
ADDIS ABABA SCIENCE AND TECHNOLOGY UNIVERSITY

College of Natural and Social Sciences


A Thesis submitted to College of Natural and Social Sciences of Addis Ababa Science and Technology University in partial fulfillment of the requirements of the Degree of Masters of Business Administration in Construction Management

By: Mekonnen Abebe Anshebo   ID No. GSR/038/08

Advisor: Dr. Arvind Kumar Bhatt

June, 2017

Addis Ababa, Ethiopia

By: MEKONNEN ABEBE ANSHEBO

Approved by Board of Examiners

Chairman

Advisory Name

External Examiner’s Name

Internal Examiner’s Name

College Dean’s Name

Signature

Signature

Signature

Signature

Date

Date

Date

Date

Date

Declaration

I, Mekonnen Abebe, confirm by my signature and that this thesis is my own original work and has not been presented for a degree in other university, and that all sources of material used for the thesis have fittingly acknowledged.

Signature

Name of Student: Mekonnen Abebe Anshebo

Signature: __________________________  Date __________________

Name of Advisor: Dr. Arvind Kumar Bhatt

Signature: __________________________  Date __________________

Appendices

ADDIS ABABA SCIENCE AND TECHNOLOGY UNIVERSITY

College of Natural and Social Sciences

Department of Business and Management

Subject:-Request for cooperation

Dear Participant

This questionnaire is designed to identify of the challenges of construction management in the building construction of Ethiopian Public Universities, the case of Addis Ababa Science and Technology University.

The information obtained will be used for academic purpose only; all information and feedbacks will be kept strictly confidential.

Your experience and educational background in the construction industry will greatly contribute to the success of my study and I believe this kind of study will be an input for the development of Ethiopian construction industry. Your response for each questionnaire is highly valuable and contributory to the outcome of the study. So, I am kindly requesting you to respond each and every question.

Thank you,

Mekonnen Abebe

Postgraduate student: - Construction Management

Addis Ababa Science and Technology University,

College of Natural and Social Sciences

Department of Business and Management

Tel: +251 911927991 (Ethiopia)

Email: moke_abebe@yahoo.com.
PART ONE - CONTRACTORS

SECTION ONE: GENERAL PROFILE OF THE RESPONDENT

1.1. Company: ____________________________________________________

1.2. Address: ____________________________________________________

1.3. Profession/job title: ___________________________________________

1.4. Group/party:  ☐ Contractor  ☐ Consultant  ☐ Other, please specify: __________

1.5. Your organization is …
   A. Local private company          B. Local public/government Company
   C. Foreign company               D. Joint venture of local and foreign company
   E. Local endowment                F. Other (please specify)

1.6. Have you worked as a Construction Manager?
   A. Yes        B. No     If yes, for how long? ………………………………

1.7. What is the category of your organization?
   A. General contractor (GC)       B. Building contractor (BC)
   C. Road contractor (RC)          D. Specialized Contractor (SC)
   E. Other (please specify)

1.8. What is the grade of your organization? ………
   A. Grade-1(GC1/BC1/RC1)         B. Grade-2 (GC2/BC2/RC2)
   C. Grade-3(GC3/BC3/RC3)         D. Other (please specify)

1.9. Approximately, for how long has your organization been in the Construction Business? ……………………………

1.10. What is the major type of construction your organization usually performs?
      A. Building (residential, office, commercial)      B. Road
      C. Civil Engineering works (water supply, hydropower etc.)
      D. Other (please specify) ………………………………………

1.11. Has your company participated on Capacity Building Program (CBP)?
      A. Yes        B. No     C. I do not know
1.12. Your company is
   A. ISO certified or compliant  B. In a process to get the certification
   C. Neither ISO certified nor in a process to be certified  D. Other (please specify).

SECTION TWO: Building Construction Project Time Management

2.1. Does your organization made awareness about the importance of Building Construction Project time management?
   A. Yes  B. No  C. I do not know
2.2. Does your organization made any effort for managing time in your Building Construction Project?
   A. Yes  B. No  C. I do not know
2.3. Is the effort made by your organization for time management formal?
   A. Yes  B. No  C. I do not know
2.4. Does your organization prepare a schedule (plan) for the project?
   A. Yes  B. No  C. I do not know
2.5. Does your organization use the WBS when defining the schedule activities?
   A. Yes  B. No  C. I do not know
2.6. Are relationships among different activities identified and sequenced accordingly?
   A. Yes  B. No  C. I do not know
2.7. Is progress of the building construction project management activities continuously monitored and controlled according to the schedule developed?
   A. Yes  B. No  C. I do not know
2.8. Does your organization update the building construction project schedule?
   A. Yes  B. No  C. I do not know

SECTION THREE: Building Construction Project Cost Management

3.1. Does your organization made awareness about the importance of Building Construction Project cost management in your organization?
   A. Yes  B. No  C. I do not know

3.2. Does your organization prepare an estimation of the project cost?
   A. Yes       B. No       C. I do not know

3.3. Does your organization made any effort of managing cost in your project?
   A. Yes       B. No       C. I do not know

3.4. Does your organization use the WBS in preparing the estimate of budget?
   A. Yes       B. No       C. I do not know

3.5. Does your organization update the budget regularly?
   A. Yes       B. No       C. I do not know

3.6. Does your organization made any effort to monitor and control the project cost?
   A. Yes       B. No       C. I do not know

SECTION FOUR: Building Construction Project Quality Management

4.1. Is your organization performing Building Construction quality planning for the given project that means determining requirements and quality standards and strategies to meet quality objectives?
   A. Yes       B. No       C. I do not know

4.2. Is your organization preparing and implementing Building Construction quality management policies, procedures and guidelines?
   A. Yes       B. No       C. I do not know

4.3. Is your organization preparing Building Construction project quality monitoring and control plan?
   A. Yes       B. No       C. I do not know

4.4. Is your organization hiring/assigning a quality department or employees?
   A. Yes       B. No       C. I do not know

4.5. Is your organization implementing TQM (Total Quality Management)?
   A. Yes       B. No       C. I do not know

4.6. Is your organization performing Building Construction quality audit which means reviewing the processes to determine whether project activities comply with
organizational and project policies, processes, and procedures and quality requirements?
A. Yes  B. No  C. I do not know

SECTION FIVE: Building Construction Project Human Resource Management (HRM)
5.1. Is your organization preparing and defining staffing plan according to the required skill, roles and responsibilities for the project building construction project?
A. Yes  B. No  C. I do not know
5.2. Is your organization preparing building construction project organization chart?
A. Yes  B. No  C. I do not know
5.3. Is your organization make monitoring and controlling building construction project human resource, cost and time?
A. Yes  B. No  C. I do not know

SECTION SIX: Building Construction Project Procurement Management
6.1. Is your organization make planning for procurement of goods and services needed for a building construction projects?
A. Yes  B. No  C. I do not know
6.2. Is your organization try to develop and use a documented contract management/administration processes for the building construction projects?
A. Yes  B. No  C. I do not know
6.3. Is your organization using standard procurement documents for the building construction projects?
A. Yes  B. No  C. I do not know
6.4. Is your organization used the monitoring and controlling the progress of the procurement process for the building construction projects?

A. Yes       B. No       C. I do not know

Thank you for your cooperation
PART TWO - CONSULTANTS

SECTION ONE: GENERAL PROFILE OF THE CONSULTANTS

1.1. Company: ____________________________________________________________
1.2. Address: ___________________________________________________________
1.3. Profession/ job title: _________________________________________________
1.4. Group/party: □ Contractor □ Consultant □ Other, please specify: ________
1.5. Your organization is …
   A. Local private company  B. Local public/government Company
   C. Foreign company      D. Joint venture of local and foreign company
   E. Local endowment     F. Other (please specify)

1.6. Your company is
   A. ISO certified or compliant  B. In a process to get the certification
      ISO certified nor in a process to be certified  D. Other (please specify)

SECTION TWO: OPEN ENDED QUESTIONS

2. What are the building construction management control problems related with
   2.1. Planning/scheduling of the program?

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2.2. Preparation of designs and specifications

2.3. Quality management

2.4. Human resource management

2.5. Supervisions of the construction projects
2.6. Project administration & contract management

3. What are the possible solutions for the above problems?

Thank you for your cooperation
PART THREE - CLIENT

SECTION ONE: OPEN ENDED QUESTIONS CLIENT'S PROJECT OFFICE

1. What are the building construction management control problems related with

1.1. Planning/scheduling of the program?

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1.2. Preparation of designs and specifications

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1.3. Quality management

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1.4. Human resource management

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1.5. Supervisions of the construction projects

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1.6. Project administration & contract management

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2. What are the possible solutions for the above problems?

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Thank you for your cooperation
### NAME OF CONTRACTORS WHO ARE WORKING AT AASTU

<table>
<thead>
<tr>
<th>S/No.</th>
<th>Name of Contractors</th>
<th>Grade</th>
<th>No. of Blocks constructed</th>
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<tr>
<td>2.</td>
<td>Tekrom Construction</td>
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<td>Addis Ayele BC</td>
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<td>Getnet Tesfaye BC</td>
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<td>6.</td>
<td>Eshetu Yacob BC</td>
<td>5</td>
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<td>7.</td>
<td>Daniel Tsegaye</td>
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<td>8.</td>
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<td>NYG Construction</td>
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<td>Mescon Construction</td>
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<td>Dawit Geremew BC</td>
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<td>Hagos W/Giorgis BC</td>
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<td>Belachew Bedassa BC</td>
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<td>Hasset Construction</td>
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<td>Dereje G/Mariam BC</td>
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<td>Fisheha T/Medhin BC</td>
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<td>Birega W/Senbet BC</td>
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<td>Bright Construction</td>
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<td>Mulugeta Ibrahim BC</td>
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<td>27.</td>
<td>Hadish Tekle BC</td>
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<td>Shewaye Bekele BC</td>
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<td>United Construction</td>
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<td>Abebayehu Kebede BC</td>
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<td>38</td>
<td>Equator BC</td>
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<tr>
<td>39</td>
<td>Wegerate Construction</td>
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</tr>
<tr>
<td>40</td>
<td>Momina BC</td>
<td>6</td>
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</tbody>
</table>

Source: AASTU project Office, 2017

NAME OF CONSULTANTS FOR ASSTU

1. ETG CONSULTING ENGINEERS & ARCHITECTS PLC  
2. ATCON CONSULTING ENGINEERS & ARCHITECTS PLC  
3. YOHANNES ABAY CONSULTING ARCHITECTS & ENGINEERS
Abstract

The main objective of the study is to focuses on identification of the key challenges of construction management in the building construction of Addis Ababa Science and Technology University and provides the possible alternative solutions for the investigated challenges. The questionnaires survey (close ended and open ended) were conducted on the purposely selected sampled contractors, consultants and the client itself to cover all the basic research questions which were useful in fulfilling the research questions.

The findings of research indicated that most of the contractors involved in the building construction projects in the study site have implemented the building construction management parts that were discussed in the literature review sections. On the consultants and client the identified building construction management challenges were poor communications among stakeholders, poor management of the projects because of shortage of staffs for the client project office, on time supervision problems, and others. The possible solutions were like deploy materials and workmanships in accordance with the signed contract agreement, the contract agreement has to be properly prepared and implemented, avoid the low cost housing strategies for the public higher educational institutions, select the high potential contractors, improve the documentation systems, building the capacity of the stakeholders’, avoid the long process of payment modalities and etc.

**Keywords:** Building, Construction, Stakeholders, and Management challenges.

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<td>Preparation of a schedule (plan) for the project time management</td>
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<td>The progress of the WBS activities continuously monitored and controlled</td>
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<td>Awareness made about the importance of Building Construction cost management</td>
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<td>Efforts made for managing cost by the organizations</td>
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<td>Updating the budget on the regular basis by the organizations</td>
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<td>Implementing TQM (Total Quality Management) by the organization</td>
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<td>Performing building construction quality audit by the organization</td>
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<td>Make planning for procurement of goods and services needed for a building construction by the organizations</td>
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<tr>
<td>14</td>
<td>Using the monitoring and controlling the progress of the procurement process By the organizations</td>
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ACRONYMS

ANSI = American National Standards Institute
ASTM = American Society for Testing and Materials
BOT = Build-Operate-Transfer
CA = Consultancy Architects
CAE = Consultancy Architects and Engineers
CCA = Construction Contract Administration
CE = Consultancy Engineers
CM = Construction Management
CSI = Construction Specifications Institute
DBB = Design-Bid-Build
DBM = Design-Build Model
EBCS = Ethiopian Building Code of Standards
EPC = Engineering-Procurement-Construction
GFCF = Gross Fixed Capital Formation
HBC = Consultancy Highway and Bridge
HCBs = Hollow Concrete Blocks
HRM = Human Resources Management
ISO = International Standard of Organization
PMBOK = Project Management Book of Knowledge
PMC = Project Management Contractor
PMIs = Project Management Institutes
PPA = Public Procurement Agency
RFPs = Requests for proposals
RFQs = Requests for quotes

SC = Specialized Consultancy

UCBP = University Capacity Building Program

WBS = Work Breakdown Structure
Acknowledgement

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CHAPTER ONE

1.0. INTRODUCTION

1.1. Background of the study

Timely and with budget completion of a construction project is frequently seen as a major criterion of project success by clients, contractors, consultants and related stakeholders (Luka and Muhammad, 2014; Ibrahim and Nabil, 2013; Abadir, 2011; Chabota et al., 2008). The primary challenge of a project is the handling of constraints to meet the desired goal where one aims to honor the primary constraints of time and budget to produce quality result (ECIDP, 2014; Warszawski, 1996).

