ASSESSMENT OF PROJECT PERFORMANCE: CASE OF 40/60 SAVING HOUSE DEVELOPMENT ENTERPRISE IN ADDIS ABABA BOLE AYAT LOT II

MSc. THESIS

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May, 2018

DECLARATION

I hereby, declare that this MSc research project, entitled "**Assessment of Project Performance: Case of 40/60 Saving House Development Enterprise in Addis Ababa Bole Ayat Lot II**" is my original work and has not been presented for a degree in any other university, and all sources of material used for this thesis have been duly acknowledged.

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This is to certify that the MSc research project, entitled "**Assessment of Project Performance: Case of 40/60 Saving House Development Enterprise in Addis Ababa Bole Ayat Lot II**" is submitted in partial fulfillment of the requirements for the degree of MSc with specialization in construction technology and management the graduate program of the school of civil engineering and has been carried out by ALIYA ABDOSH ID No-PGCOT 235/07 under my supervision. Therefore I recommend that student has fulfilled the requirement and hence hereby can submit the thesis to the school of civil engineering.

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SGS Approval	Signature	Date

Final approval and acceptance of the thesis is contingent upon submission of the final copy of the thesis to the School of Graduate Studies (SGS) through the Department/School Graduate Committee (DGS/SGC) of the candidate's department.

Stamp of SGS **Date**_____

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DEDICATION

I dedicate this work to my Dad, Abdosh Ibrahim and Mom Ayni Zekeriya

&

to my Husband Omer Sherif and my Daughter Meryem Omer

ABBRIVATTION

AAIHDP	Addis Ababa Integrated Housing Development Program
GNP	Gross National Product
GTP	Growth and Transformation Plan
HCB	Hallow Concrete Block
IHDP	Integrated Housing Development Program
KPI	Key Performance Indicator
MSE	Micro Scale Enterprise
MUDHC	Ministry of Urban Development Housing and Construction
MWUD	Ministry of Work and Urban Development
PPE	Project Performance Evaluation
RII	Relative Importance Index
SMEs	Small and Micro Enterprise

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ABSTRACT

Construction industry has complexity in its nature because it contains large number of parties as clients, contractors, consultants and other stakeholders. Construction projects suffer from many problems and complex issues in performance such as cost, time and quality. The aim of this thesis is to identify and evaluate the main factors affecting the performance of construction projects in the case of Bole Ayat 40/60 condominium. Literature reviews about performance were sited to identify the factors affecting the performance of construction projects. The methodology/research design followed was descriptive research. A questionnaire survey was conducted and 44 factors were identified, categorized, evaluated and ranked from small and micro enterprises, client, consultants and contractors perspectives. The results were analyzed and discussed to obtain the most performance indicators. The relative importance index (RII) method was used here to determine perceptions of the relative importance of the performance indicators in construction projects. The extremely significant factors affecting time performance were shortage of material, financial problem and poor communication and coordination with RII 0.75, 0.74 and 0.71 respectively. Whereas the factors affecting cost performance were fluctuation in the cost of material, lack of cost planning and design change with RII 0.77, 0.693 and 0.691 respectively and factors affecting quality performance were educated and experienced personnel, quality of materials and equipment used in the project with RII 0.81, 0.72 and 0.69 respectively. Recommendations were formulated to improve performance of construction projects. It was concluded that every party participating on the project should have good communication and coordination to avoid design discrepancies and disputes to improve performance; they should have to hire qualified personnel to overcome any technical and managerial problems.

Key terms: - Project performance, cost, time, quality, 40/60 saving house development enterprise, condominium

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

Construction is a vital sector contributing significantly to the economics of all countries. Construction industry plays a major role in development and achievement goals of the society; it is considered as one of the largest industries and contributes to about 10% of the gross national product (GNP) in industrialized countries (Navon, 2005). Generally construction works are increasing rapidly to meet the growing needs of the population and to keep up with global development.

Construction project development involves numerous parties, various processes, different phases and stages of work and a great deal of input from both the public and private sectors, with the major aim being to bring the project to a successful conclusion. The level of success in carrying out construction project development activities will depend heavily on the time, cost and quality of the managerial, financial, technical and organizational performance of the respective parties, while taking into consideration the associated risk management, the business environment, economic and political stability (Takim and Akintoye, 2004).

Construction industry is sophisticated and has complexity in its nature because it contains large number of parties as client, design professionals which consist of architect, civil and structural engineer, and etc., construction professionals which are formed by main contractors and sub-contractors, supplier, surveyor and etc., stakeholders, shareholders and regulators. These parties can affect the performance of the project through many related topics and factors such as time, cost, quality, client satisfaction, productivity and safety. There are many realistic reasons that affect the performance of a project like, amendment of drawings and amendment of the design. In addition, there are other different reasons affecting construction projects performance such as poor management and leadership, inappropriate participants, poor relations and coordination, absence of motivation, control, monitor or decision making systems, inadequate infrastructure, political problems, cultural problems and economic conditions. It is widely believed that the

performance of projects consist of the performance of all stages with each other to result in the final performance according to time, cost and quality (Mutaz, 2015).

The development in the construction industry is increasing in size, technological complexity, interdependencies and variations in demand from the client. The scope of construction industry is very wide, including residential construction; commercial building constructions, irrigation, roads, tunnels, transportation, facility building, and heavy engineering construction refer to infrastructure construction and industrial construction that need specialist expertise and contribute substantially to the economic growth of country. Success criteria which relate to construction project often changes from project to project depending on participants, scope of services, project size, and sophistication of the owner related to the design of facilities, technological implications, and a variety of other factors (Mutaz, 2015).

Ethiopia has embarked on a long-term development strategy which aims at achieving sustainable economic development with all pre-requisites for a middle income country by the year 2025 E.C (GTP, 2010& PASDEP, 2000). This envisages creation of a strong, diversified, resilient and competitive economy that can effectively cope with the challenges of development and that can easily adapt to the changing market and technological conditions in the regional and global economy. The priorities identified as the essential catalyst for the attainment of the Vision 2025 objective include development of infrastructure as an important ingredient towards attainment of faster economic growth.

Expansion of economic infrastructure (railways, roads, telecom, power, irrigation) being critical towards achieving the country's Growth and Transformation Plan (GTP). Significant amount of the country's budget is allocated to economic development through financing infrastructures for development of educational and power projects, construction of railways and road projects which increased road network density, construction of health projects, access for water and Sanitation infrastructure (Hailemeskel, 2013).

The construction industry of Ethiopia has contributed much in reduction of poverty, in increasing employment expansion through small and medium enterprise development and job

creation through the construction of low cost houses in Addis Ababa which was subsequently replicated to other regional states (MoWUD, 2010/11).

Providing house for low and middle income group is one of the components of Urban Development program in poverty reduction scheme. The government of Ethiopia initiated the Integrated Housing Development Program in order to reduce this shortage of housing and provide a house that meets the minimum standards (kitchen, toilet and bath facilities) to low and middle income people and achieve its target in reducing poverty. To this end, the construction of condominium houses is under way.

1.2. Condominium Construction in Ethiopia

The word "condominium" comes from two Latin words meaning common ownership or control. It describes a legal form of ownership and not a type of building or residence (Hawaii RealEstate Commission, 2009). As defined in the Encyclopedia Britannica "condominium is a multiple-unit dwelling in which there is separate and distinct ownership of individual units and joint ownership of common areas." In the Condominium Proclamation Number 370/2003 of the Federal Democratic Republic of Ethiopia, it defines it as a building for residential or other purposes with five or more separately owned units and common elements, in a high-rise building or in a row of houses, and includes the land holding of the building.

In Ethiopia the concept of Condominium house as a separate form of ownership was not familiar until 2003. In 2004, the government of Ethiopia considering provision of houses as one of the major developmental tasks in reducing poverty and improving the livelihoods of slum dwellers; and thereby bringing sustainable socio-economic development, established a National Integrated Housing Development Program under the Ministry of Works and Urban Development (MWUD) later renamed as the Ministry of Urban Development, Housing and Construction (MUDHC, 2005 E.C).

The Integrated Housing Development Program (IHDP) is a government-led and financed housing provision program for low-and middle-income households in Ethiopia. Within the IHDP, specific projects are undertaken on either brown-field sites or slum areas that are cleared and residents re-housed. The common attribute of each project is that it has developed different

typology of condominium housing: multi-storied housing units for several households where communal areas are jointly owned and managed (MUDHC, 2013). Achieving the IHDP objective i.e. construction of Condominium housing for low and middle income group requires huge resources investment. This implies that stronger financial resource management is required to ensure that every cent of public money is spent on the intended purposes. Resources that are needed in the construction of condominium housing include not only finance but also materials and human resources. These resources should be properly managed so that the government intention of availing affordable housing to the poor, one of the poverty reduction strategy is achieved.

Low- cost housing means housing at low cost for all section of the population or it means that from the given physical resources of funds, materials, land, and skills one should able to build the maximum number of houses of good quality at affordable cost i.e. building houses at lower cost as compared to the prevailing cost level. This low cost housing construction (condominium) is started because of a high increase in urbanization accompanied by poverty and housing shortage. In the year 2004, the City government as major mitigation measure to address the problems of housing and poverty launched a strategic plan: the Addis Ababa Integrated Housing Development Program (AAIHDP).

Accordingly, the project involves emerging contractors and small-scale contractors and small and micro scale enterprises (SMEs) for the main construction works and the provision of prefabricated construction material respectively. The Housing Development Project Office is responsible for managing and administering of the project with the assistance of consulting firms engaged in the project as advisor and supervisors (UN-HABITAT 2011).

Recently, the government has started implementing a new housing project in Addis Ababa which is divided into four different categories based on payment modalities: 10/90, 20/80, 40/60 and housing association. The payment modality for the last one (housing associations) necessitates hundred percent upfront settlements, while the others incorporate 10, 20 and 40 percent down payment by individuals mixed with a long-term mortgage plan (Ebisa, 2014).

1.3. Statement of the Problem

The development of construction industry through the years have made construction projects become more difficult to achieve the project objectives. Previous studies shown and proved that the failure of any project is mainly related to the problems and failure in performance. Ethiopia as a country has witnessed a substantial increase in the number of stalled building construction projects due to inappropriate project organization structures, poor project management and ineffective leadership (Abera and Fekadu, 2016).

Currently, 38,709 condominium units are under construction on 12 sites. However, due to poor capacity of contractors and consultants, and inadequate government supervision, most of the projects are lagging behind schedule (http://www.capitalethiopia.com/). (Accessed on November 7, 2016). Thus performance failure in construction of condominium is creating projects that have cost overrun, delayed completion period and poor quality. Unless a systematic approach of controlling project performance is formulated and awareness created, the consequences can be costly and lengthy, with the worst outcomes often leading to undesirable litigation engagements and this will continue to affect condominium projects and may significantly affect future condominium construction endeavors. This thesis is therefore an attempt to address the performance of 40/60 condominium construction projects in order to assist owners, consultants and contractors to overcome performance problem and to improve performance of their construction projects.

1.4. Research Questions

1. How is the construction of 40/60 saving house development enterprise performing in terms of cost, time and quality?

2. How does 40/60 saving house development enterprise is affected in terms of cost?

3. How does 40/60 saving house development enterprise is affected in terms of time?

4. To what extent quality influence the performance of construction projects in 40/60 saving house development enterprise?

5. What are the key challenges of poor project performance in 40/60 saving house development enterprise?

1.5 Objective of the Study

1.5.1. General Objective

The general objective of this research is to assess the performance of 40/60 saving house development projects in Addis Ababa Bole Ayat lot II.

1.5.2. Specific Objectives

- To identify factors affecting project performance in 40/60 saving house development projects in Addis Ababa Bole Ayat lot II.
- To identify key performance indicators in 40/60 saving house development projects in Addis Ababa Bole Ayat lot II.
- To investigate the impact of poor project performance in 40/60 saving house development projects in Addis Ababa Bole Ayat lot II.
- To assess the status of 40/60 saving house development enterprise projects in Addis Ababa Bole Ayat lot II.

1.6. Significance of the Research

The government of Ethiopia is investing significant amount of resources to implement the big and ambitious project of condominium housing construction project. The program aims at achieving the targeted development projects i.e. housing supply for the low income population, mitigating urban slum expansion, increasing job opportunities for small and micro enterprises (SMEs) and unskilled laborers and improving wealth creation and distribution of the nation. Therefore, with this study primarily Ministry of Construction, AAIHDP, construction industries, contractors, condominium registrants and the country at large are beneficiary parties. The second merit of the study goes to the university academics. Since there are few studies in the area, it will give a starting point for more studies in condominium project performance.

1.7. Scope of the Study

In Addis Ababa, the capital city of Ethiopia, the building construction sector is growing rapidly. Besides that, the ongoing and planned condominium construction projects are much greater than other cities. Therefore, for this study Addis Ababa condominium construction projects undertaking by government; in particular 40/60 condominium was considered.

As the research population is too large it is because of cost and time constraint it was impossible to cover all sites of 40/60 projects located all over the country. Therefore, in-depth investigation is vital to identify current condominium building construction performances thus this research will focus on Bole Ayat lot II of which twenty contractors are involved in construction of 48 building blocks and one consulting firm.

1.8. Limitation of the Study

During the research work, there were a number of constraints. Some of the major limitations are mentioned as follows:

- Apart from limited time and budget available for the study, the data collection was limited to Bole Ayat. It is nevertheless hoped that it will be sufficient to give an overview of the major factors of project performance in the case of 40/60 saving house development enterprise
- Unavailability of a literature on the subject matter specifically on the context of problems on 40/60 condominium building projects in Addis Ababa.

1.9. Organization of the Study

The research paper is organized in five chapters. The first chapter covers introduction part of the study that includes background of the study, statement of the problem, study area, research questions, and objectives of the study, significance of the study, scope of the study and limitation of the study. Chapter two dealt with review of related literatures on construction projects performance. Chapter Three includes methodology, which is assumed as a soul of a research; chapter four covers data analysis and interpretation. Finally, conclusions and recommendations is presented in the last chapter.

CHAPTER TWO

LITERATURE REVIEW

2.1. 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, office and etc. According to Wikipedia the free encyclopedia (Accessed on May, 12 2018), construction is a process of constructing a building or infrastructure. Construction is the recruitment and utilization of capital, specialized personnel, materials, and equipment on a specific site in accordance with drawings, specifications, and contract documents prepared to serve the purposes of a client. According to Moavenzdadeh, (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 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.

