



**ST. MARY'S UNIVERSITY
SCHOOL OF GRADUATE STUDIES**

**QUALITY CHALLENGES OF LOW COST HOUSING: THE CASE
OF ADDIS ABABA 20/80 CONDOMINIUM HOUSING**

**A RESEARCH REPORT SUBMITTED TO St. MARY'S
UNIVERSITY, SCHOOL OF GRADUATE STUDIES IN PARTIAL
FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF
MASTERS IN PROJECT MANAGEMENT**

BY : SEYOUM MOSISA

**JANUARY 2018
ADDIS ABABA, ETHIOPIA**

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(SGS/0531/2008A)

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ACRONYMS and ABBREVIATIONS

AAHDPO	Addis Ababa Housing Development Project Office
CSA	Central Statistical Authority
GTZ-IS	Gesellschaft für Internationale Zusammenarbeit (Deutsche)
GDP	Gross Domestic Product
GTP	Growth and Transformation Plan
IHDP	Integrated Housing Development Program
MDGs	Millennium Development Goals
MWUD	Ministry of Work and Urban Development
NBE	National Bank of Ethiopia
SMEs	Small and Micro Enterprises
SPSS	Statistical Package Social Science
TVET	Technical Vocational Education Training
UN	United Nations
UNDP	United Nations Development Program
WTO	World Trade Organization

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ABSTRACT

Quality is a fundamental aspect in the condominium housing to enable livable and sustainable environments for dwellers. Hence, the aim of the study is to assess quality challenge of low cost housing specific to 20/80 condominium housing, focusing on the major role player SMEs and small contractors, through three research questions; major quality defect of low cost housing, assessing quality standard guidelines for low cost housing, and on endeavor that the Addis Ababa Housing Development Project Office in order to get better the quality of 20/80 condominium housing. The methodology employed is descriptive type of research, where the sources of the data are both primary and secondary data from the study area of Kilinto and Bole Arabsa 20/80 condominium site found in Akaki Kality and Bole sub-city respectively. The major role player on quality of housing is Addis Ababa development project office, SMEs, contractors and consultants. The most common defects are those related to sanitary and electrical fixtures, door & window handles, door & window broken glass, fragmented floor and wall. There is low cost housing quality standard guideline for 20/80 condominium housing projects but most participant of the project have no information about its existence. The capacity building program by Addis Ababa Housing Development Project Office is overlook quality of housing. Addis Ababa Housing Development Project Office structure is not proper for checking and rechecking of quality of housing the project awarding system for contractors, and Micro and Small Enterprises are not considering quality of housing. Addis Ababa Housing Development Project Office is better to include quality of housing one of its objectives.

Key Words: Quality, Housing, Micro and Small Enterprises, contractors, consultants, Addis Ababa Housing Development Project Office, and Capacity Building

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Housing is one of the three most essential human needs. According to the United Nations Universal Declaration of Human Rights (1948), Article 25 (1): “Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care” Mekonen (2008), This implies that everyone has a right to live in a house that fulfills the minimum standards i.e., the house should be accessible; there should be access to safe drinking water, electricity, and etc. However, in Ethiopia most of the houses have no such facilities. According to Mekonen (2008), even in the capital city Addis Ababa, where 80% of the total housing stock is found, most of the housing units are old, dilapidated, and substandard, overcrowded and have no kitchen, toilet, and bathing facilities. Hence, they are not fit for healthy life.

The government of Ethiopia initiated the Integrated Housing Development Program in order to reduce this shortage of housing and provide a house that meets the minimum standards (kitchen, toilet and bath facilities) to low and middle income people and achieve its target in reducing poverty. To this end, the construction of condominium houses is under way. The word "condominium" comes from two Latin words meaning common ownership or control. It describes a legal form of ownership and not a type of building or residence Hawaii Real Estate Commission. (2009). as defined in the Encyclopedia Britannica “condominium is a multiple-unit dwelling in which there is separate and distinct ownership of individual units and joint ownership of common areas”.

In the Condominium Proclamation Number 370/2003 of the Federal Democratic Republic of Ethiopia, it defined condominium as a building for residential or other purposes with five or more separately owned units and common elements, in a high-rise building or in a row of houses, and includes the land holding of the building.

AAHDPO previously known as IHDPO was inaugurated after successful completion of Bole Gerji pilot apartments construction conducted in the years 1999-2002. Low cost housing project

was established based on bilateral agreement between Ethiopian and German governments to provide technical, managerial and financial support. German Agency for Technical Cooperation-International Services (GTZ-IS) was delegated to support the program in technical and managerial aspects. By using low cost technology, (GTZ-IS) in collaboration with the Ethiopian Ministry of Federal Affairs carried out the first pilot project in Addis Ababa. In this project, viable and technically sound construction solutions on the basis of pre-fabricated building elements were introduced.

To meet its main objective of affordability and employment creation, the program adapted low cost technology through alternative construction methodologies (use of prefabricated building component), lowered the building standards to acceptable standard for low cost housing and use of monotonous building typology and mass construction (GTZ-IS 2005). The program also promoted the participation of contractors and SMEs. Contractors is broadly defined as one with limited capital investment, who may need financial and managerial support to effectively run their business (GTZ-IS 2005).

The main role player who are involved during the construction phase are AAHDPO, contractors SMEs and consultant contractors are the general who are responsible for major construction activities and SMEs are manufacture and provide prefabricated building components, install electrical and sanitary works, and manufactures metal window and door frames. The study will focuses on the quality challenges of low cost housing in the case of 20/80 condominium housing in Addis Ababa.

1.2 Statement of the Problem

Government of Ethiopia housing program is not only contribution towards employment opportunity also on addressing housing shortages and slum reduction but also provide a house that meets the minimum quality standards for (kitchen, toilet and bath facilities) to low and middle income people. Criticism has also made not only on the un-affordability of the houses but also quality of housing. (UN-HABITAT 2011) pointed out that management of specific issues like quality of housing is unanticipated challenges of the project. The same report expressed that if not addressed properly, the mentioned challenges might jeopardize the long-term success of the project.

According to (Kanji and Wong1998), the housing quality has numerous problems because of its complicated nature of operation. The project is comprised of a multitude of participants are involved in the different phases of the project. The client, material provider, and contractor of a housing project all have a role to play in delivering a quality housing. Failure of any of the parties will seriously affect the quality of the final outcome.