Ethiopia is the fastest-growing, non-oil driven economy among African countries. The country has showed a remarkable growth over the past ten years. The average annual growth GDP is 10.9% (UNDP, 2014). This figure is double of the Sub Sahara Africa and triple of the world average growths indicating that Ethiopia is one of the fastest economic growths in the world (ibid). As a result the contribution of the industry against the GDP is only 3% and this is lower than the sub-Saharan African average which is 6%. The construction industry trend in the past 10 years shows a yearly growth rate of 12.43 and this shows a share of 5.3% of the country’s GDP (UNDP, 2014).

The construction industry is a fundamental economic sector which permeates most of the other sectors as it transforms various resources into constructed physical, economic and social infrastructures necessary for socio-economic development. It embraces the process by which the physical infrastructure are planned, designed, procured, constructed or produced, altered, repaired, maintained, and demolished. The construction industry has important contributions to the Ethiopian economy, as demonstrated by its share in the GDP. The sector has registered a remarkable growth, over the last 11 years there has been increased investment on the development and expansion of various infrastructure projects. (Source: Annual Progress report, Ethiopian Federal House of parliament, 2011/12)

The realization of Vision 2025 partly depends on the existence of a reliable and competitive local construction industry that is capable of delivering quality services and value for money in the development and maintenance of the physical infrastructure. Since 2005 there have been a number of initiatives geared towards fostering the local construction industry. Despite such interventions, the state of the local construction industry has remained poor. Performance constraints include inadequate capacity of local contractors and consultants, inadequate public sector delivery capacity, corruption, erratic work opportunities, use of outdated technologies and practices, lack of effective supporting policies and poor state of the economy.

Thus, the construction industry in general and the building construction in particular of Ethiopia suffers from poor construction management with the highlights given above, and the study focuses on identifying the key challenges of construction management in the building construction of Ethiopian Public Universities: a case of Addis Ababa Science and Technology University.

1.2. Statement of the problem

As it is known that the construction sectors face many challenges. The challenges of building construction can be categorized into construction issues and peripheral pressures. The construction issues are of three types. These are raising costs, time and quality. The rising of costs in construction can be manifested in terms of wages, materials & supplies, productivity, time delay, capital equipment and inflation. The time issues in building construction are also described as delivery of materials on time, and supplies schedule. The quality issues in building construction is one of the critical challenges such as design criteria, inspection, lack of skilled workers, supervision, finance, and availability of materials. The mentioned three building construction management challenges i.e. raising costs, time and quality are clearly observed in the Ethiopian Public Universities.

The building construction management challenges in Addis Ababa Science and Technology University are time delay in construction, supervision challenge, design problem, availability

& delivery of construction materials, quality of building, contract administration, inefficient and non-transparent procurement systems, corruption and financial mismanagement and the like.

The researcher focuses on identifying the key challenges of construction management in the building construction of Ethiopian Public Universities: a case of Addis Ababa Science and Technology University.

1.3. Objectives of the study

1.3.1. General objective

The main objective of the study is to focus on identification of the key challenges of construction management in the building construction of Addis Ababa Science and Technology University and provides the possible alternative solutions for the investigated challenges.

1.3.2. Specific objectives

The specific objective of this study is:

- Identifying the main stakeholders responsible for the challenges of building construction management.
- To identify different types of the challenges of building construction management.
- To identify causes of challenges of building construction management.
- Providing possible alternative solutions for the identified construction management challenge.

1.4. Research Questions

1) Who are the main stakeholders responsible for this building construction management challenges?
2) What are the building construction management control problems related with planning, material management, workmanship, project administration & contract management?
3) How can the challenges of construction management in the building construction of the Addis Ababa Science and Technology University be solved?

1.5. Significance of the study

Though the building construction sectors for the public Universities are given high prominence at the federal government level, several challenges are being noted in this sector especially in the management aspects that need immediate actions. This study is significant in helping to alleviate some of the problems facing the building construction industry by enlightening the parties involved in the building construction industry about solving the challenges of construction management starting from the contractual stage and in turn making the projects achieve their objectives effectively and efficiently and provide a clue for those who device different policies, regulations, rules and standards in management of the public building construction sectors.

1.6. Delimitation/Scope of the study

The scope the study covers only to focuses on identifying the key challenges of construction management in the building construction of the Addis Ababa Science and Technology University and provides the possible alternative solutions for the investigated challenges.

Therefore, the research involves contractors, client and consultants only that undertakes building construction projects.

1.7. Limitation of the study

The factors that limit for conducting this study are time constraint, and lack of recent literatures of the newly constructed Public Universities like Addis Ababa Science and Technology University.
1.8. Organization of the research

This thesis has five chapters that discuss various aspects of the building construction management issues which are of relevance with this thesis. Chapter one is an introductory part containing discussions on background, research problems, research questions and objective of the research, significance of the research, delimitation/scope and limitation of the research and organization or layout of the research. Chapter two presents literature review that provides a general understanding of previous studies and theories related to the research area. Chapter three discusses about research design and methodology. Chapter four presents results and discussion of the research findings. Chapter five contains conclusions and recommendations based on what is discussed in the previous chapters.
CHAPTER TWO

2.0. LITERATURE REVIEW

2.1. Introduction

This chapter discusses the findings from different reviewed literatures on the subjects of building construction management issues like time management, cost management, quality management, human resource management, procurement management, and the nature of construction projects. It also discusses problems of contracting practices in public construction works, challenges of construction management in developing countries, and factors affecting project cost performance. Hence, the literature review tried to highlight these issues in relation to investigating the key challenges of construction management in the building construction starting from the contractual stage.

2.2. Project

A project is “an endeavor in which human, material and financial resources are organized in a novel way, to undertake a unique scope of work, of given specification, within constraints of cost and time, so as to achieve beneficial change defined by quantitative and qualitative objectives”. (Turner & Müller, 2003)

Every project creates a unique product, service, or result (PMI [Project Management Institute, Inc.], 2013). Projects can thus be classified into types and typologies. The three primary types are: Business projects, Development projects and Change projects. The four factors influencing the typologies are: size, institutional/industry context, organizational condition, and task features (Morris, Pinto, & Söderlund, 2010).

2.3. Construction Project

Construction is one among many types of project-based production systems (Ballard & Howell, 2003). According to Chitkara (1998), construction project refers to a high-value, time bound and special construction mission with predetermined performance objectives. He further explains that the project mission is accomplished within complex project
environments, by putting together human and non-human resources into a temporary organization, headed by a project manager.

Building construction constitute the largest segment of the construction business. Building works include residential and commercial complexes, educational and recreational facilities, hospitals and hotels, warehouses and marketing facilities. The building business serves mankind by providing shelter and services for its habitation, educational, recreational, social and commercial needs. The Building works are mostly designed by the Architect/Engineering firms, and are financed by public and private sector and individuals (Chitkara, 1998).

The very nature of construction introduces challenges typically not encountered in other industries. For example, construction differs widely from manufacturing in that:

- The work is often seasonal
- Each project is unique
- Often involves remote sites with various access problems
- The process is not as predictable
- Difficulty in applying automation
- There is high potential for encountering unforeseen conditions
- Costs can vary according to conditions
- Difficult to manage and supply utilities and other resources.
- Technical innovations are adopted slower.
- Success is dependent upon the quality of its people.
- Very custom-oriented.
- Product can be of mind-boggling size, cost, and complexity.
- The work is not performed in controlled conditions, therefore highly impacted by weather and other environmental conditions.

2.4. Nature and Characteristics of Construction Projects

The management of construction project has some differences from the management of other projects. The differences mainly stems from the nature and characteristics of construction

projects. The consideration of these differences is important for successful management of construction projects.

2.4.1. Construction Project Lifecycle

Construction projects, just like other projects, have a predetermined duration with a beginning and an end. The starting point of a project is the time when the project idea is conceived by the client. The end marks the time when the mission is accomplished. The time span between the start and completion of a project represents the project life cycle. According to Chitkara (1998), the life cycle of a typical construction project can be broadly divided into the following phases: formulation phase, mobilization phase and construction phase. The details of each phase as discussed below:

- The formulation phase includes the conception of the project idea, feasibility studies, investment appraisal and project definition.
- The mobilization phase covers the preparation of the project preliminary plan, designs and drawings, contracts, resources mobilization and earmarking funds, and
- The construction phase includes planning and controlling execution, inducting resources, construction and commissioning, and finally, handing over to the client.

2.5. Overview of the Construction Industry in Developing Countries

Construction industry makes significant contributions to the socio-economic development of most developing countries. The level of that contribution is measured in several ways – notably in terms of gross domestic product, GDP, of the national economy and of capital assets or gross fixed capital formation, GFCF [United Nations Center for Human settlement (1984)].

According to a correlation made by the United Nations Industry Development Organization, UNIDO, between the per capita value added by construction and that of per capita GDP, the share of construction in GDP tends to increase with increasing per capita GDP. In other words, it may be said that value added by construction may represent between 2 and 10
percent of the GDP; for most developing countries it represents between 3 and 5 percent and for most developed countries between 5 and 9 percent [United Nations Industrial Development Organization (1969)]. However, the present state of the construction industry in developing countries in general doesn’t meet the domestic and international quality standards and the performance demand expected from the sector. In Ethiopia, its percentage contribution of GDP only amounts to 3 percent which is considerably lower than the Sub-Saharan average of 6 percent [NAOUM S.G. (1998)]. Of course, this low level of contribution to GDP is expected to gradually progress with the growth of overall economy of these countries as the amount of investment for physical infrastructure is expected to increase [PASDEP (2006) and TOKUORY T. (2006)].

2.6. Construction Project Management

The management of construction projects has much in common with the management of similar types of projects in other industries (Hendrickson). “Much of the content of PMBOK Guide is also directly applicable to construction projects.” (Project Management Institute (PMI), 2007). Even though, management of construction project is similar to management of other kind of project in many respects, it has also some peculiarities that differentiate it from managing other kind of projects such as software development. For example, unlike the management of many other projects, the project managers in construction project are often changed from one phase to another or some may specialize in only one phase of the construction project. (Project Management Institute (PMI), 2007).

2.7. Building construction projects

A construction in simple words is a process of constructing something by human for one purpose or another. It may be a road, bridge, a dam, a private residence, an airport, a commercial building, etc. According to Moavenzadreh F. (1976), construction contributes to the economic development of any country by satisfying some of the basic objectives of development including output generation, employment creation and income generation and re
distribution; it also plays a major role in satisfying basic physical and social needs, including the production of shelter, infrastructure and consumer goods.

Wikipedia, the free encyclopedia, defines building construction as the process of adding structure with walls to real property or construction of buildings. It further discusses that if this buildings are not designed and constructed by professionals they might lead to undesirable results such as structural collapse, cost overrun and disputes.

A building construction project, like any other project, also faces different risks throughout the life of the project. According to Nafishah B., (2006), this is due to the uniqueness of every project, the uncertainties introduced by the project stakeholders, statutory or regulatory protocols and other intrinsic and extrinsic constraints. He further discusses that risk can constrain the achievement of key project objectives, time, cost and quality. Inability to achieve the project objectives has great consequence on all project stakeholders involved in the construction. For the client it could mean extra cost and less return on investment, for the consultants it could result in loss of confidence placed in them by the clients, for the contractor it could mean loss of profit and bad reputation etc.