A project is a temporary endeavor undertaken to create a unique product, service or result (PMI, 2008). According to Hillson, (2009), all projects are risky and there are three separate reasons for that. The first reason is that all projects share common characteristics which inevitably introduce uncertainty. Some of this common characteristics are projects are unique, complex, involve assumptions and constraints, performed by people and involve change from a known present to an unknown future. The second reason is that all projects are undertaken to achieve some specific objectives. The final reason is all projects are affected by the external environment they exist in.

A building construction project, like any other project, also faces different risks throughout the life of the project. According to Nafishah, (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.

Construction can be considered as a vital sector contributing significantly to the economics of all countries. The construction industry must be dynamic to be able to respond to the changes that the world is constantly facing, as well as the social, economic, and technological challenges affecting all industries. It highly contributes to the growth and development of the economy in developing countries like Ethiopia (Wells. 2001; Moavenzdadeh, 1976). According to these studies, the construction industry plays a major role in developing countries since it constitutes a significant portion of gross national product and employment; at least three-quarters of the world's construction workers are in the less developed countries.

2.2. Performance

Performance can be considered as an evaluation of how well individuals, group of individuals, organizations or systems have done in pursuit of a specific objective. These objectives vary significantly, but from an organizational perspective, they generally revolve around satisfying the key stakeholders, notably customers, employees, shareholders, the various suppliers, government and society as a whole. Mullins (2005) described performance as relating to such factors as increasing profitability, improved service delivery or obtaining the best results in important areas of organizational activities. Performance in the construction context may be approached from two perspectives; the first relating to the business performance of organizations and the second relating to project performance. The former is normally assessed using financial results and ratios, and productivity figures (Mbugua, 2000). Other more comprehensive self-assessment tools such as the balanced record Kaplan and Norton, (1992), pyramid of measures Lynch and Cross, (1995) and the business performance measurement framework Mbugua, (2000) are also available for use in assessing the business performance of

construction organizations. In many cases, references to performance and research in this genre have been focused on project performance (Soetanto et al., 2001; Xiao and Proverbs, 2003). Primarily, this can be linked to the characteristics of the industry whereby each project can represents a major part of a contractor's annual turnover, and can be the ultimate determinant of a construction organization's business performance. References to performance in this review therefore generally relate to project performance, and to the extent to which performance measures are met.

2.3. Performance of Construction Projects

To perform is to take a complex series of actions that integrate skills and knowledge to produce a valuable result (Elger, 2008). Project performance has been defined as the degree of achievement of certain effort or undertaking which relates to the prescribed goals or objectives that form the project parameters (Ahmad et al, 2009). The key requirements of suitable performance measures and measurement frameworks are identified as, having a few but relevant measures, being linked with critical project objectives, providing accurate information, and comprising financial and non- financial measures (Ankrah & Proverbs, 2005). There are many potential measures of performance for evaluating the success of a construction project. All address performance in three key areas: scope, schedule and budget (Alvarado et al, 2005). Akintoye and Takim (2002) discovered seven project performance indicators, namely: construction cost, construction time, cost predictability, time predictability, defects, client satisfaction with the product and client satisfaction with the service and three company performance indicators. Namely: safety, profitability and productivity.

2.4. Measuring Project Performance

Performance measurement is defined as the process of evaluating performance relative to a defined goal. It provides a sense of "where we are and, more importantly, where we are going:" (Rose, 1995). Rose further stated that measurement can guide steady advancement toward established goals and identify shortfalls or stagnation. Willis and Willis (1996) maintained the importance of measuring performance because it will indicate status and direction of a project.

It is widely accepted view that, at a minimum, performance measures of a project are based on time cost and quality (Barkley and Saylor, 1994). Atkinson (1999) noted that these three components of project performance as the 'iron triangle' i.e. cost, time and quality.

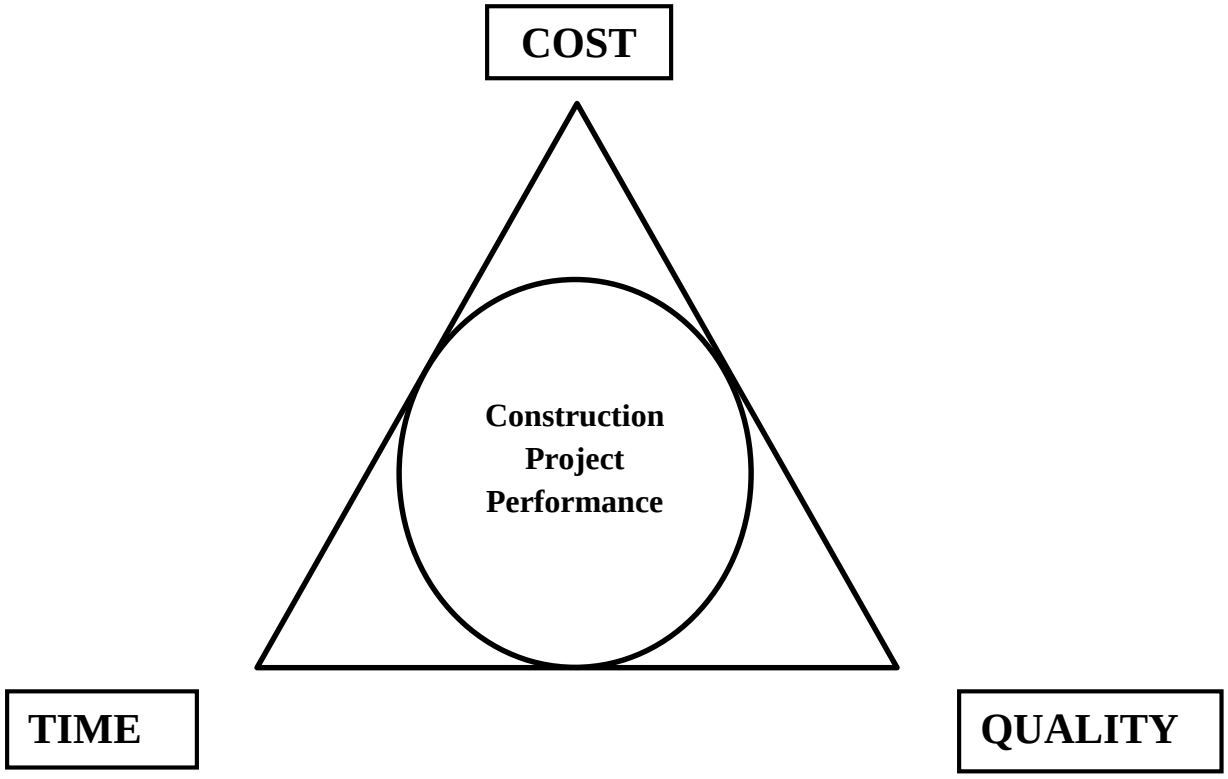


Figure 1: The iron triangle of construction project performance measurement (Atkinson, 1999)

The purpose of performance measurement is to help organizations understand how decision-making processes or practices led to success or failure in the past and how that understanding can lead to future improvements. Karim and Marosszeky, (1999) stated that performance measurement systems have been one of the primary tools used by the manufacturing sector for business process re-engineering in order to monitor the outcomes and effectiveness of implementation. Evaluation of framework to measure the efficiency of building project management by using conventional economic analysis tools such as time, cost and quality (Adams, 2000).

The performance measurement is a complex issue that normally incorporates at least three different disciplines: economics, management and accounting. Measurement of performance

has garnered significant interest recently among both academics and practitioners, and also remarked that the choice of a suitable measurement technique depends on a number of factors, including the purpose of the measurement; the level of detail required; the time available for the measurement; the existence of available data; and the cost of measurement (Tangen, 2004). Performance measurement is needed not only to control current projects but also to update the historic database. Such updates enable better planning of future projects in terms of costs, schedules, labor allocation, etc. measuring the performance of any construction project is a very complex process because modern construction projects are generally multidisciplinary in nature and they involve participation of designers, contractors, subcontractors, specialists, construction managers, and consultants. With the increasing size of the project, number of participants in the project also increases. The objectives or goals of all participants need not be same even in a given project. Hence to measure performance of a project without specifying the participant and without specifying the criteria for judging the performance holds no meaning. Past researchers have employed different criteria such as compliance to schedule, cost and quality to judge the project performance (Iyer and Jha , 2005).

Cheung, (2004) stated that New South Wales Public Works Department in Australia launched a Project Performance Evaluation (PPE) framework, which covers a wide range of performance parameters. PPE parameters are communication, time, cost, quality, safety, claims and issues resolution, environment, contract relations. The main purpose of PPE is to extend project performance measures to cover soft parameters also, such as communication and dispute resolution.

2.4.1. Cost as performance indicator

Cost is defined as the degree to which the general conditions promote the completion of a project within the estimated budget (Bubshait and Almohawis, 1994). Curt,(2005) argued that the cost management system tracks current spending and commitments and predicts ultimate cost outcome. Fetene, (2008) found that the most common effects of cost overrun were delay, supplementary agreement, adversarial relations among stakeholders, and budget shortfall of project owners which guides efforts to improve the performance of the construction industry in the future.

Aftab et al, (2010) stated that fluctuation in price of material, cash flow and financial difficulties faced by contractors, shortage of site workers, lack of communication between parties, incorrect planning and scheduling by contractors are most severe factors while frequent design changes and owner interference are least affecting factors on construction cost performance. Amusan, (2011) discovered from the analysis that factors such as contractor's inexperience, inadequate planning, Inflation, incessant variation order, and change in project design were critical to causing cost overrun, while project complexity, shortening of project period and fraudulent practices are also responsible.

Baloyi and Bekker, (2011) discovered that the increase in material cost is the single largest contributor to cost overruns for both global and pitches projects. Mrema and mhando, (2005) found that in most cases, distortion of clients to assume roles of their consultants through making decisions and changes that affect the design and the project cost has undermined the efforts to attain the intended goals. Shaban, (2008) stated that the most important factors affecting the performance of construction projects agreed by the owners, consultants and contractors were: materials shortage; availability of resources as planned through project duration; leadership skills for project manager; escalation of material prices; availability of personals with high experience and qualification; and quality of equipment and raw materials in project.

2.4.2. Quality as performance indicator

In the construction industry, quality is defined as the totality of features required by a product or services to satisfy a given need, or fitness for purpose (Parfitt and Sanvido, 1993). In other words, the emphasis of quality in construction industry is on the ability to conform to established requirements. Requirements are the established characteristics of a product, process or service as specified in the contractual agreement and a characteristic is any specification or property that defines the nature of those products, processes or services, which are determined initially by the client. In order to achieve a completed project that meets the owner's quality expectations, all parties to a project must acquire an understanding of those expectations, incorporate them into the contract price and other contract documents to extend possible, and commit in good faith to carry them out (Ganaway, 2006).

Curt, (2005) stated that the quality management system monitors and analyzes quality of the constructed product and predicts quality problems and issues. Typical quality measures include: (i) Quality control tests: number performed, frequency and percentage passed/failed, number of non-conformance issues, number of change requests and root causes, cost of rework, number of exceptions at turnover and cost of quality

(ii) Quality Assurance Cost (cost of resources): quality assurance cost as a percentage of construction cost, Cost of Quality and Cost of Quality as percentage of construction cost.

Lepartobiko, (2012) stated that quality can be assured by identifying and eliminating the factors that cause poor project performance. Jha & Jha, (2006) found that the project manager's competence and top management support are found to contribute significantly in enhancing the quality performance of a construction project. Lack of contractor experienced topped the quality related cause of project failure. Ling and Bui, (2010) discovered that major enablers that lead to project success are government officials inspecting the project and very close supervision when new construction techniques are employed. A factor which leads to poor performance is the lack of accurate data on soil, weather, and traffic conditions.

2.4.3. Time as performance indicator

Time is money to owners, builders, and users of the constructed facility. It is very important for construction projects to be completed on time, as the clients, users, stakeholders and the general public usually looks at project success from the macro view where their first criterion for project success appeared to be the completion time (Lim and Mohamed, 2000). From the owner's perspective there is lost revenue by not receiving return on investment, cash flow crunch, potential alienation and loss of clients/tenants, extended interest payments, and negative marketing impacts. From the users' perspective, there are financial implications similar to owners (Bob & Muir, 2005). Aje, et al, (2009) showed that contractors' management capability has significant impact on cost and time performance of building projects. Wiguna and Scott, (2005) showed the critical risks affecting both project time and cost perceived by the building contractors were similar. They were: high inflation/increased material price, design change by owner, effective design, weather conditions, delayed payments on contracts and defective construction work. With respect to time delays the most significant contributing factor for global

projects was late delay in payments while for the stadia projects design-related factors caused the most delays (Baloyi & Bekker, 2011). Iyagba, (2010) identified the factors that contribute substantial detrimental effect to project performance, thus affecting the integrity of the construction industry.

2.5. Project Success and Project Performance

Project success is almost the ultimate goal for every project. Success of construction projects depends mainly on success of performance. Many previous researches had been studied performance of construction projects. Reichelt and Lyneis, (1999) remarked three important structures underlying the dynamic of a project performance which are: the work accomplishment structure, feedback effects on productivity and work quality and effects from upstream phases to downstream phases. Thomas, (2002) identified the main performance criteria of construction projects as financial stability, progress of work, standard of quality, health and safety, resources, relationship with clients, relationship with consultants, management capabilities, claim and contractual disputes, relationship with subcontractors, reputation and amount of subcontracting.

Cheung, (2004) stated that construction time is increasingly important because it often serves as a crucial benchmarking for assessing the performance of a project and the efficiency of the project organization. For each of the project goals, one or more Project Performance Indicators is needed. Cheung et al, (2004) identified project performance categories such as people, cost, time, quality, safety and health, environment, client satisfaction, and communication. It is obtained by Navon, (2005) that a control system is an important element to identify factors affecting construction project effort. Ugwu and Haupt, (2007) remarked that both early contractor involvement and early supplier involvement would minimize constructability-related performance problems including costs associated with delays, claims, wastages and rework, etc. Control system is an important element to identify factors affecting construction project effort. For each of the project goals, one or more Project Performance Indicators is needed. Generally performance of construction projects plays a main role in the success process of the projects.

