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**FACTORS AFFECTING THE PERFORMANCE OF
CONSTRUCTION PROJECTS: A CASE OF
20/80 CONDOMINIUM PROJECTS IN
ADDIS ABABA**

By: HENOK WENDAFRASH

**A Thesis Submitted to Addis Ababa University School of Commerce
MA in Project Management Program in Partial Fulfillment of the
Requirements for the Degree of Master of Arts in Project Management**

**Addis Ababa University School of Commerce
Project Management Graduate Program**

Nov, 2018

Addis Ababa, Ethiopia

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APPROVAL BY BOARD OF EXAMINERS

NAME OF INTERNAL EXAMINER

SIGNATURE

NAME OF EXTERNAL EXAMINER

SIGNATURE

STATEMENT OF CERTIFICATION

This is to certify that Henok Wendafrash has carried out his thesis on the topic entitled "Factors affecting The Performance of Construction Projects: The Case of Condominium Projects in Addis Ababá. This work is original in nature and suitable f or the award of Masters of Arts (MA) in Project Management.

Certified by:

Dr. Abraraw Chane

Signature

Date

STATEMENT OF DECLARATION

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

HENOK WENDAFRASH

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Abstract

Best performing project completes the projects in estimated time, estimated cost and stated quality. But different projects are failed to meet these performance parameters. Condominium projects in Addis Ababa are among these projects that fail to meet stated quality, scheduled time, and cost estimations. This study was conducted with an objective of identifying factors affecting the performance of condominium projects in Addis Ababa by using two projects that are under construction. Descriptive research design was implemented to identify these factors. Data was collected through structured questionnaire from 133 contractors and 58 consultants of the projects. Descriptive analysis such as mean, frequencies, charts and factors analysis were used to analyze the data and the analysis was conducted by using SPSS version 23. This study has identified that project characteristics, project procedures, project management actions and external environments have impact on performance of the projects. Therefore, this study recommends awareness creation for the contractors, consultants and associations that supply construction material. The client is recommended to reduce payment delays to the contractor. The consultants are recommended to make stronger follow up on the projects. To reduce the effects of material cost escalation, the client is recommended to store most important materials. Contractors are recommended to reduce profit margin and improve employee performance.

Key Words: Project performance, time, cost, quality, consultant, contractor, client

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The construction industry is the sector involved with erection, repair and demolition of buildings and civil engineering structures in an economy. The industry entails the assembly of building materials and/or components on site; the materials and components are supplied by a variety of industries in the manufacturing sector; they are delivered to the site by the transportation and trade sectors; the assembly proceeds in accordance with plans, designs, and management procedures supplied mainly by the business services industry in the service sector; and most of the funds required for construction are supplied by the financial services industry in the service sector (Bon 1992). According to Navon (2005) construction industry has complexity in its nature because it contains large number of parties such as clients, contractors, consultants, stakeholders and regulators. As contractors are one of the key players in the industry and the makers of the final product, any development and improvement initiatives in the industry has to consider ways of improving the capacity and capability of the contractors.

The Key performance indicators in construction industry framework consist of three main groups: time, cost, and quality (DETR, 2000). In the realm of project management, the schedule, cost and quality achievement is also referred to as the iron triangle. Out of these three aspects, it is the achievement of schedule and cost compliances that the project management is attending to most of the time. This results in a half-hearted attempt to achieve quality at project sites. In order to achieve the schedule and cost objectives, project quality is sometimes overlooked. Out of the commonly used project performance criteria the quality compliance has come second next to schedule compliance (Jha, 2004). Lower quality consequences may be in terms of loss in productivity, additional expenditures by way of rework and repair, re-inspection and retest in the short term. In the long term, poor quality can hurt reputation, and if the company continues in the same way it might have to close its shop for want of new projects. If a number of construction

companies of a country start neglecting the quality aspects in their projects, this also starts reflecting on the reputation of the country.

Adams & Long (2004) have indicated that poor managerial capability of contractors to be one of the critical problems of the construction industry in developing countries. Similarly, Dlungwana & Rwelamila, (2004), have also strongly emphasized the importance of improving the management skills of contractors that improving the contractors' project management capability can significantly contribute to the overall improvement of contractors' capability to deliver successful project. There are many realistic reasons such as closures, amendment of drawings and design. In addition, there are other different reasons affecting construction projects performance in Kenya such as poor management and leadership; inappropriate participants; poor relations and coordination; absence of motivation, control, monitor or decision making systems; inadequate infrastructure, political problems; cultural problems and economic conditions (The United Nations Relief and Works Agency, UNRWA, 2000).

Since 2005, Ethiopia has been implementing an ambitious government led low and middle income housing program, despite evident limitations in ensuring construction quality, delivery time of the houses to users; and cost overrun on the contractors and end users. According to Hiwot (2012) Addis Ababa Integrated Housing Development Project (AAIHDP) has an integrated approach to solve the housing shortage through mass construction of low cost houses and to reduce unemployment rate through engaging a large workforce in the construction process. Accordingly, the project involves emerging contractors and medium and small enterprises for the main construction works and the provision of prefabricated construction material respectively. The Housing Development Project Office is responsible for managing and administering of the project with the assistance of consulting firms engaged in the project as advisor and supervisors.

Despite the expected contribution, condominium projects in Addis Ababa fails conformance to the performance indicators. In addition, performance measurement systems are not effective or efficient to overcome this problem. Construction projects performance problem appears in many aspects in the projects. They fail in time performance, others fail in cost performance and others fail in quality performance.

Therefore, this study intends to identify factors affecting the performance of condominium construction projects in Addis Ababa.

1.2 Statement of the Problem

Atkinson et al (2007) reveals that client's will be not satisfied if the end product fails to meet their price, quality, time frame, functionality and delivery performance standard. In view of this, the consultants will not develop the skills and knowledge, or make the effort to design and manage processes, unless the client meets their required employment conditions. More so, the contractors and suppliers may not continue to deliver good products and resources to clients or to any company that fails to give them an opportunity to earn a reasonable return on the investment of their time and capital. As a result, end-users will not be happy if the end product does not meet their requirements in terms of performance including time, cost and quality. In essence, successful stakeholders' performance has to be measured and managed in order to ensure their continual participation and co-operation in a construction project. Unlike many other industries, the construction industry has the ability to have a more profound impact through its end products. The industry is no longer isolated from the pressures and demands of society.

Helping the parties involved in condominium construction projects to identify the critical attributes responsible for achieving the desired performance level (success factors) and also to find the attributes adversely affecting the project performance (failure factors) has been the motivating factor behind this study. It is realized that maximization of the success factors and minimization of failure factors will ensure the construction industry realizes its performance goals.

Different factors are identified as causes of poor performance in construction industries in different countries. Rwelamina & Savile (1994) identified a lack of management expertise and worker participation, and Tam & Harris (1996) added equipment and quality management of the team as a major cause. Atkinson (1999), Love & Li (2000), and Odeh & Battaineh (2002) further identified major causes of performance defects as human error, poor workmanship and contractual relationship underlining on the effect of relationship management on project performance in construction. These studies are conducted in the case of business projects and they fail to include all the key performance

indicators. Unlike these business construction projects, condominium projects in Addis Ababa are public projects and they include different stakeholders such as micro and small enterprises, inexperienced contractors and consultants and clients that are not an end-user.

According to Enshassi, *et al.*, (2009) in developing countries like Ethiopia, poor productivity was seen as a major concern in the construction industry. Although literature exists on contractor performance in the construction industry, the need to evaluate the critical factors affecting the performance of construction projects was fitting as they constitute a greater percentage of contractors. This will provide data for performance improvement in the quest of enhancing better performance of construction projects and overall performance of the construction industry. Performance of condominium projects are concern of clients, contractors and consultants and also end-users. It is therefore necessary to pay adequate attention to various factors that have been influencing quality performance of construction projects for better and improved productivity. Studies conducted earlier made an attempt to assess and evaluate the efficiency of the housing project overall condominium housing project performance in Ethiopia especially in Addis Ababa. UN-HABITAT (2011) pointed out that management of specific issues like location, built environment design, and construction quality are unanticipated challenges of the program. Concerns nowadays intensified over quality and life span of the buildings; in particular, the quality of structures, construction finishing and infrastructure. If not addressed properly, the mentioned challenges might jeopardize the long-term success of the program.

According to Hiwot (2012) most of construction projects in Ethiopia are characterized by time delay, cost overrun and poor quality construction due to poor performance of the contractor and weak stakeholder commitment. Completion of the project is taking more than 200% additional time since the construction is started. End users are waiting more than 10 years to get the houses. Hiwot (2012) further indicated that construction quality defects are observed in completed housing units at condominium houses in Addis Ababa. The households are subject to unexpected maintenance costs and economical issue at large. Condominium houses now days received less confidence among the owners as to the durability, stability and safety.

Michael (2017) identified that quality and safety are apparently undermined and negotiated in the housing projects. The houses are reconstructed; facilities in the houses are at very low standard that is impossible to use; doors and windows are reconstructed and new designs are implemented and civil works are unfinished. This lower quality is resulting on higher financial costs on the users for rebuilding and maintenance. On average end-users pay Birr 45,000 for basic maintenance. There are also open houses that nobody is living in. according to Fetene (2008) end-users are paying very high price for the houses due to inefficiencies of management by Addis Ababa Housing agency.

The identified studies in the area of the study are conducted selectively on a single performance indicator and very small samples were used. Therefore, this study intended to identify factors affecting performance of construction projects in the case of condominium projects in Addis Ababa by including all key performance indicators and by using larger sample from condominium projects that are under construction.

1.3 Research Questions

On the basis of the problems explained in the statement of the problem section, the research will revolve around the following research questions.

1. What are the project characteristics that affect the performance of construction projects in the case of condominium projects in Addis Ababa?
2. What are the factors that are related to project procedure that affect performance of construction projects in the case of condominium projects in Addis Ababa?
3. How project management actions affect performance of construction projects in the case of condominium projects in Addis Ababa?
4. What is the influence of external environment on the performance of construction projects in the case of condominium projects in Addis Ababa?

1.4 Objectives of the study

1.4.1 General Objective

General objective of this study is to identify factors affecting the performance of construction projects in the case of condominium projects in Addis Ababa.

1.4.2 Specific Objectives

1. To identify project characteristics that affect the performance of construction projects in the case of condominium projects in Addis Ababa;
2. To identify the effect of project procedure on the performance of construction projects in the case of condominium projects in Addis Ababa;
3. To analyze project management actions that affect performance of construction projects in the case of condominium projects in Addis Ababa; and
4. To determine the influence of external environment on the performance of construction projects in the case of condominium projects in Addis Ababa;

1.5 Scope of the Study

The study is delimited to examining the performance problems confronting 20/80 condominium project in Addis Ababa. Although there are different condominium projects in Addis Ababa, this study is delimited to projects under construction. This is due to the fact that the researcher cannot reach contractors and consultants in the projects which are already completed. For this reason, the study was conducted in Koye Feche and Bole Arabsa sites. Despite the number of data collection instruments, questionnaire was used to cover the larger sample. This study has used contractors and consultants as respondents.