2.8. Building Construction Material Management

There is no single definition of material management. Various books deferent scholars define material management in different ways. According to the definition of business dictionary, material management is “The planning and control of the functions supporting the complete cycle (flow) of materials, and the associated flow of information. These functions include (1) identification, (2) cataloging, (3) standardization, (4) need determination, (5) scheduling, (6) procurement, (7) inspection, (8) quality control, (9) packaging, (10) storage, (11) inventory control, (12) distribution, and (13) disposal (Business Dictionary, Retrieved on July 05, 2015).”

Management dictionary /MBA dictionary defines material management as follows “Materials management is a group of organizational functions responsible for the planning, sourcing, stocking, manufacturing, control and distribution activities of material used in the internal and external fulfillment of demand. Typically the term includes all logistical activities that control the transmission of tangible, physical materials through the value chain such as shipping and transport, distribution and warehousing, quality control, work in progress and manufacturing (Material Management Dictionary, Retrieved on July 05, 2015,).” Material management has different process like material planning, requisition, procurement, purchasing, storing, delivery, etc.

2.9. Construction Project Time and Cost Performance Management

Construction project sites are generally complex because of the extensive use of sophisticated plant, equipment, modern methods of construction, multidisciplinary and multitasked aspects of its project workforce (Aftab Hameed Memon, I. a. (2012)). That is why management of construction project is needed to organize, arranges every function, actions and everyone involved. Management will help to settle everything in the right place (Aftab Hameed Memon, I. a. (2012)).

Generally, time and cost management of construction project is defined as centralized of time and cost planning, organizing and controlling in the fieldwork or in the construction sites to meet the goals of schedule, cost and quality estimation (Aftab Hameed Memon, I. a. (2012)).

2.10. Time management of construction projects

Time management is the process of organizing and implementing a strategy related to the time required for work activities on a project. Effective time management is essential to successfully and efficiently meeting budget and program targets, as well as achieving profitability.
Projects can risk incurring unnecessary costs and delays as a result of ineffective time management, either by failing to allow for the full complexity of a project, or by failing to effectively manage scheduled work or unexpected events.

During the planning stage, all work activities should be properly understood, and planned in detail to optimize the allocation of resources and reduce the potential for ‘unknowns’. Estimates can then be made of how long each activity will take. This is critical to the setting of milestones and deadlines, for allocation of resources, and for determining the pricing of contracts and cash flow requirements.

As well as work packages, time management should also make allowance for activities including:

- The interrelationships between tasks.
- Project management administration.
- Liaison with third parties, such as the local authority.
- Client approvals and decision making processes.
- Training.
- Accidents and emergencies.
- Internal and external meetings.
- Holidays and sickness in staff.
- Suppliers and subcontractor activities.
- Equipment breakdowns.
- Missed deliveries by suppliers.
- Interruptions to work progress due to inclement weather.
- Inspections, testing and other forms of quality control.

2.11. Basic conception of project cost management

The construction cost management is to correct the variance of cost which is going to happen or has already incurred, and control the total expense under the budget to ensure to achieve the target cost by using technical and effective management methods. It is very important to
make a reasonable estimated cost (the cost which means the targeted and planned cost of an investor) before starting a project. It is the precondition of construction cost control. In a project, the construction cost is a core part of the entire project. Generally there are seven type managerial models: DBB (Design-Bid-Build), CM (Construction Management), DBM (Design-Build Model), BOT (Build-Operate-Transfer), PMC (Project Management Contractor), EPC (Engineering-Procurement-Construction) and Partnering.

2.12. Quality Control and Safety during Construction
Quality control and safety represent increasingly important concerns for project managers. Defects or failures in constructed facilities can result in very large costs. Even with minor defects, re-construction may be required and facility operations impaired. Increased costs and delays are the result. In the worst case, failures may cause personal injuries or fatalities. Accidents during the construction process can similarly result in personal injuries and large costs. Indirect costs of insurance, inspection and regulation are increasing rapidly due to these increased direct costs. Good project managers try to ensure that the job is done right the first time and that no major accidents occur on the project. (Fox, A.J. and Cornell, H.A, 1984)

As with cost control, the most important decisions regarding the quality of a completed facility are made during the design and planning stages rather than during construction. It is during these preliminary stages that component configurations, material specifications and functional performance are decided. Quality control during construction consists largely of insuring conformance to these original designs and planning decisions. (Fox, A.J. and Cornell, H.A, 1984)

2.12.1. Organizing for Quality and Safety
A variety of different organizations are possible for quality and safety control during construction. One common model is to have a group responsible for quality assurance and another group primarily responsible for safety within an organization. In large organizations, departments dedicated to quality assurance and to safety might assign specific individuals to assume responsibility for these functions on particular projects. For smaller projects, the project manager or an assistant might assume these and other responsibilities. In either case,
insuring safe and quality construction is a concern of the project manager in overall charge of the project in addition to the concerns of personnel, cost, time and other management issues. (Skibniewski, M. and Hendrickson, C., 1983)

Inspectors and quality assurance personnel will be involved in a project to represent a variety of different organizations. Each of the parties directly concerned with the project may have their own quality and safety inspectors, including the owner, the engineer/architect, and the various constructor firms. These inspectors may be contractors from specialized quality assurance organizations. In addition to on-site inspections, samples of materials will commonly be tested by specialized laboratories to insure compliance. Inspectors to insure compliance with regulatory requirements will also be involved. Common examples are inspectors for the local government's building department, for environmental agencies, and for occupational health and safety agencies. (Fox, A.J. and Cornell, H.A, 1984)

2.12.2. Total Quality Control

Quality control in construction typically involves insuring compliance with minimum standards of material and workmanship in order to insure the performance of the facility according to the design. For the purpose of insuring compliance, random samples and statistical methods are commonly used as the basis for accepting or rejecting work completed and batches of materials. Rejection of a batch is based on non-conformance or violation of the relevant design specifications. (Hinze, Jimmie W, 1997)

An implicit assumption in these traditional quality control practices is the notion of an acceptable quality level which is an allowable fraction of defective items. Materials obtained from suppliers or work performed by an organization is inspected and passed as acceptable if the estimated defective percentage is within the acceptable quality level. Problems with materials or goods are corrected after delivery of the product. (Skibniewski, M. and Hendrickson, C., 1983)
2.13. Human resources management (HRM)

Human resources management (HRM) is the personnel function which is concerned with procurement, development, compensation, integration and maintenance of the personnel of an organization for the purpose of contributing towards the accomplishments of the organization’s objectives. Therefore, personnel management is the planning, organizing, directing, and controlling of the performance of those operative functions (Aswathapa.K.).

According to Marchand,D.A., Kiettinger,W.J. and Rollis, J.D., (2008) the policies and practices involved in carrying out the “people” or human resource aspects of a management position, including recruiting, screening, training, rewarding, and appraising comprises of HRM.

Generally HRM refers to the management of people in organizations. It comprises of the activities, policies, and practices involved in obtaining, developing, utilizing, evaluating, maintaining, and retaining the appropriate number and skill mix of employees to accomplish the organization’s objectives. The goal of HRM is to maximize employees’ contributions in order to achieve optimal productivity and effectiveness, while simultaneously attaining individual objectives (such as having a challenging job and obtaining recognition), and societal objectives (such as legal compliance and demonstrating social responsibility).

2.14. Procurement Management

Procurement management follows a logical order. First, you plan what you need to contract; then you plan how you’ll do it. Next, you send out your contract requirements to sellers. They bid for the chance to work with you. You pick the best one, and then you sign the contract with them. Once the work begins, you monitor it to make sure that the contract is being followed. When the work is done, you close out the contract and fill out all the paperwork.

Contract planning is where you plan out each individual contract for the project work. You work out how you’ll manage the contract, what metrics it will need to meet to be considered
successful, how you’ll pick a seller, and how you’ll administer the contract once the work is happening.

The procurement management plan details how the procurement process will be managed. It includes the following information:

- The types of contracts you plan to use and any metrics that will be used to measure the contractors’ performance.
- The planned delivery dates for the work or products you are contracting.
- The company’s standard documents you will use.
- The number of vendors or contractors involved and how they will be managed.
- How purchasing may impact the constraints and assumptions of the project plan.
- The coordination of purchasing lead times with the development of the project schedule.
- The identification of prequalified sellers (if known).

### 2.14.1. Procurement Plan

After the decision has been made to purchase goods or outsource services, the procurement team develops a plan that includes the following:

- Selecting the appropriate relationships and contract approaches for each type of purchased goods or outsourced service.
- Preparing requests for quotes (RFQs) and requests for proposals (RFPs) and evaluating partnership opportunities.
- Evaluating RFQs, RFPs, and partnerships.
- Awarding and signing contracts.
- Managing quality and timely performance.
- Managing contract changes.
- Closing contracts.
Depending on the complexity level of the project, each of these steps can take either hours or sometimes weeks of work to complete. Each of these steps is also included in the project master schedule. The time involved in the procurement cycle can influence the scheduling of critical activities, including the decision to self-perform the work or contract the work to others. The delivery dates for equipment and materials and the work completion dates for contracted works are placed on the project schedule. Any procurement activities that create a project delay or fall on the project critical path may require special attention.

2.15. **Construction in Ethiopia**

Ethiopia is a country located in the Horn of Africa. It is a large country with an area of 1.13 million square kilometers. Ethiopia is home to a large population of inhabitants, according to a report by self-help Africa, 2013, these amounts to about 91 million. The average number of inhabitants per km² can be estimated to be around 80 people. According to Alem T. (1999), the majority of the Ethiopian population lives in the rural areas of the country and only a few live in the urban areas.

From the above statements it can be observed that the construction industry is only confined within a small portion of the country since majority of construction is undertaken in urban areas. The rural area, where majority of the population live, is uncivilized, i.e. there are only small traditional constructions used for habitation of people and cattle and in few places there are small scale school and health center constructions. According to Abraham A., 2007 and Kassim S., 2008, the construction industry is the most important enabler for the overall development specifically for least developing countries like Ethiopia. They also state that the construction industry is among the leading industries in producing employment and it contributes to the national development of any country.

The above discussion is trying to show that construction is very important for countries like Ethiopia. As mentioned earlier, any construction project involves risk and the impact it causes can be very critical in developing countries like Ethiopia. According to Hillson D. (2009), the most important thing that can be done in projects is make sure that the inevitable risk
associated with every project is at a level which is acceptable by the organization and is effectively managed. This statement implies that different organizations have different risk acceptance levels and Ethiopia as a country or the organizations involved in construction can only afford to accept small levels of risk due to their low capital. This implies risk management is especially important in developing countries to avoid loss and make the projects more successful.

The Ethiopian construction industry consists of different types and size of firms.

The firms are classified according to size, expertise and financial capability by the Ministry of Works and Urban Development (MoWUD). The professional services sector consists of architects, civil engineers, electrical engineers, sanitary engineers, and mechanical engineers, quantity surveyors and surveyors who provided the design expertise. Construction firms are broadly classified based on trend of work as follows: General Contractors, Building Contractors, Road Contractors and Specialized Contractors. The first three categories are again divided into ten grades with different resource requirements. Consultancy firms are broadly classified as follows: CA – Consultancy Architects, CAE – Consultancy Architects and Engineers, HBC – Consultancy Highway and Bridge, CE – Consultancy Engineers and SC – Specialized Consultancy. All of the above consultancy firm categories are divided into six grades with different resource requirements.

Currently there are over 6000 contractors, out of which only 60 are grade one contractors. The number of consulting firms has reached 187 and among these, only 20 are grade one consultancy firms with CAE license. This number is very small compared to the total population of the country. As discussed earlier, construction is very important tool for development of any country and the number needs to increase to help achieve the desired development.
2.16. Construction project management in Ethiopia

Like any developing country the construction industry plays major role and contributes highly to the development of the economy of the country. Next to agriculture, the industry provides one of the largest employment opportunities.

Developing countries like Ethiopia, spend substantial amount of their budgets in infrastructure development that involve significant construction works in projects such as construction of roads, buildings, water works, telecom civil works, etc. This is also the case in Ethiopia. For example, the Ethiopian government has spent about 50% of its total budget in fiscal year 2007/2008 for capital projects out of which road construction accounts about 33% (Ministry of Finance and Economic Development (MoFED), 2008). From project expenses in other sectors, the construction part accounts for the major part as most socio economic projects such as school and healthcare involve significant construction component. Even though significantly large amount of money is being poured in to infrastructure development, the infrastructure of the country is still considered to be very poor, even when seen by the standards of the Sub-Saharan countries. For example, the country’s passengers and freight traffic, road density is one of the lowest compared to other Sub-Saharan Countries. From the huge hydropower potential the country has, only less than 10% of it has been put in use (Ministry of Finance and Economic Development (MoFED), 2006). These all mean, enormous volume of infrastructure (construction) works is coming to the industry. Nevertheless, the construction industry of the country looks unprepared for these huge volumes of works to come. The industry is still in the infancy stage, growing unfortunately, slowly both technically and financially.

