



EVALUATION OF MICRO AND SMALL ENTERPRISES PERFORMANCE IN 20/80
CONDOMINIUM HOUSING CONSTRUCTION: THE CASE OF GULELE SUB-CITY,
ADDIS ABABA

MSc THESIS

ZERIHUN ALEMAYEHU TEKA

HAWASSA UNIVERSITY, HAWASSA, ETHIOPIA

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ZERIHUN ALEMAYEHU TEKA

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ADVISORS APPROVAL SHEET

This is to certify that the thesis entitled “Evaluation of micro and small enterprises performance on 20/80 condominium housing construction: The case of Gulele sub city, Addis Ababa” submitted in partial fulfillment of the requirements for the Degree of Masters specialization in Construction Technology and Management, the graduate program of the Department of Civil Engineering, and has been carried out by Zerihun Alemayehu Teka under our supervision. Therefore, we recommended that the student has been fulfilled the requirements and hereby can submit the thesis to the Department.

Name of major advisor

Signature

Date

Bahiru Bewket (PhD)

Name of Co-advisor

Signature

Date

Daniel Alemayehu (MSc)

EXAMINERS APPROVAL SHEET

As member of the board of examiners, we certify that we have read, evaluated the thesis prepared by **Zerihun Alemayehu Teka** and examined the candidate. We recommended that the thesis is accepted as fulfilling the thesis requirement for the degree master of Science with specialized in Construction Technology and Management Stream.

_____	_____	_____
Internal Examiner (Chairperson)	Signature	Date
_____	_____	_____
External Examiner	Signature	Date
_____	_____	_____
Internal Examiner	Signature	Date
_____	_____	_____
Major Advisor	Signature	Date
_____	_____	_____
Co-Advisor	Signature	Date
_____	_____	_____
DGC/ SGC	Signature	Date
_____	_____	_____
SGS	Signature	Date

DECLARATION

I declare that this “**Evaluation of micro and small enterprises performance in 20/80 condominium housing construction: the case of Gulele sub-city, Addis Ababa**” thesis is my original work and has not been presented for a degree in any other university, and all sources of materials used for this thesis have been dually acknowledged

Name: Zerihun Alemayehu Teka

Signature: _____

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TABLES OF CONTENT

ACKNOWLEDGMENT.....	I
TABLES OF CONTENT.....	II
ABBREVIATIONS.....	V
LIST OF TABLES.....	VI
LIST OF FIGURES.....	VII
ABSTRACT.....	VII
1.1 Back ground of the study.....	1
1.2 Statement of the problem.....	3
1.3 Objectives.....	4
1.3.1 General objective.....	4
1.3.2 Specific objectives.....	4
1.5 Significance of the study.....	5
1.6 Scope and limitations.....	5
1.7 Organization of the Thesis.....	5
This study divide into five chapters that organized, illustrate and describe the steps taken to meet the specified research objectives. The study is organized as follows:.....	5
2. LITERATURE REVIEW.....	6
2.0 Introduction.....	6
2.1 Micro and Small enterprise in Ethiopia.....	6
2.2 Challenges of MSE Development in Ethiopia.....	8
2.3 Construction Industries in Ethiopia.....	9
2.4 Condominium Housing Construction practice in Ethiopia.....	9
2.5 Addis Ababa condominium housing construction.....	10
2.6 Performance of stakeholders in building construction.....	13
2.6.1 Performance indicator.....	15
2.6.2 Performance Evaluation.....	16

2.7 Quality in building construction	16
2.7.1 Factors that affect quality	18
2.7.2 Application of quality	19
2.7.3 Quality management.....	20
2.8 Time in construction.....	20
2.8.1 Delay in construction projects	21
2.8.2 Causes of delay in construction projects.....	22
2.9 Cost in building project	23
2.9.1 Cost influencing factors in construction (The concepts of cost in building constructions) ...	23
2.9.2 Cost over run	25
2.9.3 Factors that influence construction cost.....	26
2.10. Summary on identification of gaps of the literature.....	27
3. MATERIALS AND METHODS	29
3.1 Description of study area.....	29
3.2 Research design.....	30
3.3 Populations and samples determination.....	30
3.4.1 Primary data	34
3.5 Methods of data analysis	35
4. RESULTS AND DISSCUSION.....	37
4.0 Introduction	37
4.1 Survey results and discussions	37
4.2 Performances of MSEs according to the questionnaire, the case study and site observation results	44
4.2.1 Questionnaires result on performance of MSEs.....	44
4.2. 2 Major types of challenge that hampers the performance of MSEs responded from the construction stakeholders	48
4.2.2.1 Challenges that hampers the performance of MSEs on delivery of their work on Time ...	49
4.2.2.2 Challenges that hampers the performance of MSEs on delivery of their work on quality product out put	51

4.2.2.2 Challenges that hampers the performance of MSEs on delivery of their work on the budgeted cost.....	53
4.3.2 Major types of building defect observed on some selected buildings which were executed by MSEs.....	56
4.3.3 Performance evaluation of housing construction from the case study	61
5.0 CONCLUSIONS AND RECOMMENDATIONS	66
5.0 Introduction	66
5.1 Conclusions	66
5.3 Recommendations	67
5.4 Recommendations for further study	67
REFERENCE.....	68
APPENDIXS	72

ABBREVIATIONS

AAGHP	Addis Ababa Grand Housing Program
CSA	Central Statistical Agency
ETB	Ethiopian Birr
GDCF	Gross Domestic Capital Formation
GDP	Gross Domestic Capital
GTZ	German Technical Corporation
IHDP	Integrated Housing Development Program
ILO	International Labor Organization
ISO	International Standard Organization
KPIs	Key Performance Indicators
LCH	Low Cost Housing
LDC	Least Developing Countries
LMMS	Large and Medium Manufacturing Industries Survey
MSMEs	Micro, Small and Medium Enterprises
MWUD	Ministry of Workers and Urban Development
MSEs	Micro and Small Enterprises
PASEDEP	Plan for Accelerated and Sustained Development to End Poverty
QA	Quality Assurance
SDPRP	Sustainable Development and Poverty Reduction Program
SMEs	Small and Medium Enterprises
UK	United Kingdom
USD	United States Dollar

LIST OF TABLES

Table 3. 1 The response rate of the respondent	36
Table 4.1: Respondents construction contractor license grade.....	39
Table 4.2: Respondent positions on the site	40
Table 4.3: Educational background of respondent	40
Table 4.4: Respondent work experiences	42
Table 4.5: Category numbers and members of MSEs	43
Table 4.6: Frequency of the respondent on the performance of MSEs	47
Table 4.7: The RII and ranking for delay factors	50
Table 4. 8: The correlation coefficient for delivery time among respondents.....	51
Table 4.9: The RII and ranking for factors that affect delivery of quality output	52
Table 4.10 : The correlation coefficient for quality product output among respondents	53
Table 4.11: The RII and ranking for factors causing cost overrun.....	54
Table 4.12: The correlation coefficient for cost among respondents	55
Table 4.13: The correlation coefficient for a critical challenge hampers MSE	56
Table 4.14: Case studies on housing buildings (Contractor).....	63
Table 4.15: Case studies on housing buildings (MSE).....	65

LIST OF FIGURES

Figure 3.1: Location of the study area on the map	29
Figure 3.2: Population of the study area	33
Figure 4.3: Numbers of construction professional in members of MSE	44
Figure 4.4: Frequency of the respondent on the performance of MSEs	48
Figure 4.5: Poor electrical installation on the building	58
Figure 4.6: Defects on metal work	59
Figure 4.7: Low quality material and poor material handling on the site	61

ABSTRACT

Ethiopia has embarked on a long term development strategy which aimed at achieving sustainable development with all pre-requisites for a middle income country by the year 2025. The poor and deteriorated state of the construction industry with poor performance has detrimental effects to the developments of the industry. Thus, makes construction industry end product encountered many problems in terms of quality, delivery time and cost. Therefore the aims of this study also evaluation on micro and small enterprises that were engaged in 20/80 condominium housing construction at Addis Ababa in terms of quality, delivery time and cost. To achieve the proposed objectives, data were collected through the case study; questionnaire survey and site observation then making detailed discussion and analysis of problems and constraints that were hampering the performance of them. The finding of this research indicates MSEs on the average 67.6% MSEs couldn't delivered their activities on the required time, 75.7% MSEs couldn't deliver quality product output and 54.05% housing construction project office saves its cost by participating MSEs than that of contractors. On the other hand, on average according to the respondent 78.37% critical challenges were that hamper the performances of MSEs in 20/80 condominium housing construction projects at Addis Ababa. Factors causing delay in delivery of activities for MSEs are: delay in delivery of materials, contractor improper planning and skill shortage whereas factors which affect their quality include poor project management, low quality of materials and lack of experience. On the other hand major factors that cause cost overrun for MSEs in rendering activities are delay in material supply, poor project management and lack of skill. This study contributes to the advance knowledge in the area of enhancing and improving the performance of micro and small enterprises on 20/80 condominium housing construction. And also, its output will be used as a primary input for the government body during amendment and introducing of the new policies on the issues like, challenges that hampers the performance of MSEs and the solutions to overcome those problems.

Key words: Performance, Time, Quality, Cost

1. INTRODUCTION

1.1 Back ground of the study

Ethiopia has embarked on a long term development strategy which aimed at achieving sustainable development with all pre-requisites for a middle income country by the year 2025. This envisages the creation of 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 essential catalyst for the attainment of the vision 2025 objective include development of infrastructure as an important ingredient towards attainment of faster economic growth (Ministry of Urban and Construction, 2012).

The construction industry in Ethiopia has been developing tremendously since 2001. Recent studies indicated that the GDP contribution of the industry has been raised to 5.6% and approaches to the sub Saharan on average (6%). Meanwhile, the gross domestic capital formation (GDCF), which was about 60% in 1996/97, has reached nearly 75% in 2002/03. Beyond its contribution to the nation, the industry is also the 6th major contributor of the content infrastructure stock following South Africa, Egypt, Morocco, Algeria and Nigeria (Taddese et al, 2012).

The inefficient and deteriorated state of the construction industry with poor performance has detrimental effects to the developments the industry. Weaknesses problems and constraints are hampering the performances and developments of the industry (Ministry of Urban and Construction, 2012).

The construction industry is the sector of the economy that transforms various resources into constructed physical economic and social infrastructure necessary for socio economic development. The majority of enterprises in construction industry in least developed countries (LDCs) are small with a few of them being in the medium categories. It is said that, worldwide, small and medium enterprises (SMEs) account for 90% of all enterprises and over 99% in developing countries. They are also mostly owned by inhabitants. Small and medium enterprises are a very diverse group, ranging from small establishment to medium sized units,

scattered throughout the country. Micro, small and medium sized enterprises are vital for the creation of employment growth for developing countries. They are the only firms willing and able to undertake the small, scattered projects especially, in areas which are among the key components of developments required to satisfy the basic needs of peoples such as housing, health facilities, sanitations, and roads for geographical mobility. Growth of SMEs provides also a platform for further medium and large scale firms owned by home-grown people in the respective countries (Ministry of Urban and Construction, 2012).

A definition of MSEs often varies by country and is usual based on the number of employees, the annual turnover, or the value of assets of the enterprises. Typically micro enterprises are defined as enterprises with up to ten employees, small enterprises as those that have ten to hundred employees and medium sized enterprises as those with hundred to two hundred fifty employees. This includes all types of enterprises irrespective of their legal form such as family enterprises, sole partnerships or cooperatives or whether they are formal or informal enterprises (Ministry of Urban and Construction, 2012).

The construction industry of Ethiopia has contributed much in reduction of poverty, in increasing employment expansion through micro, small and medium enterprises development and job creation through the construction of low cost houses in Addis Ababa which was subsequently replicated to other regions. Ethiopia has also issued successive public procurement reforms to adhere good governance principles, reform efforts were made in order to promote competitive tendering for the selection of suppliers and for effective deliver of projects with predictable cost and time (Ministry of Urban and Construction, 2012).

Micro, small and medium sized enterprises make a crucial contribution to job creations and income generations, they account for two- thirds of all jobs worldwide. Therefore, the promotion of MSEs and SMEs has been a key area of intervention of ILO. Its advisory services on SMEs policies are in high demand among ILO member countries. This demand has become even stronger in recent years in view of the major development challenges in many developing and developed countries. Many international agencies are working on SME promotion, and the ILO is perceived as an important partner. It provides added value because

of its focus on both the quantitative aspects of employment creation and the fact that it serves constitutes that provide large potential outreach (ILO, 2015)

1.2 Statement of the problem

In Addis Ababa 20/80 condominium housing construction were the major issues city administration to satisfy housing demand of the dwellers and alleviation of urban poverty through participation of micro and small enterprises creation of employment opportunities in housing sector. Even if the city administration strategies on urban poverty reduction rises on positive perspective but major problems of the construction were exists related to quality, project delivery time and cost. This would have an effect on the housing demands of the dwellers and loss of public resources.

Now a day, in Ethiopia construction industries are becoming boom due to construction of major public infrastructure, public buildings, commercial buildings and housing development programs. However, construction quality, delivery time and the cost of the projects are becoming serious problems, especially on condominium housing construction projects at Addis Ababa and no attention is given to such subject. The stakeholders on the construction are often fail to identify and control quality, time and cost in the construction process, because the absence of appropriate tools to measure such problems. Therefore this study focused on evaluation and identification of performances of micro and small enterprises on condominium construction with a goal of establishing possible measures to overcome such problems.

Sustained high organization and population rates in Ethiopia will put extra pressure on already failing and deteriorating urban infrastructure, service and housing stock. The massive housing needs are unlikely to meet by small scale housing cooperatives, government and upgrading approaches prevailing from the late 1970's until the of 2000's especially, considering the high by low income sector of the populations for affordable housing. In particular IHDP envisages the utilizations of housing as an instrument to promote urban development create job, revitalize the local urban economy through MSE development, encourage saving and empower urban residents through property ownership and develop capacity of the domestic construction industry (UN-Habitat, 2010).

1.4 Research question

This study concerned with the evaluation and assessment on micro and small enterprise that are engaged on construction of condominium housing at Addis Ababa in terms of quality of product out puts, delivery time and costs with answering of the following basic research questions.

- ✓ How micro and small enterprises engaged in 20/80 condominium housing construction?
- ✓ Are micro and small enterprises performing to address the construction projects on the required quality?
- ✓ Are micro and small enterprises performing to address the construction projects on the proposed time?
- ✓ Are micro and small enterprises performing to address the construction projects cost efficient product output?
- ✓ What are the critical challenges that hamper micro and small enterprises performance?

1.3 Objectives

1.3.1 General objective

The general objective of this study to evaluate the performances of micro and small enterprises those engaged in 20/80 condominium construction at Addis Ababa.