1.6 Significance of the Study

The study is intended to assess factors contributing to unacceptable standard of performance of construction of condominium houses that will help in pinpointing solutions to improve quality life, ensure sustainable development and community well-being. This research paper therefore would contribute in triggering construction performance awareness at all levels of governmental establishments and other stakeholders to assure compliance of Ethiopia building construction enforcing regulations, laws and legislations with the basic operating requirements. It is also believed that this study will be necessary to explore possible sources of performance defects and examine challenges in construction of condominium houses. Since this study will identify causes of lower performance of the projects, it will be used by all

stakeholders to solve respective problems. Finally, the researcher believes that this study will contribute for further studies in the area of the study.

1.7 Limitations of the Study

This study was conducted with an objective of identifying factors affecting performance of construction projects the case of condominium projects in Addis Ababa. Despite the number of construction projects in Addis Ababa, this study has used only condominium projects in Addis Ababa. Although different condominium projects were constructed in the city, this study has used only projects that are currently under-construction to easily access the targeted respondents. Other limitation of this study is using questionnaire as a only instrument to collect the study data.

1.8 Definition of Terms

Project Performance:

It is an overall project performance in meeting the expectation of customers or compliance to the specifications of customers in time scheduled, quality specified and budget allocated. Quality is expectation of the client the project to meet based on the specification. It is a project time expected to complete the project activities. It is a budget allocated to complete the project (Barrett, 2000).

Project characteristics

A project characteristic is defined in terms of project scope, nature of project and complexity of project. Project scope refers to the type of project, the number of stories and the sophistication of the project. Nature of the project defines whether it is a new works project or a refurbishment project. Some projects are more expensive to build than others. Refurbishment works tend to have a higher unit cost than new works. Project complexity can be measured in terms of site access, design buildability, design coordination, site conditions, and quality management (Collins, 1996).

Project Environment

Project environment is an all external influences on the construction process. Broadly, the project environment is grouped as physical, economic, socio-political, and industrial relations, and they act at national or local level, and in different ways in the public and

private sectors. Changes in environment can create uncertainty in prices and terms of investment in the work of an organization, which will affect the performance.

Project Procedure

Project procedure comprises the concept of procurement form and the method of tendering. The fragmental nature of the construction industry, the fact that no two construction projects are identical and the resulting ephemeral nature of the project organization places great dependence on the project team in setting up the construction process and bringing the project to a successful conclusion.

Project Management Actions

The management action is primarily concerned with decision making for planning and controlling organizational endeavor. The managerial subsystem can be seen as spanning the entire organization by relating the organization to the environment, setting the goals, developing comprehensive strategic and operational plans, designing the structure and establishing control process.

1.9 Organization of the Study

The study is organized into five chapters. The first chapter is about the introduction of the study that includes background of the study, statement of the problem, research questions, objectives of the study, scope of the study and significance of the study; the second chapter is about literatures reviews which include theoretical literature, empirical literatures and conceptual frame work; the third chapter discusses about methodology of the study which includes description about study area, research design, data source and collection method, sampling techniques and sample size determination, method of data analysis, reliability and validity analysis, and ethical consideration; the fourth chapter presents result and discussion; and the last chapter, fifth chapter is about conclusion and recommendation.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

This chapter presents about the review of related literatures in the study area. It has three subsections: theoretical review, empirical review and conceptual framework. Theoretical views about factors affecting performance of projects are reviewed from different books and websites. In addition to theoretical reviews, the researcher has reviewed recent empirical studies. Based on the literatures and study gap, the researcher has developed conceptual framework.

2.1 Theoretical review

2.1.1 Performance

According to Collins (1996) performance is described as the oldest documented profession. In its simplest form performance can be defined as meeting the expectation of customers or compliance to the specifications of customers in time scheduled, quality specified and budget allocated. A number of definitions were used to define project performance by quality, time and cost professionals. No matter what definition followed for performance, it becomes very complex to put it into actual practice. For a user, performance is nothing but satisfaction with the appearance and reliability of the project for a given price range.

The approach to project performance has evolved from performance control to performance management through performance assurance and reached policies. In developed countries, where performance systems have been established long time ago, the principle has become to produce best performance rather than to control it at the end. The new approaches are not only beneficial to the customer but also to the manufacturer as cost of performance are optimized to minimize the total loss. The results are less cost per unit of better quality, more shares in the market and increased profits (Davis, et al., 1989).

In construction industry, the performance is generally considered to be very costly, and best performing organizations are established only as a result of contractual requirements. In construction industry, performance is different from factory or plant production; therefore, performance considerations need special care. Especially when the production (construction/installation) is not in place, cost of remedial works may go extremely high if attention is not paid to performance assurance (Barrett, 2000).

In the modern construction market, performance is a major function in construction organization. Quality is rapidly becoming as important factor as price has been traditionally (Davis, et al., 1989).

2.1.2 Performance Management Philosophies

Three philosophers W.Edwards Deming, Joseph Juran and Philip Crosby have developed distinct philosophies on how to measure, manage and improve performance.

Deming (McCabe, 1998) focuses on the improvement of product and service conformance to specifications by reducing uncertainty and variability in the design and manufacturing process. In Deming's view, variation is the chief culprit of poor performance. To achieve reduction of variation, he advocates a never-ending cycle of product design, manufacture, test, and sales, followed by market surveys, the redesign, and so forth. Deming claims that higher performance leads to higher productivity, which in turn leads to long term competitive strength.

Deming (1998) identifies two sources of improvement in any process: reducing the "common causes" of variation inherent in the production system, and eliminating isolated "special causes" identifiable with a specific individual, machine, or batch of materials. Statistical methods provide a means for identifying special causes and understanding common causes. Statistical thinking is only a portion of the modern Deming philosophy. Deming (1998) emphatically stated that managerial practices are in need of a radical overhaul and he has developed "14 points" constitutes the core of his program for achieving performance excellence. The Deming philosophy is an all-or-nothing proposition; none of the 14 points can be viewed in isolation and companies cannot be selective in the ones they wish to implement. His 14 points include; Create constancy of

purpose towards improvement of product and service, with the aim to become competitive, stay in business and provide jobs; Adopt the new philosophy, top management and everybody; Cease dependence on inspection to achieve quality; End the practice of awarding business on the basis of price tag; Improve constantly and forever the system of production and service; Institute training on the job; Teach and institute leadership; Drive out fear. Create trust. Create a climate for innovation; Break down barriers between departments; Eliminate slogans, exhortations and targets for the workforce; Eliminate work standards (quotas); Remove barriers that rob people of pride of workmanship; Encourage education and self-improvement for everyone; and Take action to accomplish transformation.

Juran (McCabe, 1998) defines performance as “fitness of the project”. This is broken down into four categories: quality of design, quality of conformance, availability and field service. Quality of design focuses on market research, the product concept and design specifications. Quality of conformance includes technology, manpower, and management. Availability focuses on reliability, maintainability, and logistical support. Field service quality comprises promptness, competence, and integrity. Juran provides ten essential stages explaining his perspective: Create awareness of the need and opportunity for quality improvement; Set goals for continuous improvement; Build on organization to achieve goals by establishing a quality council, identifying problems, selecting a project; Give everyone training; Carry out projects to solve problems; Report progress; Show recognition; Communicate results; Keep a record of successes; and Incorporate annual improvements into the company’s regular systems and processes, and thereby maintain momentum.

The essence of Crosby’s quality philosophy is embodied in what he calls the “Absolutes of Quality Management” and the “Basic Element of Improvement”. Crosby’s approach is summarized in five points for quality management (McCabe, 1998): Quality means conformance to requirements, not elegance; There is no such thing as a quality problem; problems must be identified by those individuals or departments that cause them; There is no such thing as the economics of quality; it is always cheaper to do the job right the first

time; The only performance measurement is the cost of quality; and The only performance standard is “Zero Defects”.

2.1.4 Performance Management in Construction

The construction industry is typified by highly differentiated, fragmented and loosely structured system. The skills, loyalty and orientation of professionals and practitioners in the industry have developed in an environment of specialization, differing traditions and often opposing interests at integration, if any, are presently weak. Developing a best performance system is the first step towards improving performance in construction industry.

According to Nee (1996) a performance system consists of the performance policy, Organization structure, Procedures, Processes, Training and performance manual. The performance policy shall be relevant to the organization’s goals and the expectations and needs of its customers. It must state goals and objectives that are measurable and pertinent to the organization’s functional plan and the expectations and needs of its customers. The documented quality system should be designed to carry out goals and objectives of the performance policy. The first objective in establishing a performance system should be to satisfy the internal needs of the organization. It follows therefore that it should be cost-effective, compatible with accepted good practice within the industry concerned, and beneficial to the organization. There are two types of systems for implementation of quality: centralized and decentralized systems.

According to Ashford (1989) Centralized systems lay stress on the practice of quality control or the operational techniques and activities that are used to fulfill requirements for quality. Under a centralized system, the quality related operations would be the responsibility of a quality control department with its own management hierarchy independent of production departments. The difference between centralized and decentralized systems is that in the latter the responsibility for controlling performance is placed firmly on the shoulders of those actually doing the work. This follows the principle that production management has a duty to make things comply with specifications, a duty which should not be permitted to relinquish or to share with others.

The performance system through the documented procedures must be effectively implemented. The complexity of the procedures depends on the complexity of work, methods used, skills, and training needed in carrying out the activity. Documented operational procedures should be developed to coordinate different activities with respect to an effective quality system. All documented procedures should be stated simply, understandable, unambiguously, and should indicate methods used and criteria to be satisfied. The organization shall identify and plan production (construction), installation, and servicing processes directly affecting performance. It shall insure that all of these processes are carried out under controlled conditions including: Use of appropriate equipment for the construction, installation, or servicing, and a suitable working environment; Compliance with all applicable codes, quality plans and documented procedures; Monitoring and controlling process parameters and product characteristics; Approval of process and equipment as required; Criteria for workmanship defined in the clearest practical manner-e.g., written standards, representative sample, or illustrations; and Suitable maintenance of equipment to ensure continues process capability(Nee, 1996).

The organization shall establish and maintain documented procedures for identifying the training needs of all personnel performing activities affecting performance. The required training shall be provided and, where personnel are performing specific assigned tasks, they shall be qualified on the basis of appropriate education. Records of all training shall be maintained (Nee, 1996).

According to Evans & Lindsay (1992) the purpose of the performance manual is to provide an adequate description of the quality management system which is serving as a permanent reference in the implementation and maintenance of that system. To the extent that each company is unique, it follows that every company's performance manual should be an original document. The manuals could be in five sections; control, policy, organization, instruction and project performance assurance.

Control introduces the manual to the reader, establishes its authority and describes the method adopted to keep the manual up-to-date and to inform users of changes that have been made. The Company Policy states the company objectives and establishes the

principles with which company quality systems are expected to comply. Company Organization describes the activities of the company and sets out its management structure. It defines the responsibilities attached to the principal managerial posts and establishes the status and duties of the company quality assurance manager. Company instructions schedules and describes all company instructions, which relate to the management of quality and cross-reference them to the relevant items of standards. Project performance Assurance sets out the procedures for the assignment of performance assurance engineers to projects and outlines their duties. It then describes the preparation of project performance plans and project procedures (Evans & Lindsay, 1992).

2.1.5 Factors Affecting Performance of Construction Projects

Different studies have identified different factors that affect the performance of construction projects but there is no common agreement on the factors. According to Chan & Tam (2000) generally perceived factors that influence quality performance can be grouped into categories of client, project environment, project team leaders, project procedures and project management procedures.