Establishment and achievement of acceptable levels of quality in housing projects has long been a problem (Arditi & Gunaydin, 1997) but despite a significant amount of investigation already being undertaken to examine quality failures, housing projects are still encountering numerous quality problems (Heravitorbati, et al. 2011). According to (Xiao, 2002), poor housing quality performance that results in increased rework and has significant impacts on cost and schedule is among the major defects experienced in housing projects. There have been instances of building failures in different parts of the country, cases of abandonment of low cost housing projects and projects failing to meet the requirements even after execution. All these have been attributed to various problem but the success of projects can only be measured in terms of the achievement of quality.

Integrated Housing Development Program established with the objective of reducing housing problem and creating employment opportunity to the city of Addis Ababa, one of the major is 20/80 condominium projects. The major role player in this project are contractors, SMEs, consultants and including AAHDPO, they have their own contribution for the quality of housing and. IHDP does not take in to account quality of housing issue in to its objectives. Quality standard and guideline for 20/80 condominium housing are important for those majorly participate in this projects to get to the bottom of quality compliance from dwellers.

Compliance to quality standards in low cost housing projects is therefore a very critical factor if the management and execution of such projects is to be a success. "On 06 April 2017, one of the local Radio in Ethiopia known as Sheger FM 102.1 organizing a program of on a local Ahmaric Language "Ye Sheger Andand Gudayoch" gathering a housing quality problem complaint from the 20/80 condominium inhabitant. On that live program a lot of question raised on quality of housing problem from inhabitants and in order to react on the complaint raised from inhabitant,

Head of AAHDPO and head of Addis Ababa Housing Transfer office was their but they are not went to disclose the problem with the quality of housing.

According to international studies and researchers it seems as construction parties are increasingly realizing that the quality bar must be raised higher, quality must be improved and defects and rework reduced. The results of doing so would lead to better effectiveness and efficiency within the sector. Moreover, more emphasis must be put on creating value for the customer by meeting his needs and demands. Successfully implemented quality management has been proven to be a useful tool helping to obtain quality housing goals. Many studies on low cost housing are focused on unaffordability and time overrun of the project this drive the researcher to scrutinize the quality challenge of 20/80 condominium housing.

1.3 Research Question

The study is guided by the following key researchable questions:

1. What are the major quality challenge on 20/80 condominium housing of project?
2. Are there quality standard guidelines related to low cost housing and way of implementation, specifically to 20/80 condominium housing project of Addis Ababa
3. What an effort that the Addis Ababa Housing Development Project Office in order to improve the quality of housing?

1.4 Objective of the study

1.4.1 General objective

The overall objective of the study is to find out quality challenge of low cost housing specific to 20/80 condominium housing, focusing on the major role player AAHDPO, SMEs, contractors, and consultant.

1.4.2 Specific objective of the study

The specific objectives of the study are the following:

- To find out major quality challenge on 20/80 condominium housing of project.
- To assess quality standard guidelines related to low cost housing and its implementation, specifically to 20/80 condominium housing project of Addis Ababa.

- To examine the role that the Addis Ababa Housing Development Project Office in order to improve the quality of housing.

1.5 Significance of the study

The significance of this research thus lies in the possibility of adding to the existing information on quality measurement practices in 20/80 condominium housing projects in Addis Ababa in particular and low cost housing in the country at large and as well as proposing solutions to the inherent problems associated with the non-compliance to quality standards in the management and execution of public housing projects.

The processes and criteria involved in awarding low cost housing project contracts to contractors and SMEs are very important. As such, incorporation of quality assurance programmes in the management and delivery of low cost housing projects could contribute to achieving a higher level of success in the delivery of such projects. Also, since the cost of quality could be very high if compromised, a minor defect in the quality standards in the case of structures can bring about a whole lot of damage to lives and properties of end users. It is therefore very important that quality measurement be put in place.

It is expected that it will increase alertness of the program in quality defects also identify gaps and come with possible recommendations that may be used as inputs by the government to improve its policy for achieving its objectives. Then if corrective measures are taken, it will ensure sustainability of the program in delivering quality low cost houses in Addis Ababa. Moreover, the study will also contribute other researcher as an input and solutions to similar undergoing programmed in the country as a whole.

1.6 Scope of the study

IHDP have three low cost housing program (10/90, 20/80 and 40/60), from this program the study will really on 20/80 program of low cost housing program. this program has many projects in the city the study will conducted on Kilinto project site its founding location are Akaki Kaliti sub City the client of the project is Addis Ketema sub city and Bole Arabsa project site its location is Bole Sub City the client of the project is Nifas silk Lafto sub City of 20/80 Condominium housing construction site.

Low cost housing construction project have many contributors to the quality of the project, the study mainly considers the two major roll player, MSEs and small contractor. The research focused on quality issue related to defects of construction. It envisages construction defects in association with the performance of small contractor and SMEs. This involves revealing the constraints that the small contractor and SMEs facing during the construction process, examining the program effort to insure quality on the project. Furthermore, the research detect the defects observed on the already finished and handed over condominium houses, suggest solutions and approaches to addressing problems, and there by lessen the defects in the construction process.

1.7 Limitation of the study

There are several limitations to the study. Firstly, the research population is too large to cover in the limited time given thus sampling is required which might have an impact on the general output of the study Secondly, since the program has political implications, the issue of defects might not be sound for the AAHDPO officials thus they might be reserved to cooperate with this study.

1.8 Organization of the thesis

The researcher has organized the entire study into five chapters. Chapter one introduction to the study. This provides a background to the study, statement of the problem, research questions, objectives, and significance of the study, scope and limitations. Chapter two is literature Review. The chapter discusses theories relevant to the study and provides literature previously done by other authors on quality of low cost housing. Chapter three is research design and methodology. This chapter discusses the research design, sampling procedures, data collection methods and analyses that would have been used in the research. Chapter four is presented results and discussion the in relation to the research questions. And finally chapter five is conclusions recommendations the findings will be summarized and recommendations and conclusions given based on the results.

CHAPTER TWO

REVIEW OF LITERATURE

2.1 Housing in Ethiopia

Ethiopia's construction sector is one of the most robust in Africa. Conditions are ripe for a surge in building across the country. The updating and building of new infrastructure links, residential developments and so on is of considerable interest to the Ethiopian Government. Indeed, development of these areas features heavily in the nation's Second Growth and Transformation Plan (GTP II).

The GTP five year plans lay out the blueprint for Ethiopia's continued economic growth. As such, construction will play a key role towards achieving the country's economic prosperity goals. According to the NBE, construction accounts for half of all the nation's industry. What's more, the industry is expanding rapidly. Data from the NBE also suggests that during 2013/14 the building sector grew 37%.

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

AAHDPO is a government-led and financed housing provision program for low-and middle-income households in Ethiopia. Projects are undertaken on either brown-field sites or slum areas that are cleared and residents re-housed. The common attribute of each project is that it has developed different typology of condominium housing: multi-storied housing units for several households where communal areas are jointly owned and managed (MUDHC 2013).