1.3.2 Specific objectives

The specific objectives of this study were:

- ✓ To assess micro and small enterprise engagement in 20/80 condominium construction at Addis Ababa.
- ✓ To evaluate MSEs in terms of quality product output
- ✓ To evaluate MSEs in terms of timely product output
- ✓ To evaluate MSEs in terms of cost efficient product output
- ✓ To identify the critical challenges that hamper micro and small enterprises performance.

1.5 Significance of the study

This study contributes to the advance knowledge in the area of enhancing and improving the performance of micro and small enterprises on 20/80 condominium housing construction. And the output of this study will be used also, as a primary input for the government body during amendment and introducing of the new policies on the issues like, challenges that hampers the performance of MSEs and the solutions for to overcome those problems.

1.6 Scope and limitations

This study were limited to focused on evaluation and analysis of the performances of MSEs that were engaged on 20/80 condominium housing construction at Addis Ababa specifically, at Gulele sub city. The performances parameter that was stated on objectives was covered. The other limitations of the research were accessibility of organized data, willingness of respondent and lack of enough finance.

1.7 Organization of the Thesis

This study divide into five chapters that organized, illustrate and describe the steps taken to meet the specified research objectives. The study is organized as follows:

Chapter one is an introductory part containing discussions on background, statement of the problems, objective of the research, significance of the research & scope and limitation of the research.

Chapter two contains the literature review with theoretical and empirical literatures related with the issue which were incorporated.

Chapter three deals about the research methodology: research design, approach and method; sampling design, sources of data, data collection methods, analysis and presentation were incorporated.

Chapter four presents results and discussion of the research findings.

Chapter five contains conclusions and recommendations based on what is discussed in previous chapters.

2. LITERATURE REVIEW

2.0 Introduction

The construction industry is the vital for development of any nation, in many ways: the pace of the economic growth of any nation can be measured by the development of physical infrastructure, such as buildings, roads and bridges. Construction project development involves numerous parties, various processes different phases and stages of work and great deal of input from both public and private sectors, with the major aim being to bring the project successful conclusion (Takim et al, 2002). The level of success in carrying out construction project development activities will depend heavily on the quality of the managerial, financial , technical, and organizational performance of the respective parties while taking into considerations the associated risk management , the business environment, and economic and political stability. According to Wang (1994), as construction becoming more complex, a more sophisticated approach is necessary to deal with initiating, planning, financing, designing, approving, implementing and completing a project (Takim et al, 2002). The construction industry in Ethiopia is the major sector where public and private sectors are investing huge amount of fund. The percentage share of the construction sector to GDP at constant basic price has increased from 4.3% in 1993 E.C to 5.8% by 2002 E.C. 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 to increase access for water and sanitation infrastructure. Share of the Private sector in the value add of construction is also significant (MUC, 2012).

2.1 Micro and Small enterprise in Ethiopia

The issues of MSEs development ranked first among the prorates of socio economic, given the growing need for employment creations and poverty alleviations.

Ethiopia is one of the world's poorest countries, and it has the structural characteristics of an economy at an early stage of development. Even though agriculture employs 85% of the labor force, the agricultural sector contributes less to Ethiopia's Gross Domestic Product (GDP) than the economy's other sectors taken together. The differences in value added per worker across sectors are huge.

Diversification out of agriculture is often argued to be the way forward for Ethiopia. However, growth in Ethiopia's non-farm sector has been slow. Even compared to other countries in industry and manufacturing in Ethiopia contribute relatively little to the overall economy: industry contributes about 15 per cent and manufacturing about 5 per cent. Like many other African countries, the industrial sector in Ethiopia is characterized by large number of very small enterprises and small numbers of large firms.

Unlike most other African countries, Ethiopia has collected a lot of data on performance and employment in manufacturing sector. Most of the existing data derive from surveys conducted by the Central Statistical Agency (hence forth CSA) of Ethiopia. The most comprehensive data is that based on the large and medium manufacturing industries survey, which attempts to cover all manufacturing establishments in the country that engage ten persons or more and use power driven machinery (Jhon et al, 2012).

In Ethiopia, the idea of micro and small enterprises (MSEs) development emerged as promising agenda in the 1980s. Micro and small scale business are catalyst in the socio economic development of any country. They are a veritable vehicle for the achievement of national macro-economic objective in terms of employment generation at low investments cost and enhancement of apprenticeship training (Jegade et al, 2012). The construction industry of Ethiopia has contributed much in reduction of poverty, in increasing employment expansion through small and medium enterprises development and job creation through the construction low cost houses in Addis Ababa which was subsequently replicated to other regions. Ethiopia has also issued successive public procurement reforms to adhere good governance principles, reform efforts were made in order to promote competitive tendering for the selection of suppliers and for effective deliver of projects with predictable cost and time (Ministry of Urban and Construction, 2012).

A variety of reasons have been cited for the surge of interest in MSEs development (HK, 2010) like:

MSEs are a better means for poverty reduction.

- ❖ MSEs are a platform for sustainable development and productivity.
- ❖ MSEs are important actors within the trade sector and a platform for economically empowering women and men
- ❖ The MSE sector plays an important role in providing people with livelihood and income generating opportunities, providing income and services to people who cannot get employment in the formal sector.

Micro and Small Enterprises (MSEs) have played and continue to play significant roles in the growth, development and industrialization of developing countries. Accordingly, most developing countries have formulated and implemented a wide variety of MSMEs development strategies in order to support the growth of the sector, thereby transforming economies and generating substantial employment opportunities (Ada and First consult plc, 2017).

2.2 Challenges of MSE Development in Ethiopia

In Ethiopia, MSEs are confronted with various problems, which they are structural, institutional, and economic in nature. Lack of capital, working premises, marketing problems, shortages of supply of raw materials and lack of qualified human resource are the most pressing problems facing MSEs. Although the economic policy of Ethiopia has attached due emphasis to entrepreneurship values and applications of sectors contribution to the economy, there are still constraints related to infrastructure, credit working premises, extension service, consultancy, information provision, prototype developments, imbalance preferential treatment, and others which therefore need proper attention and improvement. It is in this context that Ethiopian micro and small enterprises development strategy was conceived and developed (HK , 2010).

2.3 Construction Industries in Ethiopia

The construction industry is a sector of the economy that transforms various resources into constructed physical economic and social infrastructure necessary for socio- economic development. Its development also a deliberate process to improve the capacity and effectiveness of the construction industry in order to meet the demand for building and civil engineering products, and to support sustained national economic and social development objectives (Kenny, 2012).

It embraces the process by which we said physical infrastructure are planned, designed, procured, constructed, or produced, altered, repaired, maintained and demolished. The constructed infrastructures include:

- ❖ Buildings
- ❖ Transportation systems and facilities which are air ports, harbors, highways, sub ways, bridges, railroads, transit systems, pipelines, and transmission and power lines.
- ❖ Structure for fluid containment, control and distribution such as water treatment distribution systems, sewage collection and treatment, distributions system, sedimentation lagoons, dams and irrigation and canal systems, underground structures, such as tunnels and mines (Ministry of Urban and Construction, 2012)

2.4 Condominium Housing Construction practice in Ethiopia

According to UN-Habitat (2010) report in 1974, the land and housing situations significantly changed as a result of political revolution, In July 1975, Proclamation No.47: ‘Government Ownership of Urban Lands and Extra Houses’ nationalized all urban land in an effort to force a fairer distribution of wealth across the country. Two new typologies in the housing sectors were established; government owned, rental units, administered by agency for administration of rental houses, and Keble Housing managed by Keble Administration units, the smallest government administration unit, operating at the neighborhood level (UN-Habitat , 2010).

During the late 1980s the ‘Dreg’ loosens its control of housing supply by allowing private houses owners and tenants of public premises to sell and exchange their houses although in the reality the government developed very little control and maintained its positions as key driver

of housing supply. Proclamation No. 292 of 1986 specified that residential buildings could be produced only by state enterprises, municipal governments, housing cooperatives and individuals who build dwellings for their personal consumption”, effectively excluding large-scale private sector housing developers to address the large demand (UN-Habitat, 2010).

The low rental rates resulted in a little to no investment in housing which lead to a further deterioration of housing quality. The housing conditions were poorest in the center of Addis Ababa. The Ethiopian People’s Revolutionary Democratic Front (EPRDF) in 1991, Ethiopia has been undergoing market-orientated reforms, Addis Ababa first housing policy, incorporating the governments practice of maintain public ownership, was also implemented at this time but it assumed that the housing market alone would meet the demand for affordable housing of the low income population (UN-Habitat, 2010).

2.5 Addis Ababa condominium housing construction

According Azeb (2004) the city administration Addis Ababa has established the legal institutions housing agency, housing development project office, micro and small scale commercial enterprise and technical and vocational education trainings to implement housing development program. Private sector housing supply remains constrained by high costs and time required for title registration, land access, construction material supply, along with cumbersome and expensive procedures for land and property transactions and the shortage of experienced. Private developers under housing agency a department is created with the main responsible of looking for assistance from different sources to be used for constructing residential houses for low income residents (Azeb, 2004).

Integrated housing development program (IHDP) initiated by the Ministry of Works and Urban the prominent current government approach to solving the low income housing challenge in the integrated development (MWUD) in 2005. The program is a continuation of the Addis Ababa grand housing program which supported endeavors of Ethiopia government in their implementations of Plan for Accelerated and Sustained Development to End Poverty (PASDEP) (Azeb, 2004).

The IHDP aims to;

- ❖ Increase housing supply for the low income populations.
- ❖ Recognize existing urban areas and mitigate their expansion in the future.
- ❖ Increase job opportunities for micro and small enterprises and unskilled laborers, which will in turn provide income for their families to afford their own housing.
- ❖ Improve wealth creation and distribution for the nation.

Phases Addis Ababa housing project office is conduct to address housing project housing problems of the city.

Phase 1- Low cost housing (LCH)

According to Sacha (2013) the full scale housing program was not established from the outset. It emerged from the government's preliminary exploration of more effective and affordable housing constructions techniques in the late 1990s. During this research Ethiopia found the German government as partner and signed bilateral agreement for technical assistance in working with Germany's official development agency German technical corporations (GTZ), the collaborations aim was to develop a simple technology to promote housing construction. While the subsequent low cost housing project (LCH) eventually aimed at a larger scale, its first phase (1992-2002) was predominantly focused on testing housing construction through the so called LCH technology and was mainly implemented as two stored buildings on test sites located in the regional state of Tigray and the city of Addis Ababa. The LCH technology's designing a new and cheaper hollow blocks size ; creating columns without formwork by inserting reinforcement inside the hollow blocks combining both strip and slab foundations, and introducing a pre-fabricated formwork free slab system using beams and hollow blocks. Overall this resulted in construction costs of ETB 500-800 (USD 59-95) per square meter a 40% reduction of average building costs in Ethiopia at the time (Sacha, 2013).

Phase 2 -Addis Ababa Grand Housing Program (AAGHP)

The ambition to extend these preliminary tests into a full scale housing program was initiated during the second phase of LCH project (2002-2006) and was partially due to a change in national development policy. In 2002, the EPRDF introduced the, sustainable development

and poverty reduction program (SDPRP) the first of series of comprehensive economic development plans. The SDPRP, covering the amount between 2002 and 2005 declared the requirement of formulating a housing policy that ought to improve housing affordability via introducing acceptable housing standards that think about local resource capacities and requirements (Sacha, 2013). In accordance with these directives and within the already running LCH project, the Ethiopian government, together with GTZ, launched a large-scale housing scheme, the so-called 'Addis Ababa Grand Housing Program'. While this step asked for new measures such as integrating the local construction industry, the construction technology itself was not fundamentally transformed. The AAGH was formally launched in 2004 with the inauguration of its pilot program at the 'Bole-Gerji web site, which extended the LCH technology to buildings of four to five stories, featured four newly designed prototypes that contained studio, one-bedroom, two bedroom and three-bedroom apartments, and consisted of 696 units distributed among 28 housing blocks Following an ambitious pace however, the completion of the Bole Gerji site was not only the beginning of a new phase: during the pilot project's construction, the GTZ – in collaboration with the local firm MH Engineering – already designed 20,000 units on 20 new sites and marginally adjusted the housing blocks compositions into three basic types (an 'I-type', 'L-type' and 'T-type'). Also at the same time, the GTZ's operational subsidiary GTZ International Services (GTZ IS), the GTZ and MH Engineering also supported the newly established Addis Ababa Housing Development Project Office (AAHDPO) to set up and style consequent one hundred sites and 66'000 units. For the pilot project, the planners managed to remain within the upper range of the LCH project's costs, spending ETB 800-900 (USD 92-104) per square meter (Sacha, 2013).

Phase 3 – Integrated housing development program

The next step of increasing the housing program was indicated inside the following economic process framework 'Plan for Accelerated and Sustained Development to finish Poverty' (PASDEP) that coated the amount from 2005 to 2010. Based on the already tested and implemented housing sites in Addis Ababa, the government declared to design "a national integrated housing development program that involves a combination of government financing

and construction of housing in giant and medium-sized cities targeted at middle and low-income households (Sacha, 2013).

Following this assignment, renaming and scaling up the AAGHP to the ‘Integrated Housing Development Program’ (IHDP) in 2006 simultaneously marked the end of the LCH project’s second phase and the official collaboration with the GTZ. Incorporating the development efforts inside the previous AAGHP, the IHDP set formidable ‘five-year goals’ for the amount between 2004 and 2008, in the main targeting Addis Ababa. Apart from a reduction of slum dwellings by 50%, the program planned to build 150,000-200,000 housing units, create 60,000 jobs, give the basis for 2000 micro and small enterprises (MSEs), reorganize the existing training procedures for the domestic construction sector, broadly introduce the developed low-cost building technologies, raise ETB five billion(USD 573 million) for initial housing construction, develop 1,200 hectares of land, and therefore ‘build an institutional capacity’ that can oversee and implement an annual output of 50’000 housing units in the long run with regards to design, the IHDP basically adopted the AAGHP’s housing blocks, integrating only small variations and extensions of existing building (Sacha, 2013).

In order to adequately introduce such an amount of building mass, the “provision of large scale housing should focus on conducive housing within conducive neighborhoods (Azeb, 2004).

Although the initial IHDP documents assumed the same cost range as realized within the pilot project, the average costs increased successively during the implementation phase, resulting in ETB 1507 (USD 131) per square meter in 2009/2010. Despite clearly missing the aspired cost targets and quantities within the given time frame, as of 2010, a respectable amount of about 80’000 units had been built all over Addis Ababa.

2.6 Performance of stakeholders in building construction

The performance of the industry and its contribution to the welfare of society in comparison to other industries such as the manufacturing industry has lately been the focus of many commissioned reports and academic research publications. Bernold and AbouRizk (2010) mention two clusters of performance measures: efficiency and effectiveness. While efficiency focuses on operational ratio and productivity matters in the short term, effectiveness comprises

measures focusing on long-term improvement goals such as the amount of rework and owner satisfaction of completed projects. The so-called iron triangle of time, cost and quality have been the most important metrics of construction project performance, especially for the selection of appropriate procurement methods); however, other factors such as safety and environment impact were also considered (Abukar , 2011).