The elements affecting performance of the construction process are the components of both construction inputs and construction processing. Tan & Lu (1995) grouped the elements affecting performance of the building construction project into eight criteria and every criterion is divided into several impacting factors. These quality criteria are manpower qualified to achieve project mission, requirements, and objectives; conformance to codes and standards, conformance to owner's requirements, conformance to design process and procedures, conformance to schedule requirements, conformance to cost requirements, completeness of and conformance to output standards and constructability.

2.1.5.1 Project Characteristics

Project characteristics can be best defined in terms of project scope, nature of project and complexity of project. Project scope refers to the type of project, the number of stories and the sophistication of the project. Nature of the project defines whether it is a new works project or a refurbishment project. Some projects are more expensive to build than others. Refurbishment works tend to have a higher unit cost than new works. Project

complexity can be measured in terms of site access, design buildability, design coordination, site conditions, and quality management. Sophisticated clients (those having built projects before) and specialized clients (repeated similar buildings) has a better chance of success with their projects than novices. Other aspects of the client, such as the nature of client (i.e. whether they are from the public or private sector), clarity of project mission, their competency in terms of ability to brief, make decision, define roles, etc, have been shown to influence the performance of a project.

2.1.5.2 Project Environment

Project environment is an all external influences on the construction process. Broadly, the project environment is grouped as physical, economic, socio-political, and industrial relations, and they act at national or local level, and in different ways in the public and private sectors. Changes in environment can create uncertainty in prices and terms of investment in the work of an organization, which will affect the performance.

The project team in the construction industry is that group of construction professionals and personnel from one or more organizations who combine to fulfill the necessary design, detailing and construction functions comprising the construction projects. The management of construction projects involves many diverse groups, client, designers, suppliers, sub-contractors, and the construction management team and client consultants responsible for advising on progress in terms of time, cost and quality. The performance of the team depends to a large extent on the skills and experience of several key project team leaders: the client representative, the design team leader, and the construction team leader. The performance of the project team members can be assessed by their technical and managerial skills, working relationship and attitude, and support from their parent companies.

Abdel-Razeq, et al., (2001) stated that the construction process consists of construction inputs, construction processing and construction outputs. Construction inputs are defined as all resources and parties involved in the construction process. Construction processing is the execution process, which can be defined as activating construction inputs for executing construction activities. Construction output is the construction facility

(project). The main parties involved in construction phase are owner, designer, general contractor, material supplier, owner's site team, and contractor's site team.

2.1.5.3 Project Procedure

Project procedure comprises the concept of procurement form and the method of tendering. The fragmental nature of the construction industry, the fact that no two construction projects are identical and the resulting ephemeral nature of the project organization places great dependence on the project team in setting up the construction process and bringing the project to a successful conclusion. To ensure success, the selection of the most appropriate organization for the design and construction of the project requires early and particular attention. In the main, the construction team will be appointed under competition through competitive tendering process. Sometimes the head contractor may be appointed by negotiation on the basis of a fee. In case when the design and construction is done as a complete package, both may be let by competition. The selection procedures applied to the members of the project team are therefore by no means always the same. It was noted from research that competitive tendering can adversely affect the outcome of major projects and the number of separate contracts is related to the chances of success. Different selection methods will pose different levels of risk to the project team members. Systems such as competitive tendering would involve a higher degree of risk to the team member, whereas cost reimbursement contracts would be low risk bearing by comparison.

2.1.5.4 Project management Actions

The managerial system is primarily concerned with decision making for planning and controlling organizational endeavor. The managerial subsystem can be seen as spanning the entire organization by relating the organization to the environment, setting the goals, developing comprehensive strategic and operational plans, designing the structure and establishing control process. An integral element of the managerial task is organizational decision making, choosing an overall strategy, setting specific objectives, designing structures and processes, selecting people, delegating responsibility, evaluating results and initiating changes. The degree of project management actions can be reflected in the range and type of control mechanisms set up for particular problem. At one end of the

range there will be a very low control situation, if professional design team, drawings, specifications, documentation and standard form of contract do not exist. Minor works may fall into this category. On the other hand, a high control situation may exist if detailed documentation is administered through a system of regular meeting, monitoring and inspections.

According to Abdel-Razeq (1998) factors that affect construction projects performance are: design and planning during the pre-construction phase; developing and improving quality assurance and control systems; the financial level and standard of living of employees; the accuracy of cost estimating, proper classification of contractors, consultants and projects; employees' consciousness; training for contractors, owners and consultants; encouraging ISO 9000; contractors' technical and managerial efficiency; maintenance systems during and after construction; utilization of resources; specialization in construction work, co-operation between construction industry and scientific organizations, participating and co-operating with advanced international organizations, defining responsibilities between project parties, encouraging innovation for simpler and more accurate work methods.

Low & Goh, (1993) identified 10 factors which have higher effects on the performance of a construction building project. These factors include Poor workmanship by the contractors in completing the works results from low tender prices; the drawings and specifications that do not specify clearly the intentions of the designers which have resulted in poor co-ordination during construction; the contractors pay more attention to complete the works on schedule and control the costs to within budget than to achieving quality in construction; poor co-ordination exists between the contractors and the subcontractors as well as the nominated subcontractors; the designers do not consider the "buildability" problems in design. For example, the designers do not consider the use of special construction methods to achieve the tight tolerance caused by site conditions; the contractors cannot plan and control the works; the contractors lack the skills to interpret the design and cannot provide the end products on site in accordance with the design and specifications; the completion period fixed by the client and consultants is not realistic; the design does not satisfy the relevant codes and standards that has resulted in a large

amount of remedial work for the contractors and delay in the completion of projects; the contractors do not know how to establish a quality system to control the works; and the materials chosen by the consultants do not satisfy the standards or the Building Control Authority.

2.2 Empirical Reviews

Chua et al. (1999) have developed a hierarchical model for construction project success for different project objectives. They find that the project performance is influenced by four main project aspects, namely, project characteristics, contractual arrangements, project participants, and interactive processes.

Arditi & Gunaydin (1998) find that management commitment to continuous performance improvement, management leadership in promoting high process quality; quality training of all personnel; efficient teamwork to promote quality issues at the corporate level; and effective cooperation between parties taking part in the project are generic factors that affect process quality.

Bubshait & Al-Atiq (1999) observe that a contractor's quality assurance system, which ensures consistent quality, is essential in preventing problems and the reoccurrence of problems. His survey also points to the lack of documentation of a quality system for the majority of the contractors. Abdel-Razek (1998) has studied the quality improvement methodology and finds that 'improvement of employee satisfaction' is the most important area in contributing quality improvement in Egypt.

Ledbetter (1994) has developed a performance management system (QPMS) that tracks labor costs in three main categories: normal work, quality management work (prevention and appraisal), and rework (deviation correction). He has assumed the cost of quality to be the sum total of quality management and rework. He finds QPMS to be useful in promoting awareness and improving the understanding of the quality process in addition to facilitating communication, reducing the overall cost of quality, and directing the management to the areas where quality improvements could be made.

Love & Smith (2003) have proposed a generic framework for benchmarking rework at the interfaces of a project's life cycle. As can be seen from the above discussion,

substantial research has been carried out that addresses the quality issues at international levels. Under Indian conditions, not many systematic studies have been undertaken for construction projects.

Jha and Iyer (2005) identified factors that affect the performance of construction projects. They identified that lack of management commitment to continual quality improvement, lack of quality training of staff, management leadership and efficient team work among stakeholders are factors in affecting the quality performance of the projects.

According to Enshassi *et al.*, (2009) material and equipment cost rarely affect the quality of the construction projects. The rate of material ordered and delivered late to construction sites are also other constraints of the projects' quality. In addition to these factors this study has stated that contractual relationships between consultants and contractors are affecting the quality of the projects. Enshassi, *et al.*, (2009) further stated that the average delay in payment from client to contractor affects the performance of construction project.

Jamaludin, *et al.*, (2014) identified the factors affecting the cost and quality of construction. They include fraudulent practices and kickbacks; incorrect planning; level of competition; number of competitors; lack of coordination between designers and contractors; poor financial control on site; wastage on site; previous experience of contractor and frequent design changes.

Mallawaarachchi & Senaratn (2015) identified that affect quality of the housing projects such as lack of technical and professional expertise and resources to perform task, lack of employee commitment and understanding and lack of education and training to drive the improvement process.

According to Mane & Patil, (2015) Other factors affecting performance of construction projects included project managers competence, poor monitoring and feedback, lack of on-site project manager, inadequate project team capability, poor planning and control techniques, poor/insufficient information and communication channels, lack of early and continual client/consultant consultation by contractor and insufficient project managers experience.

Ayodeji (2017) examined various factors affecting performance quality of construction projects by collecting data questionnaire from contractors, architects, engineers, quantity surveyors and construction managers. The study identified that major factors affecting performance quality of construction projects are related to the use of unskilled and incompetent contractors, poor on-site supervision and lack of commitment by supervising team, poor planning and scheduling and inadequate knowledge, training and skills of construction workmen. To minimize the impact of these factors and improve performance quality of construction projects, the study recommends proper and modern construction equipments, techniques and methods should be adopted by construction firms, there should be proper site management and supervision to ensure conformance with drawings and specification and adequate project duration should be allocated and stated in the contract documents.

Jha & Iyer (2016) identified the reasons for the underperformance of Indian construction projects suggesting possible remedial measures. The critical success factors obtained were: project manager's competence; top management's support; monitoring and feedback by project participants; interaction among project participants; and owners' competence. The factors that adversely affected the quality performances of projects were: conflict among project participants; hostile socio-economic environment; harsh climatic condition; PM's ignorance & lack of knowledge; faulty project conceptualization; and aggressive competition during tendering. Analyses also led to the conclusion that the extent of contribution of various success factors varies with the current performance ratings of the project. Project manager's competence and top management support are found to contribute significantly in enhancing the quality performance of a construction project. As in the manufacturing industry, the study establishes that management plays an important role in achieving quality even in construction projects.

Teena (2014) identified the factors that affect process quality of construction projects by collecting data from consultants and contractors through questionnaire. The data analysis was done by using Relative Importance Index. According to the study the most important factors that affect quality of projects are financial problems, quality of raw materials in

project, availability of personnel with high qualifications and conformance to codes and standards.

Adnan & Sherif (2009) identified the factors affecting the performance of local construction projects; and their relative importance. The most important factors agreed by the owners, consultants, and contractors as the main factors affecting the performance of construction projects were: material prices, availability of resources as planned through project duration, average delay because of closures leading to materials shortage, availability of personnel with a high experience and qualifications, quality of equipment and raw materials in project and Leadership skills for project managers.

Mohammad, (2012) identified factors affecting performance of a building construction project by collecting data through questionnaire from contractors and consultants and analyzed the data through factor analysis method. According the study, the factors that affect the quality of the projects are characteristics of site layout, skill and experience of site staff, characteristics of design documents, and using equipment, materials, quality and labor management systems and the owner quick response in taking decisions. Type of awarding system and the political environment are also among the factors effecting quality.