The Ethiopian low cost housing policy has two primary objectives; first, it aims to extend market for low-income households that are not covered by the private housing market through increased supply of affordable low-cost housing. In many developing countries, the great majority of lower income households cannot afford the lowest priced houses in the formal housing market. This is particularly problematic in developing economies where urban growth is predominantly driven by in-migration by rural households that often lack the financial wherewithal to participate in formal housing markets. In the present Ethiopian context, at prevailing housing price and financing mechanism, only households above the 95th percentile of the income distribution can afford to become home owners in the formal private housing market. The only choice opens to lowest income households in such economies is to rent under precarious and uncertain tenure terms, double up with relatives, or build some form of shelter in unauthorized sectors that exacerbate the proliferation of slum areas. Consequently, lower-income households not only live in sub-standard housing conditions, but also have limited access to basic public services as well as access to finances as they are often considered not creditworthy either due to their employment, which is often in the informal economy and or lack of collateral for mortgage lending when available (Alebel, et.al 2016).

Second, the housing policy aims to stabilize rental markets in urban Ethiopia through the increased construction of low-cost housing units that target lower income households as well as by increasing the general housing stock. It is estimated that Ethiopia's current housing deficit in urban areas is about a million units, and that only 30 percent of the current housing stock is in "fair" condition, with the remaining 70 percent in need of total replacement. The housing deficit is even more severe in major urban areas like Addis Ababa, where the deficit is set to increase concurrently with rapid population growth. Consequently, this has placed significant upward pressure on the demand for rental housing in urban areas, which in turn is pushing rental prices and creating affordability challenges to working class households. Housing affordability challenges in the private market are occurring largely due to the limited rental housing options for renters. To ensure stable and affordable rental housing prices, the supply of new housing stock has to increase to match the rapidly growing urban housing need (Alebel, et.al 2016).

Different housing construction technical manuals was prepared by the support of GTZ-IS in collaboration with MH Engineering Consulting Engineers P.L.C. (Advisor of the program) and

the Ethiopian Ministry of Federal Affairs prepared technical manuals to be used as a guideline during the implementation phase of the program.

Volume I of the technical manual describes a modular building system introduced by the Low-Cost Housing Project. It has four parts the first part describes machines and special tools for the pre-fabrication process and simple handicraft-techniques, the second part introduces modular system - measurement basics and the standardized building parts. The third part visualizes a typical building process based on a model to illustrate the order in which the building parts should be assembled. The fourth part consists of models of condominium buildings (GTZ-IS/ETHIOPIA 2003).

Volume II is a continuation of the first technical manual published with the objective to inform the development of low-cost housing in Ethiopia. Furthermore, the manual includes a construction guideline “step by step” meant to guide site supervisors and site engineers to organize construction sites and control the quality as well as the implementation of the technical requirements. It is a very practical guide, which includes checklists for the different tasks that need to be accomplished. It goes through the whole construction process from excavation, earthwork to slab construction (GTZ-IS/ETHIOPIA 2005).

The low cost housing program has three types of housing schemes, categorized based on the minimum requirement for down payment: 10/90, 20/80 and 40/60 schemes. The beneficiaries for the 10/90 housing schemes are required to pay 10% of the transfer price upon owning the house, and the rest 90% will be paid on installment in 25 years. Those eligible for 20/80 and 40/60 are expected to pay 20% and 40% as down payment, and the rest in 15 to 20 years. These schemes are expected to suit households of different income levels. (Alebel, et.al 2016). The studio unit of the 10/90 program is targeted at the lowest income group, with an average monthly income of ETB 300 (USD 23) at the time of the program design in 2004. The 20/80 scheme targets the middle incomers, while the 40/60 scheme targets the upper middle-class that can save quickly or pay upfront. The features of the low cost housing are designed to contain private access to basic amenities such water, sewerage, and electricity connections and also a bathroom, which includes a shower, flush-toilet, and hand basin, and a kitchen (Alebel, et.al 2016).

2.2 Quality of housing

Some researchers like (Arditi & Gunaydin 1997), use the term quality instead of project performance to indicate the effect. Quality project refers to a project, which is completed on time Within budget and meets its functional requirement (Arditi & Gunaydin 1997).

What is quality?

(Vincent & Joel 1995), define quality as the integration of all functions and processes to achieve continuous improvement of the quality of goods and services to meet customer satisfaction. According to (Arditi & Gunaydin 1997), Quality is meeting the requirements of the stakeholders: designer, contractor and regulatory agencies as well as the owner. To ensure project quality implementation of a Total Quality Management System (TQMS) is necessary. TQMS is an effort that involves every organization in the industry to improve performance and focus on process improvement, customer and supplier involvement, teamwork, education and training to achieve customer satisfaction defect free work (Meng 2011).

There are two widely used terms in TQMS namely Quality Assurance (QA) that covers activities Necessary to provide quality in project work and Quality Control (QC) that is set of procedure to Meet QA. The activities in QA involve establishing project related policy, system necessary to Produce quality, standards, training and guidelines whereas the procedures in QC involve planning, coordinating, developing, checking, reviewing and scheduling of work (Arditi & Gunaydin1997). The training in QA includes instruction in the basic TQM cause and effect analysis, team problem solving, interpersonal communication and interaction and cost of quality measurement (Arditi & Gunaydin 1997).

(Arditi & Gunaydin, 1997), also identify the importance of teamwork in the implementation of TQMS. The team, which is responsible for establishing joint goals, plans, and controls should Include all members of the parties involved in the project. The teamwork provides a mechanism for listening to and communicating with the owner, thus useful for measuring the level of customer satisfaction.

As the customer's perspective of quality levels is important (Deming 1986), performance should be measured and informed to all stakeholders involved (Thomas & Thomas 2005). The next Subsections then address stakeholder involvement, performance measurement and customer Satisfaction.

The Oxford Dictionary of Current English (1984) defines defects as 'lack of something essential, imperfection, shortcoming, failing. A defect is defined in ISO 8402 as the non-fulfillment of intended usage requirements. It means lacking and not meeting the required standard. A defect is present when there is a difference the required standard and the actual delivered standard. The concept of Zero defects are performance to agreed specification (Al-Mahade 2008).