Project success is the completion of a project within acceptable time, cost and quality and achieving client's satisfaction. Project success can be achieved through the good performance of indicators of the project. So, success refers to project success and performance refers to performance of indicators such as project managers. Al-momani, (2000) stated that the success of any project is related to two important features, which are service quality in construction delivered by contractors and the project owner's expectations. Managing the construction so that all the participants perceive equity of benefits can be crucial to project success. It is obtained that the complete lack of attention devoted to owner's satisfaction contributes to poor performance, also low efficiency and productivity can lead to poor performance. The success of construction projects depends up on technology, process, people, procurement, legal issues, and knowledge management which must be considered equally. The focus of most studies of project success is on dimensions of project success (how to measure it) and factors influencing project success (Pheng and Chuan, 2006).

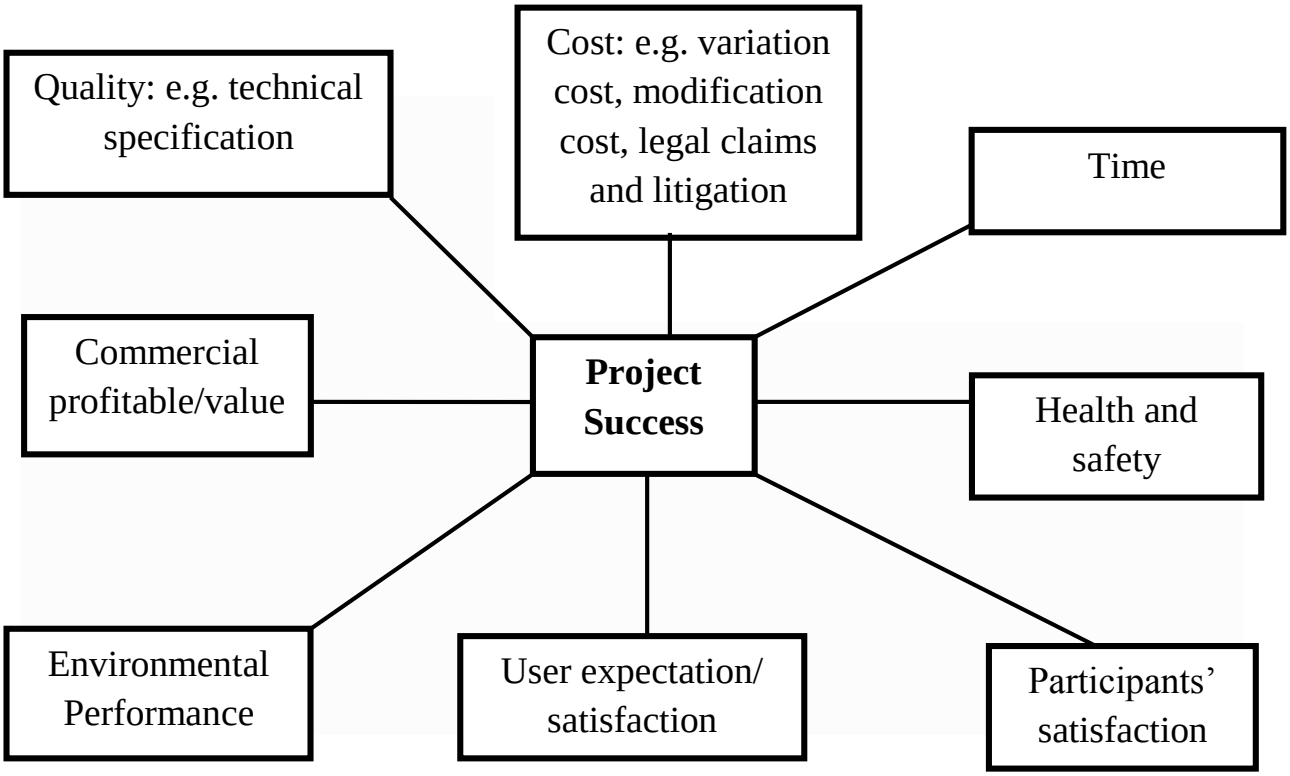


Figure 2 The consolidated framework for measuring project success (Chan, Albert 2001)

2.6. The Use of Performance Assessment in Ensuring Favorable Outcomes

The PMI, (2004) recommends five distinct but interrelated project management process groups: initiation, planning, execution, monitoring and closing process groups. Monitoring and controlling is central to project management processes. Monitoring and controlling is the process necessary for collecting, measuring, and disseminating performance information, and assessing measurements and trends to effect process improvement. When this is done continuously, the body of knowledge suggests, it will provide the project team insight into the health of the project and highlights any areas that require additional attention. The main activities in monitoring and control include:

- Monitoring the ongoing project activities against the project management planed the project performance baseline.

- Influencing the factors that could circumvent integrated change control so that only approved changes are implemented. In particular, the measurement and evaluation of performance are central to control posing four basic questions (Shaw, 1999):

- What has happened?

- Why has it happened?

- Is it going to continue?

- What are we going to do about it?

The first question can be answered by performance measurement. The remaining ones will depend on the information from assessing the performance of the project for management to take decisions and actions. The information about what is really happening is vital for the project management team and other stakeholders to determine with considerable certainty what to do. Thus, assessing the performance of project throughout its lifecycle is one of the major ways of achieving the objectives of the project and to ensure better performance. In addition, it is a means of ensuring improvements in executions. Improvements in project execution within a construction industry will then be one of the key indicators of a construction industry of a country. Within the construction sector, mostly in the developed countries, various frameworks

exist for the measurement of project success or failure. This also includes which factors are influencing the performance of the projects (Shaw, 1999).

2.7. Criteria for Assessing Project Performance

Patanakul and Milosevic, (2009) grouped their measurement criteria into three:

I. criteria from organizational perspective: Resource productivity, Organizational learning
II. criteria from project perspective: time-to-market, Customer satisfaction and
III. criteria from personal perspective: personal growth, personal satisfaction.

Sadeh et al, (2000) proposed a division of project success into four dimensions. These are: Meeting design goals, benefit to end user, benefit to the development organization, benefit to the defense and national infrastructure, in that order. Finally, Freeman and Beale, (1992) provided technical success, efficiency of project execution, managerial and organizational success, personal growth, completeness, and technical innovation as the main success criteria. Taking from the often quoted adage Peter Drucker of performance management: "if you cannot measure, you cannot manage", it is also true that: if you cannot measure appropriately, you cannot manage appropriately.

2.8. Benchmarking of Projects Performance

For continuous improvement to occur, it is necessary to have performance measures which check and monitor performance, to verify changes and the effect of improvement actions, to understand the variability of the processes, and in general, it is a necessary to have objective information available in order to make effective decisions. Tolosi, (2000) defined benchmarking as a process which continuously measures the products, services and operational practices of a given organization to compare the organization's performance and operational practices with a selected sample group. In addition to create a basis for comparison, benchmarking is a good development tool because it enforces a self-critical approach, indicating the points of operation the company must improve. However, benchmarking must be used with caution, and its design as a tool of analysis must be thoughtfully considered in order to achieve accurate and meaningful indicators. Benchmarking helps companies to define the best possible indicators for comparison and to obtain a picture of the company's entire operation. Therefore, benchmarking is a useful

tool for evaluating a company. Augusto, (2006) stated that the effective performance cannot be achieved without challenges and obstacles. To meet these challenges and overcome these obstacles, an organization must have a clear understanding of its performance in relation to its competitors. To accomplish this task, an organization must have an organizational benchmarking system which is occupied with analytical models designed to measure multifaceted performance characteristics and parameters. The results presented how business organizations may locate their position against competition, reduce their weak points and determine which characteristics will improve their global performance. This gives the ability to identify the most critical improvement actions and adopt the best practices of the industry.

Benchmarking and performance measurement service for the evaluation and comparison of scheduling techniques. Presented how benchmarking approach can be applied to evaluate and improve the construction project management. A conceptual research framework was generally developed to perform a benchmarking study of the project management performance (PMP) from the contractor's viewpoint. It was remarked that benchmarking approach can help construction firms to learn from the best practices of others and carry out continuous improvement (Cavalieri, 2007).

2.9. The Theory of Performance

The Theory of Performance develops and relates six foundational concepts to form a framework that can be used to explain performance as well as performance improvements. To perform is to produce valued results. A performer can be an individual or a group of people engaging in a collaborative effort. Developing performance is a journey, and level of performance describes location in the journey. Current level of performance depends holistically on six components:

- context,
- level of knowledge,
- levels of skills,
- level of identity,
- Personal factors and fixed factors.

Three axioms are proposed for effective performance improvements. These involve a performer's mindset, immersion in an enriching environment, and engagement in reflective practice (Elger, 2008)

Performance advancing through levels is shown in figure 3 where the labels "Level 1," "Level 2," etc. are used to characterize effectiveness of performance. That is, a person or organization at Level 3 is performing better than a person or organization at Level 2. As shown on the right side of figure 1, performing at a higher level produces results that can be classified into categories:(i) quality increases—results or products are more effective in meeting or exceeding the expectations of stakeholders produce a result goes down; amount of waste goes down, (ii)capability increases—ability to tackle more challenging performances or projects increases,(iii) capacity increases—ability to generate more throughput increases, (iv) knowledge increases—depth and breadth of knowledge increases,(v) skills increase—abilities to set goals persist, maintain a positive outlook, etc. increase in breadth of application and in effectiveness and(vi) identity and motivation increases—individuals develop more sense of who they are as professionals; organizations develop their essence.

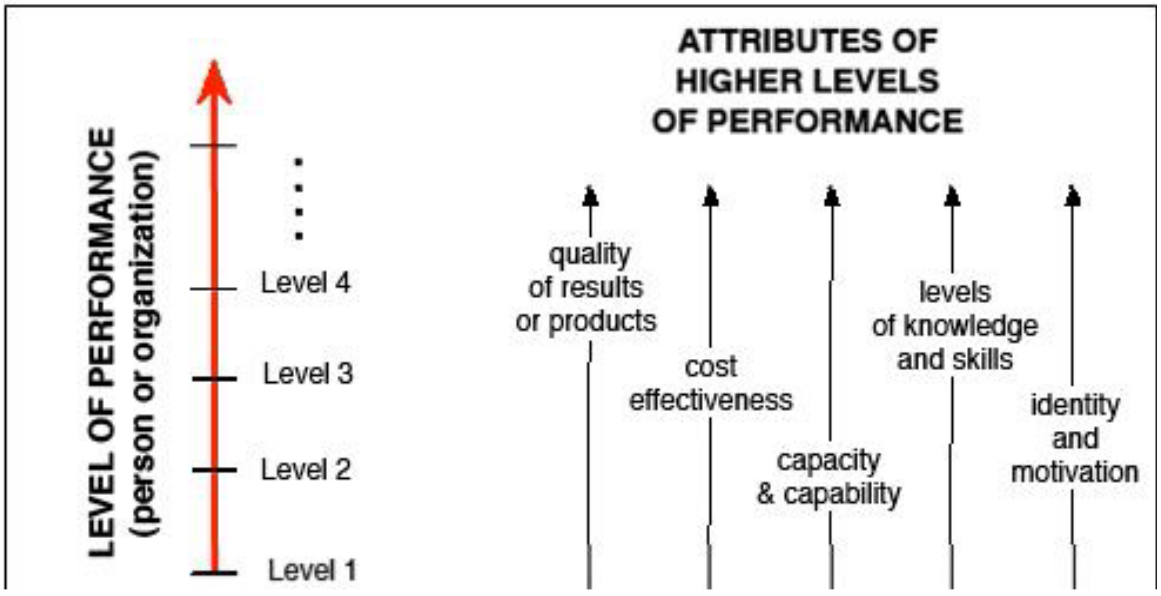


Figure 3 performance advancing through levels (Elger, 2008)

2.10. Factors Impacting Project Performance

Controlling project time and costs requires a proactive attitude. The ability to anticipate and ward off potential project disruptions is a basic characteristic of the successful construction manager. However, even when the project team applies all of the tools and techniques available to them, most projects will still be derailed somewhere along the way. Practically every job will experience time delays, cost overruns, or quality failures during the course of construction (Jackson, 2002).

As making a perfect plan is hard, it is virtually impossible to predict and anticipate every possible occurrence that could cause a hiccup in our scheme. So problems are inevitable. Therefore, it is a good idea to know in advance where these glitches might come from. There are a number of factors that can influence our job performance. Some of them are beyond our control, and some of them are a result of poor management or lack of foresight. The factors listed below and explain how they can influence project performance (Jackson, 2002).

2.10.1. Weather conditions

Weather is probably the most common and most obvious reason for work slowdown resulting in cost overruns. Work proceeds much more slowly under adverse weather conditions, and such conditions can impact the quality of the work as well (Jackson, 2002).

2.10.2. Quality of the workforce

As a general contractor who hires subcontractors, the contractor does not really have any control over the subcontractor's workforce. Therefore the contractor have to trust that the subcontractors will provide experienced workers on the job. Therefore, all subcontractors should be pre-qualified. The risks associated with poor work quality are significant. If there is a problem, the poor quality will result in rework, and rework slows down job progress and can impact safety. The potential losses due to poor quality can put the entire project in a tailspin, and if this occurs, the project manager must take immediate steps to mitigate the situation (Jackson, 2002).

2.10.3. Quality of the supervision

Obviously, if there is no proper supervision on the job, there are going to be problems. Many issues have to be addressed every single day on the job, and everyone looks to the manager for

direction and clarification regarding those issues. If there is an inexperienced manager who is not up to speed on the project, the type of work, or the systems in place to manage the project, there will be a disaster, plain and simple (Jackson, 2002).

2.10.4. Incorrect sequencing of work

Unfortunately, there are times when pressure from an owner or from the main office can cause a manager to schedule work out of sequence and before it is ready, just to satisfy some unrealistic demand for action. But no one knows better than the superintendent and the field personnel how the work needs to be scheduled to keep things on track. Sometimes a work activity is initiated just to give the appearance of making progress when in reality these artificial starts just waste time and cause all kinds of havoc on the job. If this occurs too often, the inefficiencies will eventually show up and expose the real story (Jackson, 2002).

2.10.5. Change orders

Change orders can be one of the most insidious factors influencing project performance. A little change here or there often seems like no big deal. Many contractors fail to ask for additional time when they process the cost of the change, thinking that they can wiggle the extra work into the existing schedule. (Jackson, 2002).