Like the industry in other developing countries, the construction industry in Ethiopia is plagued by many problems. The description of the current state of the industry given in various studies is summarized here under:

Generally the current state of the industry is characterized by:

✓ An inadequate capital base.
Old and limited numbers of equipment and low levels of availability and utilization.
Severe shortage of construction materials, most notably cement.
Low level of management, especially project management knowledge and practice (Low level of Contract administration, Project planning and Project monitoring capabilities).
Deficiencies in technical, financial management and entrepreneurial skills.
Small-scale local contractors which lack experience in construction management.
Limited experience and participation of the private sector in large construction project or the provision of related consulting services.
Outdated technology (insufficient and ineffective labor-based construction technology).
Inadequate and inappropriate project organization structures, which lead to problems of authority, responsibility, communication and coordination, etc.

The need for the improvement and development initiative has already been acknowledged by the government of Ethiopian, and University Capacity Building Program (UCBP) has been initiated with the assistance of the German government to support the capacity of local contractors by providing managerial and entrepreneurial training and coaching that prepare contractors for ISO 9001 certification. Contractors under the program were given training in areas such as modern contract and project management, modern financial and construction equipment management systems, general management and leadership, marketing, project and quality management.

2.16.1. Construction Project Stakeholders

Stakeholders are individuals, groups or organizations, institutions and others that are actively involved in a project and whose interests may be positively or negatively affected by the project execution. They may also exert influence over the project and its results. In short, they are claimants who claim ownership, who have rights or interests in a project and its activities. Hence, every project is influenced and must be managed from a perspective that goes beyond
the basic relationship between customers and companies that perform the project [PMBOK (2000), CLELAND D.I. and IRELAND L.R (2002), and WUBISHET J. (2004)].

Project stakeholders can be classified into two major groups: primary and secondary stakeholders. Primary stakeholders are those persons or groups of the project team who have a contractual or legal obligation to the project team and have responsibility and authority to manage and commit resources according to schedule, cost, and technical performance objectives. These stakeholders can also be named as contractual stakeholders. Secondary stakeholders are those who have no formal contractual relationship to the project but can have strong interest in what is going on regarding the project. These stakeholders can be participants on budgetary and financial agreements, business and professional interests or relationships and they are also referred to as budgetary and collateral stakeholders [PMBOK (2000), CLELAND D.I. and IRELAND L.R (2002), and WUBISHET J. (2004)].

Contractor is a person or an organization responsible for assembly of the materials and components required to produce the facility or to execute the works. Similar to the employer and engineer, the contractor is also identified in public works contract as a person or persons, firm or company to whom the contract has been awarded by the employer that include his personal representatives, successors and permitted assignees [United Nations Industrial Development Organization (1969), ATKINSON A.V. (1992), MoWUD (1994) and DAVID M. (2004)].

A consultant is a person who provides professional or expert advice in a particular field of science or business to either an organization or individual. As there is no legal protection given to the job title 'consultant', in theory, anyone can on a day wake up and decide to adopt the consultant title. Despite the broad definition that can be subsumed under the term consultant, there are in essence three characteristics that distinguish a consultant from other professions.

The client has an important role in the process since they will appoint advisors, authorize work to take place, agree costs and timetable and appoint professionals to the project. Some
projects will have a community organization or group as the client but may have difficulties with the role of Employer due to its liabilities. Client has the following role:

- Being responsible for the execution of the project from the initial idea to implementation.
- Choosing the players involved in all stages from design through construction to long term management.
- Ensuring that the needs of building users/customers are met.
- Ensuring that the relevant permissions are secured (planning etc.) in partnership with the professionals appointed to the project.
- May also be financier and eventual owner.

Construction materials merchant or supplier is also another important stakeholder acting as intermediary between the manufacturing industry and the contractor. Construction materials merchant stocks a large number of construction materials, components and fittings; provides small contractors with valuable technical and commercial information; and most importantly of all, he gives short term credit to the contractors (United Nations Industrial Development Organization (1969)).

2.17. Contract management and contract administration

Contract management and contract administration have some factors in common. Both skill sets call for a deep understanding of how contracts work and how both parties can fulfill their obligations under such legal agreements. The key difference lies in the timing of these tasks. Contract administrators’ work out how the contract is worded before the parties agree to the arrangement, while contract managers make sure that each party has the capabilities to carry out their contractual obligations after the agreement is signed.

2.17.1. Functions of Contract Administration

Many of the functions of contract administration involve the planning and development of contracts. These functions include an understanding of all the major components of the
contract. The components can include delivery dates, disbursement dates and amounts and terms to accept or dissolve the agreement. Contract administrators often will include the means by which to measure the performance of both parties to determine if they are meeting their obligations, as well as procedures to monitor the performance of both parties.

2.17.2. Construction Contract Administration (CCA)

Contract administration involves making decisions and the timely flow of information and decisions to enable completion of the project as required by the contract documents including review and observation of the construction project. This is important to the Owner and Consultant not only to determine that the work is proceeding in conformity with the contract documents, but also because it allows a final opportunity to detect any inaccuracies, ambiguities or inconsistencies in the design.

The objective of the CCA program is to improve construction contract administration by providing education related to the administration and enforcement of contract requirements during the construction phase of the project.

2.18. Problems of Contracting Practices in Public Construction Works

While the construction industry makes the above contributions and is the basis for national economic development, it is suffering for so many problems and difficulties to meet the national development objectives of developing countries. In these countries, the public sector is the main employer of the industry that forces most formally constituted contractors and consultants to rely on the public sector for work. This is mainly because the commercial or private sector is relatively undeveloped [United Nations Center for Human settlement (1984) and OFORI G. (1993)].

From the many other inter-related problems that are taken as causes for lack of any appreciable development of the domestic construction sector of the developing countries, two of these problems are reported to be use of inappropriate contract procedures and inequitable

2.19. **Challenges of Construction Management in Developing Countries**

A number of factors have been identified for the poor performance of projects in developing countries. Generally factor such as government policies, insufficient funds, withdrawal by donors, shortage of foreign exchange, inappropriate contract conditions, political priorities, poverty, socio-cultural conditions, corruption, low institutional and human capacity, and occurrence of unexpected events such as war, drought are considered to be the major factors behind the poor performance of projects in developing countries [(Jekale, 2004), (Andersen, 2008) and (Idoko, 2008)]. Subsequent paragraphs provide detail discussion of the challenges.

Projects in developing countries are highly influenced by their external environment [(Jekale, 2004)]. Moreover, the project environment in many developing countries is unstable and characterized by rapid change of markets, shift of funding sources, frequent change of government policies and the business environment. In addition, projects in those countries are affected by prevalence of corruption, war, drought and governments political priorities [(Alutu & Udhawuve, 2009), (Jekale, 2004)]. For example in Nigeria, the cost of construction materials was reported to have shown a 400% increase over a period of two years because of change in government policies (devaluation of its currency and inflation) (Sonuga etal,2002). Likewise, in Ethiopia inflation has increased in double digit and cost of construction has almost doubled in the last three years.

According to (Cusworth & Franks, 1993) “Most of the special problems of project management in developing countries is related to the environment, which can generally be attributed to the turbulence (the tendency of unpredictability) and rapid change in the project environment; and severe scarcity of resources in those countries”. These prevailing external factors are making the planning and generally management of project extremely challenging for the poorly trained highly constrained project managers in those countries.
2.20. **Factors Affecting Project Cost Performance**

The project cost is the amount of money that is required to complete all project activities (Abubeker, 2015).

Project cost has its proven importance as the prime factor for project success. In spite of its proven importance, it is not uncommon to see a construction project failing to achieve its goal within the specified cost. Cost overrun is a very frequent phenomenon and is almost associated with all projects of the construction industry (Turkey, 2011).

The lack of fulfillment of cost management functions often leads to project overruns producing an immediate impact on construction stakeholders.

2.20.1. **Definition Cost Overrun**

Cost overruns are defined as the excess of actual project costs over budgeted costs. The cost overburden is obtained by the estimated cost, final cost and the contract between a contractor and an owner. The difference between estimated and final cost is termed as the magnitude of the cost overrun of a project (Savita Sharma & Pradeep K. Goyal, 2014). According to Abubeker (2015) cost overrun is the amount by which actual costs exceed the baseline or approved costs.

2.20.2. **Causes of Cost Overrun**

There are several factors which affect the construction cost and various studies have been conducted to address these factors.

Okpala and Aniekwu (1988) studied the reasons of cost overrun in Nigeria Construction projects and found out that the price fluctuations, additional works, delays, fraudulent practices, shortening of the contract period, inaccurate estimates, were the main causes of cost overrun.

Mansfield (1994) also carried out a questionnaire survey among key stakeholders (contractor, consultant and client organizations) in Nigeria. From the study, it has been found that poor
planning, shortage of materials, imported materials, changes in site conditions, design changes were the main causes of construction delays and cost overrun.

According to Long (2008), mistakes in design or poor design are caused by the low-competence designer. The approved design or drawing process becomes low quality and ineffective, especially for those with government funded projects. The unrealistic design which found after the start of the construction projects has to change and it could lead to cost overrun.

The prime variables of cost overruns have been commonly identified as: unpredictable weather, inflationary material cost, inaccurate materials estimates, complexity of the project, contractor’s lack of geographical experience, contractor’s lack of project type experience, and non-familiarity with local regulations (Kaming et al 1997).

According to Frimpong (2003), improper planning and management experience limitation causes cost overrun. Poor site supervision and management and poor project management assistance contribute to the problem of cost overrun in construction projects. Poor site management reflects the weakness and incompetency of contractors. Skills and experience human resource is insufficient in site management (Long, 2008)

2.21. Impacts of Poor Time and Cost Performance

The construction industry is one of the most complex, fragmented industries referred as schedule and resource driven. In construction industry timely completion of project with the budgeted cost is a major criterion of project success.

Time and Cost overruns have obvious impact for the key stakeholders in particular, and in the construction industry in general. Delays and cost overruns in construction projects prevent the planned increase in property and service production from taking place, and this phenomenon in turn affects, in a negative way, the rate of national growth [Arditi, et al, 1985].

Different researchers have studied the impact of time and cost overruns related to time and cost performances. Aibinu and Jagboro (2002) studied the impact of construction time

overrun on project delivery in the Nigerian construction industry and identified five impacts; Cost overrun, dispute, arbitration; total abandonment; and litigation.

To the industry as a whole, cost overruns could bring about project abandonment and a drop in construction activities, bad reputation, and inability to secure project finance or securing it at higher costs due to added risks. All these consequences undermine the viability and sustainability of the construction industry.

The impact of time and cost overrun are not confined to the construction industry, but are reflected in the state of the overall economy of a country. Fetene (2008) has found out twenty main effects of cost overrun which are collected from the respondents of the questionnaire survey and desk study:

- Delay,
- Supplementary agreement,
- Additional cost, budget shortfall,
- Adversarial relationship between participants of the project,
- Loss of reputation,
- High cost of supervision and contract administration for consultants,
- The contractor will suffer from a budget shortfall of the client,
- Poor quality workmanship,
- Dissatisfaction by project owners and consequently by end users,
- Negative attitude towards the construction industry by the higher public authority and by the society as a whole,
- The contribution of the construction industry to the growth of the national economy of the country will be less,
- Cost overruns on construction projects prevent the planned increase in property and service production from taking place, and this phenomenon in turn affects, in a negative way, the rate of national growth
- Weakens the growth of the construction industry by eroding mutual trust and respect,
- Pours money unnecessarily to the project at hand at the expense of other new projects,

✓ Distorts fair and equitable resource distribution,
✓ Discourage investment, the investment in building construction by public clients will be less, hence the number of projects will decrease in the future,
✓ Creates skeptical outlook on appraisal of other new construction projects,
✓ Some project owners (clients) become reluctant to effect additional payments to contractors and they view the cost overrun as a fabricated matter. This will propel to delay the project and become a source of dispute among participants of the project,
✓ Creates frustration on stakeholders.

Poor time and cost performance doesn’t affect only stakeholders in the project, but also the building construction industry as a whole and consequently to the national economy of the country.