It literally means 100% error free. Is it attainable, or is it good enough to achieve a certain percentage of acceptable defects? The zero defects concept became popular when Crosby a quality manager developed a concept based on his beliefs that product should be defect-free when delivered to the customer (Harrington 1998). This concept was neither a technique nor a methodology; it embodied an attitude that Crosby sought to instill in every individual. It focused on an individual's commitment to always meet the engineering specification. Defects may appear as a building is constructed or after an element of work is completed. In most standard forms of buildings contractors, there are usually provisions that require rectification of defects by the contractor at his own costs.

The defects Liability Period (DLP) is a period of a number of months's stated in the contract, commencing from the day a project is certified practically completed and handed over to the client (Sikan 2001). Defects in construction can result in very large costs. Even with minor defects; the operations of a quality may be impaired, resulting in increased costs and delays. Generally, construction industry players believe that to achieve zero defects in construction is not possible. However, it must be highlighted that the concept of zero defects in not only about achieving zero effects as an absolute goal, but also generating a different attitude towards work. It is about looking at projects from a customer's point of view and catering for their needs. It is about getting the work right the first time and delivering the project on time (Costain 1998). However, defects occur either because of poor material quality or poor capacity of the contractor. These causes may operate singly or in combination and result in defects indicated by changes in

composition of materials in the construction itself; in the size, shape or weight of materials or parts of a building; or simply in appearance.

Ethiopia currently is faced with many problems, housing being one of them. The quality of housing and the aspects which contribute to it leaves much to be desired. The key purpose of this research study is to suggest that by systematic focus on implementation of quality of construction condominium housing projects skilled workmanship (small contractor) and SMEs results in effective quality product. When placing emphases on the word quality it may be described as the degree of excellence (Croome and Sherratt 1977). However, (Barrie and Paulson 1984) mentions that quality assurance is considered generally to be a broader, more nearly all encompassing term for the application of standards and procedures to ensure that a product or facility meets or exceeds the desired performance criteria. (Powell 1976) further mentions that quality in housing construction demands functional soundness and also demands subjective acceptability for it to be a marketable product.

According to (Griffith 1990) as well as (Levey 2002), at present quality within the construction industry is fraught with difficulty. The relatively unique aspect of each construction project and its temporary nature make the continuity and development of approach across projects far from easy. (Griffith 1990) further postulates that quality should try to address science and technology aspects of construction as well as manage the physical and psychological aspects of the human element. Quality in construction therefore represents a complex socio-technical managerial challenge (Griffith 1990). In order to overcome these challenges, considerable efforts need to be made to achieve perfection at the very first attempt (Bennett 1991). Therefore, by focusing on the quality of implementation in conjunction with the quality of conformance to these designs, quality to the constructed facility is made possible (Barrie and Paulson 1984).

(Griffith, 1990) contends that in recent years the need for well-formulated, structured and formal systems of construction management to take into consideration aspects of quality performance has increased as a direct result of capacity of contractors, materials and components provision. Quite a number of problems, such as contractors, which have been experienced in the building process, seem to be inadequacies ranging from small technical and aesthetic aspects to the major building defects.

(Levey 2002) further states that the growing shortages of skilled workers, be it designers or construction managers and their labor, which began to appear in the 1980's in the United States of America, has reached dangerously low levels in today's construction industry. This concern remains one of the major challenges facing the industry, ultimately jeopardizing quality. (Powell, 1976) adds that quality would also be jeopardized due to the fact that there are no acceptable quality criteria for middle management and site management in speculative housing. These problems are known to cost the building industry hundreds of millions of dollar annually due to mismanagement. Therefore, it is said that many of these difficulties might be dealt with through greater care and attention to standards of performance and quality at the client briefing, design and construction stages which form part of the building process (Griffith 1990).

The cost of the housing is also determine the quality of the house, but there is a way to control (Lewale 2011), also points out areas where cost can be minimized: to reduce plinth area by using thinner wall concept, use locally available material in an innovative form like soil cement blocks in place of burnt brick, and use energy efficient materials that consume less energy like concrete block instead of burnt brick. Additionally, use environmentally friendly materials that are substituted for conventional building components, pre-plan every component of a house and rationalize the design procedure for reducing the size of the component in the building have an effect to reduce construction cost.

Thus, cost-effective and alternative construction technologies reduce construction cost by reducing quantity of building materials through improved and innovative techniques. Apart from reducing construction cost the technology can play a great role in providing better housing methods and protecting the environment. Building material accounts for 60-70% of the total building cost (Lewale 2011). Therefore, reducing material cost results in a vital change in the overall construction cost.

Low cost housing supply also has certain constraints (Moavenzadeh 1987) financial problems due to late payment and withholding portion of payment as form of guarantee, high cost of equipment and unavailability of access to credit are the main ones. The problems are worse for small-scale contractors in developing countries. They face idleness of equipment due to unavailability of consistent work, transportation of building components, lack of technicians and

supplies for spare part of equipment, inefficiency of equipment, and inadequate supply of skilled construction labor. (Moavenzadeh 1987) also suggests remedial action to the specified constraints. Timely payment, upon arrival or even in advance payment for material and facilitate access to the loan are remedial actions associated with finance. Remedial actions concerning technical support for contractors include, training workers for the construction and building materials industries- especially crafts people, managers, engineers and other professionals and apprenticeship systems for skilled workers and managers, which remains the best bet for mitigating shortage of technical and managerial talent. In addition, incorporate workers in the informal sector since they are already experienced in the manufacturing, use of domestic materials and the construction of low cost housing. Any program to improve the housing conditions of the poor would profit by their inclusions. At last policies that favors small-scale production and institutional mechanisms will not only promote the social and economic welfare of the poor but also generate growth and employment in nearly all sectors of a developing nation (Moavenzadeh 1987).

Quality controlling system in housing construction project plays a great role in the low-cost housing sector. Quality controlling system, in short refers to a program for systematic monitoring and evaluation of the various aspects such as construction processes and input provide based on the characteristics of a project, to ensure that standards of quality are being met Quality Assurance (Harrison, 2005).

According to (Harrison, 2005) the quality systems currently implemented in the low-cost housing sector are:

- Document Control: To ensure employees have the correct procedures and that the procedures are properly maintained.
- Audits: To verify that quality procedures are being followed.
- Non-conformance Tracking: To monitor and track quality issues and that defects are kept from customers.
- CAPA (corrective action and preventative action): To correct flawed processes (i.e. quality procedures) when detected via audits and nonconformance tracking and to prevent defects from reoccurring.

- **Management Review:** Reviewing quality systems data quality metrics to determine if the quality system is working and if it is not, taking the appropriate action to improve the system.

2.3 Major role players on quality of 20/80 condominium housing

The main participant who are involved during the construction phase are AAHDPO, contractors SMEs and consultants. The small contractors are the general contractors who are responsible for major construction activities. MSEs are the other major role player, who manufacture and provide prefabricated building components, install electrical and sanitary works, and manufactures metal window and door frames.