The performance of the construction industries in many developing countries, the industries in these countries continue to face problems including poor cost, time and quality performance; lack of work opportunities and poor level of professionalism ,the main reasons for project failure in developing countries are: lack of advance planning, a holistic approach, lack of comprehensive engineering and management strategy, inconsistency in monitoring and follow-up, coordination and communication lapses and above all, absence of a methodical approach. Extending his argument further described that these factors significantly affect the efficient performance of construction team and in most cases lead to project failure. According to developing countries in general fall short when compared with other sectors of the economy within their own countries, as well as with their counterparts elsewhere with regard to productivity, quality, safety and health, and environmental performance. Although these problems are common for most construction industries in all countries, those in the developing nations face them to larger extent due to the additional difficulties of economic stress, resource shortages, and institutional and legal which make the task of improving their performance even more demanding (Tadesse et al, 2016).

The extent of construction related problem in some selected African Countries are becoming high, among such countries are Nigeria, Kenya, Ghana, Uganda and Tanzania. In Tanzania found out that total cost and time overrun rates on average to be 44% and 26% respectively by considering seven projects. Further identified that among other factors the average contribution of inadequate design to be 26% and 32% respectively and the extent to which inadequate design contributes, as a percentage, to cost and time overruns was 61% and 85% respectively.

The case in Ghanaian construction industry as it is highlighted by has also several of the characteristics of construction industries in developing countries. According to the industry's

performance in most respects, such as cost, time, quality, safety and health of its workers, the durability of its products and the satisfaction of its stakeholders are inadequate.

The Nigerian construction industry is also still struggling with a lot of intrinsic challenges, ranging from inadequate technical and managerial know-how to insufficient financial, material and equipment capital base. A study on evaluation of management challenges facing the Nigerian construction industry also revealed that time; cost, quality, and safety remain the top management challenges facing construction managers in Nigeria.

The case in Kenya is also not different with other most of African countries. The industry is facing lots of challenges such as the expenditure exceeding the budget, delay to complete the project in time, the building defects and over-reliance on foreign workers.

Most construction projects especially road infrastructure in Kenya are exposed to extreme cost escalation to the extent that it calls not only for extra funding but also specialized expertise hence leading to technical and project managerial conflicts between project's parties .

Study in Botswana on the other hand investigated that seven out of ten public projects had reported cost overruns and the factors that influence cost overruns have been identified and ranked in order of significance, accordingly variations, re-measurement of provisional works, contractual claims and fluctuations in the cost of labor and materials, with variations being the most significant. He also cited a recent study in which only 16% of the projects were considered successful (i.e. completed on time, within budget, and to Specification (Tadesse et al, 2016).

2.6.1 Performance indicator

The UK operating teams on key performance indicators (KPIs) have known ten parameters for benchmarking comes so as to realize a decent performance in response to Egan's report (1998). However, most of those indicators, like construction price, construction time, defects, shopper satisfaction with the merchandise and repair, profitableness and productivity, promote result-orientated thinking, whereas foregone conclusion of style cost and time, and foregone conclusion of construction price and time, and safety are often considered process-orientated thinking. There aren't any suggestions for performance indicators in benchmarking come at the project choice phase i.e., analysis stage, once the shopper and end-user's needs would like statements and therefore the delivery strategy are determined. In addition, the angle of the

‘project’ and ‘supplier’ isn't clearly indicated. None of the measures mentioned in this section could identify the performance of suppliers in a project environment (Takim et al, 2002).

2.6.2 Performance Evaluation

Performance mensuration is employed as a scientific means of judgment project performance by evaluating the inputs, outputs and therefore the final project outcomes. The inefficient and deteriorated state of the development business with poor performance has prejudicial effects to the event of the business (Ministry of urban and construction, 2012). Weaknesses, issues and constraints hampering the performance and development of the business include:

- ❖ Low capability and capability of the native contractors and consultants thanks to weak resource base and inadequate expertise.
- ❖ Inadequate and erratic work opportunities, inappropriate contract packaging of works that favor foreign companies in donor funded comes, low public investment in infrastructure comes and over dependence on donor funding.
- ❖ Inefficient and non - clear acquisition Systems Corruption and monetary direction in public/private sectors.
- ❖ Lack of auxiliary institutional mechanisms in terms of economic credit facilities, instrumentality for rent and skilled development.
- ❖ Unfavorable donor conditionality's that tend to marginalize native construction enterprises.
- ❖ Poor operating setting, as well as low standards of safety and activity hazards on construction sites
- ❖ Weak and non-facilitative policies and restrictive framework
- ❖ Low productivity and quality Low technological base.

2.7 Quality in building construction

Quality may be outlined as meeting the legal, aesthetic and practical necessities of a project. Quality in construction projects is not only the quality of product and equipment used in the construction of a facility but the total management approach to complete the facility i.e., integrated action due to human, material, machinery, process methodology and work environment, also known as process quality, which reflects the quality of products (Ying,

2010). In order to ensure the quality of construction project, the quality of each process must be controlled, which is the focus of quality control during construction. The quality of construction depends mainly upon the control of construction, which is the primary responsibility of the contractor (Abdulrazzak, 2011).

The quality of the construction process is the quality of attainment of acceptable levels of quality in the construction industry has long been a problem. Great expenditures of time, money and resources, both human and material, are wasted each year because of inefficient or nonexistent quality management procedures (Hmala et al , 2015).

Design and construction are the two important phases of project life cycle which affect the quality outcome of construction projects significantly. Further, quality of construction projects can be regarded as the fulfillment of expectations of the project participants by optimizing their satisfaction. It is because, since the quality outcomes of the projects are not according to required standards, faulty construction takes place. Further, the errors on construction projects occur frequently and can be costly for the contractors and owners of constructed facilities. In fact, 6-15% of construction cost is found to be wasted due to rework of defective components detected late during construction and 5% of construction cost is wasted due to rework of defective components detected during maintenance Hmala et al (2015) Hence, quality has become one of the most important competitive strategic tools which many construction organizations have realized it as a key to develop their building products in supporting the continuing success.

According to the manual of professional practice of or quality in the constructed project, "Quality Assurance (QA) is a program covering activities necessary to provide quality in the work to meet the project requirements. Quality Assurance involves establishing project related policies, procedures, standards, training, guidelines, and system necessary to produce quality. The design professional and constructor are responsible for developing an appropriate program for each project. Quality Assurance provides protection against quality problems through early warnings of trouble ahead. Such early warnings play an important role in the prevention of both internal and external problems". On the other hand quality Control (QC) is the specific implementation of the quality assurance program and related activities. Effective

quality assurance reduces the possibility of changes, mistakes and omissions, which in turn result in fewer conflicts and disputes (Arditi et al, 1997)

2.7.1 Factors that affect quality

Poor quality in construction comes may be a common development within the world, the satisfaction of quality level within the construction comes has not been achieved and, it's a significant drawback. However, most of the countries have been evolved to implement quality standards to ensure construction quality. Therefore, it is necessary to investigate the importance of quality for construction project success (Hmala et al, 2015). Establishing the project necessities for quality begins at project beginning. A careful balance between the owner's necessities of the project prices and schedule, desired operating characteristics, materials of construction, etc. and the design professional's need for adequate time and budget to meet those requirements during the design process is essential.

Owners balance their necessities against economic concerns and, in some cases, against chance of failure. The design skilled is duty-bound to guard public health and safety within the context of the ultimate completed project. The creator is answerable for the means that, methods, techniques, sequences and procedures of construction, as well as safety precautions and programs during the construction process. Project requirements are the key factors that define quality in the process of construction (Arditi et al, 1997).

The process of construction are often de-escalated into 3 main phases, namely,

- ❖ The planning and design phase,
- ❖ The construction phase, and
- ❖ The maintenance and operation phase.

Quality and construction quality control is the responsibility of the contractor. However it could be categorized into two parts i.e.

- ❖ The quality of workmanship
- ❖ The construction materials.

Concerning the workmanship, it is usual to have experienced Foreman to be on the Construction Site continuously until the project is completed. Apart from this, the building

materials are tested to ensure the quality i.e. since the Ethiopian standard code of practice sets minimum quality requirements, the materials should fulfill the standards specified by the code before using them in the construction project. These qualitative tests are mostly done according to the Ethiopian standards institution, by building design enterprise, as well as by the university and other firms (Alem , 2015).

2.7.2 Application of quality

From the attitude of a construction company, quality management in construction comes ought to mean maintaining the standard of construction works at the desired standard thus on get customers' satisfaction that would bring long term competitiveness and business survival for the companies (Hmala et al, 2015). Further, the adoption of quality in construction industry has been promoted in some literature. The application of ISO standards has received a lot of attention from researchers (Hmala et al, 2015).

ISO certification is nowadays a trend in most industries including construction industry. A project can be considered successful when it is delivered within the specified budget and time, and has met the specified level of functionality. Construction projects are unique and no repetitive in nature, and have their own quality requirements that can be developed by integration of project specifications and an organization's quality management system (Abdulrazzak, 2011).

Xiao and Proverbs, (2002) Stress that the achievement of a low cost and speedy construction period should not compromise the quality of the project since poor quality could lead to extra costs in terms of rework and repair. There are crucial elements that would cause the owner, designers/architects, contractors, and the end-users of the project to be dissatisfied and thus negatively assess project performance. In a study of critical success factors for construction projects, Sanvido et al, (1992) point out that the financial reality of doing business appears to be a common factor for all three participants (owner, designer and contractor) of a project. A common loss for all the stakeholders of a construction project could therefore be the associated cost of quality, which is estimated to be relatively high (more than 15%) in terms of total project cost (Abukar, 2011).

2.7.3 Quality management

Standard setting is one of the first issues in developing a quality assurance system, and increasingly organizations are relying on readily available standards rather than developing their own (Abdulrazzak, 2011).

Monitoring specific project result to work out if they go with relevant quality standards and characteristic ways that to eliminate reason for unhappy performance Contract documents comprise a transparent, complete, and accurate description of the facility to be constructed, correctly conveying the intent of the owner regarding the characteristics of the facility needed to serve his or her purposes. The contract documents outline a made facility thought-about acceptable underneath the applicable regulative codes and standards of skilled apply, in terms of its liableness, the benefit with that maintenance and repairs are often performed, the durability of its materials and operating systems, and the life safety provided to its users. The facility is constructed in accordance with those documents (Lakshimi, 2015).

Managers are able to make better informed decisions made during the delivery process, resulting in a better owner satisfaction to testing of required building construction materials and to determine the quality and quantity of our required area of the building construction (Isaac et al, 2003).

2.8 Time in construction

In the construction industry, the aim of project control is to ensure that projects finish on time, within budget and achieve other project objectives (Olawale et al, 2010). A productive project is that the solely project that has accomplished its technical performance, maintained its schedule, and remained within budgetary costs. Project management tools and techniques play an important role in the effective management of a project (Isaac et al, 2003).

Construction time and price area unit elementary issues in project management and considered most significant parameters for mensuration success of any project. Poor performance of time and cost can lead to a significant amount of time and cost overrun which is global phenomenon. Time overrun are often outlined as late completion of works as compared to the planned schedule or contract schedule. It happens once the progress of a contract falls behind its scheduled program. It may be caused by any party to the contract and should be immediate

results of one or a lot of circumstances. A contract delay has adverse effects on each the owner and contractor (either within the style of lost revenues or further expenses) and it typically raises the contentious issue of delay responsibility, which may result in conflicts that frequently reach the courts (M.I. et al, 2006)

Cost overruns are often thought-about because the distinction between actual value of a project and its value limit. It happens once the resultant value target of a project exceed its value limits wherever value limit of a project refers to the utmost expenditure that the shopper is prepared to incur on a completed building project whereas value target refers to the counseled expenditure for every component of a project. Construction value that is out of management adds to investment pressure, will increase construction value, affects investment decision-making and wastes the national finance may lead to corruption or offence (Aftab et al, 2012).

2.8.1 Delay in construction projects

Construction delay are result of a mismanaged events and can see as a risk for projects , which if identified, analyzed and managed in a systematic process at inception could be managed, minimized, shared, mitigated or accepted to give some good result and minimized further delay (Fung et al, 2006).

It's also considered as time lag in completion of activities from its specified time as per contract or can be defined as late completion or late start of activities to the baseline schedule directly affects specified cost. Delay defined as the slowdown of work without stopping construction entirely and that can lead to time over run either have agreed of project (Seid et al, 2003).

Construction delay defined as the late completion of work compared to planned or contract schedule and defined as the something happening at later time than planned expected , specified in contract or beyond the date that the parties agreed upon for the delivery of a project (Werku , 2016).

2.8.2 Causes of delay in construction projects

There are many factors that contribute to causes of delays in construction projects. Delays occur in each construction project and also the magnitude of those delays varies significantly from project to project. It is essential to outline the particular causes of delay so as to attenuate and avoid delay in any construction project. A number of studies have been carried out worldwide to determine the causes of delay in construction projects.

Sambasivan and Soon (2017) have known ten most significant causes of delay in Asian nation. The survey was carried out with clients, consultants and contractors. Based on their survey results, the most important delay factors were: contractor's improper planning, contractor's poor site management, inadequate contractor experience, inadequate client's finance and payments for completed work, problems with subcontractors, material shortage, labor supply, equipment availability and failure, lack of communication between parties, and mistakes during the construction stage. A similar study in Malaysia was carried out by (Alaghbari, 2007) with a list of 31 delay factors. The major delay factors from their survey results were: financial difficulties and economic problems, contractor financial problems, late supervision and slowness in making decisions, material shortages, poor site management, construction mistakes and defective work, delay in delivery of materials to site and lack of consultant's experience.

Adnan et al (2010) conducted a survey in Hong Kong to determine and evaluate the relative importance of the significant factors affecting the construction delays. They analyzed and ranked the main factors affecting the construction time, and classified them into two groups: the role of the parties in the local construction industry and the type of projects. Based on their survey results, they indicated that the five major causes of delays were: poor site management and supervision, unforeseen ground conditions, low speed of decision making involving all project groups, client initiated variations and necessary variations of works.

Fugar et al (2010) also studied the causes of delays in building construction projects in Ghana. They identified 32 possible causes of delay and further categorized into nine major groups. The list of the causes of delay was conducted into survey. Based on their analysis, they concluded that the delay in honoring certificates, underestimation of the costs of projects,

underestimation of the complexity of projects, difficulty in professional opinions from the respondents in Perth, Western Australia. In addition, some recommendations to the identified top ten delay factors will be provided. This report is intended to identify the most common and critical delay factors based on all the respondents that participated in the survey in order to prepare an action plan for reducing and mitigating any delays associated with a construction project.