2.10.6. Overcrowded job site

One of the things that can actually hinder work productivity is having too many people on the job. The researcher has heard more than one subcontractor complain about packing too many workers in tight quarters trying to get a job done. They end up getting in each other's way and tempers can flare. It becomes so counterproductive that it actually slows down the job instead of speeding it up as planned (Jackson, 2002)

2.10.7. Defective materials

Discovering that the material or equipment planned to install was defective is a real problem. It is certainly one that can be avoided with proper quality control. But in some cases, this defective material is not discovered until the workers are on the job ready to start the project. By this time, it is way too late. The time has already been wasted and it will take time to reorder the material and reschedule the crews to install it (Jackson, 2002).

2.10.8. Inadequate tools and equipment

Having the right tools and equipment on a construction job may seem like a no-brainer. But again, when so much of the work of the contract is passed on to subcontractors, contractors don't always have control over even these simple aspects of the job (Jackson, 2002).

2.10.9. Late deliveries

Late deliveries are probably one of the most frustrating causes of schedule delays and cost growth in construction. Once again, the contractor has very little influence or control over the manufacturing or fabrication processes involved in the making of many of the products or equipment used on the project. However, the stakes can be very high for the project if items arrive late. That's why on projects with critical lead-time items, it is best to assign someone to do nothing but expedite deliveries and stay on top of the project buyout schedule (Jackson, 2002).

No matter how well planned, estimated, and scheduled the job to go a certain direction; these are just a few of the things that can easily impact the project's outcome in a negative way. Some of them seem trivial and yet they are exactly the kinds of things that can get cost, time, and quality off track in a hurry. As a construction manager, one must be forever vigilant and on the lookout for disruptions and inefficiencies that will derail the plans. Potential problems can never be avoided, but having some idea about how different factors can affect the job will give a head start when trying to correct course after a problem does hit (Jackson, 2002).

2.11. Factors Affecting Cost and Time Performance

One of the most important problems in the construction industry is time and cost overruns. Time and cost overruns occur in every construction project and the magnitude of these delays and cost overruns varies considerably from project to project. So it is essential to define the actual causes of time and cost overruns in order to minimize and avoid the delays and increasing cost in any construction project. Time overruns is defined as the extension of time beyond planned completion dates traceable to the contractors. Delays are incidents that impact a project's progress and postpone project activities; delay causing incidents may include weather delays, unavailability of resources, design delays, etc. In general, project delays occur as a result of

project activities that have both internal and external factors surrounded the project. Cost overrun is defined as excess of actual cost over budget. Cost overrun is also sometimes called "cost escalation," "cost increase," or budget overrun. It's the difference between the original cost estimate of project and actual construction cost on completion of works of a commercial sector construction project. A number of unexpected problems and changes from original design arise during the construction phase, leading to problems in cost and time performance. It is found that poor site management, unforeseen ground conditions and low speed of decision making involving all project teams are the three most significant factors causing delays and problems of time performance. It is remarked that effective communication, fast information transfer between project participants, the better selection and training of managers, and detailed construction programs with advanced available software can help to accelerate the performance (Chan, 2002).

2.12. Factors Affecting Quality Performance

This process is needed in this stage to make sure that what is produced by the team is exactly what had been agreed upon with the client or customer. Quality management is needed not only in this phase but throughout the project. At this point it is important to ensure that expectation of our work is what was planned from the beginning. The factors that affect process quality in the three phases (design, construction, and operation) of the lifecycle of a building project are identified and ranked by degree of importance. The perceptions of long-time practitioners are obtained by means of a questionnaire survey. The findings indicate that management commitment to continuous quality improvement, management leadership in promoting high process quality; quality training of all personnel, efficient teamwork to promote quality issues at the corporate level, and effective cooperation between parties taking part in the project are generic factors that affect process quality. Industry-specific factors that are perceived by practitioners to enhance the quality of the building process include drawings and specifications that are consistent, designers and contractors that are selected on merit, communication practices between the parties that are effective, inspection of quality on the construction site that is diligent, a building operation manual that is thorough, and an adequate operation & maintenance budget that is planned as early as in the design phase (Arditi and Gunaydin, 1998).

2.13. Performance Indicators

In UK, a project performance measurement tool referred to as the Key Performance Indicators (KPIs) was developed by the KPI working group under the UK Construction Industry. These working groups on Key Performance Indicators (KPIs) have identified ten parameters for benchmarking projects in order to achieve a good performance in response to Egan's report (1998). These indicators, are construction cost, construction time, defects, client satisfaction with the product and service, profitability and productivity, promote result-orientated thinking, whereas predictability of design cost and time, and predictability of construction cost and time, and safety can be regarded as process-orientated thinking and the three major steps in implementing KPIs are as follows: Decide what to measure, Collect data and calculate the KPIs. There are no suggestions for performance indicators in benchmarking projects at the project selection phase i.e., analysis stage, when the client and end-user's requirements need statements and the delivery strategy are determined. In addition, the perspective of the 'project' and 'supplier' is not clearly indicated. None of the measures mentioned in this section could identify the performance of suppliers in a project environment. According to Dvir et al., 2002), the output of the requirements at the analysis stage will most likely determine the output of the entire development process. They indicate that the origination and initiation phase, in which major decisions are made, such as decisions on the project's objectives and planning the project's execution, has the most influence on the project's success. The issue is much more serious when the kind of activities that should be undertaken depends on the outcome of earlier activities. It is therefore important to identify parameters (performance indicators) for benchmarking projects at the project selection phase in order to achieve good project performance. Posten, (1985), who found that 55% of all defects in R&D projects occur during requirement analysis and specification, earlier documented this position, whereas 43% of all defects are not found until after the testing stage. It is not surprising that the same situation is applicable to construction projects.

The purpose of the key performance indicator (KPI) is to enable measurement of project and organizational performance throughout the construction industry (KPI working group,2000) advocates that the process of developing KPIs involved the consideration of the following factors:

- ✓ KPIs are the general indicators of performance that focus on critical aspect of outputs or outcomes
- ✓ Only a limited, manageable number of KPIs is maintainable for regular use. Having too many (and too complex) KPIs can be time and recourse consuming.
- ✓ The systematic use of KPIs is essential as the value of KPIs is almost completely derived from their consistent use over a number of projects.
- ✓ A large sample size is required to reduce the impact project specific variable. Therefore KPIs should be designed to be used on every building project
- ✓ For performance measurement to be effective, the measure or indicators must be accepted, understood and owned across the organization.
- ✓ KPIs will need to evolve and it is likely that a set of KPIs will be subject to change and refinement.
- ✓ Graphic displays of KPIs need to be simple in design, easy to update and accessible.

With these factors in mind, a range of KPIs to measure the performance of a construction project is developed, both objectively and subjectively. With reference made to chan's (1996;1997) and Naoum's (1994) earlier research, each KPI will be discusses in detail and practical approaches to measure these KPIs will be introduced. The measures of the suggested KPIs are mainly divided in to two groups. The first group is to use mathematical formula to measure the critical quantitatively. Formula will be presented after the detail explanations of each KPI, such as time, cost value, safety and environmental performance. The other group criteria are based on subjective options and personal judgment. This group includes the satisfaction of client, users and other key participants, the functionality of building and quality. Figure 5 provides a pictorial presentation of the KPIs.

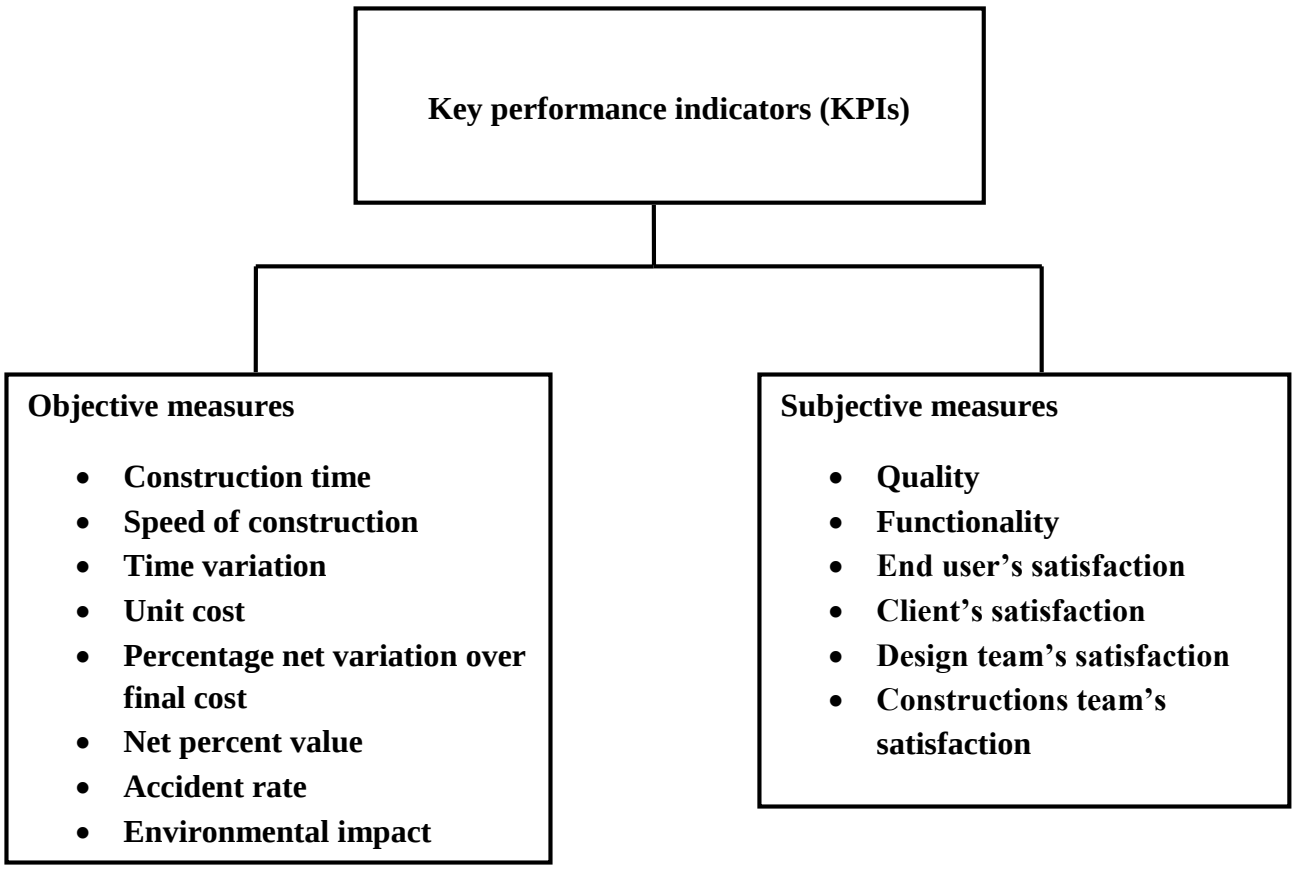


Figure 4: Pictorial Presentation of the KPIs (chan's (1996; 1997) and Naoum's (1994))

2.14. Previous Research Review Based on Identifying Factors Affecting Construction Performance

Mbugua et al. (1999) reviewed the various financial factors like Liquidity, Efficiency, Profitability, Growth and nonfinancial factors like Leadership, Process quality, Human Resource, Customer focus and satisfaction that influence construction business as well as the critical success factors (CSF) associated with construction business.

Takim et al. (2002) indicated that the successful construction project performance can be divided along three orientations procurement, process and result orientations.

Enshassi et al. (2009) conducted research on factors affecting the performance of local construction projects and their relative importance. Mainly three recommendations to improve project were suggested 1) project owners must work collaboratively with contractors 2) project

participants should actively have their input in the process of decision- making and 3) continuous coordination and relationship between project participants.

Dadzie et al. (2009) identified factors affecting the performance of consultants on government projects. The most affecting factors to the performance were indicated urgency of the project at hand, project duration in terms of time spent in getting the work done, political influence from higher authority affecting project delivery, timely decision making on the part of the consultancy team and the experience of the design team on the project.

Peter et al. (2011) found some characteristics of the numerous factors, especially with regarded to the performance of Small Scale-Building Contractors (SSBCs). Judging from the findings it was concluded that the variables influencing performance of SSBCs could be linked to two main underlying issues, namely 1) fiscal policies, and 2) managerial capacity.

Enshassi et al. (2011) evaluated the questionnaire survey conducted on the main factors affecting the performance of construction projects in the Gaza Strip. The most important factors which affect the performance of construction projects were average delay, availability of resources, leadership skills of project managers, escalation of material prices, availability of personnel with high experience and qualification, and quality of equipments and raw materials in project.

Saraf (2013) evaluated the factors affecting performance of construction project and their relative importance. The most important factors affecting project performance was construction method.

Mamman et al. (2014) identified and evaluated the main factors affecting the performance of construction projects in Niger state. The important factor were availability of personnel with a high experience and qualifications, quality of equipment and raw materials in project, conformance to specification, planned time for project construction, availability of resources as planned through project duration, average delay in payment from owner to contractor, information coordination between client and project parties.

Mbawi et al. (2015) studied that performance of the project was considered as a source of concern to both public and private sector clients. Planning, management support, human capital,

communication and monitoring evaluation have a positive and significant effect on project performance.

Table 1: Factors affecting construction performance

Author(s)	Performance factors identified
Mbugua et al. (1999)	Client satisfaction, construction cost, construction time, public interest, defects, productivity, project performance, profitability, research and development, financial.
Takim et al. (2002)	Client attributes, project attributes, delivery strategy, contractors performances, stakeholders attributes, social obligation.
Enshassi et al. (2009)	Escalation of material price, project design cost, material and equipment cost, planned time for project construction, conformance to specification, management-labor relationship, site conditions and climate conditions.
Dadzie et al. (2009)	Project duration, urgency, ability to coordinate, project value, ability to work as a team, timely decision making, design team experience, political influence from higher authorities, poor relationship among team members.
Peter et al. (2011)	Ability to delegate responsibility, availability of materials and equipments, availability of technology, existence of labor, weather condition, government policies, competition from other contractors, traders skills, health and safety consciousness, client satisfaction, interest rate, communication.
Enshassi et al. (2011)	Average delay because of closures and material shortage, conformance to specification, availability of resources as planned through project duration, availability of personals with high experience and qualification, escalation of material prices, learning from own experience and past history, leadership skills for project manager, training the human resources in the skills demanded by the project, belonging to work, quality of equipments and raw materials in project.
Saraf (2013)	

	Shortage of labor and technical personnel, construction methods, improper planning, site management, client's satisfaction, unforeseen site condition, productivity, decision making, contract management.
Mamman et al. (2014)	Quality of raw materials and equipments in project, conformance to specification, planned time for construction project, cost of material and equipment, learning from best practice and experience of others, climate condition.
Mbawi et al. (2015)	Performance, planning, management support, human capital.