2.3.1 Contractors Roles

Contractor performance has a direct impact on project quality for instance poor contractor's performance can lead to poor project quality. From the SWOT analysis made in European construction sector, small contractors have low productivity, little interest in education and training than other construction companies (Jankovichova 2010).

The other factor that negatively affects contractor performance is that contractors are not customer oriented and focused. Contractors can be rated in terms of various aspects such as management, claims orientated, site offices, safety, relations with site neighbors, plant and equipment condition, administration, worker skill, and quality (Latham 1994). Latham further added factors that negatively affect contractor's performance in terms of quality for instance workers' skills, out of sequence work, late information, emphasis on production, project duration, poor specification, design change, employer change, bad weather, and late information and procurement system.

Due to the above constraints, it is difficult for the contractor to deliver quality housing, which then affects the construction sector as a whole. (Krooden, Milne & Atkins, 1995) underline the importance of contractor development program to overcome poor workmanship and maximize development impact on projects in poor communities. Thus, development programs have to consider management options that encourage development, institutional roles that ensure

coordination and project quality success and project options that match the project with development objectives (Krooden, Milne & Atkins 1995).

Most of the contractor development programs include training and capacity building schemes where the level of the support, depends on the level of the contractors (Krooden, Milne & Atkins 1995). The Less developed contractor will have broader needs of technical and managerial aspects. Training is a vital part of the development program that should be given immediately before a project starts to enable the contractor to perform well and be competent. Training is provided either by manpower upgrading programs or NGOs and should focus on technical competence, business and managerial skills and program management (Krooden, Milne & Atkins 1995).

Potential differences in the quality of housing delivered between Grade 2 to 4 contractors and by Grade 5 to 9 contractors are significant Grade 5 to 9 are poor than Grade 2 to 4 that the quality of housing and also completed work delivered decreases quality with increasing project size (Groenkloof, 2011). Of significance, however, is that small contractor's rate poor site management, a lack of understanding of quality and a lack of quality improvement processes as significant barriers to attaining construction quality (Groenkloof 2011).

2.3.2 SMEs Roles

The criteria for determining SMEs are also different for different countries. For instance, in India, the criteria for determining SME status is based on investment, while in South Africa SME eligibility depends on the number of employees and turnover. Similarly, in Ethiopia, the working definition of MSEs is based on capital and labor. However, there are three parameters that are generally accepted when defining SMEs in most countries; number of workers employed, which is the most widely used criteria, firm's level of capital investment or of assets, and firm's volume of production or annual turnover (WTO).

EU classifies micro, small and medium-sized enterprises - SMEs based on staff head count and Financial ceilings accordingly EU (2003);

1. A medium enterprise is defined as an enterprise which employ fewer than 250 persons and have an annual turnover not exceeding EUR 50 million, and/or an annual balance sheet not exceeding EUR 43 million.
2. A small enterprise is defined as an enterprise which employs fewer than 50 persons and whose annual turnover and/or annual balance sheet does not exceed EUR 10 million.
3. A microenterprise is defined as an enterprise which employs fewer than 10 persons and whose annual turnover and/or annual balance sheet does not exceed EUR 2 million.

According to Ethiopian development strategy 2011, MSEs are categorize as follow:

- Enterprise with capital below Birr 50,000 and have less than 5 employees considered as micro enterprise and
- Enterprise with capital below or Birr 1,500,000 and have 6-30 employees considered as small enterprise

AAHDPO mainly aims to strengthen and improve the capacity of the construction sector and improve the TVET system in building the capacity of SMEs. This component has two major activities. First, construction management, which includes various activities such as the production of Capable Site Engineers and Foremen; SME entrepreneurs who will participate at different value chain of the housing project as manufacturer and sub-contractor; build the coordination and supervision capacity of the city. Second, capacity building and facility requirements, in which three key activities are done. First, training, the fulfillment of the required facility and equipment, and preparation of guidelines and procedures to facilitate the implementation of the program including institutional and organizational arrangements. It will also result in strengthening and building of the capacity of the city in construction material production, construction services, skilled manpower, and institutional service delivery (Alebel, et.al 2016).

SME will involve in the different components of the housing construction including structure work, construction and production of manufacturing such as hallo block concrete, door, window, sanitary work, and Electrical installation. The TVET activity is designed to improve SME's vocational skills to a higher stage and ensure them to sustain in employment through innovation and produce high quality products. This activity will produce 2300 SME established and 80,000

jobs created. AAHDPO Mobilizes and prepare 8.8 billion Birr required for the housing construction project (Alebel, et.al 2016).

"The utilization of housing as an instrument to promote urban development, create jobs, revitalize the local urban economy through MSE development, encourage saving and empower urban residents through property ownership, and develop the capacity of the domestic construction industry" (MUDHC 2005 E.C.).

AAHDPO has tight costing and quantity surveying mechanisms that aim to minimize construction costs. The office is responsible for purchasing all construction materials, in bulk and therefore at low prices. Contractors are engaged on fixed-cost contracts, which reduce the burden of soliciting for, receiving, and choosing tenders for each job. The material requirements for each condominium block are calculated and the exact material quantities are given to contractors. This centralized system minimizes wastage, helps to keep records for material supplies and distribution, and enables any surplus materials to be used on other site (UNHBITAT 2010).

2.4 Measuring housing quality

Measuring quality enable managers to know how close they are to their target and how to make the right decisions for improving work process (Oztas 2005). Continual measuring of project performance for further improvement also helps in meeting customer expectation on the project outcome. (Deming 1986) also affirms that the customer's perspective of quality levels is critically important. Hence it is important for the project team to understand what customer satisfaction means.

Quality should be measured on a regular basis throughout the project, which helps the team to review progress and identify opportunities for further improvement (Thomas & Thomas 2005). Benchmarking allows a project team to learn from best practice by comparing its own performance with others (Chan 2004). Without clear measurement of performance against benchmarks, it is difficult for any teams to determine how well they have done and what improvement they need to make (Chan 2004).

Accurate construction planning is a key determinant in ensuring the delivery of a quality housing on schedule and within budget. A contracting organization needs a sound time-planning and

control system which allows not only efficient and effective management of an individual project but also the likely need to manage multiple projects simultaneously (Griffith 1990).

2.4.1 Benchmarking quality of housing

The philosophy of benchmarking has proliferated in many manufacturing industries; relatively little attention has so far been drawn to its potential value in the construction industry. Benchmarking is the search for the best practices that will lead to superior performance of an organization (Chan 2004). Researchers in construction management and practitioners in the construction industry have begun to realize the importance of developing best practice benchmark measures, say for instance, of construction quality performance to be used by clients, consultants and contractors (Chan 2004).