2.9 Cost in building project

Construction (building) project is a mission, undertaken to create a unique facility, product or service within the specified scope, quality, time, and cost. In apply, but some construction comes encounter cost, delay on completion time or poor workmanship upon completion. Cost overrun, bed quality workmanship and delay of construction projects require an in-depth investigation to improve the outputs of the construction industry (Abukar, 2011).

It is not uncommon to envision construction comes failing to attain their mission of making facilities inside the desired price and time. Hardly few comes get completed on time and inside budget since construction comes square measure exposed to unsure environments owing to such factors as construction complexity; presence of varied interest groups like the project house owners, end users, consultants, contractors, financiers; materials, equipment, project funding; climatic environment; the economic and political environment and statutory regulations (Climbing the curve, 2015). The prospering execution of construction comes, keeping them within estimated cost and the prescribed schedules, primarily depends on the existence of an efficient construction sector capable of sustained growth and development so as to address the wants of social and economic development and to utilize the newest technology in designing and execution adequate designing at the first stages of a project is crucial for minimizing delays and price overrun.

2.9.1 Cost influencing factors in construction (The concepts of cost in building constructions)

Construction costs are to be approximately planned. The correct prices are well-known solely when the completion of a project. At the initial stage, contractors who are bidding should have the complete knowledge about the Direct and Indirect/Overhead costs. This helps them to

control of overheads throughout the project. Overhead prices square measure important prices whereas estimating a building. Overhead costs increases continuously and does not go down. The overhead prices can't be neglected in any project; these prices represent an awfully substantial value of the project. A direct and indirect cost structure seems to include most of the cost components incurred by the various actors in the construction process and indeed enhances the distinction between cost and price in relation to supplier structure.

The factors influencing construction costs were formed into four groups/layers: project specific factors, client-contractor-related factors, competition and market conditions, and macroeconomic and political factors. The grouping is based on the extent to which the construction actors, especially contractors and clients, could influence the factors (Abukar, 2011).

Uncontrolled projects end up unexpected cost overrun and ineffective accomplished project in terms of cost. The ultimate aim of project control activities is to gain competitive and comparative advantages over the project implementation process specifically to the owners benefit or fit for purpose (Tefera, 2013). Design change is undoubtedly considered the most important factor that inhibits the ability to control cost and time of Construction projects (Olawale et al, 2010). Even if most of the projects are facing the problem of cost overrun. However, the degree of overrun varies from project to project (Aftab et al , 2012).

One of the biggest concerns for accurate estimating of anticipated costs prior to committing to the project. Projects square measure moving therefore quick they need restricted time to develop the scope and accurately estimate prices. This result in issues where the standard contingency used (10 percent) is not enough to cover the project risks.” Contingency planning typically involves downside risk estimates for budget and delivery times throughout the project life cycle (Climbing the curve, 2015).

2.9.2 Cost over run

Definition

- a. Costs overrun an instance in which the provision of contracted goods or service are claimed to require more financial resources than was originally agreed between project sponsor and contractor.
- b. Cost overrun: the amount by which actual costs exceed the baseline or approved cost (Wideman, 2002).

Cost overrun: the difference between the original cost and the actual cost when the project is completed. Cost is one in all the main concerns throughout the lifecycle of a project. Unfortunately, most of the projects failed to achieve project completion with the estimated cost. Besides time overrun, cost overrun is also a serious problem in the construction industry. This is a major problem both in developed and developing countries. The trend is a lot of severe in developing countries wherever these overruns generally exceeds 100% of the anticipated value of the project (Ahar, 2008). The history of the development business worldwide is jam-packed with comes that were completed with important quantity of value overruns. Despite the wide handiness and use of various project management ways and packages, many construction projects still suffer cost overruns (Olawale & Sun, 2010).

Cost overrun is the difference between the final and originally estimated (i.e. initial, expected or estimated) cost of the projects. The originally expected cost is called the initial project cost and also called estimated cost of project works. Estimated costs are defined as budgeted or forecast costs which are made at the beginning of the project to build a project. Even if the project planning and scheduling process varies with project type, time and country, it is possible to locate for a particular project a specific point in the procedure that could be identified as the time where the formal decision is made to build the project. Actual cost is defined as real, accounted cost determined at the time of completing a project (Seid et al, 2003)

Cost overrun is measured as a share of actual prices over the calculable prices of the project as (Cantarelli, 2010). Shown in:

$$\text{Cost Overrun} = \frac{\text{Actual Cost} - \text{Estimated Cost}}{\text{Estimated Cost}} \dots \dots \dots \{ \text{Equation 2.1} \}$$

Actual prices square measure outlined as real and accounted construction prices determined at the time of project completion. Estimated prices square measure outlined as budgeted or forecasted construction prices determined at the beginning of comes (Cantarelli, 2010).

2.9.3 Factors that influence construction cost

Cost overrun in construction comes will occur thanks to several factors. It is terribly crucial to see these factors in rising value performance.

Ahar (2008) investigated cost causes in industry of Pakistan. A survey exploitation form containing forty two (42) factors showed that the highest 10 cost factors found were fluctuation in costs of raw materials, unstable cost of manufactured materials, high cost of machineries, lowest bidding procurement procedures, poor project (site) management/ poor cost control, delays between design and procurement phases, incorrect/ inappropriate methods of cost estimation, additional work, improper planning, and unsupportive government policies.

Ameh (2010) investigated the causes of cost overrun in 53 telecommunication projects of Nigeria through structured questionnaire survey containing 42 factors. Survey results showed that high seven factors were lack of expertise of contractors, cost of material, fluctuation in the prices of materials, frequent design changes, economic stability, high interest rates charged by banks on loans received by contractors, mode of financing, bonds & payments as well as fraudulent practices & kickbacks.

Enshassi (2009) conducted questionnaire survey to identify major causes of cost overrun in construction projects of Gaza by investigating 42 factors amongst contractors, consultants and owners. Results indicated that top ten factors that cause cost overruns as perceived by the three parties include increment of materials prices due to continuous border closures, delay in construction, supply of raw materials and instrumentation by contractors, fluctuations in the cost of building materials, unsettlement of the local currency in relation to dollar value, project materials monopoly by some suppliers, resources constraint: funds and associated auxiliaries

not prepared, lack of cost planning/monitoring during pre-and post-contract stages, improvements to standard drawings during construction stage, design changes, and inaccurate quantity take-off.

According to Flyvberg (2009) two fundamental reasons why expertise value comes overruns. Firstly, strategic misrepresentation, which is an Orwellian euphemism for describing deceptive actions used by politicians and planners to ensure that projects proceed. Secondly, optimum bias, which encapsulates the systematic tendency for decision makers to be over-optimistic about the outcome of, planned actions. This includes over-estimating the likelihood of positive events and under-estimating risk and loss. The United Kingdom (UK) government has acknowledged that optimism bias is a problem in the planning and budgeting infrastructure projects and developed measures for dealing this with problem.

2.10. Summary on identification of gaps of the literature

This literature revised about micro and small enterprises in Ethiopia , challenges of MSE development in Ethiopia, condominium housing construction practice in Ethiopia specifically Addis Ababa condominium housing construction at different phase: phase one, low cost housing , phase two, Addis Ababa grand housing program and phase three, integrated housing development program.

In phase three integrated housing program, it has been launched on the ten sub cities of the city. This literature moreover, gives emphasis on performance of micro and small enterprises performance which they are engaged in construction of condominium housings. The main reason of the literature review were to adapt best experiences of different developing and developed countries the issues related to delivering of construction end product on the proposed time, on specified quality standards and on the budgeted cost for construction of 20/80 condominium housing construction projects and to identify other researches to this study.

From the literature review, the success factors for any construction projects are: project delivery time, quality and cost are the major factor to measure the performance of the stakeholders at different stages of construction. From these factor which affects project

delivery time are contractor improper planning, poor site management, and delay on delivery of materials, under estimation time of completion, skill shortage, lack of contractors experience, inadequate client finance, equipment availability and failed and rework for defective works. The major factors which affect quality of any construction end products are poor project management low quality construction materials, lack of experience, lack of skill financial difficulties and soon. The factors which are influencing construction project cost are formed into: project specific factors, client contractor related factors, market condition and macro-economic and political factors.

During the researcher try to review the literature related to the research topic on the study areas different researchers were done their study related to building defect in 20/80 condominium housing construction , roles of micro and small enterprises in employment creation , micro and small enterprise development in Ethiopia. But there is no research related with performance of micro and small enterprise in condominium housing construction. Therefore, this research tries to fill the gap by giving emphasis on the performances micro and small enterprises in 20/80 condominium housing construction at Addis Ababa.

3. MATERIALS AND METHODS

3.1 Description of study area

Gulele sub city is the sub city of Addis Ababa, capital city of Ethiopia. The district is located north suburb of the city, near the mount Entoto natural park. It borders with the districts Kolfe keranio, Addis ketema, Arada and Yeka sub city of Addis Ababa. It lies on the coordinate's $9^{\circ}3'46.8''$ N $38^{\circ}44'36.96''$ E, the elevation of 2,355 meter (7726 ft.) and total area of 30.18 square kilo meter or 11.65 square miles. The population is around 284,865, males about 137, 690 and females 147, 175.



Figure 3.1: Location of the study area on the map

3.2 Research design

In this study, mixed method research approaches were used. This approach is useful the best to capture both qualitative and quantitative data. To employ mixed method, a questionnaire survey conducted and analyzed which is followed by an in-depth case analysis from quantitative data source. In line with the above strategies the research carried out using a four steps approach in order to achieve the objectives of the research. First undertaken a literature search on previous publications on quality, delivery time and project cost. Although the review of related literature will carried out as a standing alone chapter, the researcher used literature throughout the whole research process to substantiate arguments and claims.

In the second phase, questionnaires were developed and distribute to the client, contractors, consultants and MSEs. Those were also, includes project manager, assistant project manager, resident engineer, site supervisors, site and office engineer and Forman. Upon obtaining the desired data, checking and sorting of data has been done. In the third phase, case studies conducted in some selected blocks which were delay in their progress. The case study data were gathered employing cheek list and by evaluating biding documents of the stockholders. Fourthly, Site observations also conducted and were supported by a photo camera on the areas of MSE activities regarding to their efficiency on delivery time, quality and cost. Finally, this followed by thorough discussions in order to draw conclusions and to forward recommendations based on the findings of the study.

3.3 Populations and samples determination

At Addis Ababa city administration, there were condominium housing construction projects across all sub cities having different sites. This study was done at 20/80 condominium housing constructions projects undergoing in Gulele Sub-Cities. For the selection of this sub city, unfinished and active projects creates a good opportunity for the researcher to get access to contractors, consultants and MSEs before they transferred the project and leave the site which enables the researchers to detect construction problems and performances related to MSEs before they transferring to the client. In Gulele sub city, there was housing

development project branch office having four different construction sites namely; Bereket site,

Wetader site, Fanuel and Jemo gara sites. Bereket and Wetader site were contains 24 numbers of G+4 and 44 numbers of G+7 buildings and also Fanuel and Jemo gara sites having 42 numbers of G+4 and 12 numbers of G+7 buildings.

Therefore, totally sum of buildings from the all sites unfinished building in Gulele housing project which constitutes 125 blocks. The target groups from which the data were collected includes: contractors', consultants', clients and micro and small enterprises'. As suggested by Al-Moghany (2006) the sample size determination formula was used since my population is categorized as small sized population.

Accordingly Al-Moghany, (2006) sample size determination from the total of 49 construction contracting companies, questionnaires were distributed for 15 contractors', from a total 154 micro and small enterprises 47 questionnaires were distributed and for the two consulting firm representatives a total of 40 employees, 13 questionnaires were distributed. Likewise, 10 questionnaires were distributed to 30 professionals for clients working both on the sites and office. The appropriate formula to determine sample size based on small population is as follows:-

Therefore, the following equation was used to determine the sample size (Al-Moghany, 2006).

$$SS = \frac{Z^2 * P * (1-P)}{C^2} \text{-----} \text{ {Equation 3.1}}$$

Where SS = Sample size

Z = Z value (1.96 for 95% confidence level)

P = percentage picking a choice, expressed as a decimal (0.05 used for sample size).

C = margin of error (9%)

$$SS = \frac{1.96^2 * 0.05 * (1-0.05)}{0.09^2} \approx 119$$

Correction for finite Sample:-

$$SS_{\text{new}} = \frac{SS}{1 + \frac{SS-1}{POP}} \text{----- \{Equation 3.2\}}$$

Where: Total sampled of construction parties = 159 match the proposed contracting companies

$$SS_{\text{new}} = \frac{119}{1 + \frac{119-1}{273}} = 83.1 \approx 83$$

To ensure good representation of each stratum, the following was done:

For determining sample size of the client, employees were 30 persons, from those the sample size by using the above formula

Client = 30

$$SS_{\text{new for client}} = \frac{30 \cdot 83}{273} = 9.12 \approx 10$$

In similar manner employees of the two consulting firms were 36 persons, from those the sample size by using the above formula

Consultant=36

$$SS_{\text{new for consultant}} = \frac{40 \cdot 83}{273} = 12.16 \approx 13$$

The total number of the contractors which were involved in the housing construction was 49, from those the sample size by using the above formula

Contractor=49

SS new for Contractor = $\frac{49 \cdot 83}{273} = 14.89 \approx 15$, The total number of the MSEs which were involved in the housing construction was 154, from those the sample size by using the above formula MSE = 154 SS new for MSE = $\frac{154 \cdot 83}{273} = 46.82 \approx 47$