2.3 Conceptual Framework

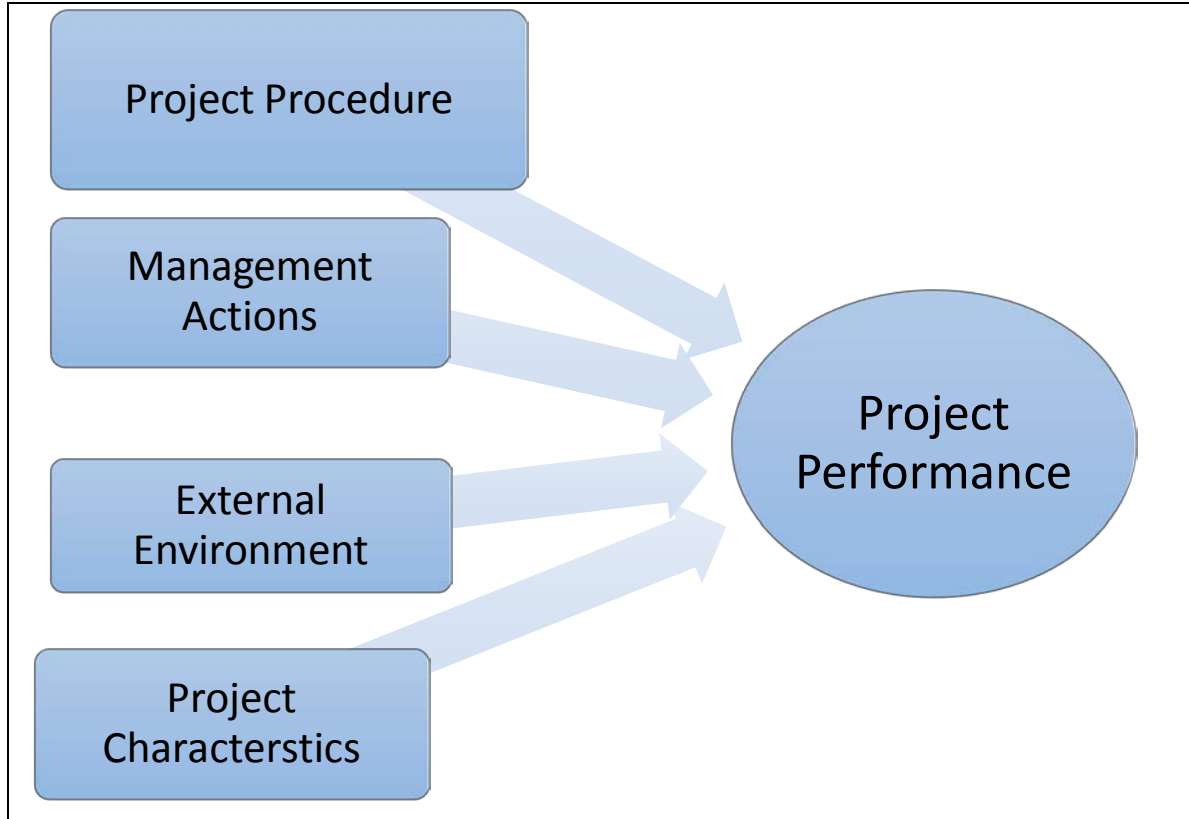


Figure 1 conceptual framework: Source: *Researchers' Design, 2018*

A conceptual framework developed from a literature review shows the four perceived factors that could affect project performance. The research will revolve around this four constructs or independent variables which are Project Procedure, Project Management Action, External Environment and Project Characteristics. Under each of these independent variables there are five or six influencing factors that affect the project performance or the dependent variable.

Project Procedure comprises the concept of procurement form and tendering method. Project Management Action includes the project management related factors and all the action a project management could undertake in the courses of managing the project. External Environment includes all the external influences of the construction projects. Project Characteristics can be best defined in terms of project scope, nature of the project and complexity of the project.

CHAPTER THREE

METHODOLOGY

3.1 Research Design

Designing a study helps the researcher to plan and implement the study in a way that help the researcher to obtain intended results, thus increasing the chances of obtaining information that could be associated with the real situation (Burns & Grove, 2001). This study will use descriptive research design. According to Kothari (2004) descriptive research is a situation or condition at hand in which information is collected without changing operating environment. From different methods of research designs the descriptive research design is accepted based on the purpose of the study. Frequencies, percentages, tables, charts and factor analysis to describe the factors affecting the performance of the projects were used.

3.2 Research Approaches

This study has used quantitative research approaches. Creswell (2005) explains that the three methods that are commonly implemented in a research are quantitative, qualitative and mixed, where one of them is not better than the others, all of this depends on how the researcher want to do a research of study. Quantitative research is a type of educational research in which the researcher decides what to study, asks specific, narrow questions, collects numeric (numbered) data from participants, analyzes these numbers using statistics, and conducts the inquiry in an unbiased, objective manner. Quantitative approach is one in which the investigator primarily uses postpositive claims for developing knowledge, i.e., cause and effect relationship between known variables of interest or it employs strategies of inquiry such as experiments and surveys, and collect data on predetermined instruments that yield statistics data.

3.3 Population and Sampling Method

3.3.1 Population of the Study

According to Hair, et al (2010) target population is a specified group of people or object for which questions can be asked or observed to collect required data structures and information. This study was conducted by using two project sites; Koye Fetcbe and Bole Arabsa condominium projects that are the only 20/80 under construction condominium projects in Addis Ababa. Population of this study were direct participants in the project and who have good experience about the study area. It includes contractors and consultant of the projects. According to the Addis Ababa housing agency, there were 209 contractors and 110 consultants participating in the Koye Fecbe project; and 119 contractors and 58 consultants in Bole Arabsa Project. Therefore, targeted population is 496. The project managers were targeted from the contractors and the project consultants were targeted from the consulting companies.

3.3.2 Sampling Method

The researcher has used simple random sampling method to select respondents from the targeted population.

Alreck & Settle (2005) states that sample size is determined after considering statistical precision, practical issues and availability of resources. According to Lowler (1984) there is no a single precise way for the determinations of sample size hence there are a number of inadequacy for deciding on sample size. Malhotra & Peterson(2006) stated that, the larger the sampling size of a research, the more accurate the data generated. Sample size for the study was determined by Yemane (1967) formula based on a 95% desired confidence level and a 5% desired level of precision.

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

Where: - n = Sample size
 N = population size, N=496
 e = level of precision, e=0.05

Based on computation by the formula, sample size is determined to 221 respondents. Table 1 below presents the sample size determined based on the formula selected for the sample size determination.

Table 3. 1Sample Size Determination

| Sites | Population | | | Sample Size | | |
|-------------|-------------|-------------|-------|-------------|-------------|-------|
| | Contractors | Consultants | Total | Contractors | Consultants | Total |
| Koye Feche | 209 | 110 | 319 | 93 | 49 | 142 |
| Bole Arabsa | 119 | 58 | 177 | 53 | 26 | 79 |
| Total | 328 | 168 | 496 | 146 | 75 | 221 |

Source: Own computation by using Yemane (1967), 2018

Then the respondents were proportionally computed from each category. Accordingly, 93 consultants from Koye Feche site and 53 contractors from Bole Arabsa site were sampled. Similarly, 49 consultants from Koye Feche site and 26 consultants from Bole Arabsa site were selected. Therefore, 146 contractors and 75 consultants were targeted.

In the targeted sites the respondents were stratified in contractors and consultants. In the case of contractors, project managers were purposively selected because they have better knowledge about the factors that affect the project performances and they directly involve in the performance indicators. After determining the sample size, respondents were randomly selected in each site. Therefore, this study has used stratified, purposive and simple random sampling methods or multi stage sampling method to select respondents from the selected companies.

3.3 Data Type and Source

Both primary and secondary data were used for the study. According to Biggam (2008) primary data is the information that the researcher finds out by him/herself regarding a specific topic. The main advantage with this type of data is that it is collected with the research's purpose in mind. It implies that the information resulting from primary data is more consistent with the research questions and objectives. The primary data were collected from the selected contractors and consultants of both sites. Secondary data were obtained from published and unpublished materials such as magazines, reports and websites.

3.4. Methods of Data Collection and Instruments

In order to achieve the objectives of the study, the researcher used quantitative research methods through questionnaire to cover larger target groups than the interview, given the quality and chance of no response. The questionnaires were prepared using close-ended method questions; yes/no, multiple choices and 5 Point Likert-Scale approaches (i.e., from “Strongly Disagree to Strongly Agree”). For the 5-point likert scale the respondents were asked to indicate their level of agreement with the ratings of Strongly Disagree (1), Disagree (2), neutral (3), Agree (4) and Strongly Agree (5). The questionnaires were designed in English as respondents could read and understand the questions. Therefore, there was no importance to translate into Amharic or any other language.

3.5 Methods of Data Analysis

The data collected through questionnaire was analyzed using quantitative data analysis techniques. The data collected from respondents was analyzed by using statistical package for social science (SPSS) version 23. For presenting the data different types of descriptive data analysis methods such as frequency, percentage, simple tabulation, cross tabulation, mean and standard deviation were used. Factors affecting performances of the project are identified by using factor analysis method through principal component analysis.

3.6 Validity test

Validity is defined as how much any measuring instrument measures what it is intended to measure. Bryman & Bell (2003) suggested that the important issue of measurement validity relates to whether measures of concepts really measure the concept. Validity refers to the issue of whether an indicator (or set of indicators) that is devised to gauge a concept really measures that concept. Several ways of establishing validity are: content validity; convergent validity concurrent; predictive validity; construct validity; and convergent validity (Bryman and Bell, 2003). This study addressed content validity through the review of literature and adapting instruments used in previous researches.

3.7 Reliability Test

The level of reliability of the instrument that is the consistency of the variables is checked by the Cronbach's alpha statistics. Cronbach's alpha is an index of reliability associated with the variation accounted for by the true score of the underlying construct (Nunnaly, 1978). Cronbach's Alpha can only be measured for variables which have more than one measurement question. Nunnaly (1978) has stated that 0.5 is a sufficient value, while 0.7 is a more reasonable Cronbach's alpha. The results were extracted presented in table 2 and Cronbach's Alpha values are more than 0.7 implying that constructs are consistent to measure the variables.

Table 3. 2 Reliability Statistics

| Variable | Cronbach's Alpha | N of Items |
|-------------------------|------------------|------------|
| Project characteristics | .921 | 5 |
| Project management | .884 | 6 |
| Project procedure | .952 | 6 |
| External environment | .836 | 6 |

Source: Own Survey, 2018

3.8 Ethical Consideration

Before the data collection, permission from the organizations was requested. During the distribution of the questionnaire, respondents were informed about the purpose and the benefit of the study along with their full right to refuse or accept the participation. The respondents` were told their response would be kept confidential and their identity shall not be exposed. Every person involved in the study was entitled to the right of privacy and dignity of treatment, and no personal harm will be caused to subjects in the research. Information obtained was held in strict confidentiality by the researcher. All assistance, collaboration of others and sources from which information was drawn were acknowledged.

CHAPTER FOUR

RESULT AND DISCUSSION

Introduction

This study was conducted with an objective of identifying factors affecting project performances in condominium projects in Addis Ababa. As a part of the study, this chapter presents about the results of data collected through structured questionnaire from the contractors and consultants of the projects, and discussion about the results. The results are presented in tables and figures. Descriptive statistics such as frequency, percentage, mean, standard deviation and factor loading were used.