According to (Alarcon and Serpell 1996) there is still a consensus around researchers and the construction industry experts, that one of the principal barriers to promote improvement and sustainability in quality construction projects is the lack of appropriate quality performance measurements. (Alarcon and Serpell 1996) further mention that for continuous improvement to occur it is quite pivotal to have quality performance measures in place in order to check and monitor these quality performance, to also verify changes and the effect of improvement actions, to understand the variability of the process and in general it is a necessity to have objective information readily available in order for any construction company to make effective decisions.

(Mohamed 1996) confers that the ever-rising customer requirements and expectations have increased demands for continually introducing improvements in quality of housing. With competitors in construction increasing at a vast rate, construction organizations all around the globe are enhancing their competitive position by improving their performance and in addition setting new operating targets and standards for the national market. This dynamic mechanism and the well-known fierce national competition have raised the awareness of quality performance measurement known as benchmarking among the majority of contractors.

According to (Alarcon and Serpell 1996) benchmarking is considered to be a new topic within the construction industry. (Alarcon and Serpell 1996) further mention that to this day there is

almost no available information that describes the potential that benchmarking offers to quality of housing.

However, (Kyro, 2003) states that benchmarking has established its position as a tool to improve contractor's quality performance. (Kyro 2003) defines benchmarking as the process of evaluating and applying best practices that provide possibilities to improve the quality of work. (Kyro 2003) further mentions that benchmarking is an evolving concept that has developed since the 1940's towards more sophisticated forms. He proposes that it has undergone five generations. (McCabe 2001) adds that many of the techniques directly associated with benchmarking may have their roots in the so-called quality movement of the 1980's, but the concepts which underpin them are a lot older.

(Mac Cabe 2001) explains that records show that the Egyptians used benchmarks in construction work, by cutting a notch in a lump of stone at accurately determined points, while a flat strip of iron would then be placed horizontally in the incision to act as the bench for a leveling staff. Using this as a reference further heights and distances could be measured. While the term benchmark may have changed to a more contemporary meaning, at its heart it is still the fundamental principle of being able to measure in a definitive way, in order to improve quality standards (McCabe 2001).

(Mohamed 1996) mentions that in housing quality benchmarking is not a straight forward task due to both the very nature of the industry which lacks solid data gathering and the remarkable fluctuation in productivity. In housing quality benchmarking attempts always run a risk of facing certain difficulties such as incomplete or non-existing data (plans incomplete). Even if the data was complete or did exist, benchmarking would be highly dependable on project size, type and budget. Therefore, it is difficult to use it effectively as a basis for comparison. Benchmarking only works if consistent methods of measuring the quality performance of operations can be developed and introduced.

(Mc George and Palmer 1997). state that there are three types of benchmarking; they are: internal, competitive and generic benchmarking.

2.4.1.1 Internal benchmarking

Internal Benchmarking is where a contractor aims towards identifying improvement areas within its structure through comparing its business operations with those of others who do things better, thus setting new targets to meet (Mohamed 1996). (McCabe 2001) confers that internal benchmarking is the most straightforward of the three types, because it is carried out inside the organization. When focusing on internal benchmarking, it may be discovered that a particular department is able to perform better than others. (McGeorge and Palmer 1997) further state that internal benchmarking allows best practice that exists within the organization to be identified and installed contractors-wide.

2.4.1.2 Competitive benchmarking

Competitive benchmarking is a comparison between the processes of companies operating within the same industry (Mc George and Palmer 1997). Therefore, if a competitor of the same industry suddenly gains a competitive advantage for example selling goods at a cheaper rate or to a higher specification, other companies will be forced to follow or meet the same standard (McCabe 2001). The problem however with competitive benchmarking is that because it deals with the companies operating in the same industry, best practice of a competitor is not necessarily good enough. For example, a construction company can have an excellent reputation for construction process and material use, due to no direct follow-on from this; this does not mean their estimating processes are any better than others (Mohamed 1996).

2.4.1.3 Generic benchmarking

According to (Mohamed 1996) generic benchmarking is when the industry as a whole attempt to increase quality through tools and techniques developed and successfully used by other industries applicable to construction. The advantage of generic benchmarking however that is it breaks down the barriers to thinking and offers a great opportunity for innovation. The disadvantage is that it can be difficult, time-consuming and expensive (Mc George and Palmer, 1997).

2.5 Common quality problem in low cost housing

Quality problem in newly completed buildings are becoming a serious phenomenon as lower cost and medium cost house are being built (Alsadey et.al. 2010). Construction defect according to (Alsadey et.al. 2010) is lacking and not meeting the required standard that may reveal as a building is constructed or after an element of work is completed. Defects usually include any deficiency in the performing of the design, planning, supervision, inspection, construction or observation of construction to any new home or building. The defects usually are start to appear after 2 years of occupancy (Chong & Low 2006).

Housing quality defect affects society or end-users due to possible danger posed and direct and indirect cost of repairs imposed. Some of the most common construction defects involve leaking roofs and windows, cracked and heaving concrete, cracks in walls and joints, defective plumbing and improperly installed electrical equipment shown below (Alsadey et.al. 2010),