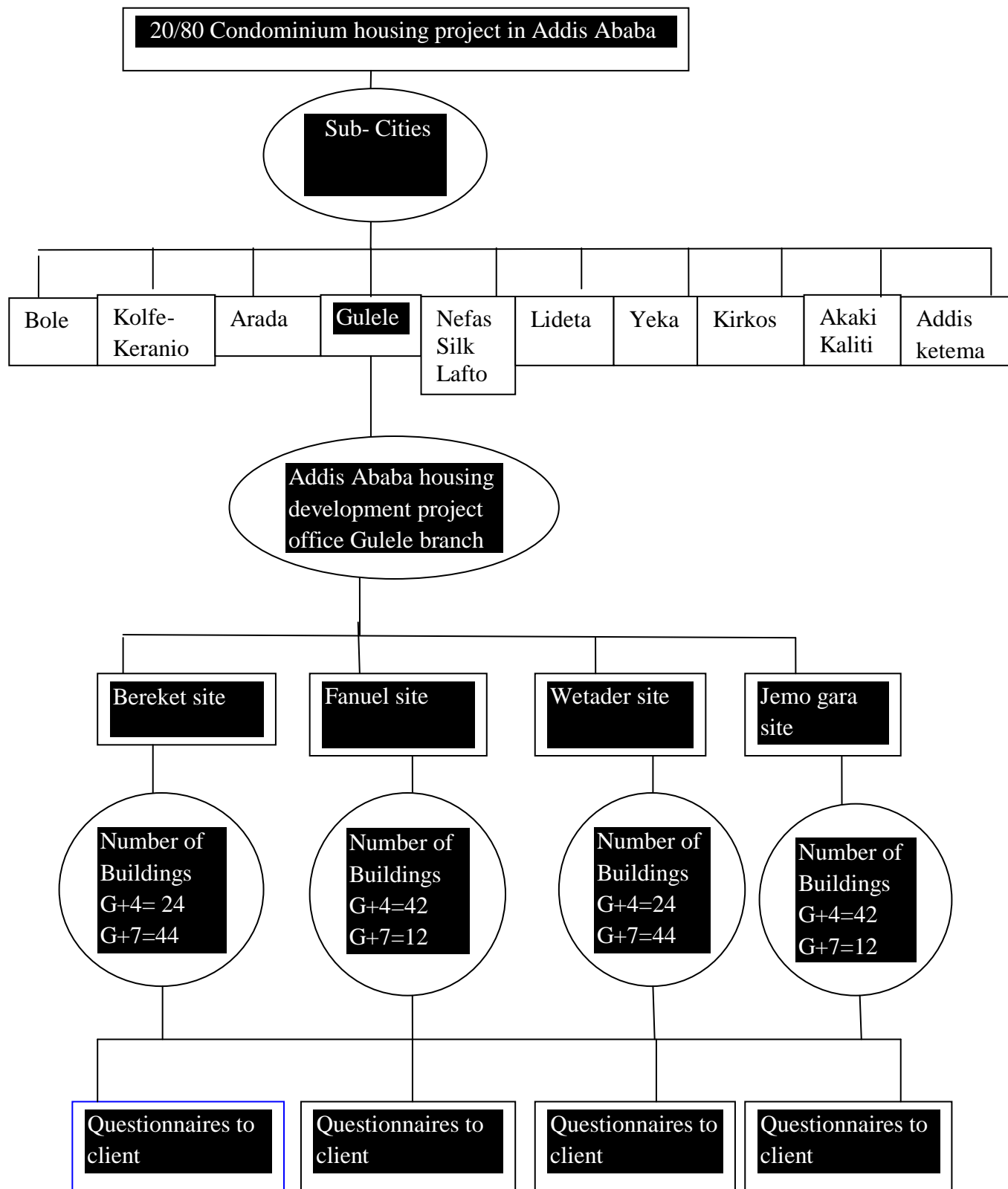


Figure 3.2: Population of the study area

3.4 Data collection methods

3.4.1 Primary data

Questionnaire

A questionnaire was developed to assess the perceptions of clients, consultants, contractors and MSEs on the performance of micro and small enterprises on 20/80 condominium houses construction at Addis Ababa. For this study, semi structure and structured questions both closed-ended and open-ended questions were employed. Closed ended questions for easier and quicker to answer, code and analyze, facilitates comparison of answers across respondents and response choices clarify question for respondents. Open-ended for respondents were able to express all perceptions and ideas, can provide unexpected insights into the situation and respondents have the opportunity to qualify and clarify responses. The researcher collect basic information on causes and impact of hampering construction performance in condominium housing building construction projects in general were examined and identified through a relevant literature review and then based on the questionnaire data review and evaluate the performance of MSE by perceptions of clients, consultants, contractors and micro and small enterprises. Finally, evaluate the performance of MSE and the factors contributing to poor performance and possible measures to minimize the problem were assessed by the client, contractor and consultant.

A draft questionnaire was first discussed with principal advisor and Co-advisor whose gave the researcher useful advices to address the proposed objective of the study. Many of these advices have been taken into consideration during the preparation of the final revision of questionnaire.

Case study

In depth study and narrow abroad field of the population in order focus on specific and interesting cases related to studying area. For case study analysis data were gathered employing cheek list and evaluation of the bidding documents of the parties.

Site observation

Site observations were conducted and it's also supported by a photo camera on the areas of MSE activities regarding to their efficiency on delivery time, quality and cost.

3.5 Methods of data analysis

The results of questionnaires' were analyzed using data analysis software known as SPSS version 20. Relative importance index tables and descriptive statistics were constructed to display results with respect to each question and performance parameters. Ranking analysis were used to rank the common types of challenges that hamper the performance contributing to poor performance and degree of effectiveness to make measurement for overcome performance problems.

Data was analyzed by calculating frequencies and Relative Importance Index (RII). The Relative Importance Index (RII) is calculated as follows (Aibinu and Jagbro, 2002).

$$RII = \frac{4n_1+3n_2+2n_3+1n_4+0n_5}{4N} \dots\dots\dots \{Equation 3.3\}$$

Where: N; total number of respondent

Ni; the variable expressing the frequency of the ith response

n1; number of frequency "very high response

n2; number of frequency "high" response

n3, number of frequency "moderate" response

n4, number of frequency "low rate/ insignificant" response

n5, number of frequency "never/no" response

The levels of responses are:

Very high = [100%]

Moderate= [50%]

No/never= [0%]

High = [75%]

Low rate/ insignificant= [25%]

Correlation analysis (Spearman’s rank correlation coefficient) was used to identify the significance of relationship between the variable responses of the respondents in this research. The Spearman (rho) rank correlation coefficient for any two groups of ranking is given by the following formula.

$$\text{Rho (rcal)} = \frac{1 - (6 \times (\sum di^2))}{n(n^2 - 1)} \text{ ----- \{Equation 3.4\}}$$

Where: Rho (rcal) =Spearman rank correlation coefficient

di= Difference between ranks given by two respondents for each variable

n = Number of pairs of values in the data set.

Correlation coefficient describes about two variables they are related each other

Table 3.1: Correlation coefficient and its interpretations

Correlation coefficient	Interpretation
-1	Perfectly negatively correlated
1	Perfectly positively correlated
0.8 – 1.0	Very strong positively correlated
0.59-0.8	Strong positively correlated
0.4 – 0.59	Moderately positively correlated
0.2 – 0.39	Weak positively correlated
0- 0.19	Very weak positively correlated
0.00	No correlation

Source: Yidenekachew (2018)

4. RESULTS AND DISSCUSION

4.0 Introduction

This chapter introduces the results and discussion of the data collected through questionnaires, case study, site observation and literature review regarding to performance evaluation of MSE and identification of challenges that hamper their performance in condominium construction. The data were presented using appropriate data presentation tools (tables, graphs and photos).

4.1 Survey results and discussions

This section shows the results, analysis and discussions obtained from the surveyed companies. The survey results were discussed in more details in this section to evaluate the performance of MSEs on condominium construction at Addis Ababa in case of Gulele sub city.

Table 4.1 presents the response rate of respondent for the questionnaire. A total of 85 questionnaires were sent to a selected sample of respondents in the 20/80 condominium construction at Gulele sub city which comprise the following: 10 client, 13 consultants, 15 contractors and 47 MSE. Form those questioners 10 clients', 13 consultants' 14 contractors 'and 32 MSE questioners were analyzed.

The numbers were determined on the basis of the available engineers employed by the contractors and consultants on the sites when the time available for conducting the research works. Questionnaire has been designed to considering the result would be analyzed quantitatively. Consequently, the responses of the questionnaire survey were coded in SPSS version 20 and Microsoft Excel spreadsheet. The descriptive statistics function such as: relative importance index, frequency distribution, which shows the frequency of observation of each response to each variable under investigation, is used to analyze the result of some questions. Computation of relative importance index was used to analyze the results of 'ranking scale' type of the questions. Consequently a spearman correlation is employed to analyze the correlation between the ranking of the respondents' response, such as clients, contractors, consultants and MSE.

Table 4.1: The response rate of the respondent

R.N	Respondents	Questionnaire Distributed	Returned Questionnaire		Unfinished Questionnaire		Analyzed Questionnaire	
		No.	No	Percent	No.	Percent	No	Percent
1	Client	10	10	100	-	-	10	100
2	Consultants	13	13	100	-	-	13	100
3	contractors	15	14	93.33	-	-	14	93.33
4	MSEs	47	34	72.34	2	4.25	32	68.08
Total		85	71	91.42	2	4.25	69	90.35

Table 4.2 shows respondent's construction contractor license grade. From this, 7.14 percent contracting companies were grade 2, 35.5 percent grade 3, 28.57 percent grade 4 and 28.57 percent grade 5 buildings and general contractors. According to the result about 64.07 percent were both grade 3 and 4 contractors. This indicates that 20/80 condominium housing construction executed most of grade 3, grade 4 and below.

Table 4.1: Respondents construction contractor license grade

Grade of contractors	Category	No.		Percentages (out 100%)	
Grade 2	BC	1	1	7.14	7.14
	GC	-		0	
Grade 3	BC	3	5	21.43	35.71
	GC	2		14.28	
Grade 4	BC	3	4	21.43	28.57
	GC	1		7.14	
Grade 5	BC	2	4	14.28	28.57
	GC	2		14.28	
TOTAL		14		100	100

Table 4.3 below shows respondents’ position on the site. According to the survey result from the target group 40 percent construction supervisors, 10 percent senior officers, 10 percent planning and budgeting experts, 20 percent office engineer and 20 percent for clients employees; whereas employees of the consultants 15.38 percent were project coordinator, 23.07 percent resident engineer, 15.38 percent site supervisor, 7.69 percent office engineer and the rest 38.46 percent of site inspector for consultants.

Contractor’s representatives’ positions on the site were 7.14 percent project manager, 7.14 percent site supervisor, 64.28 percent site engineers, 7.14 percent sanitary inspector and 14.28 percent Forman. Unfortunately MSE representatives were, 37.5 percent MSEs managers and 62.5 percent members.

Table4.2: Respondent positions on the site

Client			consultant			Contractor			MSE		
Position	No	%	Position	No	%	Position	No	%	Position	No	%
Construction supervisor	4	40	coordinator	2	15.3	Project manager	1	7.1	Mger.	12	37.5
Senior officer	1	10	Resident engineer	3	23.0	Site supervisor	1	7.1	Mem.	20	62.5
Planning and budgeting expert	1	10	Site supervisor	2	15.3	Site engineer	9	64.2	-	-	-
Office engineer	2	20	Office engineer	1	7.6	Sanitary inspector	1	7.1	-	-	-
Junior officer	2	20	Site inspector	5	38.4	Forman	2	14.2	-	-	-
Total	10	100		13	100		14	100		32	100

Note: Mger. Stands for ‘Manager’ and Mem. for ‘member’.

Table 4.4 illustrates educational background of respondent. The survey indicates, the educational background of respondents includes from high school certificate to MSc or post graduate level. From this about 1.45 percent were grade 10th completed, 8.70 percent 12th completed, 33.33 percent diploma, 50.72 percent BSc graduates and the rest 5.80 percent were MSc or post graduates.

Table 4.3: Educational background of respondent

Educational background									
MSc (post graduate)		BSc (graduate)		Diploma		12 th completed		10 th completed	
No.	percent	No.	percent	No.	percent	No.	percent	No.	percent
4	5.80	35	50.72	23	33.33	6	8.70	1	1.45

Table 4.5 shows the years of experience both on building construction and condominium housing construction for the surveyed client, contracting companies, consultants and MSEs at Gulele housing project. About 13.04 percent had < 1 years of experience, 30.43 percent have 1-3 years of experience, 24.64 percent have 3-5 years, 18.84 percent have 5-10 years of experience of experience, 10.14 percent have 10-15 years of experience and 2.90 percent have 15-20 years of experience on building construction. Whereas, 15.94 percent have <1 years of experience, 39.13 percent have 1-3 years of experience, 26.08 percent have 3-5 years of experience, 8.69 percent have 5-8 years of experience, 4.35 percent have 8-10 years of experience and the rest 5.8 percent have 10-15 years of experience on condominium housing construction.

Table 4.4: Respondent work experiences

Experience					
At building construction			At condominium		
Year	No.	Percent	Year	No.	percent
<1	9	13.04	<1	11	15.94
1-3	21	30.43	1-3	27	39.13
3-5	17	24.64	3-5	18	26.08
5-10	13	18.84	5-8	6	8.69
10-15	7	10.14	8-10	3	4.35
15-20	2	2.90	10-15	4	5.80
>20	0	0	>15	0	0
Total	69	100		69	100

Table 4.6 below illustrates the categories of MSE, their numbers from each category, their member and percentage of each category from the total. Electrical installation category had 10 numbers of MSE and 31.25 percentage share, Sanitary installation had 6 numbers of MSE and 18.75 percentage share, metal work had 9 numbers of MSE and 28.12 percentage share, Terrazzo supply and work, had 9 numbers of MSE and 28.12 percentage share. Number of members and gender classification were on figure 4.2 below show for more clarifications.

Table 4.5: Category numbers and members of MSEs

No.	Category of MSE	No of MSE	No. members			Percentage of MSE
			Male	Female	Sum	
1	Electrical installation	10	13	3	16	31.25
2	Sanitary installation	6	9	0	9	18.75
3	Metal work	9	15	2	17	28.12
4	Terrazzo supply and work	7	21	12	33	21.87
TOTAL		32	58	17	75	100

Figure 4.1: Gender classification on members of MSEs

The Figure 4.3 below shows numbers of construction professionals of members of MSE in 20/80 condominium housing construction Gulele branch at Addis Abba. The total numbers of MSEs included on the analysis of this study were 32 on four different categories on electrical installation, sanitary installation, metal work and terrazzo flooring. From those, categories the number of construction and related field of MSEs members, that had only one members of construction professional were 17, two numbers of professional 13 and three numbers were two MSEs.