Table 1 The Challenges of Construction Industry

<table>
<thead>
<tr>
<th>Construction Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rising Costs</td>
</tr>
<tr>
<td>Wages</td>
</tr>
<tr>
<td>Materials &amp; Supplies</td>
</tr>
<tr>
<td>Productivity</td>
</tr>
<tr>
<td>Time delay</td>
</tr>
<tr>
<td>Capital equipment</td>
</tr>
<tr>
<td>Inflation</td>
</tr>
<tr>
<td>Time</td>
</tr>
<tr>
<td>Delivery of materials, supplies, &amp; equipment</td>
</tr>
<tr>
<td>Government restraints</td>
</tr>
<tr>
<td>Productivity</td>
</tr>
<tr>
<td>Changes</td>
</tr>
<tr>
<td>Design schedule</td>
</tr>
<tr>
<td>Quality</td>
</tr>
<tr>
<td>Design Criteria</td>
</tr>
<tr>
<td>Inspection</td>
</tr>
<tr>
<td>Lack of Skilled Workers</td>
</tr>
<tr>
<td>Supervision</td>
</tr>
<tr>
<td>Finance</td>
</tr>
<tr>
<td>Availability of Materials</td>
</tr>
</tbody>
</table>

Cost-Time-Quality Trade-offs

Source: Adapted from Barrie and Paulson 1992
CHAPTER THREE

3.0. RESEARCH METHODOLOGY

3.1. Introduction

The previous chapter discussed about the different issues on the building construction management challenges concerning cost management, time management, quality management, human resource management, procurement management, material management, and the construction activities took place in Ethiopia. It also tried to provide an in depth understanding of building construction management challenges by discussing the findings of other researches. This research presents the findings of the research conducted to investigate the key challenges of construction management in the building construction of the Addis Ababa Science and Technology University.

3.2. Type of Research

This research tried to identifying the key challenges of construction management in the building construction of the Addis Ababa Science and Technology University which was selected from the newly constructed, ten 3rd generations established by 2011G.C, Universities purposely selected and a hybrid of both qualitative and quantitative type were used because it is suitable for description and explanation of these challenges and simple statistical analysis of the output of the research to create clear understanding of the subject matter.

3.3. Type of Research Design

Data for the research were collected using both primary and secondary sources. The primary data was obtained through questionnaire directed to contractors, client and consultants that were involved in building construction of the Addis Ababa Science and Technology University project. The secondary data were also obtained from the internet, thesis, journals, books and different articles in published documents. The secondary data were used to get an insight of the problem and were used as criteria for developing and analyzing the primary data. In consideration of the nature of the research question, qualitative research method was
selected for this study as the research questions relates to the personnel attitude, opinion and view.

### 3.4. Research Techniques

This research focused on identifying the key challenges of construction management in the building construction of the Addis Ababa Science and Technology University which were supported by the attitude, opinion and view of client, contractors and consultants about the challenges to be conducted. Thus, the participants’ opinion and understanding were extracted using survey techniques by deploying structured, open ended questionnaires and interviews (unstructured).

### 3.5. Population/Participants of the study

The participants, out of which, the sample of one client, two consultants and ten contractors are potential respondents were taken by purposive sampling from one client, three consultants and forty contractors.

### 3.6. Sample Design

In this case, the entire participants/ *i.e.* client, contractors and consultants of the study area, the sampling frame, sampling unit, sampling techniques, and sample size were well defined to achieve the objective of the research for identifying the key challenges of construction management in the building construction of the Addis Ababa Science and Technology University.

### 3.7. The sampling Frame

To achieve the objective of the research one clients, two consultants and ten contractors were purposely selected from the total participants for collecting the data.

### 3.8. Data Collection

The data collection approach adopted for conducting this research includes both primary and secondary sources. Questionnaire, interview, and survey study provide the primary data for this
thesis while the secondary data sources include journals, internet sources, as well as reviewing related archival documents, correspondences and other related documents. These different methods of data collection have been used in order that the data or information obtained from one can be supplemented by the others whereby the collected data will give multiple evidences.

3.8.1. Questionnaire

Questionnaire provides firsthand information for the subject matter of a research as it is focused on issues which further serves as a survey to understand the main concerns and attitudes of respondents towards the problems. In this thesis, questionnaire was administered to some randomly selected stakeholders of the construction industry such as contractors and consultants. For the purpose of this thesis, a random sampling of these organizations was made and copies of the questionnaire were distributed to the selected firms.

3.8.2. Interview

Interview is one of the primary data collection methods which is flexible and adaptive way of investigating underlying motives of a subject in a way that self-administered questionnaires cannot. The interview undertaken for this thesis was based on structured style. This type of interview has a predetermined set of questions (generalized form of questionnaire) with a flexible order depending on what the interviewer perceives the subject matter by looking at the respondent capability and exposure or experience.

3.8.3. Secondary Data sources

Archival documents, correspondences and other related documents have been reviewed to understand the background of building construction problems and practices in public construction works. These secondary sources provide a general understanding of the subject area by presenting a wide range of ideas in the field which help to supplement other specific information obtained from the primary data sources.
3.9. Analysis of the Results

The research attempted to touch most of the relevant problems under the study that enables to appreciate all the concerned issues under the subject area. A descriptive statistical method has been used for the analysis of the data which provides a general overview of the results in order that some kind of interpretations and discussions can be made on the results. Moreover, reviewed literature was also used as one of the main backbone for the analysis of the findings. For summarizing of the collected data and to determine the number of responses belonging to each category, frequency tables and charts have been used.

Figure 1 Conceptual Framework of the methodology

- Determine type of Research Design and Techniques
- Determine Study Population and Sample Size
- Data Collection
  - Primary and Secondary data
- Analysis of the Result
CHAPTER FOUR

4.0. RESULTS AND DISCUSSION

4.1. Introduction

The results and discussion chapter is categorized into four parts in line with the objectives of this research as well as the sections of the questionnaires. This categorization helps to achieve objectives of the research. The first part tried to address the findings of the questions directed towards the sampled contractors for identifying the level of awareness their of building construction managements like the overall management process, time management, cost management, quality management, procurement management and human resource management. The second part focused on the findings of the questions directed towards the sampled consultants for identifying the building construction management control problems related with poor planning, material management, quality management, poor workmanship, project administration & contract management failure and the results are discussed. The third part is focused on the questions directed towards the client in order to identifying the overall building construction management problems and the results are discussed in detail. The fourth part of this section tried to present the summary of the results and discussions.

4.2. Constructors

Wikipedia, the free encyclopedia, defines building construction as the process of adding structure with walls to real property or construction of buildings. It further discuses that if this buildings are not designed and constructed by professionals they might lead to undesirable results such as structural collapse, cost overrun and disputes.

In the literature part, contractor can be defined as a person or an organization responsible for assembly of the materials and components required to produce the facility or to execute the works. Similar to the employer and engineer, the contractor is also identified in public works contract as a person or persons, firm or company to whom the contract has been awarded by the employer that include his personal representatives, successors and permitted assignees.


4.2.1. Building Construction Project Time Management

According to the literature, time management in construction project is crucial in order to accomplish the project on the specified period of time and it has also implication on the performance capacity of the contractors. Time management is the process of organizing and implementing a strategy related to the time required for work activities on a project. Effective time management is essential to successfully and efficiently meeting budget and program targets, as well as achieving profitability.

As discussed in the literature concerning time management, it says time management is critical to the setting of milestones and deadlines, for allocation of resources, and for determining the pricing of contracts and cash flow requirements. Therefore; contractors are expected to be aware of the time management.

In this section, the respondents were questioned about the whether their organization made an awareness of the importance of building construction time management in their respective organizations or not. The responses of such respondents were revealed that most of the organizations were made an aware of the importance of building construction time management. The following table 2 depicts the responses of the respondents while they were questioned whether they were aware of the concept of building construction time management or not. From the 10 respondents, 7 (70%) were aware of building construction time management. This implies that most of the contractors, 70%, aware about building construction time management.
Table 2 Awareness made about the importance of Building Construction Project time management

<table>
<thead>
<tr>
<th>Response for awareness made about the importance time management</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>7</td>
<td>70</td>
</tr>
<tr>
<td>No</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>I do not know</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: data from interviewees, 2017

Concerning the efforts made for the implementation of building construction time management in their respective organization, most respondents said that their organizations were made any effort in order to manage time for the achievement of their objectives. The figure 2 below shows 80% of the respondents were confirmed that their organization made any efforts for managing time in the building construction. This result implies the contractors were pay due attention in the building construction industry for the management of time accordingly.

Figure 2 Efforts made for managing time Building Construction Project

![Response for efforts made for managing time](image)

Source: data from interviewees, 2017

To identify the efforts those were made by the respective organization were either in the formal way or not, the researcher was asked the respondents in what manner did they make an effort. From the total respondents, 7 (70%) were answered that the efforts made for managing time in the building construction was in the formal way. Table 3 reveals the results of the responses. This indicates that the organizations were used the formal time management procedures for conducting their duties and responsibilities.

**Table 3 Effort made for formal time management of building construction**

<table>
<thead>
<tr>
<th>Responses for efforts made for formal time management.</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>7</td>
<td>70</td>
</tr>
<tr>
<td>No</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>I do not know</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: data from interviewees, 2017

As it was known the efforts made for time management in building construction has to be formal and it was already confirmed by the respondents. The researcher tried to investigate whether the organization has prepared a schedule (plan) for the project or not. Scheduling plays a significant role in the construction sectors. The research finding shows that about 7 (70%) of the contractors have prepared a schedule (plan) for the project; the other 2 (20%) has not prepared a schedule (plan) for the project to achieve the goal of project time management. The rest 1(10%) of the contractors has no idea about the prepared schedule (plan) for the project time management formally. The following figure 3 shows this result. This implies that preparation of a schedule (plan) for the given project is a critical part by following the formal way in order to know the progress of the project.
To have formal scheduling/planning of different activities for the intended building construction projects, a detailed WBS (work breakdown structures) have be developed. Table 4 indicates that the organizations use the WBS when defining the schedule activities. From the total respondents, 9 (90%) uses the WBS for defining the planning/scheduling activities. This implies most of the organizations exercise WBS in order to implement the scheduled activities accordingly.

**Table 4 Use of the WBS when defining the schedule activities**

<table>
<thead>
<tr>
<th>Responses for the use of the WBS when defining the schedule activities</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>9</td>
<td>90</td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>I do not know</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: data from interviewees, 2017
In the process of building construction \textit{i.e.} the actual implementation of the already identified and scheduled work breakdown structures by the contractors, the progress of the project management activities has be continuously monitored and controlled according to the developed schedule/plan. This is because to prevent the problems which will be happen during the actual work like delayance, complain, claim, and other related problems. Therefore, the researcher tried to find the practice of monitoring and controlling activities of the prepared work breakdown structures in the sampled organizations. Figure 4 shows the findings of such practice. From the total respondents, 6 (60\%), 3 (30\%) and 1 (1\%) use, not use and they don’t know the timely monitoring and controlling of the progress of the project activities respectively. This indicates that most of the organizations have a good practice of using the timely monitoring and controlling of the progress of the given project activities according to its work breakdown structures they developed for the achievement of the objectives.

\textbf{Figure 4 The progress of the WBS activities continuously monitored and controlled}

![Pie chart showing responses for the progress of the WBS activities continuously monitored and controlled](image)

Source: data from interviewees, 2017

Since we are living in the dynamic world, there is always a change. This situation is also applicable in the construction industry too. Some of the factors for these sudden changes in the construction industries are weather condition, political condition; environmental conditions and others related issues. These situations have direct impacts in the performance/progress of the construction projects which were already developed a work breakdown structures. Hence; the researcher tried to explore whether the organizations have to update the building construction project schedules according to the changes or not. In the table 5 below, 7 (70%) of the respondents update their schedules, 4 (40%) of the respondents not update their schedules and the rest 0 (0%) have no idea about the update of the schedules. This result indicates the major portion of the organizations have used updating of their schedule according to the change that occurred in the process of the activities which are appreciable.

**Table 5 Organization update the building construction project schedule.**

<table>
<thead>
<tr>
<th>Responses for update the building construction project schedule</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>7</td>
<td>70</td>
</tr>
<tr>
<td>No</td>
<td>4</td>
<td>40</td>
</tr>
<tr>
<td>I do not know</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: data from interviewees, 2017

4.2.2. Building Construction Project Cost Management

The construction cost is the fee which takes place during whole engineering construction, which means that construction enterprise regards construction project as an accounting objective, inclusive consumption of materials, component and fittings, amortization charge and rental expense of machines, the salaries and bonuses given to workers and all expenditures of construction organization. The construction cost of a project is a main cost of a project.

According to the literature cost management, if managed appropriately, is plays a significant role for the success of the construction projects.