4.1 Response Rate

To reach at the aforementioned objective, 221 questionnaires were distributed to 146 contractors and 75 consultants. But 191 (86.43%) questionnaires were returned from 133 (91.1%) project managers and 58 (77.33%) consultants.

4.2 Demographic Information

Table 4.1 below presents about the demographic information of the respondents.

Table 4. 1 Demographic Information

| Variable | Category | Frequency | Percent |
|------------|-------------------|-----------|---------|
| Gender | Male | 135 | 70.7 |
| | Female | 56 | 29.3 |
| Age | less than 30 | 20 | 10.5 |
| | 31-40 | 111 | 58.1 |
| | 41-50 | 55 | 28.8 |
| | above 50 | 5 | 2.6 |
| Experience | below 5 | 101 | 52.9 |
| | 5-10 | 70 | 36.6 |
| | above 10 | 20 | 10.5 |
| Education | Bachelor's degree | 126 | 66.0 |
| | Master's degree | 65 | 34.0 |

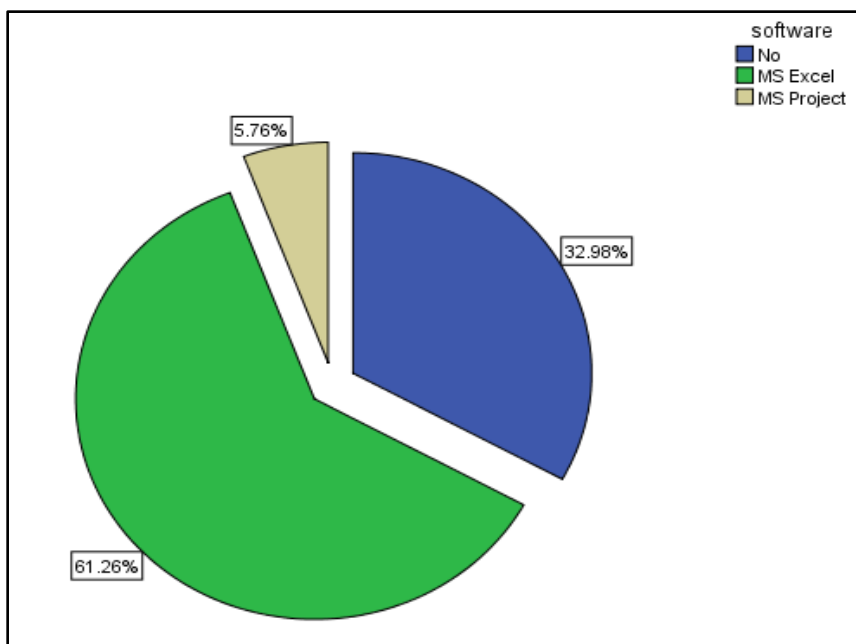
Source: Own survey, 2018

As presented in the table 4.1 above, 135(70.7%) of the respondents were male and remaining 56(29.3%) of the respondents are female suggesting the majority of the project managers and consultants in Addis Ababa condominium projects are male. 111 (58.1%) of the respondents are in the age category of 31 to 40 years and followed by an age category of 41 to 50 years which is 28.8% of the respondents. But only 2.6% of the respondents have age of above 50 years. This suggests that project managers and contractors are at younger age. Experience in the construction industry shows that 101(52.9%) of the respondents have an experience of less than 5 years and 70(36.6%) of the respondents have experienced for 5 to 10 years. But only 20(10.5%) of the respondents have an experience above 10 years. This suggests that condominium projects in Addis Ababa are managed by very low experienced manpower. Table 3 about the education background of the respondents summarize that 126(66%) of the respondents have bachelor's degree and remaining 65(34%) of the respondents have master's degree.

4.3 Project Management Software Implementation

Figure 2 below shows companies that have implemented the project management software and type of the software implemented in the companies.

Figure 2: Software implementation



Source: Own Survey, 2018

As indicated in the figure 2 above, 32.98% of the companies have not implemented the project management software. 61.26% of the companies are using MS Excel for project management. But only 5.76% of the companies have implemented MS project which is the only professional software to manage project from the implemented software. No company has implemented Primavera for the project management.

4.4 Descriptive Analysis

This section presents results of descriptive analysis about factors affecting project performance by using mean and standard deviation. Responses are sorted according to their mean values in descending order; higher mean value suggesting the higher practice of the factor.

4.4.1 Project Characteristics

Table 4.2 presents result of practices of the project managers and consultants about the factors affecting project performance that are related to project characteristics. These factors are identified as causes for lower performance of the project.

Table 4. 2Project characteristics descriptive statistics

| | N | Mean | Std. Deviation |
|------------------------------|-----|--------|----------------|
| Low quality projects | 191 | 4.5445 | 1.02437 |
| Low cost project | 191 | 4.0942 | 1.10574 |
| Ownership of the project | 191 | 4.0524 | 1.21282 |
| Project time | 191 | 3.9424 | 1.14792 |
| Inflexibility of the project | 191 | 3.4398 | 1.50273 |

Source: Own survey, 2018

As it is presented in table 4.2 above, characteristics of the project is identified by using project related factors such as quality orientation, value of the project, ownership of the project, project time and flexibility of project for changes in environment. The consultants and contractors responded that project performance is lower because the project by itself is not giving attention to the quality issues. It is indicated by mean value of 4.5445 indicating that majority of the respondents agree that the project designed is the low quality project. Similarly, responses about the cost of project as a cause of lower

project performance agree that lower value of the project is a reason for lower quality. This is indicated by mean value of 4.0942 suggesting that lower cost projects are less performing especially regarding to the quality. Ownership type is also another reason for performance variation. Since this project is owned by government and there is no serious follow-up, quality and time conformance gets low attention when compared to privately owned projects. This suggests that public ownership results on lower performance unless it is properly controlled. Project time and rigidity of the project for variations in the environment have lower practices in affecting the project performance when compared to other project characteristics used in the study. Finding of this study is similar to the finding of Chua et al. (1999) that project characteristics affect the performance of the projects through lower quality, higher cost and delayed project time.

4.4.3 Project Procedures

Table 4. 3Project Procedures

| | N | Mean | Std. Deviation |
|---|-----|--------|-------------------|
| Delay in claim approval and payment to contractor | 191 | 3.9738 | 1.36665 |
| Conformance to specification | 191 | 3.5759 | 1.16223 |
| Delivery of the important project materials by the client | 191 | 3.5707 | 1.79002 |
| Performance of different parties involved in the project (e.g. associations, contractors, consultants, and clients) | 191 | 3.5497 | 1.46409 |
| Control mechanism | 191 | 3.5445 | 1.58840 |
| Quality assessment system in the project | 191 | 3.4712 | 1.29288 |

Source: Own survey, 2018

As it is indicated in table 4.3 above, among the project procedures delay in claim approval and payment to contractors is the main factor that is affecting the project performance especially time delay and lower quality because costs of materials increase that forces to use low cost materials. Due to bureaucratic issues in managing the project client delay payments. Conformance to specification is another factor in project procedure that affects the performance of the project. Contractors are required to conform

even wrong specification otherwise waits for the design review. Wrong specification has resulted on longer time requirements and lesser quality. On the other hand, project materials such as metal, cement and water are delivered by the client. It takes longer time to deliver to all contractors in the project because of inefficiency in the project owner. This in turn is affecting performance of the contractors and the project. In the project there are different parties involving; small and medium associations, contractors, consultants, and client. The performance of the project depends on the performance of the parties involving in the project. The associations have no experience in the complex projects and their supplies are with lower quality that affects the quality of the project. Materials from the associations are not supplied on the basis of project schedule. This is resulting on project delay. The supervision of the consultants is corrupted. The consultant is less experienced and profit oriented. Client has lower responsibility for the projects. This in together are resulting on lower quality, time delay and cost overrun. Control mechanism and quality assessment practices have resulted on higher cost of the project and lower quality in addition to time delay. Finding of this study is similar to the finding of Jha and Iyer (2005) that project procedures used in the projects are factors for both weak and strong performance of the projects.

4.4.2 Project Management Actions

Table 4.4 below presents another factor affecting project performance. This factor is project management actions that are indicated by project sequencing based on project schedules, communication in the project, project management skills, employee training and employee motivation.

Table 4. 4Project Management Actions Descriptive Statistics

| | N | Mean | Std. Deviation |
|--|-----|--------|----------------|
| The project is not sequenced according to schedule of project. | 191 | 4.0681 | 1.02113 |
| Communication in the project | 191 | 4.0262 | 1.32758 |
| Expected profit rate of project by the contractor | 191 | 4.0209 | 1.20507 |
| Project team leader's experiences and technical skills | 191 | 3.9424 | .97432 |
| Not providing trainings to the employees | 191 | 3.9058 | 1.28207 |
| Demotivated employees due to lower payments | 191 | 3.8115 | 1.41275 |

Source: Own survey, 2018

Result in the table indicates that projects are not sequenced according to the project schedules. This is indicated by mean value of 4.0681 indicating respondents agree that the project is not conducted according to the schedules in project planning. Civil and electric works expected to be built before finishing the major activities are coming after some important construction. This has resulted on destruction some parts and delays in the project, lower quality and higher cost. Communication problems in the project are also another for lower performance of projects. This is indicated by mean value of 4.0263 suggesting majority of the respondents agree that there is problem of communication in the project suggesting lower management skill has resulted on project delay, lower quality and higher cost. Expected profit rate is another important factor for the lower performance of the projects especially for the quality performance. The contractors use cheaper materials to maximize profit although some important construction materials are supplied by the client. Managerial skills are also another factors affecting performance of the project. As it is indicated in the demographic information section above, both project managers and consultants are less experienced in managing and handling the projects. Lower experience and technical skills have resulted on lower project quality, higher time requirement and higher project cost on the client. Employee training and demotivation are also affecting the performance of projects. To compensate the costs in the

construction, the companies are not providing trainings to employees and they are paying low salary because of expected profit and lower project values. This finding is consistent to the finding of Arditi & Gunaydin (1998) that project performance is affected by the management actions in the project. Similarly, Jha and Iyer (2005) identified that project management actions have high effect on performance of the projects.

4.4.4 External Environment

Table 4.5 below presents result of opinions of the consultants and contractors that external environment has effect on project performance. The assessed external environmental factors are inflation, resources availability, labor market, physical area, political environment, and exchange rate.

Table 4. 5External Environment

| | N | Mean | Std. Deviation |
|---|-----|--------|-------------------|
| Overall inflation in the economy | 191 | 4.2827 | .91976 |
| Availability of resources as planned through project duration | 191 | 3.8377 | 1.01559 |
| Labor market inefficiency to supply qualified employees | 191 | 3.5707 | 1.25404 |
| Physical area (site) of the projects | 191 | 3.4660 | 1.21293 |
| Political instabilities | 191 | 3.3665 | .95792 |
| Exchange rate variations in the economy | 191 | 3.2513 | 1.47244 |

Source: Own survey, 2018

As indicated in the table 4.5 above, responses of the contractors and consultants have the mean value of 4.2827 indicating majority of the respondents agree that inflation is affecting performance of the projects they are involving in. inflation increases cost of materials used for the project. This reduces performance of the contractors that results on time delay in project and cost overrun. Additionally, it reduces quality of the projects because the contractors use cheaper materials. The second important factor among the environmental factors is unavailability of the resources in the market. Unavailability of materials stated in the project also resulting on project time delay and using lower quality

materials. Majority of the respondents agree that labor market is inefficient in providing qualified labor force. This directly affects the performance of the projects by delaying the project time and lowering the quality of the project. Physical sites and political instabilities are also influencing the project performance by delaying project time. Similar to the finding of Chua et al. (1999), this study has identified that project performance is affected by the environmental factors.