2.15. SUMMARY

The construction of condominium through the past years has suffered from criticism, as it always adopt the conservative way in work, and lack innovation, new ideas, and creative methods in implementing the construction projects are needed to be implemented in the new ways of technology. According to previous studies, it can be said that the performance measurement is a process include factors as Key Performance Indicators such as time, cost and quality in order to enable measurement of current organizational project performance and to achieve significant performance improvements of future projects. It was obtained that there were many fields and topics which are related to performance such as, construction management, information technology, factors affecting performance of managers, measurement of project performance, key performance indicator and benchmarking. The key performance indicators are used to evaluate performance of construction projects. These indicators can then be used for benchmarking purposes, and will be as a key component of any organization to move towards achieving best practice and to overcome performance problem in construction projects. Based on previous studies and literature review, the factors which will be studied in this research are:

I. Cost factor
I. Time factor
II. Quality factor

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.3. Description of the Study Area

This study was made on project owned by the City Government of Addis Ababa, Saving Houses Development Enterprise. The enterprise has been constructing various branches and projects of 40/60 condominium which accounts for thirteen projects in different location around city of Addis Ababa. Thus, this study was made on one of the branches of the project called Bole Ayat lot II in which 20 contractors are involved in construction of 50 building blocks and one consulting firm. There are two kinds of building design typologies, 2 Basement + Ground +13 floors and 2 Basement + Ground +15 floors and as highlighted on the map is located in the East part of Addis Ababa, found around 3km towards east from Ayat square and nearby previously constructed Ayat 20/80 Condominium Buildings (http:// www.AddisBiz.com). (Accessed on June 22, 2016)

Figure 5 Study Area; Location of Bole Ayat (addisababa.gov.et)

Here are the list 40/60 condominium sites in Addis Ababa and date of contract, duration of contract, number of blocks and number of houses in each site.

Table 2: 40/60 Condominium - Locations, Number of Blocks, Number of Houses, and Completion date (http://www.AddisBiz.com). (Accessed on June 22, 2016)

No	Site	No of Blocks	No of Houses	Date of Contract	Duration of Construction
1	Senga Tera	5	410	January 2013	18 months
2	Kality Crowen	14	882	May 2013	15 months
3	Ihil Nigd	13	1,716	November 2014	18 months
4	Ihil Nigd 2	6	732	October 2014	18 months
5	Hintsa Akrabi	8	1,056	January 2014	18 months
6	Bole Bulbula	23	2,850	February 2014	-
7	Meri Loqe	14	1,848	February 2014	18 months
8	Bole Hayat	133	8,937	May 2014	15 months
9	Summit	11	1,912	March 2015	19 months
10	Turist Nigd	10	340	May 2015	13 months
11	Bole Beshale	53	6,077	May 2015	18 months
12	Bole Hayat 2	50	6,702	May 2015	18 months
13	Bole Bulbula 2	24	2,698	-	-

3.1. Research Design

This research investigates the performance of building construction projects in Addis Ababa Bole Ayat Lot II and the research questions are orient to investigate the factors and impacts of the performance of building construction projects of 40/60 saving house development enterprise. The researcher used descriptive type of research method, because it tries to describe the actual rate of performance indicators and the variables or factors affecting construction

performance under 40/60 saving house development enterprise. The research obtains quantitative in nature. The data is collected from both primary and secondary sources of data. The primary data was obtained through questionnaire from Client, Contractors, Consultants and Small and Micro Enterprises (SME) of 40/60 saving house development enterprise. The secondary data was obtained from review of documents, related reference materials, recorded data, published literature, thesis, journals, books and project observation.

3.2. Population Size and Sampling Technique

The population of this study consisted of employees of contractors, consultants, clients as well as SMEs. The sample size selected here was considered as representative of company's employees and from all 285 employees of the company, the researcher has taken 75 samples to represent the total population. As to the sample size determination, from among different methods, the one that has developed by Carvalho (1984), (as cited in Tamrat, 2007) was used. The following table 3 presents the sample size for this study.

Table 3: Sample size determination (Carvalho, 1984)

Population Size	Sample Size		
	Low	Medium	High
51-90	5	13	20
90-150	8	20	32
151-280	13	32	50
281-500	20	50	80
501-1,200	32	80	125
1,201-3,200	50	125	200
3,201-10,000	80	200	315
10,001-35,000	125	315	500

The population size of the study was 285, which was found within the range of 281-500 as Carvalho's sample size determination indicated in table 3.2 above. According to Carvlho's sample size determination, the sample size for the study was determined to be 50. But, taking in to account that larger sample size is more representative to the population under study and that the respondents may not all complete and return the questioners, larger sample size was applied in accordance with the given population size.

In order to obtain a representative sample, this study employed stratified random sampling technique. Under this technique, the population was divided into different parties (Client, Contractors, Consultants and SMEs), which is individually more homogeneous than the total population. Then staffs were selected from the parties by random sampling technique. Since each party is more homogeneous than the total population, this study was able to get more precise estimate for each party. By estimating more accurately each of the component parts of population, the study got a better estimate of the whole population.

Table 4: List of contractors at Bole Ayat lot II

Ser. No	Contractor's Name		Ser.No	Contractor's Name
1	Felema Construction		11	Sina Construction
2	Afrotsion Construction		12	ATS Engineering Construction
3	Kibko Service		13	Amel Construction
4	Magercon Construction		14	Osac Business Plc
5	Fufa Lejissa Building Contract		15	Zeleke Redi Building Contract
6	Wonder Construction		16	Mat Engineering Construction
7	Kasu G/Tsadik Building Contract		17	Bekele Sorsa Building Contract
8	Eney Construction		18	JB Construction
9	Gutema Feresa Construction		19	Baeka Building Contract
10	Zeab Real State		20	TNK Building Contract

3.3. Instruments

Contractors, client, consultants and SMEs have been approached for their view on factors affecting performance of construction projects and the impact of low performance by using

Primary data which was gathered through structured questionnaires containing both close and open-ended questions, to enable respondents to comment freely on any aspects. The questionnaires are administered to the sample respondents of the study area and were organized using Likert scale ranging from 1 to 5. Based on Likert scale we have the following table (Cheung et al, 2004; Iyer and Jha, 2005; Ugwu and Haupt, 2007).

Item	Extremely Significant (ES)	Very Significant (VS)	Moderately Significant (MS)	Slightly Significant (SS)	Not Significant (NS)
scale	5	4	3	2	1

A cover letter was attached to the questionnaire, which explained the purpose of the study, ethical considerations such as anonymity, confidentiality, and it also highlighted that the participation is on voluntary basis. Respondents was informed that the purpose of the study is to assess project performance in the case of 40/60 saving house development enterprise in Addis Ababa Bole Ayat lot II and there were no right or wrong answers to questions included in the survey.

3.4. Data Collection

Data collection methods was quantitative. Quantitative methods are based on structured surveys with predetermined possible answers, which the researcher prepared and distributed questionnaire for the respondent. The researcher hoped that, these sources are enough and relevant to investigate the most common and frequent factors affecting project performance of 40/60 saving house development enterprise and the impacts of low performance.

Questionnaires was used to gather data because the information could be collected from a large sample and diverse experienced personnel, confidentiality was upheld and saved on time.

3.5. Data Analysis

The analysis part was based on all groups of respondents in order to obtain significant results. The data was analyzed by calculating the relative important index model (RII) to rank the

hypothesized factors based on their importance and frequency which is derived from the views of the respondents of the groups in 40/60 saving house development enterprise.

The relative importance index method (RII) is used to determine the most significant key performance indicators of construction projects. The RII method has been adopted by many researchers (Kometa et al., 1994; Aibinu and Jagboro, 2002 and Cheung et al, 2004; Iyer and Jha, 2005; Ugwu and Haupt, 2007).

The relative importance index is computed as:

$$RII = \sum W/A*N$$

Where: RII = relative importance index

W = weighting given to each factor by respondents (ranging from 1 to 5)

A = highest weight (i.e. 5 in this case); and

N = total number of respondents.

The RII values have a range of 0 to 1 (0 not inclusive); the higher the RII is the more important factors indicators affecting the performance of construction projects. The RIIs is ranked, and the results are shown by using tables and/or graphs.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1. General Information

4.1.1. Type of respondent's organization

In this study 38 out of 40 contractors (95 %), 9 out of 10 owners (90 %), 15 out of 15 consultants (100%) and 8 out of 10 SMEs (80%) had participated in the questionnaire. The general response rate for contractors, owners, consultants and SMEs was 93 % and the total number of respondents for these four parties were 70. This implies that the client, consultant, contractor and SMEs respondents were taken from 40/60 saving house development enterprise in Addis Ababa Bole Ayat lot II project is sufficient to find out the perceptive of the relative importance of project performance indicators.

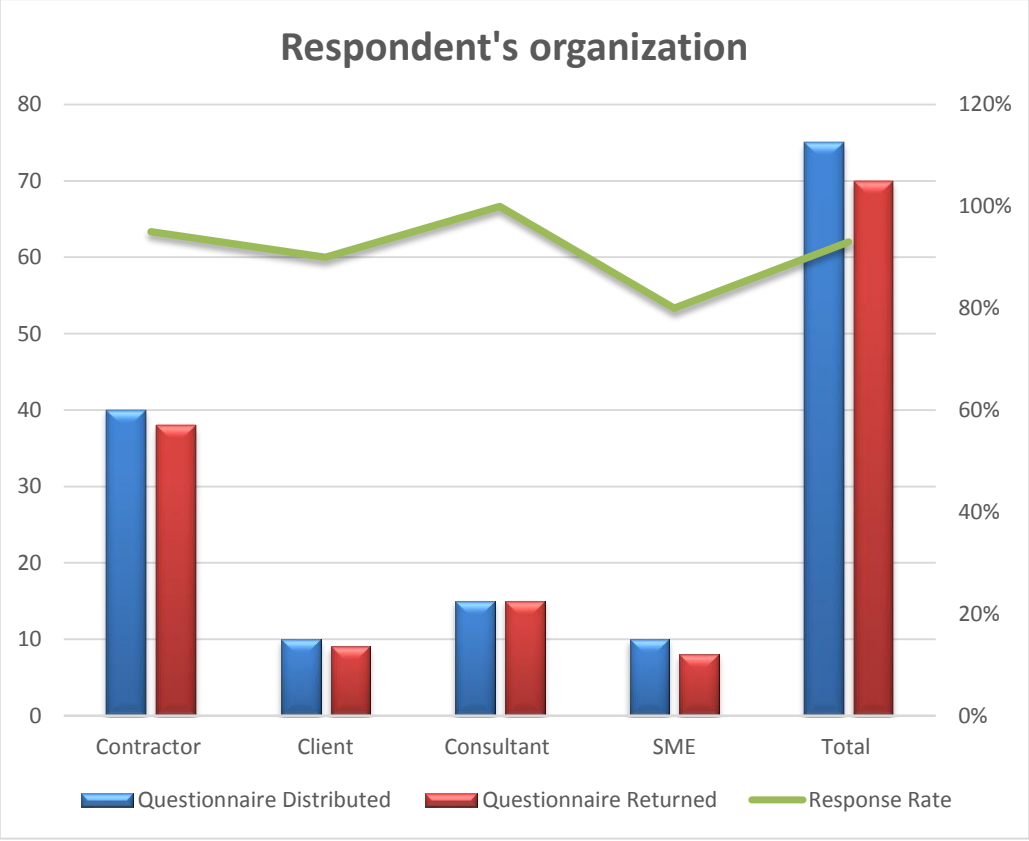


Figure 6: Percent of respondent's organization

4.1.2. Respondents Designation

Table 5 shows that 10.5 % (4) of contracting companies respondents were head of organization, 26.32% (10) were projects managers, 26.32 % (10) were site engineers, 26.32% (10) were office engineers and 10.5% (4) were other (project administration & logistics, project coordinator and formans). It has been found that 22.22 % (2) of client respondents were site engineers, 33.33 % (3) were office engineers, 33.33% (3) were site supervisor and 11.11% (1) were other (resident engineer). It has been founded that 6.67 (1) was head of organization, 20%(3) of the consultants companies respondents were project manager, 13.33 % (2) of the consultants companies respondents were site engineers, 13.33 % (2) of the consultants companies respondents were office engineers and 46.67% (7) were site supervisor. It has been founded that 62.5 % (5) of small and micro enterprise companies' respondents were head of organization, and 37.5% (3) were other (employee). Totally out of 65 respondents from the four parties, 18.25 % (9) of the respondents were Head of organization, 6.58% (10) were projects managers, 12.14 % (12) were site engineers, 17.41% (14) of the respondents were office engineers, 25.83 % (10) were site supervisors and 19.77 % (10) were others. This shows that everybody in the construction firm had the opportunity to respond to the questionnaire.

Table 5: Respondents Designation

Respondents Designation	**Contractor**		**Owner**		**Consultant**		**SEM**	
	Frequency	**%**	Frequency	**%**	Frequency	**%**	Frequency	**%**
Head of Organization	4	10.5	0	0	1	6.67	5	62.5
Project Manager	10	26.32	0	0	3	20	0	0
Site engineer	10	26.32	2	22.22	2	13.33	0	0
Office engineer	10	26.32	3	33.33	2	13.33	0	0
Site supervisor	0	0	3	33.33	7	46.67	0	0
Other	4	10.5	1	11.11	0	0	3	37.5
Total	38	100%	9	100%	15	100%	8	100%

4.1.3. Experience of respondents

Table 6 shows that 37% (26) of the respondents have experience between 1 to 4 years at construction works, 30 % (21) of the respondents experience between 5 to 8 years, 23 % (16) of respondents have experience from 9 to 12 years, and 10 % (7) who have experience more than 12 years. 63% of respondents have more than 5-12 years relevant working experience. This shows that most of the respondents are capable to provide relevant data on factors affecting construction performance.

