training such as quality management practice training should be provided for the employees to improve the performance of quality management.

→ The finding showed that there was week system for quality management practice and controlling mechanisms and individuals had power over the system, thus it is recommended to build accountability in all aspect in a way to manage top managers and higher officials for their decision makings when there is an implication of less quality output.

5.4. Implication for Further Research

In this research, different information regarding the practices and challenges of project quality management in the case of 40/60 housing project has been identified, however, 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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APPENDICES

APPENDIX A: QUESTIONNAIRE

ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

TITLE OF THE THESIS: PRACTICES AND CHALLENGE OF PROJECT

QUALITY MANAGEMENT: THE CASE OF 40/60 HOUSING PROJECT

Dear respondent,

Introduction: Thank you for your willingness to participate in this study as a respondent. This questionnaire is used to collect data for the partial fulfillment of Master of Project Management. The researcher assures you that the information you provide used only for academic research purpose and anonymity of the respondent maintained throughout the research process. Thank you for your cooperation.

SECTION A: GENERAL INFORMATION

1. **Education Background**

a) Graduate (MSC) ☐   c) Undergraduate (BSC) ☐

b) Diploma ☐   d) High school complete ☐

e) If other, please specify_____

2. **Gender**

a) Female ☐   b) Male ☐

3. **What is your Position in 40/60 housing project**?

a) Site Inspector ☐

b) Coordinator ☐

c) Resident Engineer ☐

d) Site Engineer ☐

e) Project Manager ☐

f) Production Inspector ☐

g) Contract Expert ☐

h) Building Expert ☐

i) If Other Please Specify……………………………………….

4. What are your years of experience in this field?

c) 0-5 years ☐

d) 6-10 years ☐

e) 11-25years ☐

f) Above 25years ☐

g) If Other Please Specify………………………………….

5. Do you implement a formal quality management system on your projects or in your organization?

a) Yes ☐

b) No ☐

c) If Other Please Specify………………………………….

6. If yes, how long have you implemented this system?

a) 0-5years ☐

b) 6-10years ☐

c) Above 10years ☐

d) If Other Please Specify………………………………….

7. If no, why

a) Lack of knowledge on its implementation ☐

b) The implementation of a formal quality management system is expensive ☐

c) The company has thrived without such a system in place ☐

d) If Other Please Specify…………………………………………………………..

8. Which of the following factors provided the motivation to start the Quality Management

a) Pressure from competitors ☐

b) Demanding customers ☐

c) Your Company's Chief Executive/Manager ☐

d) Need to reduce costs and improve performance ☐

e) International standards ☐

f) If Other Please Specify……………………………………….

9. **What is your perception of quality?**

   a) Elimination of defects ☐

   b) A tool to increase profits ☐

   c) A competitive advantage ☐

   d) If Other Please Specify……………………………………….

SECTION B: QUALITY MANAGEMENT PRACTICES AND CHALLENGES

In your experience, please indicate the quality management practices which cut across the quality management emphases of technical and process aspects of the 40/60 Housing Construction Projects by ticking the appropriate boxes.

The following statements are issues related to implementation of project quality management. Please Mark the Appropriate Answer by (√), Using the key (**Where: 1= Strongly disagree , 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree**)

No	Practices of Project Quality Management	Degree of Agreement				
P1	**Quality Management Processes**	**1**	**2**	**3**	**4**	**5**
1.	Quality Plan are prepared before starting the Job.	☐	☐	☐	☐	☐
2.	Quality Plan is communicated to all project team.	☐	☐	☐	☐	☐
3.	Quality assurance activities are implemented regularly.	☐	☐	☐	☐	☐
4.	Quality Control activities are implemented regularly.	☐	☐	☐	☐	☐
5.	Quality improvement activities are implemented regularly.	☐	☐	☐	☐	☐
6.	Quality polices are agreed upon by decision makers.	☐	☐	☐	☐	☐
P2	**Continuous Improvement**					

		There is a quality improvement coordinating body (e.g. quality steering committee).	☐	☐	☐	☐	☐
	1.						
	2.	Quality improvement tools and techniques are widely used.	☐	☐	☐	☐	☐
	3.	The company practices continuous improvement in all of its processes.	☐	☐	☐	☐	☐
P3		**System and Procedures**					
	1.	There is a system for quality planning.	☐	☐	☐	☐	☐
	2.	There is a system for quality control.	☐	☐	☐	☐	☐
	3.	There is a system for quality improvement.	☐	☐	☐	☐	☐
	4.	Quality planning procedures are implemented.	☐	☐	☐	☐	☐
	5.	Quality improvement procedures are implemented.	☐	☐	☐	☐	☐
P4		**Resource Management**					
	1.	Employees are well equipped to tackle problems.	☐	☐	☐	☐	☐
	2.	Required human resource is available for the project.	☐	☐	☐	☐	☐
C1		**Challenges of project quality management system**					
	1.	Adequate preparation (budget, sponsor).	☐	☐	☐	☐	☐
	2.	Adequate resources.	☐	☐	☐	☐	☐
	3.	Inexpensive consultancies.	☐	☐	☐	☐	☐
	4.	Inexpensive training programs.	☐	☐	☐	☐	☐
	5.	Employees have adequate awareness of the importance of their contribution to the quality objectives.	☐	☐	☐	☐	☐
	6.	Adequate systems for quality management activities.	☐	☐	☐	☐	☐
	7.	Adequate effective measurement criteria.	☐	☐	☐	☐	☐
	8.	Adequate quality management information between different sections of the selected project.	☐	☐	☐	☐	☐
	9.	There is strong coordination with supplier.	☐	☐	☐	☐	☐