4.5 Factor Analysis

Factor analysis was applied to reduce data. Factor solution with Eigen value greater than 1 was considered for analysis after Varimax Rotation method. Factor loading values which explain how closely the variables are related to each one of the factors discovered.

Table 4. 6 Summary of Factor Analysis and Tests of Assumptions

| <i>Variable</i> | <i>Total items</i> | <i>KMO</i> | <i>Bartlett</i> | | |
|-----------------------------------|--------------------|------------|-----------------|-----------|------------|
| | | | χ^2 | <i>df</i> | <i>sig</i> |
| <i>Project characteristics</i> | 5 | .821 | 843.274 | 10 | .000 |
| <i>Project management actions</i> | 6 | .710 | 822.568 | 15 | .000 |
| <i>Project procedure</i> | 6 | .841 | 1461.791 | 15 | .000 |
| <i>External environment</i> | 6 | .527 | 955.614 | 15 | .000 |
| <i>Total</i> | 23 | | | | |

Source: Own Survey, 2018

Thus, for 23 items of four variables of project characteristics, project management action, project procedure, and external environment were performed for communalities and rotated components matrices. Therefore, 23 items with higher factor loadings computed. The coefficients of Kaiser-Meyer Olkin (KMO) against all latent variables were more than 0.50 (i.e. Minimum = 0.527 and Maximum = 0.841). Bartlett's Coefficient against all latent variables was found significant at $p = 0.01$.

Table 4. 7 Total Variance Explained

| Component | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
|-----------|-------------------------------------|---------------|--------------|-----------------------------------|---------------|--------------|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 12.274 | 53.364 | 53.364 | 6.123 | 26.623 | 26.623 |
| 2 | 3.766 | 16.375 | 69.739 | 6.041 | 26.264 | 52.887 |
| 3 | 2.023 | 8.795 | 78.534 | 4.499 | 19.561 | 72.448 |
| 4 | 1.353 | 5.884 | 84.418 | 2.753 | 11.970 | 84.418 |

Source: Own survey, 2018

The analysis produced four factors which indicate the key factors in performance of condominium projects in Addis Ababa. This factor analysis, confirmed that the key factors measured four dimensions that explained 84.418% of variance in the factors affecting performance of the projects.

As it is indicated in the table 4.8 below for rotated component matrix, all items are strongly loaded to these four factors with lowest factor loading of 0.547. Delay in payment to contractor, expected profit rate of project by the contractor, motivation of employees and political instabilities are more important and key factors in affecting performance of the projects. This suggests that delay in claim approval and payment to contractor, expected profit rate of project by the contractor, employees' motivation and political instabilities are main factors of the project performance in condominium projects in Addis Ababa.

Table 4. 8Rotated Component Matrix

| | Component | | | |
|---|-----------|------|------|------|
| | 1 | 2 | 3 | 4 |
| Delay in claim approval and payment to contractor | .899 | | | |
| Conformance to specification | .858 | | | |
| Unavailability of resources in project duration | .844 | | | |
| Quality assessment system in the project | .842 | | | |
| Performance of parties involved in the project (associations, contractors, consultants, and clients) | .814 | | | |
| Control mechanism | .812 | | | |
| Delivery of the important project materials by the client | .802 | | | |
| Exchange rate variations in the economy | .723 | | | |
| Expected profit rate of project by the contractor | | .914 | | |
| Inappropriate project time | | .820 | | |
| Being low cost project | | .815 | | |
| Project team leader's experiences and technical skills | | .740 | | |
| Communication in the project | | .693 | | |
| The projects are that give attention the quality | | .691 | | |
| Physical area (site) of the projects | | .683 | | |
| Not providing trainings to the employees | | .595 | | |
| Demotivated employees due to lower payments | | | .892 | |
| Overall inflation in the economy | | | .800 | |
| Inflexibility of the project | | | .751 | |
| Ownership of the government | | | .686 | |
| Political instabilities | | | | .818 |
| The project sequencing | | | | .718 |
| Labor market inefficiency | | | | .547 |

Source: Own survey, 2018

CHAPTER FIVE

SUMMERY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Major Findings

This study was conducted with an objective of identifying factors affecting project performance in condominium projects in Addis Ababa by using time, cost and quality parameters as performance indicators. This general objective was broken down in four specific objectives; identifying project characteristics factors, project procedure, project management actions, and external environment factors that affect the performance of the projects. The study was conducted by using two condominium projects that are under construction; and contractors and consultants as target population since they directly involved in the project performance. To achieve the study objectives, 221 questionnaires were distributed and 191 were returned. Based on the responses the following major findings were drawn from the study.

52.9% of project managers and the project consultants have experience in construction industry for less than five years. 36.6% of the project managers and consultants in the projects have work experience from 5 to 10 years. These two categories contain 85.5% of the respondents. This suggests that the projects are run by inexperienced employees.

32.9% of the companies are not using computer software to manage the projects. This suggests most of activities in projects are manual that makes the project management inefficient.

This study has identified that project characteristics factors are affecting the performance of the selected projects. Characteristics of the project is identified by using project related factors such as quality orientation, value of the project, ownership of the project, project time and flexibility of project for changes in environment. Quality considerations, overall cost of the project and ownership of the project have resulted on lower performance of the projects with mean values above 4.00.

The respondents about factors in project procedures also have high impact on lower performance of the projects. Among the project procedures delay in claim approval and

payment to contactors is the main factor that is affecting the project performance especially time delay and lower quality because costs of materials increase that forces to use low cost materials and it is indicated by mean value of 3.9738.

Factors identified from the project management actions indicate the project is not sequenced according to schedule of project, there is communication problem in the projects and expected profit rate of project by the contractor are main factors that have mean values above 4.00.

External environment factors such as inflation rate, unavailability of resources, and labor market have highest effect on performance of the project as indicated by the mean values of 4.2827, 3.8377 and 3.5707 respectively.

To identify main factors in affecting project performance in the selected projects factor analysis was implemented with the use of principal component analysis based on Varimax rotation method. As a result, four key components were identified; claim approval and payment to contractor, expected profit rate of project by the contractor, employees' motivation and political instabilities.

5.2 Conclusions

Based on the findings of the study following conclusions are drawn.

- Project characteristics such as being low quality project, low cost project, ownership by government, project time and inflexibility of the project to changes in environment has resulted on lower performance of condominium projects of lower quality, higher cost and time delay in Addis Ababa.
- Delay in claim approval and payment to contractor, failure to conformance to project specifications, delivery inefficiency for important project construction materials by the client, lower performance of suppliers, contractors, consultants and client, inefficient control mechanism, and improperly implemented quality control assessments are factors affecting the performance of the projects due procedural inefficiencies. The payment procedure is resulting on project time delay, cost overrun and lower quality of the project.

- Factors of project management actions are also affecting the performance of the projects. Important project management action factors are the project sequencing, communication gaps in the projects, expected profit by the contractors, managerial skills, untrained employees in the project and demotivation of the employees due to lower payment.
- The most important external environmental factors agreed by the consultants and contractors as the main factor affecting the performance of condominium projects in Addis Ababa are escalation of material prices due to overall inflation in the economy and unavailability of resources as planned through project duration in the market that the projects depend imports; unavailability of personnel with relevant experience and qualification; political instabilities and site layout.

5.3 Recommendations

Based on the conclusions reached, following recommendations are provided to improve the project performance.

- Since project characteristic factors are affecting the performance of the project based on the perception of contractors, the client is recommended to appropriately supervise and follow-up the activities of the contractors and the consultants. The contractors have to meet at least the stated quality although the project is low quality and cost project.
- Most consultants and contractors stated that the projects were delayed by late payment from the owner. In the condominium projects in Addis Ababa contractors are suffering from this problem. Since delay in payment from owner to contractor lead to delay of contractors' performance and cause problem in time performance, the client is recommended to improve the payment practices. The client is recommended to improve material delivery otherwise to outsource the delivery or to give the responsibility to the contractors.
- Most consultants and contractors do not use software that facilitates planning, monitoring and controlling the projects. The software used by few companies in the projects is MS Excel and MS project. The consultants and contractors are

recommended to use project management methodology and different latest software that helps to manage the project.

- To reduce the communication gap, owners, consultants and contractors are recommended to meet frequently for discussion and develop electronic media. Frequent meetings assist them for monitoring, updating and controlling the progress through project implementation. In addition, they can solve problems, evaluate current performance, and improve future work. Both contractors and consultants are not providing training for the employees in projects. Training is required accordingly to the nature and duration of the project. In addition, training is important for the improvement and development of the overall performance of the organization.
- Since the external environment factors affect the performance of the project, the project management has to adjust internal environment because they cannot adjust the external environment. Since inflation is resulting on material price escalation, the contractors and the client are recommended to store highly important materials. Project managers are expected to be vigilant and flexible. They should scan and monitor the external environment consistently and should give a quick and a well-studied response. In addition, labor market in the country has high effect on lower quality performance and time delay. The project managers are recommended to increase the payment to experienced employees.

References

- Abdel-Razek, R.H., El-Dosouky, A.I. and Solaiman, A.M. (2001), "A Proposed Method to Measure Quality of the Construction Project", International Exhibition Conference for Building & Construction, Egypt.
- Abdel-Razek, R.H. (1998a), "Factors Affecting Construction Quality in Egypt: identification and relative importance", *Journal of Engineering Construction and Architectural Management*, Vol.5, PP.220-227.
- Abdel-Razek, R.H. (1998b), "Quality Important in Egypt: Methodology and Implementation", *Journal of Construction Engineering and Management*, Vol.124, No.5.
- Adnan Enshassi., SherifMohamed.,&SalehAbushaban. (2009) "Factors Affecting theperformance of Construction Projects in the Gaza Strip",*journal of civil engineering and management.*, 15(3), 269–280.
- Aoieong, R.T., Tang, S.L. & Ahmed, S.M. (2002) "A Process Approach in Measuring Quality Costs of Construction Projects: Model Development", *Journal of Construction Management and Economics*, Vol.20,No. 2, pp.179-192.
- Ashford, J.L. (1989), "Management of Quality in Construction", McGraw-Hill.
- Atkinson, A.A., Waterhouse, J.H. & Wells, R.B. (2007) "A Stakeholder Approach to Strategic performance measurement", *Sloan Management Review*, Vol.38, No. 3, pp.25 37.
- Ayodeji, O. (2017). Factors Affecting Quality of Construction Projects in Swaziland. *Journal of Architecture, Engineering and Construction* .
- Barrett, P. (2000), "Systems and Relationship for Construction Quality", *International Journal of Quality & Reliability Management*, Vol.17 No. 4/5, PP.377-392.
- Barrie, D.S. and Paulson, B.C (1992), "Professional Construction Management", McGraw-Hill.