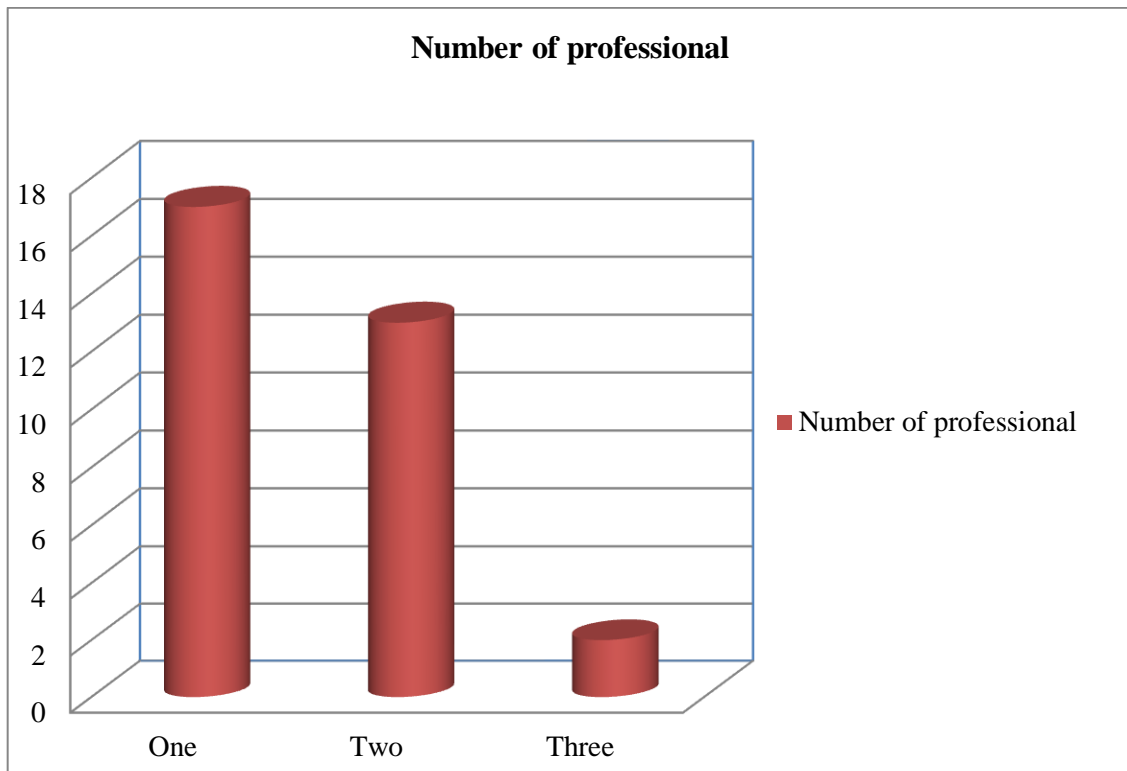


Figure 4.2: Numbers of construction professional in members of MSEs

4.2 Performances of MSEs according to the questionnaire, the case study and site observation results

In this part the result of common performance evaluating parameters for MSEs on 20/80 condominiums that are gathered from questionnaire, case study and site observation were presented and discussed. Performance of micro and small enterprise (MSEs) considered as a primary input for achieving the required activities at the required quality standard, time and cost on 20/80 condominium housing construction. Therefore, in order to address the required standard, evaluation of their performance on quality product output, timely completed activities and cost effectiveness are very necessary. Questionnaires were distributed to professional, tried to measure their performance on 20/80 condominium housing.

4.2.1 Questionnaires result on performance of MSEs

Table 4.7 below, shows frequency for replies of the respondent on the performance of MSEs According to the results of the study 50% the client's representatives were responded MSEs did deliver their activities on the proposed time, 40% of them responded that MSEs did not

deliver their activities on the time and also the rest 10% did not have any information about them. The consultants employees both at office and on the site were responded about 76.9 % of MSE did not deliver their activities on the proposed time, 23% of them they could deliver on the time. The contractors also believe that 78.6% of the MSEs did not deliver their activities on the required time and 21.4% believes MSE delivered on the time. Unfortunately, according the total responds of the client, consultants and contractors on the average 67.57% MSEs could not be delivered their activities on the required time, about 29.73% could delivered on the proposed time and the rest 2.7% did not have any information.

MSEs Performances on delivery of quality product output according to the perception of the client, about 70% of the respondents they did not deliver quality output and the rest 30% believes that they could delivered on the required quality standards. The consultants were responded 76.92% of them MSE did not deliver quality product output, 15.38% of them they could delivered quality product and the rest 7.67 did not have any information. The contactors also, believes that 78.57% of them MSEs could not delivered their activities on the specified quality standards, 14.28% of them MSE delivered their activities on the required quality and the rest 7.14% the contractor have not any information about MSE in delivery of quality product output. Generally, according to the all respondent on the average 75.67% responded MSE could not deliver quality product output, about 27.02% could deliver quality product output and the rest 2.70% did not have any information about MSEs on delivery of quality product output.

Is Addis Ababa condominium housing construction project office saves its cost by participating MSEs on housing construction than contractors? The clients representatives were respond about 70% of them yes it can save and 30% of them did not save. The consultant employees also reply about 61.54% of them yes it can save and 30.77% of them did not save and the rest 7.69% did not have any information. The contractors believe that 35.71% of them yes it's did save its cost, 50% of them did not save and the rest did not have any information. Therefore, according to the all respondents on the average 54.05% Addis Ababa condominium housing construction project office saves its cost by participating MSEs than that of contractors, 37.83% did not save its cost and the rest 8.1% did not have any information.

The critical challenges that were hamper the performance of MSEs in 20/80 condominium housing construction at Addis Ababa, the client's representatives were responded that about 60% of them, yes there were critical challenges that hamper their performance, 10% of them no any challenges and the rest 30% did not have any information about them. The consultants employees' replies about 84.61% of the respondent that challenges were exist and 15.38% did not exist. The contractors also, reply 85.71% of them believe that challenges were exist, 7.14% did not exist and the rest 7.14% did not have any information. Therefore, on average according to the respondent 78.37% critical challenges were that hamper the performances of MSE in 20/80 condominium housing construction projects at Addis Ababa.

Table 4.6: Frequency of the respondent on the performance of MSEs

Performance of MSE on condominium construction at Addis Ababa	Clients			Consultants			Contractors		
	Frequency			Frequency			Frequency		
	yes	no	don't know	yes	no	Don't know	yes	no	don't know
Does MSE deliver proposed time?	5	4	1	3	10	0	3	11	0
Does MSE deliver quality product?	3	7	0	2	10	1	2	11	1
Is A.A housing construction office save its cost by participating MSE than contractors	7	3	0	8	4	1	5	7	2
Is there any critical challenge that hamper the performance of MSE	6	1	3	11	2	0	12	1	1

Figure 4.4 shown below, presents frequencies of the respondents on the performance of MSEs in Addis Ababa Gulele sub city condominium housing construction

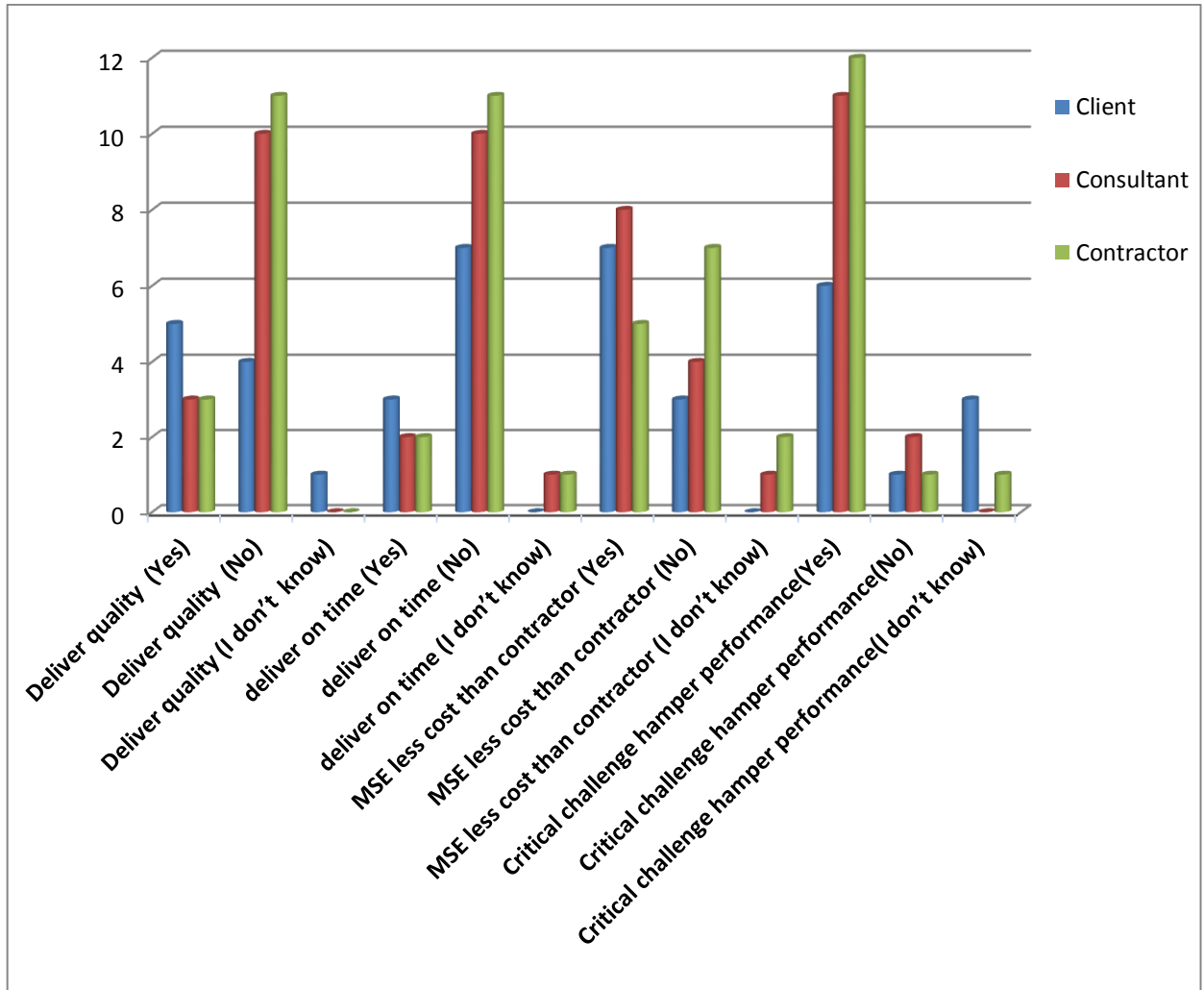


Figure 4.3: Frequency of the respondent on the performance of MSEs

4.2. 2 Major types of challenge that hampers the performance of MSEs responded from the construction stakeholders

The questionnaire of this study included three categories of major performance parameters and factors. Time parameter which had 16 factors, quality parameter had 8 factors and a cost parameter with 11 factors seen during construction and respondents were required to determined how frequently the listed factors occurred in 20/80 condominiums construction projects in Addis Ababa.

4.2.2.1 Challenges that hampers the performance of MSEs on delivery of their work on Time

Time is a major factor in construction projects to achieve the required objectives. Even if, project delivery time were specified on the contract document between the client and the contractor but, several challenge exists that affect to meet proposed period of time. Among those the major challenge that hamper MSE performance on the delivery of their activities on Addis Ababa 20/80 condominium housing projects were presented in table 4.8 below.

Table 4.7 shows the relative importance index (RII) and ranking for factors that were affecting delivery time for activities of MSEs. The relative importance index analysis allows identifying most important criteria based on participant's replies and also appropriate tool to priorities indicators rating Likert scale. According to the analysis and the result the relative importance index for respondents, delay in delivery of material, Contractor improper planning, skill shortage, poor site management and supervision and under estimation of time of completion were ranked from first to fifth that were a factor which causes MSEs delay in delivery of their activities.

Table 4.7: The RII and ranking for delay factors

Delay factors	Client		consultant		contractor		MSE		Average	
	RII	R	RII	R	RII	R	RII	R	RII	R
Design error made by designer	0.600	7	0.403	11	0.428	7	0.516	8	0.487	14
Low speed of decision	0.650	5	0.596	5	0.518	3	0.507	10	0.568	6
Lack of consultant's experience	0.600	7	0.307	12	0.446	6	0.633	4	0.496	13
Under estimation of time of completion	0.625	6	0.520	9	0.518	3	0.609	5	0.570	5
Under estimation of complexity of projects	0.650	5	0.520	9	0.589	2	0.453	13	0.553	9
Poor communication between parties	0.550	9	0.577	6	0.518	3	0.492	11	0.534	12
Contractor improper planning	0.700	2	0.615	3	0.340	9	0.758	2	0.603	2
Delay in delivery of material	0.825	1	0.846	1	0.786	1	0.843	1	0.825	1
Equipment availability and failed	0.575	8	0.635	2	0.482	4	0.523	7	0.554	8
Clients variation	0.625	6	0.577	6	0.482	4	0.461	12	0.536	11
Poor site management and supervision.	0.675	3	0.540	8	0.464	5	0.719	3	0.599	4
Unrealistic deadlines for project completion	0.675	3	0.558	7	0.518	3	0.515	9	0.566	7
Shortage of labor	0.400	11	0.440	10	0.286	10	0.430	14	0.389	16
Defective work	0.525	10	0.540	8	0.410	8	0.406	15	0.470	15
Financial difficulties	0.600	7	0.596	5	0.446	6	0.554	5	0.549	10
Skill shortage	0.670	4	0.610	4	0.589	2	0.540	6	0.602	3

Table 4.8 below shows the correlation coefficient for delivery time. In this case, significance level of 95% ($p = 0.05$), the correlated value of ρ (rho) value for the all four groups were greater than the critical value of r , so there were a strong correlation between perception of respondents. This indicates most of the respondents have the same perception on delay factors which influence the activities of MSEs.

Table 4. 8: The correlation coefficient for delivery time among respondents

Correlations	$\text{Rho} = \frac{1 - (6 \times (\sum di^2))}{n(n^2 - 1)}$	A critical value for r (Appendix -C)
Client vs. Consultants	0.692	0.429
Client vs. Contractors	0.791	0.429
Client vs. MSEs	0.678	0.429
Consultants vs. Contractors	0.670	0.429
Consultants vs. MSEs	0.537	0.429
Contractors vs. MSEs	0.567	0.429

4.2.2.2 Challenges that hampers the performance of MSEs on delivery of their work on quality product out put

Achieving the required level of quality for any construction project is a primary goal. The client or the owner of the project requirements and quality standards on the specification is the task of the contractor and the parties that involved on the construction process. Critical challenges observed on the housing construction affect the process are presented table 4.9 below.

Table 4.9 shows the relative importance index (RII) and ranking for factors that were affecting delivery of quality product output. The relative importance index analysis allows identifying most important criteria based on participant's replies and also appropriate tool to priorities indicators rating Likert scale.

Table 4.9: The RII and ranking for factors that affect delivery of quality output

Impact	Client		Consultant		Contractor		MSE		Average	
	RII	R	RII	R	RII	R	RII	R	RII	R
Lack of skill	0.750	1	0.692	2	0.625	6	0.703	3	0.692	4
Lack of experience	0.750	1	0.692	2	0.679	3	0.687	4	0.702	3
poor design	0.600	4	0.635	5	0.643	5	0.570	7	0.612	8
Poor project management	0.725	2	0.750	1	0.732	1	0.758	2	0.741	1
Poor communication	0.700	3	0.654	4	0.625	6	0.531	8	0.627	7
Financial difficulties	0.750	1	0.673	3	0.714	2	0.601	6	0.685	5
Lack of appropriate construction equipment	0.725	2	0.538	6	0.625	6	0.672	5	0.640	6
Low quality material	0.625	3	0.750	1	0.660	4	0.797	1	0.708	2

Table 4.10 below shows the correlation coefficient for quality product output. According to the result the significance level of 95% ($p = 0.05$), the correlated value of ρ (rho) value for client vs. consultant were greater than the critical value of r which means strong correlation between them and the rest less than this value, so there were a weak correlation between perception of respondents. The responses of client Vs. MSEs have negative value, this indicates that their perception on delivery of MSEs activity on the client required quality is slightly different.