SECTION C: IMPLEMENTATION OF QUALITY MANAGEMENT

The following statements are issues related to level of implementation of project quality management. Please Mark the Appropriate Answer by (√), Using the key (**Where: 1= Very Low, 2 = Low, 3 = Medium, 4 = High, 5 = Very High**)

No	Project Quality Management Implementation	Degree of Agreement				
1	How much is the level of implementation of regular budget updates	☐	☐	☐	☐	☐
2	How much is the level of commitment of all participant	☐	☐	☐	☐	☐
3	How much is the level of top management support	☐	☐	☐	☐	☐
4	How much is the level of availability of trained resources	☐	☐	☐	☐	☐
5	How much is the level of communication/ interaction between project implementers	☐	☐	☐	☐	☐

SECTION D: PROJECT QUALITY MANAGEMENT RATING AND PERCEIVED PROJECT QUALITY

The following statements are issues related to project quality management system performance rating and Perceived project quality. Please Mark the Appropriate Answer by (√), Using the key (**Where: 1= Very Low, 2 = Low, 3 = Medium, 4 = High, 5 = Very High**)

No	Project Quality Management Rating and Perceived project quality	Degree of Agreement				
1	Quality management system performance status/ Rating	**1**	**2**	**3**	**4**	**5**
		☐	☐	☐	☐	☐
2	How much does project quality management system affects project quality (Perceived project quality)	☐	☐	☐	☐	☐

SECTION E: SELECTED VARIABLES ON THE PROJECT QUALITY MANAGEMENT

The following statements are issues related to the implementation of selected variables on project quality management system. Please Mark the Appropriate Answer by (√), Using the key (**Where: 1= Very Low, 2 = Low, 3 = Medium, 4 = High, 5 = Very High**)

No	Selected Variables on The Project Quality Management	Degree of Agreement				
		1	**2**	**3**	**4**	**5**
1	How much does regular budget update affect project quality management system	☐	☐	☐	☐	☐
2	How much does commitment of all participant affect project quality management system	☐	☐	☐	☐	☐
3	How much does top management support affect project quality management system	☐	☐	☐	☐	☐
4	How much does availability of trained resource affects project quality management system	☐	☐	☐	☐	☐
5	How much does communication between project implementers affects project quality management system	☐	☐	☐	☐	☐

APPENDIX B: KEY INFORMANT INTERVIEW GUIDE

ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

TITLE OF THE THESIS: PRACTICES AND CHALLENGE OF PROJECT QUALITY MANAGEMENT: THE CASE OF 40/60 HOUSING PROJECT

Dear respondent,

Introduction: Thank you for your willingness to participate in this study as a respondent. These interview questions are used to collect data for the partial fulfillment of Master of Project Management. The researcher assures you that the information you provide will be used only for academic research purpose and anonymity of the respondent maintained throughout the research process. Thank you for your cooperation.

1. What is your position in the selected project?
2. Educational background?
3. What are your years of experience in this field?
4. How do you implement a formal quality management system on your projects or in your organization?
5. What is your perception of quality?
6. Why employees are not trained to implement quality management practices in the selected project?
7. Why there is resources shortage for implementation of Quality Management practices?
8. Why benchmarking are weakly implemented?
9. What are the challenges during the implementation of quality management?

APPENDIX C RELIABILITY TEST RESULTS

Scale: ALL VARIABLES

Reliability Model for Quality Management Processes

Case Processing Summary		N	%
Cases	Valid	20	100.0
	Excluded[a]	0	.0
	Total	20	100.0
a. List wise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.964	6

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
PQ1	13.45	40.261	.901	.956
PQ2	13.35	43.713	.894	.956
PQ3	13.65	41.713	.872	.959
PQ4	13.80	40.274	.938	.951
PQ5	13.45	44.471	.891	.957
PQ8	13.30	45.168	.842	.962

Reliability Model for Continuous Improvement

Case Processing Summary		N	%
Cases	Valid	20	100.0
	Excluded[a]	0	.0
	Total	20	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.792	3

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
P2Q1	5.95	3.164	.641	.725
P2Q2	6.32	3.895	.579	.775
P2Q3	6.05	3.942	.714	.656

Reliability Model for System and Procedures

Case Processing Summary		N	%
Cases	Valid	20	100.0
	Excluded[a]	0	.0
	Total	20	100.0

Reliability Statistics

Cronbach's Alpha	N of Items
.876	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
P3Q1	12.25	13.250	.717	.857
P3Q2	11.75	16.197	.670	.857
P3Q3	11.65	14.976	.867	.813
P3Q4	12.10	16.621	.653	.861
P3Q5	12.25	16.408	.683	.855

Reliablity Model for Resource management

Case Processing Summary

		N	%
Cases	Valid	20	100.0
	Excluded[a]	0	.0
	Total	20	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics

Cronbach's Alpha	N of Items
.716	2

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
P4Q1	2.89	1.544	.557	.
P4Q2	2.58	1.480	.557	.

Reliability Test Table for Overall Questions

Case Processing Summary

		N	%
Cases	Valid	217	100.0
	Excluded[a]	0	.0
	Total	217	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics

Cronbach's Alpha	N of Items
.846	49

DECLARATION

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

_____

Name   Signature

St. Mary's University, Addis Ababa   **June 21, 2019**

ENDORSEMENT

This thesis, titled "Practices and Challenges of Project Quality Management: The Case of 40/60 Housing Project in Addis Ababa" has been submitted to St. Mary's University, School of Graduate Studies for examination with my approval as a university advisor.

_____   _____

Advisor   Signature

St. Mary's University, Addis Ababa   **June 21, 2019**