Table 6: Experience of respondents (years)

Experience of respondents	**Contractor**		**Owner**		**Consultant**		**SME**		**Total**	**% Total**
	Frequency	**%**	Frequency	**%**	Frequency	**%**	Frequency	**%**	Frequency	**%**
<1 years	0	0	0	0	0	0	0	0	0	0%
1-4 years	13	34.21	4	44.44	8	53.33	1	12.5	26	37%
5-8 years	10	26.32	3	33.33	3	20	5	62.5	21	30%
9-12 years	8	21.05	2	22.22	4	26.67	2	25	16	23%
>12 years	7	18.42	0	0	0	0	0	0	7	10%
Total	**38**	**100**	**9**	**100**	**15**	**100**	**8**	**100**	**70**	**63%**

4.1.4. Performance measurement

All respondents; owner, consultants, contractors and SMEs were asked which measurement do they use to measure their construction performance. Accordingly all respondents replied that they use all the three parameters i.e. cost, time and quality. This shows that all parties use time cost and quality parameters collectively for performance measurement.

4.2. Factors Affecting Cost of Construction Projects Under 40/60 Saving House Development Enterprise

Table 7 shows the rank of all factors influencing cost overruns that have been investigated in this research from contractor, consultant, client and SMEs viewpoints. A total of 11 factors which influence cost performance in 40/60 saving house development enterprise have been studied and discussed. The rank was based on relative importance index (RII) of the factors.

Table 7: Factors influencing cost of construction projects.

Factors affecting cost of construction	SME		Consultant		Contractor		Client		Weighted Average	
	RII	Rank	RII	Rank	RII	Rank	RII	Rank	RII	Rank
Lack of cost planning/monitoring during pre and post contract stages	0.61	1	0.72	5	0.64	8	0.80	4	0.73	2
Design changes	0.40	5	0.78	2	0.76	3	0.82	2	0.69	3
Inadequate review for drawings and contract documents.	0.28	10	0.72	6	0.76	3	0.73	8	0.62	6
Uncertainty by the supervising team in dealing with the contractor's queries resulting in delays.	0.45	4	0.64	8	0.65	5	0.73	8	0.62	7
Unpredictable weather conditions	0.58	3	0.58	11	0.58	11	0.67	11	0.60	9
Contractual claims, such as, extension of time with cost	0.38	6	0.72	5	0.70	4	0.71	10	0.63	5
Fluctuations in the cost of materials	0.60	2	0.82	1	0.77	2	0.87	1	0.77	1
Additional work at owner's request	0.30	9	0.60	10	0.65	5	0.82	2	0.59	10
Technical incompetence, poor organizational structure, and failures of the enterprise	0.33	7	0.70	5	0.65	7	0.76	6	0.61	8

Project materials monopoly by some suppliers	0.33	7	0.76	3	0.78	1	0.76	6	0.66	4
Lack of experience of technical consultants,	0.28	10	0.72	6	0.59	10	0.78	5	0.59	11

4.2.1. SMEs view

Table 7 shows that small and micro enterprises ranked "Lack of cost planning/monitoring during pre and post contract stages" in the first position with mean score of 0.61. Cost-effectiveness and a value-for money design are more likely to be achieved if the cost is planned. "Fluctuations in the cost of materials" was ranked as the second major factor of cost overruns by contractors with a RII of 0.60. This shows the cost of raw material represents a significant portion of the cost of the job. The third cause of cost performance was "Unpredictable weather conditions" with a RII of 0.58.

The SMEs ranked "Lack of experience of technical consultants", as the least factor that affects cost performance with a mean score of 0.28. this indicate as far as the SMEs and the consultants has direct relation lack of experience of technical consultants is not the main issue.

4.2.3. Consultants view

The first important factors that affect cost performance according to consultants were "Fluctuations in the cost of materials" with a RII of 0.82. "Design changes" was the second factors affecting cost performance ranked by consultant with a RII of 0.78. Consultants consider "Project materials monopoly by some suppliers" ranked by consultants as the third factor to affect cost performance with a RII of 0.76.

Table 7 shows that consultants ranked "unpredictable weather conditions" as the least factor that affect cost performance with a RII of 0.58. Since the projects are in Addis Ababa Bole Ayat lot II it has good climatic conditions, so it isn't exposed to great rises in temperature or snow fall, therefore the weather condition does not have a significant impact on execution of construction project and to make any damages of these projects.

4.2.4 Contractors view

Contractors ranked "Project materials monopoly by some suppliers" in the first position with mean score of 0.78. it is known that the SMEs are entitled to supply HCB and precast materials and most of the time they supply the materials to the company whom they get extra money (corruption) this affect in terms of time and cost other contractors who do not want in corruptive action; they should wait other days or weeks for the SMEs to produce the HCB and precast materials and receive. "Fluctuations in the cost of materials" was ranked as the second major factor of cost overruns by contractors with a RII of 0.77. it is known that the contractors supply sand and aggregate and other minor materials like nail and wire, the cost of this materials is fluctuating within few days and this affect the mainly contractors.

The third cause of cost performance was "Design changes" and "inadequate review for drawings and contract documents" with a RII of 0.76. This problem arose by the client and this affect the project time because design change and review for drawings may need rework which will disturb the cost of the project. The contractors ranked "unpredictable weather conditions" as the least factor that affects cost performance with a mean score of 0.58. Since the projects are in Addis Ababa Bole Ayat lot II it has good climatic conditions, so it isn't exposed to great rises in temperature or snow fall, therefore the weather condition does not have a significant impact on execution of construction project and to make any damages of these projects.

4.2.5. Owners view

"Fluctuations in the cost of materials" was the first factors to affect cost performance with a RII of 0.87. "Design changes" and "Additional work at owner's request" were ranked as the second factor affecting cost performance with a RII of 0.82. "Design changes" are considered as one of major factor for increasing the cost of project. As any modification in the design will affect the budget allocated for the project, the volume of required materials, type of required materials and needed labor. Sometimes, design changes cause the rework of already completed items, which means the increase of project duration and also lose of materials. Thus the factors affecting cost performance will be present at this case.

The fourth factor ranked by owners was "Lack of cost planning/monitoring during pre and post contract stages" with a RII of 0.80. Table 7 shows that owners ranked the "unpredictable weather conditions" as the last factor with a RII of 0.67. Since the projects are in Addis Ababa Bole Ayat

lot II it has good climatic conditions, so it isn't exposed to great rises in temperature or snow fall, therefore the weather condition does not have a significant impact on execution of construction project and to make any damages of these projects.

Generally, results indicated that the factor "Fluctuations in the cost of materials" has been ranked in the first position by consultants and owners and in the second position by the contractors and SMEs. This result indicates the high importance of managing Fluctuations in the cost of materials by storing materials needed in stoke. If not it results in projects cost overrun.

The factor of "design change" has been ranked in the second position by the consultants and owner while the contractors ranked in third position. This result indicates the high importance of managing design change to complete the project planned. The design change problem creates disputes between the planned cost and actual completion cost of project, and will be affected even more. This agreement of opinions between contractors, consultants and owners proves the importance of these factors in projects cost overrun. From the results obtained at this thesis, and compare it with the results and analysis of previous literatures (Peter et al. 2011), it's found that there are a real similarity of the important factors that influencing cost performance. But fluctuation in the cost of material is a major problem.

4.3. Factors Influencing Time Construction Projects Under 40/60 Saving House Development Enterprise.

This part consists of results and discussion of factors that affect time performance. These factors include: project related factors, contractors' responsibility factors, consultants' responsibility factors, owners responsibilities factors and external factors indicators.

Table 8: Factors affecting time of construction projects

Factors affecting time performance	SME		Consultant		Contractor		Client		Weighted average	
	RII	Rank	RII	Rank	RII	Rank	RII	Rank	RII	Rank
Discrepancies between contract documents	0.275	26	0.74	9	0.6211	14	0.7111	19	0.5868	24

Delay to furnish and deliver the site (right of way problem)	0.475	16	0.80	2	0.7330	1	0.8220	1	0.7075	4
Poor communication and coordination	0.675	4	0.68	15	0.7105	5	0.7778	8	0.7108	3
Delay in finance and payments of completed work.	0.625	6	0.70	14	0.6580	10	0.7333	14	0.6791	8
Owner interference	0.475	16	0.58	25	0.6105	16	0.7111	19	0.5942	23
Slow decision-making by owners.	0.550	10	0.76	5	0.6737	8	0.7333	14	0.6793	7
Unrealistic imposed contract duration	0.350	22	0.75	7	0.6789	7	0.6444	23	0.6058	17
Design change by owners	0.350	22	0.72	12	0.5737	23	0.7780	7	0.6054	18
Delay due to financial problems	0.600	8	0.86	1	0.7316	2	0.8000	2	0.7479	2
Delay due to subcontractor	0.450	18	0.68	15	0.7000	6	0.7778	8	0.6519	13
Delay due to site management	0.500	13	0.78	3	0.6632	9	0.8000	2	0.6858	6
Delay due to Construction methods	0.275	26	0.76	5	0.6421	12	0.7111	19	0.5971	21
Delay due to Improper planning	0.525	12	0.77	4	0.7260	3	0.7333	14	0.6886	5
Delay due to Mistakes during construction	0.550	10	0.64	19	0.4947	27	0.7333	14	0.6045	19

Delay due to Quality of material	0.725	2	0.56	26	0.5684	24	0.7333	14	0.6467	14
Delay due to Shortage of material	0.750	1	0.74	9	0.7211	4	0.7990	5	0.7525	1
Delay due to Labor supply problem	0.500	13	0.60	22	0.5789	21	0.7778	8	0.6142	16
Delay due to Labor productivity	0.650	5	0.60	22	0.6211	14	0.7790	6	0.6625	12
Absence of consultant's site staff	0.350	22	0.54	27	0.5158	25	0.6444	23	0.5126	27
Contract management problem	0.375	21	0.64	19	0.5947	19	0.7770	11	0.5967	22
Lack Preparation and approval of drawing	0.500	13	0.72	12	0.6474	11	0.8000	2	0.6668	10
Lack Quality assurance /control	0.700	3	0.66	18	0.5789	21	0.7556	12	0.6736	9
Equipment availability and failure	0.625	6	0.75	7	0.6316	13	0.6444	23	0.6628	11
Major disputes and negotiations.	0.575	9	0.74	9	0.6000	18	0.6222	26	0.6343	15
Lack of communication between the parties	0.350	22	0.68	15	0.6053	17	0.7556	12	0.5977	20
Weather condition	0.425	20	0.60	22	0.5895	20	0.6667	22	0.5703	25
Regulatory changes	0.450	18	0.62	21	0.5000	26	0.6000	27	0.5425	26

4.3.1. SMEs view

Table 8 shows that the SMEs ranked "Shortage of material" in the first position with a RII of 0.75. The second important factor ranked by SMEs was "Quality of material" with a RII of 0.73. "Quality assurance/control" was ranked by SMEs as the third important factor that can affect

time performance with a RII of 0.70. The respondents from SMEs ranked "Poor communication and coordination" in the fourth with RII of 0.68. "Labor productivity" is ranked as the fifth important factor that can affect time performance with a RII of 0.65.

Generally for the SMEs to do their work timely they need materials in bulk with good quality and labor productivity is essential (rate of output per worker in the project per unit of time).

4.3.2. Consultants view

Table 8 shows that the consultants ranked "financial problems" with a RII of 0.86 as the first factor that causes delay. This indicates the high importance of cash for the progress of project. Any shortage of cash for the contractor will cause many problems such as slow progress and work decline in productivity. Also the contractors will not be able to purchase the needed equipment for work. More over the problem of cash also expanded to traders and suppliers, which in turn leads to slow the work, then to occurrence of project's delay.

The second factor that affect time performance was "delay to deliver the site (right of way problem)" with a RII of 0.80. This directly delays site hand over. Domestic contractors tolerate delayed hand over of construction sites but foreign contractors do not tolerate delayed hand over of construction sites by employers; foreign contractors claim to be compensated for idle hours of man power and equipments due to the delay. These are due to cultural differences between domestic contractors and foreign contractors; domestic contractors which suffered from delayed payments and late site hand over, say that such tolerance is to avoid adversarial relationship with the stakeholders on that project and hence to create conducive working environment (Fetene, 2008). The third important factor ranked by consultants was "Site management problem" with a RII of 0.78. Poor management cause many constrains at the projects, such as poor following up of progress, incorrect distribution of works, un commitment of employees at the site, poor monitoring of project etc. These factors contribute to delay the project.

The fourth important factor ranked by consultants was "improper planning" with a RII of 0.77. This result shows the importance of planning and time scheduling to deliver the project on time. When the activities execution is without priorities of tasks and without knowledge of critical path activities, it certainly causes the delay of project.

4.3.3. Contractors view

Table 8 shows that the contractors ranked "delay to deliver the site (right of way problem)" in the first position with a RII of 0.733. This indicates how right of way problem affect the project time. If there is a right of way problem in construction project it will lead to a significant delay in a project. As observed from desk study some projects delay for years only due to right of way problem. This result is in line with the results of Tadesse (2009).

The second important factor ranked by contractors was "financial problems" with a RII of 0.731. This is a strong indication that financial problem will cause time performance. This result coincides with the results of Tadesse (2009). The suitable description for this consensus is that cash is very necessary for contractor to construct the project within specified time. Any shortage of cash for the contractor will cause many problems such as slow progress and work decline in productivity. Also the contractors will not be able to purchase the needed equipment for work. The owner pays advance payment before the project starts. So the "financial problem" is due to contractor's mismanagement. Improper planning is ranked by contractor as the third important factor that can affect time performance with a RII of 0.726. Proper planning is important for accomplishing the project successfully. If the contractors fail to plan their work properly it will affect the project completion time and it will be a big loss for contractor and end users.

The respondents from contractors ranked "shortage of material" in the fourth with RII of 0.721. "Poor communication and coordination" is ranked as the fifth important factor that can affect time performance with a RII of 0.710.

4.3.4. Owners view

Table 8 shows that owners ranked "delay to deliver the site (right of way problem)" as the first factor that affects time performance with a RII of 0.822. Late hand over of construction sites, sometimes may happen and substantially increase the cost of construction projects. In most international projects in Ethiopia late site hand over is a common form of claim source for compensation for contractors. But site hand over problem still a major reason for time performance problem according to contractors and owners while consultants ranked second. The second important factor was "site management, financial problems and preparation and

approval of drawing" with a RII of 0.80. The fifth important factor was shortage of material with a RII of 0.799. The sixth factors ranked by owner were "labor productivity" with a RII of 0.779.