Table 4.10 : The correlation coefficient for quality product output among respondents

Correlations	$\text{Rho} = \frac{1 - (6 \times (\sum di^2))}{n(n^2 - 1)}$	A critical value for r (Appendix -C)
Client vs. Consultants	0.655	0.642
Client vs. Contractors	0.166	0.642
Client vs. MSEs	-0.012	0.642
Consultants vs. Contractors	0.631	0.642
Consultants vs. MSEs	0.571	0.642
Contractors vs. MSEs	0.463	0.642

4.2.2.2 Challenges that hampers the performance of MSEs on delivery of their work on the budgeted cost

Any construction project consists of direct and indirect costs which form the total costs and expenses the use of principal components for implementing construction projects.

Here the table below presents ranking of factor that causes cost overrun on activities of MSEs. According to the result of relative importance index factors that causes cost over run on the activities of MSEs were delay in delivery of materials, poor project management, lack of skill, Contractor improper planning and lack of strict supervision ranked first to fifth.

Table 4.11: The RII and ranking for factors causing cost overrun

Causes for cost over run	Client		consultant		Contractor		MSE		Average	
	RII	R	RII	R	RII	R	RII	R	RII	R
Exchange rate	0.625	7	0.519	7	0.429	8	0.523	7	0.524	10
Delay on drawing	0.550	9	0.480	8	0.482	6	0.562	6	0.518	11
Poor design	0.650	6	0.519	7	0.500	5	0.609	4	0.569	7
Lack of experience	0.800	2	0.654	3	0.536	4	0.500	9	0.622	6
Lack of skill	0.775	3	0.692	2	0.446	7	0.734	2	0.662	3
Poor project management	0.800	2	0.654	3	0.571	2	0.797	1	0.705	2
Delay on material supply	0.825	1	0.75	1	0.786	1	0.734	2	0.774	1
Contractor improper planning	0.675	5	0.692	2	0.464	7	0.586	5	0.604	4
Equipment availability and failed	0.575	8	0.615	4	0.482	6	0.508	8	0.545	8
Reconstruction cost	0.675	5	0.538	6	0.429	8	0.508	8	0.537	9
Lack of strict supervision	0.725	4	0.596	5	0.554	3	0.679	3	0.638	5

Table 4.12, below shows the correlation coefficient for cost. According to the result with a significance level of 95% ($p = 0.05$) all the respondents had greater spearman correlation coefficient relative to the critical value for r . It also indicates that factors for cost on the activities of MSEs and ranking their responses were very strong positively correlated.

Table 4.12: The correlation coefficient for cost among respondents

Correlations	$\text{Rho} = \frac{1 - (6 \times (\sum d_i^2))}{n(n^2 - 1)}$	A critical value for r (Appendix -C)
Client vs. Consultants	0.854	0.536
Client vs. Contractors	0.777	0.536
Client vs. MSEs	0.659	0.536
Consultants vs. Contractors	0.650	0.536
Consultants vs. MSEs	0.604	0.536
Contractors vs. MSEs	0.718	0.536

Table 4.13 below shows: The correlation coefficient for a critical challenge hampers MSEs. According to the result of spearman correlation coefficient, except delay in delivery of materials and skill shortage all the factors had positively correlated. This indicates that each factor that hampers the performances of MSEs were interdependent with each others.

Table 4.13: The correlation coefficient for a critical challenge hampers MSE

Correlations	Delay in delivery of material	Contractor improper planing	Skill shortage	Poor project Mgt.	Low quality material	Lack of experience	Delay in material supply
Delay in delivery of material	1.00	0.197	-0.107	0.111	0.271	0.219	0.401
Contractor improper planing	0.197	1.00	0.018	0.240	0.168	0.099	0.401
Skill shortage	-0.107	0.180	1.00	0.006	0.038	0.228	0.065
Poor project Mgt.	0.111	0.240	0.006	1.00	0.203		0.156
Low quality material	0.271	0.160	0.038	0.203	1.00	0.173	0.305
Lack of experience	0.219	0.099	0.228	0.308	0.173	1.00	0.268
Delay in material supply	0.401	0.065	0.156	0.139	0.305	0.268	1.00

4.3.2 Major types of building defect observed on some selected buildings which were executed by MSEs

Figure 4.5 below shows poor electrical installation on the observed buildings. The installation work carried out on the building the electric lines were not appropriately covered with slab. The wire also out of the conduit and the HCB wall chiseled to fix it. This means chiseling will affects the durability and the aesthetics of the HCB wall. The conduit and the electric lines fixed fare away from the wall.



a. Electric cables line does not covered in the slab



b. Electric wire is out of the conduit



c. Defects on electrical installations and wall



d. Poor installation and wall defects

Figure 4.4: Poor electrical installation on the building

Figure 4.6 below shows defects on fixing of handrail for stair and fixing the right position of the door and its accessories.



a. Defect on fixing of the door



b. The handrail is fixed away from the stair

Figure 4.5: Defects on metal work

Figure 4.7 below shows material handling on the site and qualities of aggregates. The fine aggregate, terrazzo and the steel dumped on site have not any protection and handling, it mixed with bad materials like soil, and animals dug, wastes, deteriorations and the steel exposed to corrosion. The fine aggregate by itself low quality and have high silt content. This also have a great impact on the durability and the strength of the built structures.



a. Low quality fine aggregate and poor handling on the site



b. Terrazzo for the flooring stored wrong manner



c. Hand rail making steel exposed to corrosion

Figure 4.6: Low quality material and poor material handling on the site

4.3.3 Performance evaluation of housing construction from the case study

Addis Ababa 20/80 condominium housing project almost all are delayed to deliver on the proposed time according to the contract document. This is due to lack of assigning a clear responsibility among the parties. The major construction materials were supplied by the client instead of the contractor. This situation creates the client failed to supply the materials at the contractors required time and causes delay on delivery of materials on the time. Contractor improper planning and executing, consultant's inspection or follow up problems and negligence of supervisors towards the structure of the staffs and their activities makes the projects much delayed and their actual cost were over run.

Table 4.14 shows cases studies on housing buildings (contractor). The actual project cost and proposed delivery time of the project on the selected buildings, on the cases Block Number 14 and Block Number 23 delay occurred 631 calendar days from the contractors hand over the

site according to the contract document for two G+7 buildings with project status 58.34% and 46.23% respectively. And also, Block Number 13, G+4 building was delay 781 calendar days with project status 57.30%. The cost of the buildings exceeded the actual project cost as per contract document with the current status of completion. The actual project cost for the two G+7 buildings according to the contract 6,239,673.34 and 6,246,649.97 the cost overrun also 11.83% and 3.51% respectively. Costs for the remaining G+4 buildings with the actual cost of 4,735,681.17 cost 20.05%.

Shortage and delay in materials supply argue to be one of the most important factors that lead to delay in construction project delivery globally (Rahman et al, 2017). Addis Ababa housing project office costs additional budget and time for the project because of basic problems like, the client failed to material supply on the required time, contractors lack of proper planning and executing and consultants negligence on supervising and monitoring activates on the site. In effective project planning and scheduling one of the major delay factors which consists of project planning and scheduling that are not capable of performing efficiently or as expected, in accurate time and cost estimation of project may the most serious cause of delay (Anil etal, 2016). In a similar manner at Addis Ababa condominium housing construction project on the selected case study buildings the contractors were failed to efficiently perform their activities on the schedule and it causes delay the projects and hamper the performance plus effectiveness of micro and small enterprises which engaged as sub-contracting on different section of the project such as metal works, electrical installation, sanitary work and other finishing works.

Table 4.14: Case studies on housing buildings (Contractor)

Studies area	Case study No.1	Case study No.2	Case study No.3
Project name	Gulele	Gulele	Gulele
Block No.	Bereket site G+7 Block No 14	Bereket site G+7 Block No 23	Wetader site G+4 Block No 13
Project starting time according to contract	Oct. 12, 2015	May , 30, 2015	Oct. 12, 2015
Project completion time according to contract	Oct. 30, 2017	Oct. 30, 2017	May 30, 2017
Actually project completion time	-	-	-
Buildings status	58.34%	57.30%	73.88%
Project cost as per contract (ETB)	6,239,673.34	6,246,649.97	4,735,681.17
Actual project cost until now (ETB)	6,978,142.92	6,466,000.29	5,685,434.56
Consultant grade	Grade 3	Grade 3	Grade 3
Contractor grade	BC 4	BC 3	BC 4
Stockholders which offered claim	Client	client	client
Claim related to time	631 Cal. days	631 Cal. days	781 Cal. days
Claim related to quality	-	-	-
Claim related to cost	Liquidated damage	Liquidated damage	Liquidated damage

(**Source:** Gulele condominium housing construction consulting office)

Table 4.15, below illustrates the performances of MSEs on three selected case study buildings according to their status of completion. MSEs, for the case studies which were involved at such buildings on electrical installation and metal work like, roofing, LTZ and hand rail according to their progress and contract duration.

The status of the building, Block number 14, G+7 housing building and Block number, 13 G+4 building at Bereket site and Wetader site MSEs started their activities on Oct. 29, 2017 and the status of the buildings were about 58.34% and 73.88% respectively. The cost as per contract for both electrical installation and works for roofing, LTZ and hand rail were 509,594.32 ETB and 418, 960.46 ETB but, the actual cost until the described status were 620,838.76 ETB and 510,419.55 ETB respectively.

In the similar manner, in the case study number two Block number 23, G+7 building with the status of 57.3 percent MSEs were made agreement to start their activities on March, 14, 2017 with the cost as per contract 451,000.21ETB and the actual cost until the described status was reached 549,453.55 ETB. Claim related to time did not been raised both client and MSES this due to the contractor improper plans and schedules and delay in delivery of materials directly affect MSEs Activities. Claim related to quality the client repeatedly gave warning notice to MSEs. In all cases MSEs prepared claim related to cost. The MSEs prepared their claims related to price escalation and the client approved their claims only the issues happened due to client failed to fulfilled and the rest rejected.

Table 4.15: Case studies on housing buildings (MSE)

Studies area	Case study No.1	Case study No.2	Case study No.3
Project name	Gulele	Gulele	Gulele
Block No.	Bereket site G+7 Block No 14	Bereket site G+7 Block No 23	Wetader site G+4 Block No 13
MSE starting time according to contract	Oct. 29, 2017	March,14,2017	Oct. 29, 2017
MSE completion their activities according to contract	-	-	-
Actually project completion time	-	-	-
Buildings status	58.34%	57.30%	73.88%
Cost as per contract (ETB)	509,594.32	451,000.21	418, 960.46
Actual cost until now (ETB)	620,838.76	549,453.55	510,419.55
Categories' of MSE	Electrical and metal work	Electrical and metal work	Electrical and metal work
Stockholders which offered claim	Client/MSE	Client/MSE	Client/MSE
Claim related to time	Not specified	Not specified	Not specified
Claim related to quality	warning	warning	warning
Claim related to cost/ MSE	Price escalation	Price escalation	Price escalation

(**Source:** Gulele condominium housing construction consulting office)

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter includes the conclusion and practical recommendation to identify and minimize the critical challenge that hamper the performance of MSE in 20/80 condominium housing construction at Addis Ababa.

5.1 Conclusions

This study is focused on performance evaluation and identification of the critical challenges that hampers the performance of MSE in 20/80 condominium housing construction at Addis Ababa: the case of Gulele sub city.

The results from analysis; majority of MSEs engaged on electrical installation, sanitary work, metal work and terrazzo flooring and supply. According to result on the average 67.6% MSEs couldn't delivered their activities on the required time, 75.7% MSEs couldn't deliver quality product output and 54.05% housing construction project office saves its cost by participating MSEs than that of contractors.

On the other hand, on average according to the respondent 78.37% critical challenges were that hamper the performances of MSEs in 20/80 condominium housing construction projects at Addis Ababa. And also factor those influence their performance ranked from the first to fifth position according to the responses of client, contractors, consultants and MSEs that the most significant factors causing for a serious challenge on performance of MSEs on condominium building construction projects were categorized into three: - factors for delay in delivery time, quality and cost overrun. Factors that were caused delay in delivery of projects, those are delay in delivery of materials, contractor improper planning, skill shortage, poor site management and supervision and under estimation of time of completion. Factors which affect quality of their activities to deliver according to the specified quality standards are: poor project management, low quality of materials, lack of experience, lack of skill and financial difficulties. Major factor that causes cost overrun on housing projects which, activates were executed by MSEs beyond initially estimated cost: delay in material supply, poor project management, lack skill, contractor improper planning and lack of strict supervision.

5.3 Recommendations

The critical areas were identified and recommended in order to minimize the major challenges that hamper the performances of micro and small enterprises on 20/80 condominium housing construction buildings based on finding of this study.

The client should necessary to make improvement on materials delivery and its quality. To reduce such problems material supply for the projects shall to be given for the contractor or the client should evaluate its self to deliver the required materials on the time and also, the materials used on the site first assured their quality before they are used.

- ❖ It should be improve the project management system and take strict measurement up to contract termination on the parities which fails to meet its responsibilities on the project.
- ❖ The client shall be provide different capacity building programs such as training and workshops has to be designed on regular basis for micro and enterprises.
- ❖ The consultant should be enforce the contractors to prepares plans and schedules and regularly make follow up the implementation of their activities.

The consultants should be strictly considered during planning stage for project completion time in order to minimize under estimation of time for project completion.

5.4 Recommendations for further study

This study identifies for areas requiring further studies. These critical areas for future study are:

- ❖ Additional studies should be done more on evaluation on the project delivery system impacts on the micro and small enterprises performance in Addis Ababa condominium housing construction projects.
- ❖ Evaluation of government policy on condominium housing project with related to micro and small enterprises in Addis Ababa

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APPENDIXS

Appendix- A

A) Questionnaire

Evaluation of micro and small enterprises performance on condominium construction at Addis Ababa in the case of Gulele sub city

Dear respondent!

This questionnaire prepared to collect necessary data for partial fulfillment of Msc thesis on the title “evaluation of micro and small enterprises performance on condominium construction at Addis Ababa” in construction technology and management at Hawassa University. Questionnaire will be filling by city government of Addis Ababa housing development project office project contractors, consultants and micro and small enterprises who are familiar with the case and participated in the project management process. The information you are going to give will help me to assess the critical challenges that hamper the performance of micro and small enterprises to be identify, draw conclusion and put appropriate recommendation and solutions to overcome it.