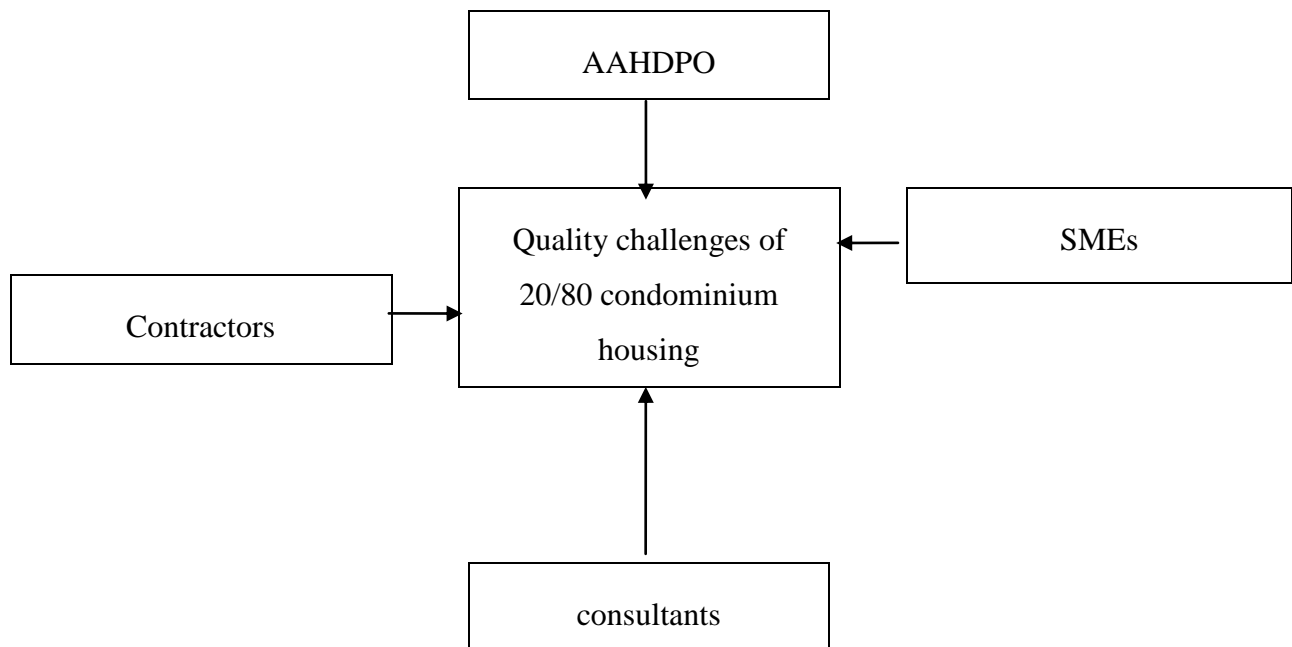
- Cracking
- Loose plastering of ceilings
- Delaminating
- Surface appearance (Surface abrasion & Surface etching)
- Corrosion
- Physical appearance Dent age (Deflection & Warping and buckling)
- Water penetration
- Sealant defects
- Staining

2.6 Conceptual framework

A number of different participants are contributed for housing quality challenges. According to the unique characteristics of this project, the identified main quality role players of 20/80 condominium housing are SMEs, contractors, AAHDPO, and consultants. In addition, this extensive review encompasses all the identified quality of housing problem identified and discussed in previous sections of literature review.

Common attribute to the major sources of quality challenge of 20/80 condominium housing problem stipulated in the figure below;

Figure 2.1 conceptual framework



CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Study design and approach

The study is drawn on descriptive (ex-post-facto) type of research design is considered by the researcher for the study. This approach is chosen by the study owing to the fact that the purpose of the study is merely to describe the state of nature as it currently exists; i.e. To report what has happened or what is happening; with no control over the variables involved. Both qualitative and quantitative approaches considered using an interview, questionnaire and secondary data (C.R. Kothari 1990 p. 37).

3.2 Data Type and Source

Both primary and secondary data obtained using different data collection methods and instruments. The primary data is collected through a questionnaire and interview from small contractors, material provider, occupant, AAHDPO professionals, and site engineers. The secondary data sources are published or unpublished documents from the AAHDPO, MUDHC, Journals, Magazines, Newsletters and Publications from other sources are also used.

3.3 Population and sampling techniques

Target population of the study is Kilinto project site. Its founding location are Akaki Kaliti sub City the client of the project is Addis Ketema sub city and Bole Arabsa project site its location are Bole sub City the client of the project is Nifas silk Lafto sub City of 20/80 Condominium housing is, contractors, SMEs, consultants, inhabitant, AAHDPO professionals, and project site engineers.

Both probability and non-probabilistic sampling techniques utilized in selecting the sample from the target population.

The target population is homogeneous behavior so that from the Probability sampling method simple random sampling technique is used on the selection of contractors, SMEs, consultants, and Inhabitant. In order to selected the sample from the target population the researcher use a

simplified formula provided by (Yamane 1967) as cited by (Singh & Masuku 2014). Shown below.

$$n = N / [1 + N (e)^2]$$

When, n is sample size, N is the population size and e is the level of precision. A 95% confidence level and e = 0.05, is assumed for the purpose of determining sample size for this research.

Non-probability sampling method implemented on the way of purposive sampling technique on AAHDPO professionals, and project site engineers which is representative of AAHDPO. Table below shows the framework for the sampling and data collection techniques.

Table 3.1: Sampling framework

No.	Respondent	Target Population	Sample Size	Sampling Technique
1.	Contractor	44	39	Simple Random
2.	SMEs	248	153	Simple Random
3.	Consultants	11	9	Simple Random
4.	Inhabitant	3,603	360	Simple Random
5.	AAHDPO Official & Professionals	47	3	Purposive
6.	Site Engineers from the Two Projects	102	5	Purposive

3.4 Data collection instrument

The data collection instrument that implemented and believe to be relevant to the study considered is; Interview, Questionnaire, and document review Table below shows the data collection Instrument.

Table 3.2: Data collection Instrument

No.	Respondent	Data Collection Instrument
1.	Contractor	Questionnaire
2.	SMEs	Questionnaire
3.	Consultants	Questionnaire
4.	Inhabitant	Questionnaire
5.	AAHDPO Official & Professionals	Interview
6.	Site Engineers from the Two Projects	Interview

3.4.1 Interview

Interview method provide work for because it is believed to have an advantage of ensuring probing for more information, clarification and capturing facial expression of the interviewees. In addition, they will also give an opportunity to the researcher to revisit some of the issues that had been an over-sight in other instruments and yet they are considered vital for the study.

To this effect, deputy manager and professionals including site engineers from AAHDPO is considered in this data collection instrument.

3.4.2 Questionnaire

In addition to the interview Questionnaire developed according to the objective of the study, including SMEs, contractor, occupant and consultants are also considered in this data collection instrument.

3.4.3 Documentary review

Documentation cannot be underestimated as it provides necessary background and much needed context both of which make re-use a more worthwhile and systematic endeavor. Secondary data is obtained through the use published and unpublished of project performance reports of the AAHDPO, MUDHC, and different publication of the city Addis Ababa. Journals, Magazines, Newsletters and Publications form other sourced are also used.

3.5 Procedure of data collection

The researcher undertakes the data collection procedures through by development of questioner and interview guide checklists for the study in order to demonstrate the objective of the study to the target population of the research to individual level discussions with identified interviewees and collecting secondary data from the concerned body through an official letter written from the university.