In the summary of each view together, results indicated that the factor "delay to deliver the site (right of way problem)" has been ranked in the first position by contractors and owners while it gets the second rank by consultant. This result indicates the high importance of delivering the site on time to complete the project on time. The right of way problem creates disputes between the parties of project, and then the time of completion will be affected even more. This agreement of opinions between contractors and owners proves the importance of these factors in projects delay. The factor of "financial problems" has been ranked in the second position by the contractors and owners while the consultants ranked in the first position. This result indicates the high importance of cash for the progress of project. Any shortage of cash for the contractors were cause many problems such as slow progress and work decline in productivity. Also the contractors were not purchase the needed equipment for work. More over the problem of cash also expanded to traders and suppliers, which in turn leads to slow the work, then to occurrence of project's delay. Shortage of cash is created either by improper use of advance payment of contractor or delay in payment by owner. From the results obtained at this thesis, and compare it with the results and analysis of previous literatures (Enshassi et al. 2011), it's found that there are a real similarity of the important factors that influencing time and cost performance. But right of way problem is a major problem in Ethiopia and not that much significant in other country. Because literatures that are done out of Ethiopia not included right of way problem as a major factor for time performance.

In some factors that are listed under time and cost; the consultant's and the client's response was a bit diffident. The reason behind was that the perception of the client as a demanding customer and the perception of the consultant as a supervisor between the client and the contractor is different. Hence their view towards ranking some of the factor listed on the questionnaire was different. For instance "discrepancies between contract documents" it can be seen that the importance of this factor was not perceived similarly between the client and the consultant.

4.4. Factors Influencing Quality of Construction Projects in 40/60 Saving House Development Enterprise.

Table 9 shows the rank of all factors influencing quality performance that have been investigated in this research from SMEs, contractor, consultant and owner viewpoints. A total of six key factor indicators which influence quality performance in 40/60 saving house development enterprise have been studied and discussed. The rank was based on relative importance index of the factors.

Table 9: Factors Affecting quality performance of Construction Projects

Factors affecting quality performance	SME		Consultant		Contractor		Client		Weighted average	
	RII	Rank	RII	Rank	RII	Rank	RII	Rank	RII	Rank
Uneducated personnel	0.35	4	0.82	1	0.73	1	0.84	2	0.69	3
Unexperienced personnel	0.85	1	0.82	1	0.73	1	0.84	2	0.81	1
Lack Quality of materials and equipment used in the project construction	0.63	2	0.80	3	0.68	3	0.76	6	0.72	2
Lack Conformance to specifications	0.28	5	0.72	5	0.67	5	0.87	1	0.63	4
Lack quality assurance training and follow up	0.38	3	0.70	6	0.67	6	0.78	5	0.63	6
Rework effects	0.28	5	0.76	4	0.67	4	0.82	4	0.63	5

4.4.1. SMEs view

Availability of personnel with “high experience” has been ranked by the SMEs respondents in the first position with RII equal 0.85. This factor is the most important one for SMEs because availability of personnel with high experience assists SMEs to implement their career with a successful and suitable performance. “Quality of equipment and raw materials in project” has been ranked by the SMEs respondents in the second position with RII equal 0.63. SMEs must implement their projects according to required and agreed quality because owners and consultants usually want materials used in supervised project according to specification and

agreement. "Quality assurance training and follow up in organization has been ranked by the SMEs in the third position with RII equal 0.38. Quality assessment system in organization is rarely achieved or implemented for SMEs in the 40/60 saving house development enterprise. "Educated personnel" have been ranked by the SMEs respondents in the fourth position with RII equal 0.35 because their work is done by more experience. Conformance to specification and Rework effect has been ranked by the SMEs respondents in the fifth position with RII equal 028.

4.4.2. Consultants view

Availability of "personals with high experience and education" has been ranked by the consultant's respondents in the first position with RII equal 0.820. This factor is the most important one for consultants because availability of personals with high experience and qualification assist consultants to supervise the project with a good professionalism and also this assist them to satisfy the owner with a successful performance of project. This result is in agreement with Cheung et al (2004) and Iyer and Jha (2005) as this factor affects strongly on project performance because it affects strongly the degree of owners satisfaction which is one of the main responsibilities of consultants.

"Quality of equipment and raw materials in project" has been ranked by the consultant's respondents in the third position with RII equal 0.800. Consultants usually want materials used in supervised project with a good quality and according to specification. Based on Cheung et al (2004) and Iyer and Jha (2005), this factor affects the project performance and the degree of owners satisfaction which is one of the main responsibilities of consultants.

"Rework effect" was ranked by the consultant respondents in the fourth positon with RII= 0.76 "Conformance to specification" has been ranked by the consultant's respondents in the fifth position with RII equal 0.72. This factor is an important to client representative satisfaction because it is mainly related to owner satisfaction. Iyer and Jha (2005) are in agreement with our result as this factor is significant for client representative because this factor is strongly related to client satisfaction.

"Quality training/meeting and follow up" has been ranked by the consultant's respondents in the sixth position with RII equal 0.700. Quality training/meeting is rarely achieved or implemented in construction projects in the 40/60 saving hose development enterprise. However, this result is not in agreement with Samson and Lema (2002) as this factor affects strongly on quality performance of construction projects.

4.4.3. Contractors view

Availability of "personnel with high experience and qualification/education" has been ranked by the contractor's respondents in the first position with RII equal 0.726. This factor is the most important one for contractors because availability of personnel with high experience and qualification assist contractors to implement their projects with a successful and suitable performance.

Samson and Lema (2002), Cheung et al (2004) and Iyer and Jha (2005) are in line with result as this factor is very important to contractors because it affects strongly on quality performance of construction projects. "Quality of equipment and raw materials in project" has been ranked by the contractor's respondents in the third position with RII equal 0.679. Contractors must implement their projects according to required and agreed quality because owners and consultants usually want materials used in supervised project according to specification and agreement. Based on Cheung et al (2004) and Iyer and Jha (2005), this factor affects the quality performance and the degree of owners and consultants satisfaction.

"Rework effect" was ranked by the contractor respondents in the fourth positon with RII= 0.674 "Conformance to specification" has been ranked by the contractor's respondents in the fifth position with RII equal 0.674. This factor is significant for contractors as it is related to consultants and owners satisfaction. Iyer and Jha (2005) are in agreement with our result as this factor is significant for contractors because this factor is related to consultants and clients satisfaction.

Quality assurance training and follow up in organization has been ranked by the contractor's respondents in the sixth position with RII equal 0.668. Quality assessment system in

organization is rarely achieved or implemented for contractors in the 40/60 saving house development enterprise.

Ugwu and Haupt (2007) are in agreement with our result as this factor is not important to contractors because of absence of quality assurance assessment systems in South African construction projects. However, Samson and Lema (2002) and Iyer and Jha (2005) are not in line with our result as this factor is significant for contractors performance in Tanzania and India construction projects. This might be due to different location and different managerial properties.

4.4.4. Owners view

"Conformance to specification" has been ranked by the owner's respondents in the first position with RII equal 0.870. This factor is the most important one for owners because this factor is an important to owner's satisfaction. The owner usually seeks to implement project according to specification. Iyer and Jha (2005) are in agreement with our result as this factor is significant for owners because this factor is strongly related to client satisfaction.

"Availability of personals with high experience and education" has been ranked by the owner's respondents in the second position with RII equal 0.840. Availability of personal with high experienced and qualified in project planning and implementation to sustain cost, time and quality professional which satisfy the owner.

This result is related to Cheung et al (2004) and Iyer and Jha (2005) results as this factor affects strongly on project performance because it affects strongly the degree of owner's satisfaction.
"Rework effect" was ranked by the clients respondents in the fourth positon with RII= 0.82

"Quality assurance and follow up" in organization has been ranked by the owner's respondents in the fifth position with RII equal 0.78. Quality assessment system in organization is rarely achieved or implemented through construction projects in the construction projects.

"Quality of equipment and raw materials in project" has been ranked by the owner's respondents in the sixth position with RII equal 0.76. The owners usually want materials used in their project

with a good quality and according to specification. Based on Cheung et al (2004) and Iyer and Jha (2005), this factor affects the project performance and the degree of owners satisfaction.

This result is in line with Iyer and Jha (2005) and Ugwu and Haupt (2007) this factor is not significant to owners because of absence of practical quality assessment system in Indian and South African construction projects. However, Samson and Lema (2002) are not in line with result as this factors affect on contractors performance.

To conclude each view together, personnel with high experience and qualification/education have been ranked by the contractor's and consultant's respondents in the first position and at second position by owners. SMEs ranked high experienced personnel first. This factor is the most important one for contractors because availability of personals with high experience and qualification assist contractors to implement their projects with a successful and suitable performance.

Samson and Lema (2002), Cheung et al (2004) and Iyer and Jha (2005) in line with this factor is very important to contractors because it affects strongly on quality performance of construction projects. There are many effects of quality problem in cost performance and owner's satisfaction.

4.5. The Practices Concerning the Performance of Construction Projects

Table 10: Does your company take construction materials for laboratory testing?

Response	**Percent % (Frequency)**							
	Client		**Consultant**		**Contractor**		**SME**	
Yes								
No	9	100%	15	100%	38	100%	8	100%

As table 10 above shows all of the respondents were not take construction materials to laboratory for testing before using them; they simply use visual material inspection at every construction work events. This implies that whether the supplied material has the required quality or not; there is no guarantee at all. Quality measures at a given purpose, approved construction materials are critical for quality performance.

4.6. Conduct of Quality Training Session for Personnel

Table 11 shows that 100% owners conduct training semi-annually. 100% consultants conduct training annually. 42% contractors conduct training annually. 58% of contractors were none training session conducted for the employees in the stated time. 100% SMEs have no quality training session. Monthly meeting assist them for monitoring, updating and controlling the progress through project implementation. In addition, they can solve problems, evaluate current performance, and improve future works. Respondents are rarely meets monthly or quarterly. Monthly meeting are required in the case of sensitive and very important works. Quarterly meeting is not effective for monitoring or updating processes. Navon (2005) stated that a controlling and updating is an important element to identify factors affecting construction project performance.

Table 11: shows how often the respondents conduct a quality training session for their personnel.

Response	**Percent % (Frequency)**							
	Client		**Consultant**		**Contractor**		**SME**	
Monthly	0	0%	0	0%	0	29%	0	0%
Quarterly	0	0%	0	0%	0	8%	0	0%
Semi-annually	9	100%	0	0%	0	3%	0	0%
yearly	0	0%	15	100%	16	42%	0	0%
none	0	0%	0	0%	22	58%	8	100%

4.7. Impact of Poor Project Performance Under 40/60 Saving House Development Enterprise

Table 12: Impact of Poor Project Performance

Impact of Poor Project Performance	SME		Consultant		Contractor		Client		Weighted average	
	RII	Rank	RII	Rank	RII	Rank	RII	Rank	RII	Rank
Building negative image of the company	0.75	1	0.72	5	0.63	5	0.89	2	0.75	2
Large impact on the company's future	0.50	4	0.86	1	0.67	3	0.78	4	0.70	4

Results in dispute between the project team	0.45	5	0.78	3	0.64	4	0.82	3	0.67	5
Creates delay on the project	0.75	1	0.86	1	0.76	1	0.91	1	0.82	1
Creates liquidated damage	0.60	3	0.78	3	0.70	2	0.78	4	0.71	3

4.7.1. SMEs view

Building negative image of the company and creates delay on the project has been ranked by the SMEs respondents in the first position with RII equal 0.75. Creates liquidated damage has been ranked by the SMEs respondents in the third position with RII equal 0.6. And large impact on the company's future has been ranked by the SMEs respondents in the fourth position with RII equal 0.5. Results in dispute between the project team has been ranked by the SMEs respondents in the fifth position with RII equal 0.45.

4.7.2. Consultants view

Large impact on the company's future and creates delay on the project has been ranked by the consultant respondents in the first position with RII equal 0.86. Results in dispute between the project team and Creates liquidated damage has been ranked by the consultant respondents in the third position with RII equal 0.78. And Building negative image of the company has been ranked by the consultant respondents in the fifth position with RII equal 0.72.

4.7.3. Contractors view

Creates delay on the project has been ranked by the contractors respondents in the first position with RII equal 0.76. Creates liquidated damage has been ranked by the contractors respondents in the second position with RII equal 0.70. Large impact on the company's future has been ranked by the contractor's respondents in the third position with RII equal 0.67. A result in dispute between the project team has been ranked by the contractor's respondents in the fourth position with RII equal 0.64. And Building negative image of the company has been ranked by the contractor's respondents in the fifth position with RII equal 0.63.

4.7.4. Owners view

Creates delay on the project has been ranked by the Owners respondents in the first position with RII equal 0.91. Building negative image of the company has been ranked by the Owners respondents in the second position with RII equal 0.89. Results in dispute between the project team and Creates liquidated damage has been ranked by the Owners respondents in the third position with RII equal 0.82. And large impact on the company's future and Creates liquidated damage has been ranked by the Owners respondents in the fourth position with RII equal 0.78.