Feel free! I would like to confirm that the data you provide will be kept confidential and only academic purpose. As such the quality of this study highly depends on the information provided by you.

Thank you! For your cooperation

Researcher: Zerihun Alemayehu

Contact!

Phone number: +251912733837

Email: zerishy@gmail.com

Part One:

I. General Information of respondent

1) Type of organization

Client Consultant Main Contractor Micro and small enterprise

2) If your answer for question no. 1 please specify class of your organization

3) Please specify your position on this project _____

4) Educational Background

Postgraduate (MS C) Graduate (BSC) Diploma,

If other, please specify _____

5. Years of experience in the construction industry

< 1 year 1 - 3 years 3 - 5 years
 5 - 10 years 10 – 15 years 15 - 20 years > 20 years

6. Years of experience in the condominium construction site

<1 year 1-3 years 3 – 5 years
 5-8years 8-10 years >10 years

II. Filled by micro and small enterprises only

1. Name of your organization (optional)-----

2. Your construction license BC(building contractor) GC(general contractor)
other specify-----

3. Number of members in your enterprise -----

4. Please specify number construction professional in your organization.

MSc degree ----- BSc degree ---- diploma----- if other specify-----

5. How many years' experience on condominium housing construction? -----

III. Filled by client, consultant and main contractor only

1) Does micro and small enterprise deliver quality product output?

Yes No I don't know

2) Do you think, micro and small enterprise complete their work on the proposed time?

Yes No I don't know

3) Is Addis Ababa housing construction project office save its costs by participating micro and small enterprises than contractors

Yes No I don't know

4) Is there any critical challenge that hampers the performance of micro and small enterprises in condominium housing construction?

Yes No I don't know

Part two:

A. Common types of challenges small and micro enterprises faces on condominium housing construction during construction phase in order to address on the proposed time. Below, common delay factors that are observed during construction phase. Please think the frequency of occurrence of the under listed delay factor on condominium projects and rank on a scale of 1-5 by ticking (× or √) in the column representing your selection.

No	Delay factors	Rate of occurrences				
		1	2	3	4	5
		Never	Low rate	moderate	high	Very high
1	Design error made by designer					
2	Low speed of decision					
3	Lack of consultant's experience					
4	Under estimation of time of completion					
5	Under estimation of complexity of projects					
6	Poor communication between parties					
7	Contractor improper planning					
8	Delay in delivery of material					
9	Equipment availability and failed					
10	Client initiation variation					
11	Poor site management and supervision.					
12	Unrealistic deadlines for project completion					
13	Shortage of labor					
14	Defective work					
15	Financial difficulties					
16	Skill shortage					

Please specify other types of delay factor on condominium construction-----

B. Major factors that have significant impact on delivery of quality product output on construction of condominium houses those are executed by micro and small enterprises. Rank on a scale of 1-5 to what level these factors contributes to low quality product output on your project by ticking (× or √) in the box representing your selection.

No.	Factor	Impact				
		1	2	3	4	5
		No	Insignificant	Moderate	High	Very high
1	Lack of skill					
2	Lack of experience					
3	poor design					
4	Poor project management					
5	Poor communication					
6	Financial difficulties					
7	Lack of appropriate construction equipment					
8	Low quality material					

If other -----

C. Major causes for cost overrun on condominium house construction projects that affect efficiency and effectiveness of micro and small enterprises. Rank on a scale of 1-5 to what level these factors contributes to the cost overrun on your project by ticking (× or √) in the box representing your selection.

No.	Causes for cost over run	Impact				
		1	2	3	4	5
		No	Insignificant	Moderate	high	Very high
1	Exchange rate					
2	Delay on drawing					
3	Poor design					
4	Lack of experience					
5	Lack of skill					
6	Poor project management					
7	Delay on material supply					
8	Contractor improper planning					
9	Equipment availability and failed					
9	Reconstruction cost					
10	Lack of strict supervision					

If other specify-----

Thank you for your information!

Appendix- B

B) Costs of roofing, LTZ and handrail for block number 23(Source: Gulele branch 20/80 condominium housing project office's Consulting Architects and Engineering PLC)


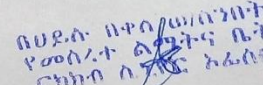
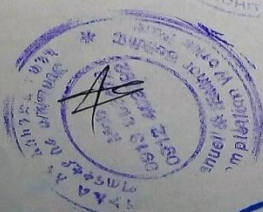


Contractor: Moget Construction Material rental PLC
 MSE: Hadgu & Rgbe Metal works P/S
ROOFING,LTZ & HANDRAILE SUMMARY
Block 23

Item	Description	BIRR	Total Amount
1.	Roofing	BIRR	18,586.59
2.	Structural Steel Works	BIRR	36,125.29
3.	Metal Work	BIRR	94,803.04
4.	Handrail	BIRR	58,616.63
	Total		208,131.55
	Vat 15%		31,219.73
	Total Amount		239,351.28

C) Costs of roofing, LTZ and handrail for block number 13(Source: Gulele branch 20/80 condominium housing project office's Consulting Architects and Engineering PLC)

T:-Gullele Housing Construction Project Branch Office
 SULTANT:-WSM Consulting Architects & Engineering PLC
 RACTOR:- Alexander Nigussie B/C
 E LOCATION:-
 ROJECT:-DOOR,WINDOW,HANDRAIL,TRUSS & ROOF METAL WORK
 YPOLOGY E-G+4 L-SHAPE BLOCK No:-13

ROOFING,LTZ & HANDRAILE SUMMARY				
Item No.	TYOLOGY	BLOCK	CURRENCY	AMOUNT
1	E-G+4 L-SHAPE	13	BIRR	157,110.70
			TOTAL	157,110.70
			VAT 15%	23,566.61
			TOTAL AMOUNT	180,677.31

D) Costs of roofing, LTZ and handrail for block number 14(Source: Gulele branch 20/80 condominium housing project office's Consulting Architects and Engineering PLC)

ROOFING,LTZ & HANDRAILE SUMMARY				
Item No.	TYOLOGY	BLOCK	CURRENCY	AMOUNT
1	O-G+4 LINEAR	14	BIRR	176,793.84
			TOTAL	176,793.84
			VAT 15%	26,519.08
			TOTAL AMOUNT	203,312.92

E) Costs of electrical installation work for block number 14(Source: Gulele branch 20/80 condominium housing project office's Consulting Architects and Engineering PLC)


F-L G+4R BASEMENT +SHOP BLOCK NO 13 SUMMARY		
A. ELECTRICAL		
1. Distribution Boards &	Birr	98,240.98
2. Circuit Breaker	Birr	0.00
3. Switch Box	Birr	437.16
4. PVC Pipe	Birr	10,485.52
5. Feeder Cable	Birr	37,943.30
6. Earthling Wire	Birr	48.03
TOTAL		147,154.99
15% VAT		22,073.25


F) Costs of electrical installation work for block number 14(Source: Gulele branch 20/80 condominium housing project office's Consulting Architects and Engineering PLC)

OL- G+7 BASEMENT +SHOP BLOCK NO 14
SUMMARY

A. ELECTRICAL INSTALLATION

1. Distribution Boards & Points	Birr	197,833.15
2. Circuit Breaker	Birr	0.00
3. Switch Box	Birr	655.74
4. PVC Pipe	Birr	13,229.32
5. Feeder Cable	Birr	3,908.30
6. Earthing Wire	Birr	48.03
TOTAL	Birr	215,674.54
15% VAT	Birr	32,351.18
TOTAL WITH VAT	Birr	248,025.72


 Teshale & Friends General Electrical Work Plshp
 Teshale Gashy
 Endale Kowalew


 Said Ahmed
 SAID AHMED BUILDINGS CONSTRUCTION

G) Costs of electrical installation work for block number 23(Source: Gulele branch 20/80 condominium housing project office's Consulting Architects and Engineering PLC)

በአዲስ አበባ ቤተ-ሰው ልማትና አስተዳደር ቢሮ
የሚሰጠው የሥራ ደረጃ ስምዕን ቁጥር 005/ሐ

ፕሮጀክቶችን ለማስገባት የተዘጋጀ መረጃ የሚሰጠው የጊዜ ሰንጠረዥ
የቤት ፕሮጀክት:-20/80
ቅርንጫፍ:-ተለላ ቤቶች ልማት ቅጽ/ቤት
የባይት ሥም:-በረከት
አማካሪ ድርጅት:-ደብሊወ ኤስ ኤም ኮንስትራክሽንና ኢንጅነርስ ጋ/የተ/የማ/ማህበር
የማህበራት የሥራ ዘርፍ:-የኤሌክትሪክ መስመር ዝርጋታ ስራ ማህበር

ግንባታው በመከናወን ላይ የሚገኙ ህንፃዎች ላይ ተመድበው እየሰሩ የሚገኙ ማህበራት

ተ.ቁ	የተመደቡበት ዋና ሥራ ተቋራጭ ሥም	የማህበሩ ሥም	የተመደቡበት የህንፃ ቁጥር	የተመደቡበት የህንፃ ዓይነት	የውሊታ መጠን (ብር)	የማህበሩ ተወካይ	ስልክ ቁጥር
1	ኤስ ደብሊው ቲ ህንጻ ስራ ተቋራጭ	ትግስት እና አመር የኤሌክትሪክ ኢንስታሌሽን ስራ ህ/ሸ/ማ	5	OG+4 St - res	140,328.33	ትዕግስት አጀታ	09-20-718229
			6	OG+4 St-res	140,328.33		
			7	IG+4 St-res	116,452.57		
2	ኤቢኤትዋይ ኮንስትራክሽን	ደረጃ:ዙፋን እና ውብቱ ኤሌክትሪክ ኢንስታሌሽን	42	SG+7 St- res+shope	193,173.75	ደረጃ ደምሴ	09-13-45898
			43	SG+7 St- res	193,758.54		
3	ኮንዴርት ኮንስትራክሽን	አንጻምላክና አበበ የኤሌክትሪክ ኢንስታሌሽን ስራ ህ/ሸ/ማ	8	SG+7 St- res+shope	205,408.46	አንጻምላክ ጥላሁን	09-21-291919
			9	OG+7 L-Shape res+shope	204,125.74		
4	አባሳ ሀሰን ህንጻ ስራ ተቋራጭ	ደረጃ እና አርሚያስ የኤሌክትሪክ ኢንስታሌሽን	40	OG+7 Linear-res	224,386.49	አ.ር.የሰ እሸቱ	09-12-607782
			41	OG+7 Linear- res+shope	224,386.49		
7	ደሊጅንት ኮንስትራክሽን	ገብረ ሚካኤልና ሰይፈ የኤሌክትሪክ ኢንስታሌሽን ስራ ህ/ሸ/ማ	1	OG+7 L-Shape res+shope	215,674.54	ገብረሚካኤል ወልደገብርኤል	09-11-083237
			2	OG+7 L-Shape res+shope	215,674.54		
8	ሞሪት ኮንስትራክሽን እና ኮንስትራክሽን አቃዎች አከራይ	ሞሪት መስመር ዝርጋታ ህ/ሸ/ማ	23	SG+7 St res+shope	211,648.93	ሞሪት ኮንስትራክሽን	09-13-360063
			24	OG+7 L-Shape res+shope	209,174.91		
			25	res+shope	203,988.37		
9	ብረዘርስ ኢንጅነሪንግ	አሰጫ እና መጠቀሚያ የኤሌክትሪክ ስራ ተቋራጭ ህ/ሸ/ማ	3	OG+7 L-Shape res+shope	215,690.12	አሰጫ ጥላሁን	09-13-297535
			4	SG+7 St res+shope	208,127.18		
10	ኮሊና ኮንስትራክሽን	ገ/ዓቂቅ ገብረ እና ነብሴ የኤሌክትሪክ መስመር ዝርጋታ ህ/ሸ/ማ	26	OG+7 L-Shape res	199,306.69	ነብሴ ከፍሌ	09-21-559487
			30	OG+7 Linear- res+shope	223,063.53		
			36	OG+7 Linear- res+shope	213,109.72		
11	ሁካኤብ ኮንስትራክሽን አቃዎች አከራይ	ተከለላማኑኤል አሰጣፊ የኤሌክትሪክ ኢንስታሌሽን ስራ መስመር ዝርጋታ	37	SG+7 St- res+shope	201,221.61	ተከለላማኑኤል አሰጣፊ	09-20-806138
			38	OG+7 Linear- res+shope	202,642.33		
			34	SG+7 St- res+shope	206,696.82		
12	ጉልላት ወዳጆ ህንጻ ስራ ተቋራጭ	መስከረም ፋንታ ኤሌክትሪክ ስራ ተቋራጭ	11	OG+7 L-Shape res+shope	211,648.93	መስከረም ፋንታ	09-10-141383
			12	SG+7 St- res+shope	209,174.91		
			13	OG+7 L-Shape res+shope	211,648.93		
13	ስጥና ጠቅላላ ስራ ተቋራጭ	ደግሰው አረጋ የኤሌክትሪክ ኢንስታሌሽን ስራ	10	OG+4 STRAIGHT res	121,809.65	ደግሰው አረጋ	09-25-978413
			47	OG+4 STRAIGHT res	121,809.65		
			48	OG+4 STRAIGHT res	121,809.65		
14	ሰለሞን ለማ ኮንስትራክሽን	ዴቪድ እና ምህረት የኤሌክትሪክ ኢንስታሌሽን ስራ ህ/ሸ/ማ	16	SG+7 St res+shope	213,724.61	ዴቪድ አውጣቸው	09-22-116886
			17	OG+7 L-Shape res+shope	215,690.12		

ያዘጋጀው የአማካሪ ባለሙያ _____

ሥም: _____

ፊርማ: _____

ቀን: _____

ያረጋገጠው :-አማካሪ አስተባባሪ _____

ሥም: _____

ፊርማ: _____

ቀን: _____

Spearman's rank table

Sample size (n)	p = 0.05	p = 0.025	p = 0.01
4	1.0000	-	-
5	0.9000	1.0000	1.0000
6	0.2860	0.8857	0.9429
7	0.7143	0.7857	0.8929
8	0.6429	0.7381	0.8333
9	0.6000	0.7000	0.7833
10	0.5636	0.6485	0.7455
11	0.5364	0.6182	0.7091
12	0.5035	0.5874	0.6783
13	0.4825	0.5604	0.6484
14	0.4637	0.5385	0.6264
15	0.4464	0.5214	0.6036
16	0.4294	0.5029	0.5824
17	0.4142	0.4877	0.5662
18	0.4014	0.4716	0.5501
19	0.3912	0.4596	0.5351
20	0.3805	0.4466	0.5218
21	0.3701	0.4364	0.5091
22	0.3608	0.4252	0.4975
23	0.3528	0.4160	0.4862

Source: (Dires, 2016)