In this section the implication of cost management by the sampled contractors for the accomplishment of the intended building construction in the study area was studied. The respondents were asked whether their organization made an awareness of the importance of building construction cost management or not. From the total respondents, 9 (90%) of them said that their organization made awareness and 1 (10%) of them said their organization did not made awareness about the importance of building construction cost management. The rest 0 (0%) of the respondents didn’t know about awareness made by their organization with regard to importance of building construction cost management. Figure 5 depicts the results of the response. This result indicates that the large proportion of the contractors/organizations pay an attention for the proper management of cost for the project that they were constructed for their client.

Figure 5 Awareness made about the importance of Building Construction cost management

![Pie chart showing the response for awareness about the importance of cost management.](source: data from interviewees, 2017)
Estimating the amount of project cost depending upon the prepared items for the given construction projects are mandatory. The organizations/contractors engaged in the construction of different buildings in study site were asked that whether they have prepared an estimation of the project cost or not. From the total respondents, 8 (80%) of them was prepared the cost estimation for each items and 2 (20%) of them were not prepared cost estimation for each items. This result was indicated in the table 6 below. The findings tell us the preparation of cost estimations for each items for accomplishing the building construction project were clearly undertaken by the large number of the organizations/contractors.

**Table 6 Prepared project cost estimation by the organizations**

<table>
<thead>
<tr>
<th>Response for prepared project cost estimation by the organizations</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>8</td>
<td>80</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>I do not know</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: data from interviewees, 2017

Preparing the cost estimation for the given construction project by itself is not an end. So that it needs an effort how to manage the already prepared cost estimation by the organization. The researcher was concerned about on this issue because simply having a cost estimation of different items for the project may not be properly applicable on the actual work. Therefore, knowing whether or not the organizations made any effort of managing cost in their construction projects were implied on the execution of work according to the estimated cost and production of the expected output as per the contract agreement they made with client. Based on this reality, the researcher asked the organizations about the effort they made of managing cost. The following figure 6 shows that from the total respondents, 5 (50%) of them was made an effort of managing cost in their construction projects and 3 (30%) of them was not made any effort of managing cost in their construction projects. The rest 2 (20%) did not know about any effort of managing cost made by their organization. This result inferred that
only having cost estimation was not enough but made an effort of managing the cost by the most of organizations were critical.

**Figure 6 Efforts made for managing cost by the organizations**

![Graph showing efforts made for managing cost by the organizations]

Source: data from interviewees, 2017

It is very important to know about the management of cost for the proper utilization of the allocated budget for the specific project activities. The client allocates the budget for each project according to the prepared work activities *i.e.* work breakdown structures. If there is a well-structured and implementable work breakdown structures prepared by the organizations/contractors, it will be too simple to manage the flow of budget/cost for each and every activities accordingly. Hence, questioning the organizations either using the work breakdown structures to estimate the project cost or not using it for proper management of cost was important. Out of 10 respondents, 8(80%) of them were used the work breakdown structures to estimate the project cost and 1(10%) of them were not used it. The rest 1 (10%) respondents did not know about it. Table 7 shows the result.
Table 7 The work breakdown structures to estimate the project cost by the organizations

<table>
<thead>
<tr>
<th>Response for estimating the project cost to work breakdown structures by the organizations</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>8</td>
<td>80</td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>I do not know</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: data from interviewees, 2017

As it was recognized the construction projects faced different constraints/challenges in the process of actual construction works like price escalation, design changes, climatic conditions, and other related factors. These challenges have impact on the already allocated budget for the construction projects unless a modification/update of budget was made on a regular basis by following the conditions of challenges. The organizations/contractors were expected to be alert for this situation. The respondents were requested that their respective organizations update the allocated budget on the regular basis for the achievement of the objective. According to their responses, 7 (70%) of the organizations update the budget on regularly and 2 (20%) of them were not update the budget on the regular basis. The remained 1 (10%) did not know about updating the budget regularly. The following figure 7 depicts the results. This finding indicates that the regular updating of the budget for the project plays significant roles for accomplishing the work.
Figure 7 Updating the budget on the regular basis by the organizations

Source: data from interviewees, 2017

Formulating the work breakdown structures, estimating the project cost and updating the budget on the regular basis for the success of the construction projects by itself were not enough. These actions should be supported by a continuous monitoring and controlling mechanisms of the cost of the project by the organizations/contractors. Because it was believed that proper monitoring and controlling of the project cost results in an efficient and effective utilization of the resources allocated for entire project activities. So any organizations/contractors have to implement this basic characteristic of the construction project in their activities. Out of 10 respondents those were questioned, 6 (60%) of them made an effort to monitor and control the project cost in their organizations and 3 (30%) of them were not made any such efforts. The remained 1 (10%) of the respondents did not know about to monitor and control the project cost. The results of the respondents were displayed in table 8 below. The implications of this finding indicates that efforts made for monitoring and controlling of the project cost is a fundamental issue for the success of the construction projects because most of the respondents made an effort.

<table>
<thead>
<tr>
<th>Response for effort made to monitor and control the project cost by the organizations</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>6</td>
<td>60</td>
</tr>
<tr>
<td>No</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>I do not know</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: data from interviewees, 2017

4.2.3. Building Construction Project Quality Management

Quality control in construction typically involves insuring compliance with minimum standards of material and workmanship in order to insure the performance of the facility according to the design.

Concerning quality the literature part said that a variety of different organizations are responsible for quality and safety control during construction. One common model is to have a group responsible for quality assurance and another group primarily responsible for safety within an organization. In large organizations, departments dedicated to quality assurance and to safety might assign specific individuals to assume responsibility for these functions on particular projects.

From the above paragraphs the quality management in the construction sector will ensure to have quality products if properly used by the contractors. Based on this fact the researcher asked the respondents different points about the building construction quality management that they employed in their organizations.

The respondents were asked the question “Is your organization performing building construction quality planning for the given project that means determining requirements and quality standards and strategies to meet quality objectives?”. For this question from the total
respondents, 6 (60%) of them said “Yes” and 4 (40%) said “No”. The rest 0 (0%) did not know about quality planning for the given project. Figure 8 below shows this result. The implication of the finding reveals that the most organizations have practice of quality planning for the success of the objectives.

**Figure 8 Performing qualities planning for the given project to meet quality objectives**

![Pie chart showing responses for performing quality planning](image)

**Source:** data from interviewees, 2017

Preparing and implementing building construction quality management policies, procedures and guidelines are prime tasks for any organization to be competent in this sector. Because quality matters for the building construction sectors and on top of this the clients need were to own the quality products. Therefore, the respondents were questioned about preparing and implementing building construction quality management policies, procedures and guidelines. Their responses were shown in the table 9 below. The response result indicates that 6 (60%) of them prepare and implement building construction quality management policies, procedures and guidelines, 3 (30%) of them not prepare and implement building construction quality management policies, procedures and guidelines and the 1 (10%) did not know about

This. It means there was a good practice of these activities i.e. preparing and implementing building construction quality management policies, procedures and guidelines.

Table 9 Preparing and implementing building construction quality management policies, procedures and guidelines

<table>
<thead>
<tr>
<th>Response for preparing and implementing building construction quality management policies, procedures and guidelines by the organizations</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>6</td>
<td>60</td>
</tr>
<tr>
<td>No</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>I do not know</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: data from interviewees, 2017

The periodical monitoring and controlling systems for different planned activities of the whole building construction projects used to identify the progress of the project according to the stated time frame/schedule and also used to indicate if there are problems while executing the building construction process. Even if the organizations/contractors preparing and implementing building construction quality management policies, procedures and guidelines for the given projects; appropriate and scheduled monitoring and controlling of the planned activities have to conducted by them for construction of quality products in our case quality building. Therefore, the researchers asked the respondents whether they were preparing building construction project quality monitoring and control plan or not. From total respondents, 7 (70%) of them were prepared building construction project quality monitoring and control plan, 3 (30%) of them were not prepared building construction project quality monitoring and control plan and the remained 0 (0%) were did not know about this issue. The following figure 9 depicts the results of the respondents. The implication of this result is the organizations/contractors were prepared and applied the monitoring and controlling of the activities in accordance with already set policies, procedures and guidelines for the
achievements of the project objectives and this also implied the quality management aspect employed in their organizations.

**Figure 9 Preparing building construction project quality monitoring and control**

![Pie chart showing response for preparing building construction project quality monitor and control plan by the organization]

Source: data from interviewees, 2017

For bringing the required quality of products as per the contract agreement made between the client and contractors, there must be the responsible quality control department and the right personnel assigned/hired in that organization. Because for clients, the quality issues were not be compromised. To know whether the sampled organizations/contractors assigned/hired the employees for the bringing quality product for the client or not, the researcher asked the contractors. The results of the respondents were displayed in table 10 below. Out of the 10 respondents, 6 (60%) were hired/assigned a quality department or employees in their organization and 3 (30%) of them were not hired/assigned a quality department or employees; the rest 1 (10%) of them did not know about the issue. Form the findings it is possible to observe that most of the organizations/contractors were hired/assigned a quality control department or employees.
Table 10 Hiring/assigning a quality department or employees by the organization

<table>
<thead>
<tr>
<th>Response for Hiring/assigning a quality department or employees by the organizations</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>6</td>
<td>60</td>
</tr>
<tr>
<td>No</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>I do not know</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: data from interviewees, 2017

In the literature, total quality control in construction typically involves insuring compliance with minimum standards of material and workmanship in order to insure the performance of the facility according to the design. For the purpose of insuring compliance, random samples and statistical methods are commonly used as the basis for accepting or rejecting work completed and batches of materials. Rejection of a batch is based on non-conformance or violation of the relevant design specifications. (Hinze, Jimmie W, 1997)

An implicit assumption in these traditional quality control practices is the notion of an acceptable quality level which is an allowable fraction of defective items. Materials obtained from suppliers or work performed by an organization is inspected and passed as acceptable if the estimated defective percentage is within the acceptable quality level. Problems with materials or goods are corrected after delivery of the product. (Skibniewski, M. and Hendrickson, C., 1983)

The above two paragraphs tell us the implementation of total quality control for the entire construction project are the most fundamental part in the construction sectors. In the above table 10, the large portion of organizations/contractors were hired/assigned a quality department or employees. This result by itself is not enough unless these organizations/contractors have to implement the total quality management system. To find out the implementation of the total quality management system to ensure the quality building construction product, the sampled respondents were questioned about this issue. The findings
shows that out of the total, 4 (40%) of them implementing TQM (Total Quality Management) in their organizations and 5 (50%) were not implementing TQM (Total Quality Management); the remained 1 (10%) of the respondents did not know about the implementation TQM (Total Quality Management) in their organizations. The respondents result was shown in the figure 10 below. The implication of this finding is the total quality management practices were not applied in the actual performance of the building construction projects in the study site and resulted in poor quality of products.

**Figure 10 Implementing TQM (Total Quality Management) by the organization**

![Response for implementing TQM (Total Quality Management) by the organizations](image)

Source: data from interviewees, 2017

Performing the building construction quality audit which means reviewing the processes to determine the project activities comply with organizations building construction project policies, processes, and procedures and quality requirements are in lined with the total quality management. The respondents were asked whether they perform quality audit or not. The research result in figure 11 below shows out of the total respondents’ 4 (40%) of them perform quality audit, 4 (40%) of them did not perform quality audit and the remained 2 (20%) of the respondents did not know about that they perform quality audit. This finding articulates that quality audit by the most of the organizations were poorly performed.
Figure 11 Performing building construction quality audit by the organization

Response for performing building construction quality audit by the organizations

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>20%</td>
<td>Yes</td>
</tr>
<tr>
<td>40%</td>
<td>No</td>
</tr>
<tr>
<td>40%</td>
<td>I do not know</td>
</tr>
</tbody>
</table>

Source: data from interviewees, 2017

4.2.4. Building Construction Project Human Resource (HR) Management

On the literature part human resources management (HRM) is defined as a management function concerned with hiring, motivating and maintaining people in an organization. It focuses on people in organizations. Human resource management is designing management systems to ensure that human talent is used effectively and efficiently to accomplish organizational goals.

The HRM is a back bone for the organizations and proper management of these human resources is also key part for the survival of the organizations. As mentioned on the above two paragraphs, implementing the HRM processes accordingly in the building construction projects results in the achievement/accomplishment of the organizational goals/objectives. Since for all construction management aspects like process management, procurement management, cost management, time management, quality management and other related management HRM is mandatory. Preparing the staffs planning and defining the required
skills, roles and responsibilities for the intended building construction projects by the organizations are fundamental. Therefore; the researcher asked the respondents concerning these issues. From the sampled respondents, 7 (70%) of them were prepared and defined staffing plan according to the required skill, roles and responsibilities for the project building construction project and 3 (30%) of the respondents were not prepared and defined staffing plan according to the required skill, roles and responsibilities for the project building construction project. The remained 0 (0%) of the respondents did not know about it. The respondents result was displayed in table 11 below and it implies that prepared and defined staffing plan according to the required skill, roles and responsibilities for the project building construction project by most of the organizations/contractors were exercised.