- Chan, A.P. and Tam, C.M. (2000), "Factors Affecting Quality of Building Projects in Hong Kong", *International Journal of Quality & Reliability Management*, Vol.17 No. 4/5, PP.423-441.
- Creative Research System (2001), "Sample Size Formulas", <http://www.surveysystem.com/ssformu.htm>.
- Davis, K., Ledbetter, W.B., and Burati, J. (1989), "Measuring Design and Construction Quality Costs" *Journal of Construction Engineering and Management*, Vol.115, No.3.
- El-Sawah, H. (1998), "Quality Management Practices in the Egyptian Construction Industry", *International Exhibition Conference for Building & Construction*, Egypt.
- Enshassi, A. Mohamed, S. & Abushaban, S. (2009) "Factors affecting the performance of construction projects in the Gaza Strip", *Journal of Civil Engineering and Management*, Vol.15, No. 3, pp.269-280 Enshassi, A.,
- Evans, J. and Lindsay, W. (1992), "Management and Control of Quality", McGraw-Hill.
- Fellows, R. and Liu, A. (1997), "Research Methods for Construction", Blackwell Science Ltd.
- Harris, F. and McCaffer (1995), "Modern Construction Management", Blackwell science.
- Hiwot B. Gameda: Thesis Effect of poor project performance on the quality of housing construction: Case of condominium houses in Addis Ababa Quote from interview with Mr. Haile, Addis Ababa City Administration
- Jha, K.N. & Iyer, K.C. (2005) "Factors affecting cost performance: evidence from Indian construction projects", *International Journal of Project Management*, Vol. 23, No. 4, pp.283-295.
- Jamaludin, S. Z., Mohammad, M. F. & Ahma, K. (2014). "Enhancing the Quality of Construction Environment by Minimizing the Cost Variance", *Procedia - Social and Behavioral Sciences*, Vol. 153, pp. 70-78
- Juran, J.M and Gyron, F.M. (1999), "Quality Planning and Analysis", McGraw-Hill.

- Kim, D.Y., Han, S.H., Kim, H. & Park, H. (2008) Structuring the prediction model of project performance for international construction projects: A comparative analysis, *Expert Systems with Applications*, Vol. 36, No. 2, pp. 1961-1971.
- Kothari, C.R. (1982), “An Introduction to Operation Research”, Kothari.
- Low, S.P. and Peh, K.W. (1996), “A Framework for Implementing TQM in Construction”, *The TQM Magazine*, Vol. 8, No.5, PP.39-46..
- McCabe,S. (1998), “Quality Improvement Techniques in Construction”, Addison Wesley Longman Limited.
- Mallawaarachchi, H. & Senaratn, S. (2015). Importance of Quality for Construction Project Success, *Proceeding of the 6th International Conference on structural engineering and construction management*, Kandy, Sri Lanka, 11-13 December, pp. 84-89
- Mane, P. P. &Patil, J. P. (2015). "Quality Management System at Construction Project: A Questionnaire
- Nee, P.A. (1996), “ISO 9000 in Construction”, John Willy & Sons, Inc. Olomalaiye, P., Jayawardane, A. (1998), “Construction Productivity Management”, Addison Wesley Longman.
- Ofori, G. (2006) “Construction Industry in Developing Countries: A research Agenda”, *Journal of Construction in Developing countries*, Vol.11, No. 1, pp.51-62.
- Palestinian Central Bureau of Statistics (2000), “Existing Buildings Survey- Overview”, <http://www.pcbs.org/english/construct/exi-over.htm>.
- Project Management Institute (2000), “A Guide to the Project Management Body of Knowledge” ,<http://www.pmi.org/info/pp-standardsexcerpts.asp>
- Pyzdek, T. and Berger, R.W (1996), “Quality Engineering Handbook”, Tata McGraw-Hill.

- StatSoft (2002), "General Regression Models (GRM)",
<http://www.statsoftinc.com/textbook/stgsr.htm>.
- Stevens, J.D., Glagola, C. and Ledbetter, W.B. (1994), "Quality-Measurement Matrix",
Journal of Management in Engineering, Vol.10, No.6, PP. 7784-7796.
- Stevens, J.D. (1996), "Blueprint for Measuring Project Quality", Journal of Management
in Engineering, Vol. 12, No. 2, PP.10141-10159.
- Taha, H.A. (1989), "Operation Research", McGraw-Hill.
- Tan, R.R. and Lu, Y.G. (1995), "On the Quality of Construction Engineering Design
Project: Criteria and Impacting Factors", International Journal of Quality & Reliability
Management. Vol.12, No.5, PP. 18-37.
- Trigunorsyah, B. (2002), "Implementing Constructability Improvement into Indonesian
Construction Industry", <http://www.civag.unimelb.edu.au/btriguna>.
- UN-HABITAT (2007) Situation Analysis of Informal Settlements in Addis Ababa. Cities
without Slums Programme: Addis Ababa Slum Upgrading Programme. United
Nations Human Settlements Programme: Nairobi, Kenya.
- Willis, T.H. (1996), "A quality Performance Management System for Industrial
Construction Engineering Projects", International Journal of Quality & Reliability
Management. Vol.13, No.9, PP. 38-48.

APPENDICES

Appendix A: QUESTIONNAIRES

Dear Sir/Madam

RE: REQUEST FOR PARTICIPATION IN A RESEARCH STUDY

I am a Postgraduate student at Addis Ababa University. As partial fulfillment for the MA Program in Project Management, I am conducting a research study on factors affecting project performance in the case of condominium houses construction projects in Addis Ababa.

Therefore, I would appreciate if you could spare a few minutes of your time to answer the following questions. All the information provided will be purely used for academic purposes and your identity will be treated with utmost confidentiality.

Your assistance will be highly appreciated and thank you in advance.

Yours faithfully,

Henok Wendafrash

Part I: Demographic Information

Please mark (X) in appropriate box to your response.

1. Gender:
 - Male
 - Female

2. Age in years:
 - Less than 30
 - 31-40
 - 41 – 50
 - above 50

3. Your work experience in construction (in years)?
 - Less than 5
 - 5-10
 - Above 10

4. Level of Education
 - Diploma/TVET
 - Bachelor Degree
 - Masters
 - PhD

5. Does your company have implemented computer software to manage the project, if implemented which software is mainly used?
 - No
 - MS Excel
 - MS project
 - Primavera

6. To what extent do you agree on the following statements that indicate the following factors are resulting on lower performance of condominium projects in your sites?
 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4= Agree and 5= strongly agree

| Project Characteristics | 1 | 2 | 3 | 4 | 5 |
|--|----------|----------|----------|----------|----------|
| Being a low cost project | | | | | |
| Ownership of the government | | | | | |
| Projects that give low attention to quality | | | | | |
| Project time frame is not appropriate to complete the project as per the schedule, budget and specification. | | | | | |
| Inflexibility of the project to changes in the economic environment | | | | | |

| Project Management Actions | 1 | 2 | 3 | 4 | 5 |
|---|----------|----------|----------|----------|----------|
| Expected profit rate of project by the contractor | | | | | |
| Demotivated employees due to lower payments | | | | | |
| Not providing trainings to the employees | | | | | |
| Tasks are not sequenced according to the schedule of the project. | | | | | |
| Project team leader's experiences and technical skills | | | | | |
| Communication in the project | | | | | |

| Project Procedure | 1 | 2 | 3 | 4 | 5 |
|---|----------|----------|----------|----------|----------|
| Delay in claim approval and payment to contractor | | | | | |
| Delivery of the important project materials by the client | | | | | |
| Conformance to specification | | | | | |
| Quality assessment system in the project | | | | | |
| Control mechanism | | | | | |
| Performance of different parties involved in the project (e.g. associations, contractors, consultants, and clients) | | | | | |

| External Environment | 1 | 2 | 3 | 4 | 5 |
|---|----------|----------|----------|----------|----------|
| Exchange rate variations in the economy | | | | | |
| Overall inflation in the economy | | | | | |
| Labor market inefficiency to supply qualified employees | | | | | |
| Political instabilities | | | | | |
| Physical area (site) of the projects | | | | | |
| Availability of resources as planned through project duration | | | | | |

Appendix B: SPSS Outputs

gender

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|--------|-----------|---------|---------------|--------------------|
| Valid | Male | 135 | 70.7 | 70.7 | 70.7 |
| | Female | 56 | 29.3 | 29.3 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

age

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|--------------|-----------|---------|---------------|--------------------|
| Valid | less than 30 | 20 | 10.5 | 10.5 | 10.5 |
| | 31-40 | 111 | 58.1 | 58.1 | 68.6 |
| | 41-50 | 55 | 28.8 | 28.8 | 97.4 |
| | above 50 | 5 | 2.6 | 2.6 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

experience

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|----------|-----------|---------|---------------|--------------------|
| Valid | below 5 | 101 | 52.9 | 52.9 | 52.9 |
| | 5-10 | 70 | 36.6 | 36.6 | 89.5 |
| | above 10 | 20 | 10.5 | 10.5 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

education

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------------------|-----------|---------|---------------|--------------------|
| Valid | Bachelor's degree | 126 | 66.0 | 66.0 | 66.0 |
| | Master's degree | 65 | 34.0 | 34.0 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

role

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|------------|-----------|---------|---------------|--------------------|
| Valid | contractor | 133 | 69.6 | 69.6 | 69.6 |
| | consultant | 58 | 30.4 | 30.4 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

software

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|----------|-----------|---------|---------------|--------------------|
| Valid | No | 65 | 34.0 | 34.0 | 34.0 |
| | MS Excel | 126 | 66.0 | 66.0 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

Being low cost project

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------------------|-----------|---------|---------------|--------------------|
| Valid | strongly disagree | 10 | 5.2 | 5.2 | 5.2 |
| | disagree | 10 | 5.2 | 5.2 | 10.5 |
| | neutral | 41 | 21.5 | 21.5 | 31.9 |
| | agree | 50 | 26.2 | 26.2 | 58.1 |
| | strongly agree | 80 | 41.9 | 41.9 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

Ownership of the government

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------------------|-----------|---------|---------------|--------------------|
| Valid | strongly disagree | 10 | 5.2 | 5.2 | 5.2 |
| | disagree | 25 | 13.1 | 13.1 | 18.3 |
| | agree | 66 | 34.6 | 34.6 | 52.9 |
| | strongly agree | 90 | 47.1 | 47.1 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

The projects are that give attention the quality

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------------------|-----------|---------|---------------|--------------------|
| Valid | strongly disagree | 10 | 5.2 | 5.2 | 5.2 |
| | neutral | 16 | 8.4 | 8.4 | 13.6 |
| | agree | 15 | 7.9 | 7.9 | 21.5 |
| | strongly agree | 150 | 78.5 | 78.5 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

Project time is not appropriate to complete the project as per the quality, cost and time.