4.8. Mitigation Strategies When Project Performance Becomes Poor

Respondents were asked to mention some strategies when their performance becomes poor; accordingly the following were listed:

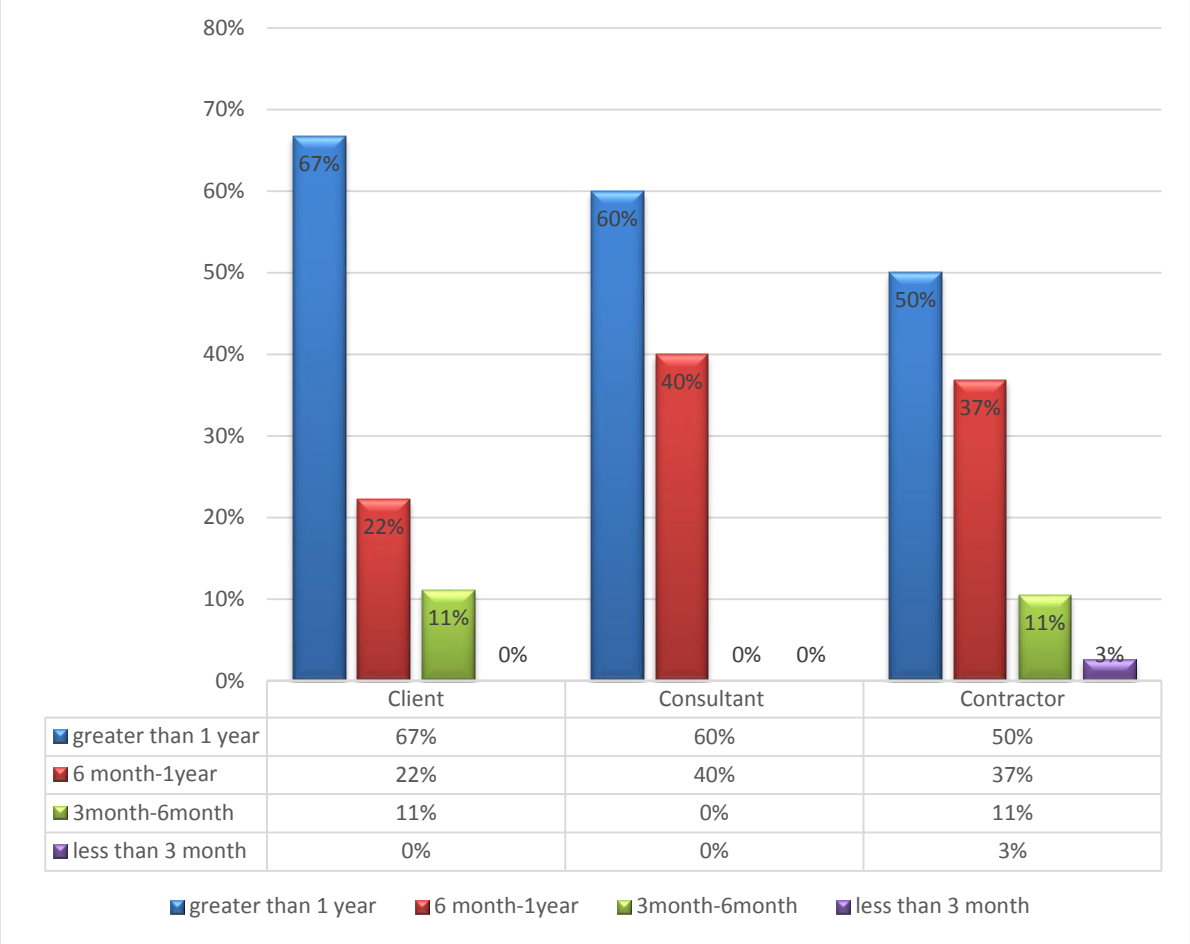
- Identify the problem and give response/ treatment asper the analysis and evaluation conducted
- Reporting to the concerned body
- Allocate meeting and discuss the root cause and find solution
- Identify the risk, incorporate mitigation and allocation of risk management in the project
- The final measure may reach to Contract termination

4.9. Status of Your Project in Bole Ayat Lot II

Out of the contractors who participated on 40/60 saving house development enterprise at Bole Ayat, 95% of them have finished above 10^{th} floor structural frames and were simultaneously working on HCB and plastering works and only 5% were not finished due to delay by the contractor's and as a consequences they were terminated from the project.

4.10. Remaining Period of the Project

The project was supposed to be finished and handed over within eighteen months from commencement date which was June, 2015 (contract agreement). Nonetheless nearly half of the respondents responded that they need more than one year time to deliver the site. This shows the project was delayed seventeen months and yet they still need another years to complete the project.



	Client	Consultant	Contractor
greater than 1 year	67%	60%	50%
6 month-1year	22%	40%	37%
3month-6month	11%	0%	11%
less than 3 month	0%	0%	3%

Figure 7 shows the remaining period for the project

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1. Conclusion

According to the IHDP, lot has been done towards achieving the objectives of the Condominium housing program. In Addis Ababa, more than 80,000 condominium houses have been constructed and more than 175 thousand employment opportunities have been created under the program from 2007 to 2014 (Kidist, 2014). However, the research results indicate that on the performance bases, particularly time, cost and quality of condominium construction houses in the 40/60 scheme were poor in their performance.

The performance according to time, cost and quality of the 40/60 condominium housing projects in Addis Ababa, Bole Ayat lot II was discussed in the questionnaire survey. The importance of identifying the causes for the time and cost overrun and poor quality of this project has been analyzed. The relative importance index of each cause was calculated. 11 causes of cost factors, 27 causes of time factors and 6 causes of quality factors were identified through the study.

The findings reveal that the top three affecting factors of cost were: fluctuation in the cost of material, lack of cost planning and design change with RII 0.77, 0.693 and 0.691 respectively. Fluctuations of material increase the cost of project. The contractor, while planning for the project, should take the cost of design change into consideration as failure to do so may escalate the cost of project.

Secondly, the first three affecting factors of time were: shortage of material, financial problem and poor communication and coordination with RII 0.75, 0.74 and 0.71 respectively. From the study, the provision of materials was the most significant factor to the overall construction progress. Especially of the materials like Hollow concrete blocks and fabrication of pre-cast beams (pre-fabricated beams) which are provided by the small and micro enterprises are very crucial in keeping the work progress.

Thirdly, the three quality factors were: experienced personnel, quality of materials and equipment used in the project and educated personnel with RII 0.81, 0.72 and 0.69 respectively.

The contractor should ensure the selected personnel are qualified and experienced, use materials and equipments of good quality, training the personnel on new skills is important and the contractor should select leaders based on their qualifications.

In this research findings, the key performance indicators were: Quality Functionality, End user's satisfaction, Client's satisfaction, Design team's satisfaction, Constructions team's satisfaction, Construction time, Speed of construction, Time variation, Unit cost, Percentage net variation over final cost, Net percent value, Accident rate, Environmental impact.

Poor performance causes negative image on the company, results dispute between the project team, creates delay and liquidity on the project.

With regards to the status of 40/60 saving house development enterprise, 95% of the contracting parties finished structural frames upto10th floor and simultaneously working on HCB and plastering.

Accordingly, it is important to note that these projects are of the highest importance to our society because of high increase in population especially in Addis Ababa and the populations housing demand is not being mate. And that will surely result in huge loss on the project because of cost overrun, delayed completion period and poor quality. Therefore, the researcher listed some useful recommendations below for the all stakeholders to implement.

5.2. Recommendations

Based on the research findings, the following recommendation should be put into practice:

Recommendation for the contractors:

- Contractors are recommended to use advance payment properly to avoid the financial problems. And also evaluate liquidity before implementation of a construction project.
- Contractors should have a proper planning, scheduling and good site management system in the different activities of the project so as to avoid any mistakes that may lead to rework of activities resulting in time and cost performance problems.

- Contractors are recommended to setup stores for required construction materials, and especially that are scarce or that are in limited quantity in the markets to avoid time and cost performance problem.
- Contractors should have qualified and experienced staffs, use good quality of materials and equipment and ensure that the project conforms to the specification.
- Leaders and personnel should be trained on new skills to improve on their performance.

Recommendation for the client:

- The client should give attention on the right of way problem. Before the construction starts the client has to fulfill all the necessary requirements for delivering the site.
- The client should determine the required duration of project and impose realistic duration to avoid time and cost overruns.
- The client is recommended to have a technical personnel who is able to manage the different stages of any project and to follow the performance percentages, and also able to compare the actual performance with the planned one.
- The client is recommended to minimizing design changes as much as possible in order to avoid any factors affecting time and cost performance.
- The communication and coordination between the stakeholders have to be improved to minimize cost, time and quality performance problem.

Recommendation for consultants:

- Consultants should have good coordination and direct communication with contractors and client, which will eliminate design discrepancies and errors as well as omissions in design and also provide an opportunity to review the contract documents thoroughly. This would help in eliminating change orders or variations due to discrepancy in contract documents.
- Consultants are recommended to hire qualified technical personnel to manage the project in a good way so that the consultant would be able to overcome any technical or management problems that may happen. And to give suitable instruction in a suitable time and to be able to answer any question stated by contractor to avoid time and cost performance problem.

- Consultants have to review and approve design documents, shop drawings, and the payments of contractor to avoid any factors affecting cost performance at the project.

Recommendation for the SMEs:

- The SMEs manufacturing capacity and allocation of materials should meet the contractor's need, and should distribute the materials on time.
- The SMEs should be competent and efficient microenterprise, with desired quantity and excellent quality.
- Most participants had low level of education, therefore, the SMEs should upgrade their education level since education increases the potential for production and innovation, as well as effective communication.

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COVERING LETTER

This questionnaire is prepared to obtain information from key informants with structured questions. The information is required for the academic research entitled "**Assessment of Project Performance in the Case of 40/60 Saving House Development Enterprise in Addis Ababa Bole Ayat Lot II**", which is being conducted as partial fulfillment of MSc in construction technology and management. The questionnaire consists of five sections and general comments.

Section 1 General Information (Personal Demographics of Respondent)

Section 2 Contains Cost Factor

Section 3 Contains Time Factor

Section 4 Quality Management Factor

Section 5 Impact of Poor Project Performance and the Status Under 40/60 Saving House Development Enterprise In Addis Ababa Bole Ayat Lot II.

Your response, in this regard, is highly valuable and contributory to the outcome of the research. All feedback will be kept strictly confidential, and utilized for this academic research only.

If you have any queries or comment on the attached questionnaire, please do not hesitate to contact me through this address:

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Hawassa University

School of Civil Engineering

Phone- 0910357160

Email- atirahji@yahoo.com

Thank you in advance for your invaluable input and kind cooperation!

Instructions: This research is conducted for academic purposes, so please try to fill it carefully and truthfully. For each of the questions, please tick [√] in the provided box which you believe is the most suitable answer using the given scale. Please also answer all the questions to enhance the objective of the research.

SECTION 1: GENERAL ORGANIZATION INFORMATION

1. Name of organization: ----------

2. Respondent organization/company type: Owner □ Contractor □ Consultant □ SEMs □

3. Respondents designation: Head of organization □ Project Manager □ Site Engineer □ Office Engineer □ Site Supervisor □ Other_____

4. Relevant working experience (Years): <1Yr □ 1-4Yrs □ 5-8Yrs □ 9-12Yrs □>12Yrs □

SECTION 2: FACTORS AFFECTING COST OF CONSTRUCTION PROJECTS IN 40/60 SAVING HOUSE DEVELOPMENT ENTERPRISE ADDIS ABABA BOLE AYAT LOT II.

Please indicate the significance of each factor by ticking (√) the appropriate boxes. Add any remarks relating to each factor on the last column

E.S. = extremely significant (5); V.S. = Very significant (4); M.S. = moderately significant (3); S.S. = slightly significant (2); N.S. = not significant (1);

2. How do you measure performance?

Cost □ Time □ Quality □ All □ Others; please specify_____

	2.1. Cost Factor	**E.S 5**	**V.S 4**	**M.S 3**	**S.S 2**	**N.S 1**	**Remarks**
1	Lack of cost planning/monitoring pre, during and post contract stages						
2	Design changes						
3	Inadequate review for drawings and contract documents.						
4	Uncertainty by the supervising team in dealing with the contractor's queries resulting in rework						
5	Unpredictable weather conditions						
6	Contractual claims, such as, extension of time with cost claims.						
7	Fluctuations in the cost of materials						
8	Additional work at owner's request						

9	Technical incompetence, poor organizational structure, and failures of the enterprise						
10	Project materials monopoly by some suppliers						
11	Lack of experience of technical consultants,						

SECTION 3: FACTORS AFFECTING TIME OF CONSTRUCTION PROJECTS IN 40/60 SAVING HOUSE DEVELOPMENT ENTERPRISE ADDIS ABABA BOLE AYAT LOT II.

	Time Factors	E.S 5	V.S 4	M.S 3	S.S 2	N.S 1	Remarks
1	**Project Related**						
1.1	Discrepancies between contract documents						
2	**Owner**						
2.1	Delay to furnish and deliver the site (Right of way problem)						
2.2	Poor communication and coordination						
2.3	Delay finance and payments of completed work.						
2.4	Owner interference						
2.5	Slow decision-making by owners.						
2.6	Unrealistic imposed contract duration						
2.7	Design change by owners						
3	**Contractor**						
3.1	Delay due to Financial problems						
3.2	Delay due to Subcontractor						
3.3	Delay due to Site management						
3.4	Delay due to Construction methods						
3.5	Delay due to Improper planning						
3.6	Delay due to Mistakes during construction						
3.7	Delay due to Quality of material						
3.8	Delay due to Shortage of material						
3.9	Delay due to Labor supply problem						
3.10	Delay due to Labor productivity						
4	**Consultant**						
4.1	Absence of consultant's site staff						
4.2	Contract management problem						
4.3	Lack preparation and approval of drawing						
4.4	Lack quality assurance/control (Waiting time for approval of tests and inspections)						
5	**External factors**						

5.1	Equipment availability and failure						
5.2	Major disputes and negotiations between stakeholders						
5.3	Lack of communication between the parties						
5.4	Weather condition						
5.5	Regulatory changes						

SECTION 4: FACTORS INFLUENCING QUALITY OF CONSTRUCTION PROJECTS IN 40/60 SAVING HOUSE DEVELOPMENT ENTERPRISE ADDIS ABABA BOLE AYAT LOT II.

	Quality Factors	**E.S 5**	**V.S 4**	**M.S 3**	**S.S 2**	**N.S 1**	**Remarks**
1	Unducated personnel						
2	Unxperienced personnel						
3	Lack quality of materials and equipment used in the project construction						
4	Lack conformance to specifications						
5	Lak quality assurance training and follow up						
6	Rework effects						

4.1. The quality management practice

4.1.1. Does your quality controller always take your materials for construction to laboratory for testing before using them?

Yes □ No □

If your answer is No, in question no 4.1.1 above which other precautions do you always take on site to ensure quality of the materials?

_____

4.1.2. How often do you conduct a quality training session for your employees?

□ Monthly □ Quarterly □ Semi-quarterly □ yearly □ none

SECTION 5: IMPACT OF POOR PROJECT PERFORMANCE IN 40/60 SAVING HOUSE DEVELOPMENT ENTERPRISE ADDIS ABABA BOLE AYAT LOT II.

	Impact of Poor Project Performance	E.S 5	V.S 4	M.S 3	S.S 2	N.S 1	Remarks
1	Building negative image of the company						
2	Large impact on the company's future						
3	Results in dispute between the project team						
4	Creates delay on the project						
5	Creates liquidated damage						

5.1 What are your mitigation strategies when your project performance becomes poor?

_____

_____

_____

5.2 What is the status of your project found in bole Ayat lot II?

_____

5.3 The remaining period to finish your project?

Greater than 1 year □

6 month – 1 year □

3 month – 6 months □

Less than 3 month □

6. If you have any additional comments and ideas regarding the performance of construction projects please write here:

_____

_____

_____