Table 11 Preparing and defining staffing plan according to the required skill, roles and responsibilities for the project building construction project

<table>
<thead>
<tr>
<th>Response for preparing and defining staffing plan according to the required skill, roles and responsibilities by the organizations</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>7</td>
<td>70</td>
</tr>
<tr>
<td>No</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>I do not know</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: data from interviewees, 2017

The preparation building construction project organization chart for each organization/contractors was also traced by the researcher through asking the respondents. The results shown in table 12 below indicates that out of the 10 respondents; 8 (80%) of them preparing building construction project organization chart, 2 (20%) of the respondents were not preparing building construction project organization chart and the rest 0 (0%) of them did not know whether the organizations/contractors preparing building construction project organization chart. The researcher observed that organizational chart prepared by the organization for the building construction is a good practice.
Table 12 Preparation building construction project organization chart by the organizations

<table>
<thead>
<tr>
<th>Response for preparation building construction project organization chart by the organizations</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>8</td>
<td>80</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>I do not know</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: data from interviewees, 2017

Frequent monitoring and controlling building construction project human resources, cost and time for the overall building construction projects used to recognize the progress of the project according to the stated resources on the contract agreement and also used to indicate if there are problems while executing the building construction process. In order to have the designed product at the end of the project completion period, a serious and timely monitoring and controlling activities of the building construction project by considering the resources (human, time and cost) are crucial. So tracing/identifying respondents who were conducted the monitoring and controlling of the different scheduled activities by using the available resources in the whole process of building construction at the study site were a big deal. Out of 10 respondents, 7 (70%) of them were made monitoring and controlling building construction project human resource, cost and time; 2 (20%) of them were not made monitoring and controlling building construction project human resource, cost and time and the remained 1 (10%) of the respondents did not know whether their organization made monitoring and controlling building construction project human resource, cost and time or not. Figure 12 depicts the response results. It is observed that the majority of the respondents were used the monitoring and controlling building construction project human resources, cost and time and this is also suggests that the resources (human, time and cost) management in the building construction projects are important.
Figure 12 Monitoring and controlling building construction project human resource, cost and time

<table>
<thead>
<tr>
<th>Response for Monitoring and Controlling building construction project human resource, cost and time by the organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>I do not know</td>
</tr>
</tbody>
</table>

Source: data from interviewees, 2017

4.2.5. Building Construction Project Procurement Management

The literature said that the procurement management follows a logical order. First, you plan what you need to contract; then you plan how you’ll do it. Next, you send out your contract requirements to sellers. They bid for the chance to work with you. You pick the best one, and then you sign the contract with them. Once the work begins, you monitor it to make sure that the contract is being followed. When the work is done, you close out the contract and fill out all the paperwork. Contract planning is where you plan out each individual contract for the project work. You work out how you’ll manage the contract, what metrics it will need to meet to be considered successful, how you’ll pick a seller, and how you’ll administer the contract once the work is happening. Any procurement activities that create a project delay or fall on the project critical path may require special attention.
Based on this concept of procurement management, the researcher tried to identify that whether the organizations/contractors involved in the building construction projects in the study area were implemented the procurement management or not according to the stated criteria in the contract agreement documents. The sampled respondents were questioned about the making of planning for procurement of goods and services needed for a building construction projects in their organization. Out of 10 respondents, 6 (60%) of them were make planning for procurement of goods and services needed for a building construction projects and 3 (30%) of the respondents were not make planning for procurement of goods and services needed for a building construction projects. The rest 1 (10%) did not know about it. The figure 13 below shows the answers of the respondents. The results of the finding implies that most of the organizations/contractors make planning for procurement of goods and services needed for a building construction projects so that the procurement management process were undertaken by the planned order.

Figure 13 Make planning for procurement of goods and services needed for a building construction by the organizations

Source: data from interviewees, 2017
Sometimes the proper procurement management process may not carry out as per the detailed specifications stated in the contract document because of different reasons. This leads to the poor output of products and results in disputes between the parties involved in the building construction processes. Therefore; the organizations/contractors should follow the structured procurement management process in order to come-up with the expected products. For having quality products for clients, the organizations/contractors try to develop and use a documented contract management/administration processes for the building construction projects and the researcher was concerned about this issues. The sampled respondents were inquired to know that they try to develop and use a documented contract management/administration processes for the building construction projects in their respective organizations. From the table 13 below, it could be easily understand that most of the respondents try to develop and use a documented contract management/administration processes. But 2 (20%) of them were not try to develop and use a documented contract management/administration processes in their organizations.

**Table 13 Develop and use a documented contract management/administration processes for the building construction projects by the organizations**

<table>
<thead>
<tr>
<th>Response for develop and use a documented contract management/administration processes for the building construction projects by the organizations</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>8</td>
<td>80</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>I do not know</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: data from interviewees, 2017

In all construction sectors in general and building construction projects in particular, there are the standardized and legally accepted procurement documents. In our case, the Public Procurement Agency (PPA) prepared these standard documents for any procurement processes. Thus, the organizations/contractors are enforced to use this document.

In the literature review, the procurement process can be described as the project procurement cycle reflects the procurement activities from the decision to purchase the material or service through to the payment of bills and closing of procurement contracts.

To explore about the use of the standard procurement documents for the building construction projects in the study area, the anticipated respondents were interrogated on this issue. The outcome of the responses were shown in table 14 below and from the table, 7 (70%) of them were used standard procurement documents for the building construction projects and 2 (20%) of them were not. The remained respondents i.e. 1 (10%) did not know about the issue. The implication of the finding is using the standard procurement documents by most of the organizations/contractors.

**Table 14 Using standard procurement documents for the building construction projects by the organizations**

<table>
<thead>
<tr>
<th>Response for using standard procurement documents for the building construction projects by the organizations</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>7</td>
<td>70</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>I do not know</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: data from interviewees, 2017

The monitoring and controlling systems for different planned activities of the whole building construction projects used to identify the progress of the project according to the stated time frame/schedule and also used to indicate if there are problems while executing the building construction process.

Though the organizations/contractors were using standard procurement documents for the building construction projects for the given projects as shown in the above table 14; the appropriate and planned monitoring and controlling the progress of the procurement process have to be used by them. The researcher tried to ask the sampled respondents concerning the
using of the monitoring and controlling the progress of the procurement process for the building construction projects in their organizations. Out of 10 respondents, 5 (50%) of them were used the monitoring and controlling the progress of the procurement process for the building construction projects, 3 (30%) of them were not used the monitoring and controlling the progress of the procurement process for the building construction projects and the rest 2 (20%) did not know about this issue. The results of the responses are shown in figure 14 below.

**Figure 14 Using the monitoring and controlling the progress of the procurement process by the organizations**

<table>
<thead>
<tr>
<th>Response for using the monitoring and controlling the progress of the procurement process by the organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>50%</td>
</tr>
</tbody>
</table>

Source: data from interviewees, 2017

The results of the analysis shows that most of the contractors involved in the building construction projects have awareness about the resources of building construction managements like cost, time, human resource, procurement, quality management; and this awareness were supported by making an effort for management of these to the practical building construction work to make their projects successful. On top of that most contractors were developed the work breakdown structures when defining the schedule activities for
managing the building construction projects as per the contract agreement they made. Moreover, the contractors were implemented the monitoring and controlling of the building construction project human resource, cost, time, quality and procurement management for the achievement of the stated objectives of the project. But there were some critical points that the contractors pay attention while they are performing the building construction processes like the quality issues.

4.3. Consultants

In the literature, consultants were described as a person who provides professional or expert advice in a particular field of science or business to either an organization or individual. As there is no legal protection given to the job title ‘consultant’, in theory, anyone can on a day wake up and decide to adopt the consultant title. Despite the broad definition that can be subsumed under the term consultant, there are in essence three characteristics that distinguish a consultant from other professions.

Firstly, a consultant provides expertise that a client lacks or support that a client is unable to fulfill. In return for their professional services, the consultant charges a fee. Secondly, a consultant operates independently from the client, implying that, from the respective consultant, there is no conflict of interests between the client's issue and the services. Thirdly, a consultant operates in a professional manner, which ranges from having the right qualifications to ensuring high quality service delivery and a solid internal operation.

Clients hire consultants because of the following reasons:

- consultants are independent and provide an objective view on dilemma's and solutions
- external consultants are less susceptible to internal politics and/or sensitive situations
- hiring consultants may in certain areas be cheaper than retaining the expertise in-house
- when firms find themselves short in capacity for projects/positions consultants can backfill
consultants can easier do the 'dirty work', i.e. take the decisions no one internally wants to make.

The major tasks of consultants are preparation of designs and specifications, preparation of the bidding documents according to the PPA, supervisions of the construction activities, preparation of payment certificates for the contractors as per the contract agreement, reporting the whole activities to the clients on timely basis, and other related activities.

In this section, the researcher took two consultants out of three who were engaged in the consulting services on behalf of the client and they were interviewed an open ended questions on the major problems which were manifested by all stakeholders (clients, contractors and consultants) and considered to be the challenges of the construction management in the building construction projects in the study site like planning/scheduling of the program, preparation of designs and specifications, quality and material management, human resource management, supervisions of the construction projects, payment preparation, project administration & contract management and finally they were requested to provide the possible solutions for the problems. The interviewed results were discussed below.

### 4.3.1. Planning/scheduling of the program

During the planning/scheduling stage, all work activities should be properly understood, and planned in detail to optimize the allocation of resources and reduce the potential for ‘unknowns’. Estimates can then be made of how long each activity will take. Concerning planning/ scheduling of the programs, the respondents said the following problems.

- There was no well detailed planning/scheduling of the programs. They planning of the programs were more of general.
- The planning/scheduling of the programs from the documents were not reliable and forecasted.
- Because of the poor documentations of planning the contractors were not always in line with the schedule.
- The contractors were not guided by the planning/ schedule most of the time. This was resulted in delayance of the projects as observed in the study site.
4.3.2. Preparation of designs and specifications

The literature section discussed on the specifications as general specifications of work quality which are available in numerous fields and are issued in publications of organizations such as the American Society for Testing and Materials (ASTM), the American National Standards Institute (ANSI), or the Construction Specifications Institute (CSI). Distinct specifications are formalized for particular types of construction activities, such as welding standards issued by the American Welding Society, or for particular facility types, such as the Standard Specifications for Highway Bridges issued by the American Association of State Highway and Transportation Officials. These general specifications must be modified to reflect local conditions, policies, available materials, local regulations and other special circumstances. (Skibniewski, M. and Hendrickson, C., 1983)

At the beginning of establishment of the university, the designs and specifications of the buildings were prepared by the consultant called MH-Engineering plc and the designs were low cost housing typologies.

The consultants responded that on their side they were prepared a designed and specifications as per the standards for the new buildings. Moreover once the designed were prepared, the concerned client will evaluate the designed by his staffs and by other senior professionals and then the designs and specifications will be implemented. But they said that the already designed buildings were of poor quality because such types of low cost housing typology building were not the right designs for the public higher educational institutions.

4.3.3. Quality and material management

In the literature part quality management described as quality control in construction typically involves insuring compliance with minimum standards of material and workmanship in order to insure the performance of the facility according to the design. In large organizations, departments dedicated to quality assurance and to safety might assign specific individuals to assume responsibility for these functions on particular projects. Specifications of work quality are an important feature of facility designs. Specifications of required quality and components represent part of the necessary documentation to describe a facility. Typically, this

documentation includes any special provisions of the facility design as well as references to generally accepted specifications to be used during construction. (Hinze, Jimmie W, 1997)

The answers of the respondents on these problems were:

- The sampled building construction materials presented by the contractors used for the constructions were least quality.
- The construction materials used for the construction were not delivered on time by the client.
- Poor contract management practice
- Poor storage systems of the construction materials and resulted in decreasing the quality of the materials.
- The provisions of the construction materials were not available and results in the delayance of the construction projects.
- Since all the building construction materials were supplied by the Addis Ketema Housing Development Project Offices and these materials like hollow concrete blocks (HCBs) were produced by small scale enterprises, the materials and quality management were not maintained because of capacity problems.
- In the previous construction building construction agreement concerning labors, it was stated that 60% of them from the contractors side and 40% of them from Micro and Small scale Enterprises (MSEs) which were resulted in poor quality and material management.
- The bidding process by itself contributes for the low quality and material management system because it favors for the least bidders and most of the time these least bidders were low capacity contractors. So they were not complete the construction project in time and as the expected quality.