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------------------|-----------|---------|---------------|--------------------|
| Valid | strongly disagree | 10 | 5.2 | 5.2 | 5.2 |
| | disagree | 16 | 8.4 | 8.4 | 13.6 |
| | agree | 85 | 44.5 | 44.5 | 58.1 |
| | strongly agree | 80 | 41.9 | 41.9 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

Inflexibility of the project to changes in the economic environment

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------------------|-----------|---------|---------------|--------------------|
| Valid | strongly disagree | 35 | 18.3 | 18.3 | 18.3 |
| | disagree | 26 | 13.6 | 13.6 | 31.9 |
| | neutral | 10 | 5.2 | 5.2 | 37.2 |
| | agree | 60 | 31.4 | 31.4 | 68.6 |
| | strongly agree | 60 | 31.4 | 31.4 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

Expected profit rate of project by the contractor

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------------------|-----------|---------|---------------|--------------------|
| Valid | strongly disagree | 25 | 13.1 | 13.1 | 13.1 |
| | disagree | 10 | 5.2 | 5.2 | 18.3 |
| | neutral | 31 | 16.2 | 16.2 | 34.6 |
| | agree | 35 | 18.3 | 18.3 | 52.9 |
| | strongly agree | 90 | 47.1 | 47.1 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

Demotivated employees due to lower payments

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------------------|-----------|---------|---------------|--------------------|
| Valid | strongly disagree | 20 | 10.5 | 10.5 | 10.5 |
| | neutral | 16 | 8.4 | 8.4 | 18.8 |
| | agree | 75 | 39.3 | 39.3 | 58.1 |
| | strongly agree | 80 | 41.9 | 41.9 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

Not providing trainings to the employees

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|----------------|-----------|---------|---------------|--------------------|
| Valid | disagree | 16 | 8.4 | 8.4 | 8.4 |
| | neutral | 45 | 23.6 | 23.6 | 31.9 |
| | agree | 40 | 20.9 | 20.9 | 52.9 |
| | strongly agree | 90 | 47.1 | 47.1 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

The project is not sequenced according to schedule of project.

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------------------|-----------|---------|---------------|--------------------|
| Valid | strongly disagree | 16 | 8.4 | 8.4 | 8.4 |
| | disagree | 10 | 5.2 | 5.2 | 13.6 |
| | neutral | 40 | 20.9 | 20.9 | 34.6 |
| | agree | 35 | 18.3 | 18.3 | 52.9 |
| | strongly agree | 90 | 47.1 | 47.1 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

Project team leader's experiences and technical skills

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|----------------|-----------|---------|---------------|--------------------|
| Valid | disagree | 10 | 5.2 | 5.2 | 5.2 |
| | neutral | 66 | 34.6 | 34.6 | 39.8 |
| | agree | 40 | 20.9 | 20.9 | 60.7 |
| | strongly agree | 75 | 39.3 | 39.3 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

Communication in the project

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------------------|-----------|---------|---------------|--------------------|
| Valid | strongly disagree | 20 | 10.5 | 10.5 | 10.5 |
| | disagree | 10 | 5.2 | 5.2 | 15.7 |
| | neutral | 15 | 7.9 | 7.9 | 23.6 |
| | agree | 46 | 24.1 | 24.1 | 47.6 |
| | strongly agree | 100 | 52.4 | 52.4 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

delay in claim approval and payment to contractor

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------------------|-----------|---------|---------------|--------------------|
| Valid | strongly disagree | 25 | 13.1 | 13.1 | 13.1 |
| | disagree | 51 | 26.7 | 26.7 | 39.8 |
| | agree | 25 | 13.1 | 13.1 | 52.9 |
| | strongly agree | 90 | 47.1 | 47.1 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

Delivery of the important project materials by the client

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------------------|-----------|---------|---------------|--------------------|
| Valid | strongly disagree | 45 | 23.6 | 23.6 | 23.6 |
| | disagree | 31 | 16.2 | 16.2 | 39.8 |
| | strongly agree | 115 | 60.2 | 60.2 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

Conformance to specification

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------------------|-----------|---------|---------------|--------------------|
| Valid | strongly disagree | 15 | 7.9 | 7.9 | 7.9 |
| | disagree | 10 | 5.2 | 5.2 | 13.1 |
| | neutral | 66 | 34.6 | 34.6 | 47.6 |
| | agree | 50 | 26.2 | 26.2 | 73.8 |
| | strongly agree | 50 | 26.2 | 26.2 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

Quality assessment system in the project

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------------------|-----------|---------|---------------|--------------------|
| Valid | strongly disagree | 15 | 7.9 | 7.9 | 7.9 |
| | disagree | 35 | 18.3 | 18.3 | 26.2 |
| | neutral | 41 | 21.5 | 21.5 | 47.6 |
| | agree | 45 | 23.6 | 23.6 | 71.2 |
| | strongly agree | 55 | 28.8 | 28.8 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

Control mechanism

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------------------|-----------|---------|---------------|--------------------|
| Valid | strongly disagree | 25 | 13.1 | 13.1 | 13.1 |
| | disagree | 10 | 5.2 | 5.2 | 18.3 |
| | agree | 66 | 34.6 | 34.6 | 52.9 |
| | strongly agree | 90 | 47.1 | 47.1 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

Performance of different parties involved in the project (e.g. associations, contractors, consultants, and clients)

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------------------|-----------|---------|---------------|--------------------|
| Valid | strongly disagree | 25 | 13.1 | 13.1 | 13.1 |
| | disagree | 25 | 13.1 | 13.1 | 26.2 |
| | neutral | 41 | 21.5 | 21.5 | 47.6 |
| | agree | 20 | 10.5 | 10.5 | 58.1 |
| | strongly agree | 80 | 41.9 | 41.9 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

Exchange rate variations in the economy

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|----------------|-----------|---------|---------------|--------------------|
| Valid | disagree | 15 | 7.9 | 7.9 | 7.9 |
| | neutral | 16 | 8.4 | 8.4 | 16.2 |
| | agree | 60 | 31.4 | 31.4 | 47.6 |
| | strongly agree | 100 | 52.4 | 52.4 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

Overall inflation in the economy

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------------------|-----------|---------|---------------|--------------------|
| Valid | strongly disagree | 31 | 16.2 | 16.2 | 16.2 |
| | disagree | 45 | 23.6 | 23.6 | 39.8 |
| | neutral | 10 | 5.2 | 5.2 | 45.0 |
| | agree | 55 | 28.8 | 28.8 | 73.8 |
| | strongly agree | 50 | 26.2 | 26.2 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

Labor market inefficiency to supply qualified employees

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|----------------|-----------|---------|---------------|--------------------|
| Valid | disagree | 61 | 31.9 | 31.9 | 31.9 |
| | neutral | 25 | 13.1 | 13.1 | 45.0 |
| | agree | 40 | 20.9 | 20.9 | 66.0 |
| | strongly agree | 65 | 34.0 | 34.0 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

Political instabilities

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|----------------|-----------|---------|---------------|--------------------|
| Valid | disagree | 40 | 20.9 | 20.9 | 20.9 |
| | neutral | 66 | 34.6 | 34.6 | 55.5 |
| | agree | 60 | 31.4 | 31.4 | 86.9 |
| | strongly agree | 25 | 13.1 | 13.1 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

Physical area (site) of the projects

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------------------|-----------|---------|---------------|--------------------|
| Valid | strongly disagree | 10 | 5.2 | 5.2 | 5.2 |
| | disagree | 41 | 21.5 | 21.5 | 26.7 |
| | neutral | 35 | 18.3 | 18.3 | 45.0 |
| | agree | 60 | 31.4 | 31.4 | 76.4 |
| | strongly agree | 45 | 23.6 | 23.6 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

Availability of resources as planned through project duration

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------------------|-----------|---------|---------------|--------------------|
| Valid | strongly disagree | 15 | 7.9 | 7.9 | 7.9 |
| | neutral | 26 | 13.6 | 13.6 | 21.5 |
| | agree | 110 | 57.6 | 57.6 | 79.1 |
| | strongly agree | 40 | 20.9 | 20.9 | 100.0 |
| | Total | 191 | 100.0 | 100.0 | |

Reliability

Reliability Statistics

| | |
|------------------|------------|
| Cronbach's Alpha | N of Items |
| .921 | 5 |

Reliability Statistics

| | |
|------------------|------------|
| Cronbach's Alpha | N of Items |
| .884 | 6 |

Reliability Statistics

| | |
|------------------|------------|
| Cronbach's Alpha | N of Items |
| .952 | 6 |

Reliability Statistics

| | |
|------------------|------------|
| Cronbach's Alpha | N of Items |
| .836 | 6 |

Descriptive Statistics

| | N | Minimum | Maximum | Mean | Std. Deviation |
|--|-----|---------|---------|--------|----------------|
| Being low cost project | 191 | 1.00 | 5.00 | 3.9424 | 1.14792 |
| Ownership of the government | 191 | 1.00 | 5.00 | 4.0524 | 1.21282 |
| The projects are that give attention the quality | 191 | 1.00 | 5.00 | 4.5445 | 1.02437 |
| Project time is not appropriate to complete the project as per the quality, cost and time. | 191 | 1.00 | 5.00 | 4.0942 | 1.10574 |
| Inflexibility of the project to changes in the economic environment | 191 | 1.00 | 5.00 | 3.4398 | 1.50273 |
| Valid N (listwise) | 191 | | | | |

Descriptive Statistics

| | N | Minimum | Maximum | Mean | Std. Deviation |
|--|-----|---------|---------|--------|----------------|
| Expected profit rate of project by the contractor | 191 | 1.00 | 5.00 | 3.8115 | 1.41275 |
| Demotivated employees due to lower payments | 191 | 1.00 | 5.00 | 4.0209 | 1.20507 |
| Not providing trainings to the employees | 191 | 2.00 | 5.00 | 4.0681 | 1.02113 |
| The project is not sequenced according to schedule of project. | 191 | 1.00 | 5.00 | 3.9058 | 1.28207 |
| Project team leader's experiences and technical skills | 191 | 2.00 | 5.00 | 3.9424 | .97432 |
| Communication in the project | 191 | 1.00 | 5.00 | 4.0262 | 1.32758 |
| Valid N (listwise) | 191 | | | | |

Descriptive Statistics

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|-----|---------|---------|--------|----------------|
| delay in claim approval and payment to contractor | 191 | 1.00 | 5.00 | 3.5445 | 1.58840 |
| Delivery of the important project materials by the client | 191 | 1.00 | 5.00 | 3.5707 | 1.79002 |
| Conformance to specification | 191 | 1.00 | 5.00 | 3.5759 | 1.16223 |
| Quality assessment system in the project | 191 | 1.00 | 5.00 | 3.4712 | 1.29288 |
| Control mechanism | 191 | 1.00 | 5.00 | 3.9738 | 1.36665 |
| Performance of different parties involved in the project (e.g. associations, contractors, consultants, and clients) | 191 | 1.00 | 5.00 | 3.5497 | 1.46409 |
| Valid N (listwise) | 191 | | | | |

Descriptive Statistics

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|-----|---------|---------|--------|----------------|
| Exchange rate variations in the economy | 191 | 2.00 | 5.00 | 4.2827 | .91976 |
| Overall inflation in the economy | 191 | 1.00 | 5.00 | 3.2513 | 1.47244 |
| Labor market inefficiency to supply qualified employees | 191 | 2.00 | 5.00 | 3.5707 | 1.25404 |
| Political instabilities | 191 | 2.00 | 5.00 | 3.3665 | .95792 |
| Physical area (site) of the projects | 191 | 1.00 | 5.00 | 3.4660 | 1.21293 |
| Availability of resources as planned through project duration | 191 | 1.00 | 5.00 | 3.8377 | 1.01559 |
| Valid N (listwise) | 191 | | | | |