4.3.4. Human resource management

In the literature HRM is expressed as the management of people in organizations. It comprises of the activities, policies, and practices involved in obtaining, developing, utilizing, evaluating, maintaining, and retaining the appropriate number and skill mix of employees to accomplish the organization’s objectives. The goal of HRM is to maximize employees’
contributions in order to achieve optimal productivity and effectiveness, while simultaneously attaining individual objectives (such as having a challenging job and obtaining recognition), and societal objectives (such as legal compliance and demonstrating social responsibility).

The HRM plays a significant role for the achievements of the organizational objectives. Any organizations were expected to be equipped with the relevant and appropriate skilled and non-skilled human resources.

In this section, the researcher interviewed the two consultants to identify the problems/challenges observed in human resource management. They mentioned the problems as:

- The contractors did not assign the right person/professional for the right activities.
- The low capacity of the contractors in the overall HRM.
- There were no enough and relevant professionals on the actual building construction process.
- They did not deploy the professionals as per the agreement they made.
- No sufficient professionals, both in quality and quantity, available.
- Poor performance.
- Low quality products.
- Delay of projects.

4.3.5. Supervisions of the building construction projects

Supervision of the building construction projects on timely basis used to know the progress of the projects, identify the problems if any and provide the corrective measures for the identified problems. The consultants were responsible for these tasks. They check that the contractors were undertaking construction projects according to the work breakdown structures and as per the contract agreement they made with the clients. In the meantime the consultants should aware /give report/ the client about the progress of the project.
For this, the sampled consultants were interrogated to list the challenges/problems they faced in the building construction process while they performed their tasks. They mentioned the following problems:

- The transport problems (lack of transport) for supervision.

4.3.6. Project administration & contract management

In the literature the functions of contract administration involve the planning and development of contracts. These functions include an understanding of all the major components of the contract. The components can include delivery dates, disbursement dates and amounts and terms to accept or dissolve the agreement. Contract administrators often will include the means by which to measure the performance of both parties to determine if they are meeting their obligations, as well as procedures to monitor the performance of both parties.

Contract management and contract administration have some factors in common. Both skill sets call for a deep understanding of how contracts work and how both parties can fulfill their obligations under such legal agreements. The key difference lies in the timing of these tasks. Contract administrators’ work out how the contract is worded before the parties agree to the arrangement, while contract managers make sure that each party has the capabilities to carry out their contractual obligations after the agreement is signed.

The significant problems described by the sampled consultants related with project administration & contract management in the building construction project of the study area were:

- Not completing the building construction project on time.
- Poor performance of the contractors.
- On time payment preparation problems.
- Time claim for justifying the problems.
- The workmanship problems.
- Poor documentation systems.
Improper use of the allocated budget.

4.3.7. The possible solutions for the above problems

The sampled consultants forwarded the following possible solutions.

- In preconstruction phase all the necessary documents have to be prepared i.e. designs and specifications as well as standard bid documents.
- The claims observed in the building construction project should be managed on time and in accordance with the agreed dispute resolution mechanisms.
- The deployed materials and workmanships should be in accordance with the signed contract agreement.
- The contract agreement has to be properly prepared and implemented accordingly.
- Measures should be taken to solve the problems.
- Avoid the low cost housing strategies for the public higher educational institutions.
- Select the high potential contractors for such types of building construction projects.
- Improve the documentation systems.
- The good relationship among the stakeholders (clients, contractors and consultants) should be established.

4.4. Client

In the literature it is worth mentioning that in many asset transfer projects the role of client may also be split. Projects can have different stakeholders and funders each of whom will have different requirements for being involved in the process of development and construction. It may be helpful to specifically consider the implications for the project of who take on the roles of 'Client' and 'Employer' at the construction stage.

The client has an important role in the process since they will appoint advisors, authorize work to take place, agree costs and timetable and appoint professionals to the project. Some projects will have a community organization or group as the client but may have difficulties with the role of Employer due to its liabilities. Client has the following role:

- Being responsible for the execution of the project from the initial idea to implementation.
- Choosing the players involved in all stages from design through construction to long term management.
- Ensuring that the needs of building users/customers are met.
- Ensuring that the relevant permissions are secured (planning etc.) in partnership with the professionals appointed to the project.
- May also be financier and eventual owner

Client is the one the stakeholders who own the products after the completion of the projects. Owners could be individuals, government, institutions, etc. In this research the client of the building construction project is Addis Ababa Science and Technology University (AASTU). The responsible office for managing these projects is the Addis Ababa Science and Technology University Project Office.

As the researcher gathered a number of information from contractors and consultants by different data collection tools, it was also essential to collect information from the client to have a clear image about the whole processes of the building construction in the study area. For this purpose, the researcher interviewed the AASTU Project Office staffs an open ended questions focused on the overall building construction management challenges observed by all stakeholders. The major challenges/problems mentioned were listed below.

- The serious human resource management problems.
- The absence of time management concepts by the contractors.
- Absence of quality management concepts and production of poor quality products/buildings.
- Even if the contractors have a work breakdown structures (WBSs), it was not in an organized manner and they did not perform the WBSs accordingly.
- The contractors have good plans/schedules; but it was only for the sake documentation.
- The contractors enter to the building construction process by least bid; but they did not complete the construction on time and on the allocated budget.
Most contractors received the advance payment but they did not use it for the actual purpose so that the construction results in delayance.

The contractors did not deploy the agreed staffs’ members on the actual construction.

High turnover of the staffs from the contractors because of the payments that they did not effect to the workers and no substitution of the staffs to fill the gap.

The contractors did not focus on the actual construction work.

Poor understanding of the construction works.

The consultants were not interpreted the work breakdown structures in detail and they did not strictly follow/supervise the construction work as well as they did not took the necessary measurement. The reasons for this were the capacity problems.

Our consultants were inefficient because they did not do the right work at the right time.

The consultants were not prepared the accurate and exact payment certificates so that there was the stack of the building construction.

The consultants were not prepared the full-fledged design and results in the redesign processes. So that the delayance of the project.

Poor decision making processes for the execution of the construction projects on time.

The consultants have no their own transportation systems.

The consultants were not deployed the required staffs on the actual construction site/office as the agreement they made with the client.

The consultants were not conducted appropriate supervisions of the building constructions because of this the crack of buildings, drainage problems, demolition some parts of the buildings, sanitary and electricity line problems were observed.

Poor communications among stakeholders.

Poor management of the projects because of shortage of staffs for the client project office.

Poor process of planning of the building construction activities observed in the client side.

The client underestimates the projects.

The client did not give the payment on time for the contractors.
4.5. Possible solutions forwarded by the stakeholders

As it were discussed above, the stakeholders forwarded the following possible solutions.

- In preconstruction phase all the necessary documents have to be prepared i.e. designs and specifications as well as standard bid documents.
- The claims observed in the building construction project should be managed on time and in accordance with the agreed dispute resolution mechanisms.
- The deployed materials and workmanships should be in accordance with the signed contract agreement.
- The contract agreement has to be properly prepared and implemented accordingly.
- Measures should be taken to solve the problems.
- Avoid the low cost housing strategies for the public higher educational institutions.
- Select the high potential contractors for such types of building construction projects.
- Improve the documentation systems.
- The good relationship among the stakeholders (clients, contractors and consultants) should be established.
- Building the capacity of the stakeholders’ attitude, skills, and knowledge about the whole building construction projects.
- The stakeholders’ should have their own transportation (services) for frequently following the progress of the project.
- Avoid the long process of payment modalities.
- The client should make a frequent follow-up of the performance of the consultants.
- The consultants should check and approve the performance the contractors work on timely basis according to the contract agreement they made with the client.
- The contractors should be committed to the work.
- The client should review the bidding document clearly in order to avoid ambiguity.
- The client should establish clear communication with the consultants and contractors.
- The contractors should give due attentions for quality product/buildings.
- The consultants and contractors should deploy the resources (professionals and machineries) as per the contract agreement they made with the client.
In the evaluations of the technical proposals during the bidding process, the client has to check the testimonies of the bidder in order to avoid forgery.

The client has to use the engineering estimations of plus or minus 20% in order to select the potential contractors.

The contractors should construct the buildings according to the specifications.
CHAPTER FIVE

5. CONCLUSIONS AND RECOMMENDATIONS

5.1. Introduction

For conducting this research, the researcher had raised three basic questions and also set the objectives which were to identify the main actors responsible for the challenges of building construction management; to identify different types of the challenges of building construction management; to identify causes of challenges of building construction management; to indicate the relationship challenges among consultant, contractors & owner/client; analyzing the identified building construction management challenges; and providing possible alternative solutions for the identified construction management challenge.

The literature review discussed about construction in general and the building construction is a complex array of interdependent activities that some would say is at best organized chaos. The very nature of construction introduces challenges typically not encountered in other industries. It was also indicated about the different building construction management issues like HRM, time management, cost management, quality control management, procurement management and other related issues.

Most building construction projects in Ethiopia fail to meet their objectives and the questionnaire was developed to ascertain if there were the serious building construction management challenges in this sectors. The developed questionnaires (close ended and open ended) and observation were supposed to cover all the basic research questions which were useful in fulfilling the research questions.

The results of the questionnaires and discussion of the findings were presented in line with the literature review in the previous section. In this section the conclusions derived from the research findings and the recommendations are presented.
5.2. Conclusions

1. Most of the contractors involved in the building construction projects have awareness about the resources of building construction managements like cost, time, human resource, procurement, quality management; and this awareness were supported by making an effort for management of these to the practical building construction work to make their projects successful.

2. Most of the contractors were developed the work breakdown structures when defining the schedule activities for managing the building construction projects as per the contract agreement they made.

3. Most of the contractors were implemented the monitoring and controlling of the building construction project human resource, cost, time, quality and procurement management for the achievement of the stated objectives of the project.

4. The most identified building construction management challenges were poor communications among stakeholders, poor management of the projects because of shortage of staffs for the client project office, poor process of planning of the building construction activities observed in the client side, the client underestimates the projects, on time supervision problems, the client did not give the payment on time for the contractors, capacity problems, the contractors enter to the building construction process by least bid; but they did not complete the construction on time and on the allocated budget, most contractors received the advance payment but they did not use it for the actual purpose so that the construction results in delayance, the contractors did not deploy the agreed staffs’ members on the actual construction, high turnover of the staffs from the contractors because of the payments that they did not effect to the workers and no substitution of the staffs to fill the gap, the contractors did not focus on the actual construction work, and etc.
5. The solutions for the identified challenges were also forwarded by the stakeholders. Some of the solutions were the claims should be managed on time and in accordance with the agreed dispute resolution mechanisms, the deployed materials and workmanships should be in accordance with the signed contract agreement, the contract agreement has to be properly prepared and implemented accordingly, measures should be taken to solve the problems, avoid the low cost housing strategies for the public higher educational institutions, select the high potential contractors for such types of building construction projects, improve the documentation systems, good relationship among the stakeholders (clients, contractors and consultants) should be established, building the capacity of the stakeholders’ attitude, skills, and knowledge about the whole building construction projects, avoid the long process of payment modalities, and etc.

5.3. Recommendations

The followings are the main recommendations that need due attentions to be given in order to alleviate the building construction management challenges.

1. Building the capacity of the stakeholders’ attitude, skills, and knowledge about the whole building construction projects.
2. Frequent supervision, monitoring, controlling and evaluating the performance of the contractors on the building construction projects should be conducted based on the prepared work breakdown structures in order to prevent the building construction management challenges.
3. In the evaluations of the technical proposals during the bidding process, the client has to check the testimonies of the bidder in order to avoid forgery.
4. The client has to use the engineering estimations of plus or minus 20% in order to select the potential contractors.
5. The claims observed in the building construction project should be managed on time and in accordance with the agreed dispute resolution mechanisms.
6. The consultants should check and approve the performance the contractors work on timely basis according to the contract agreement they made with the client.

7. The client should establish clear communication with the consultants and contractors.

8. The consultants and contractors should deploy the resources (professionals and machineries) as per the contract agreement they made with the client.

9. Improve the documentation systems for evaluating the progress of the building construction projects.
REFERENCE


5. Annual Progress report, Ethiopian Federal House of parliament, 2011/12


34. United Nations Development Program Human Development Index. Retrieved from https://data.unpd.org/dataset/Population-urban-of-population-/p2kf-c3hg browsed as at 08/03/2014


37. WUBISSET J. (2004) Performances for Public Construction Projects in (Least) Developing Countries Norway; NTNU