3.6 Data processing and analysis

After collection of data, data was processed to meaningful results. Data processing refers to the transformation of respondent's view into meaning form. Both quantitative and qualitative techniques were used to process and analyze the collected data. Using these techniques, the presentation and organization of findings made it very easy to comprehend and draw conclusions based on findings. The qualitative data was analyzed by setting responses for respondents based of which response that was repeated several times. The steps below were used to transform quantitative data into meaningful form:

Data editing: Editing of data is a process of examining the collected raw data to detect any errors and omissions and to correct them when possible. The act of editing is done during data collection and even after collection of data that is immediately after interviews. Filled or answered questionnaires should be checked to ensure that all answers given are coherently and were logically recorded to provide sufficient information. This has enabled the researcher to cross examine the relationship between the questions and the corresponding responses in order to ensure accuracy, consistency and uniformity.

Data coding /categorizing: by using Statistical Package for Social Scientists version 20 Coding data assigning a symbol or a number to a response for identification purposes. The information of every respondent was established. The aim was to identify and classify the answers to meaningful information but for open questions which had a variety of answers given by respondents, the researcher had to find out most common answers given. Therefore, coding has enabled the researcher to classify the responses into meaningful categories to bring out their essential pattern. After coding, tabulation was used to analyze data.

Data entry: Since SPSS are used in coming up with summary frequency tables and subsequent data analysis, the responses were transcribed from each coded data collection instrument into computer.

Data presentation: After data or responses has been entered into computer, there has to be data presentation or data was summarized or condensed so that there can be analysis. Statistics as a tool for research offers a researcher at least three tools for data presentation, namely: tables, graphs and charts. Tables were used to summarize data using a layout of rows and columns and the choice of when to use them for data presentation depending on advantages of such a table over the use of text. Graph and charts on the other hand have advantages such as having visual appeal that breaks monotony and ability to give an overall pattern of results at glance.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Description of participants

The personal profile of the contractors shows all contractors are well educated and have an average work experience of more than four years. The majority of respondents, which account for 70%, have university degrees and the rest have MSc degree or college diploma.

Look at their company profile the majority of the contractors 85% fall under the category of GC/BC grade 5-6 and only a few falls under category GC/BC grade 3-4. The majority of the contractors or 90% of the respondents have less than ten key employees. The analysis shows there is a close relation between years of firm's establishment and years of participation in condominium projects. This shows 65% of the contractors establish their company initially to participate in condominium projects.

On the other hand, majority of the respondents of MSEs are managers and accountant in their respective enterprises, which accounts for 70% and 20% of the total respectively. Their educational background varies from high school level 52% to university degree 5% and the rest 43% of the respondent has a diploma or vocational college certificate. According to the analysis different age group participate in this project but 52% of the respondents is an age group from 24-29. As in any other construction projects in Ethiopia, the number of female respondents are few.

Like contractors, year of enterprises establishment is highly related to years of participation in condominium projects. Besides, the majority of MSEs does not have work other than condominium projects. More than 50% of the enterprises have ten members working together. The remaining enterprises have members varying from one to twenty. The respondents were selected from each area of expertise except manufacturing and installation of Agro stone partition walls.

After AAHDPO inauguration, a total of 175,000 houses had been built also transferred to owners, and 94,000 houses are under construction. The construction sites are distributed in all sub-cities of the Addis Ababa. The AAHDPO has branch project offices in each sub city. These offices are responsible to provide land for construction, recruit and provide small contractors and

MSEs and provide supporting scheme for MSEs. The head office on the other hand is responsible for regulating and administering all projects.

The selected project site for this research are Kilinto project site its founding location are Akaki Kaliti sub City the client of the project is Addis Ketema sub city and the other is Bole Arabsa project site its location are Bole Sub City the client of the project is Nifas silk Lafto sub City. AAHDPO is responsible for both supervision and administration of the project.

“Kilinto project site” was completed in 2017 and the majority of the houses have been transferred to the inhabitants, 126 blocks that consist of about 3,371 housing units are constructed. The second project is “Bole Arabsa project site” commenced in 2014 and still under construction. This project intends to build 232 housing units in 8 blocks.

A total of 248 SMEs are participated in the two site 153 are randomly selected as a primary respondent. Sample respondents are taken from every enterprise to make the selected sample more representative of the population.

Figure 4.1: Shows partial view of Kilinto and Bole Arabsa Project site



A total of 44 small contractors are participated in the two site 39 are randomly selected as a primary respondent. Sample respondents are taken from every contractor to make the selected sample more representative of the population.

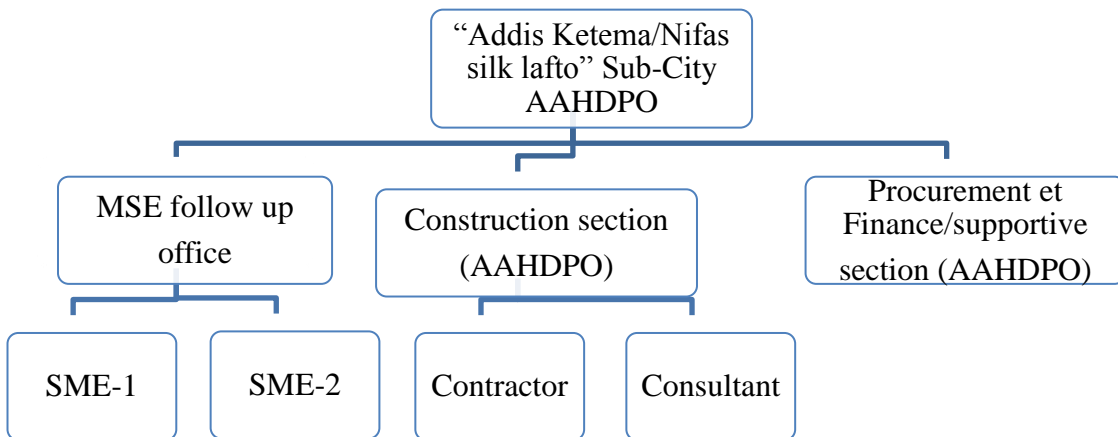
AAHDPO officials who have different responsibilities in the project were selected to give imminent about the project. The respondent helped to get overall information on how contractors and MSEs are engaged in the project and what supporting schemes are provided for them.

Another set of respondents was taken from inhabitant who own condominium houses or who are currently living in the condominium houses in the selected site. These respondents were helpful in identifying defects observed before and after occupancy.

4.1.1 AAHDPO Structure

According to the organizational structure, “Addis ketema and Nifas silk lafto” Sub-City Housing Development Project office leads the project at the site level. The office has two main sections one is a construction section that is responsible for construction works and the other is procurement and finance office that is responsible for material delivery (raw materials and prefabricated materials). The consultant and contractors are under the management of the construction section. The other important office is MSEs, work progress follow up office, it manages and assist all MSEs in the project. MSE-1 is MSEs who act as subcontractors responsible for installation works in the project and they are under supervision of the main contractors. The others are MSE-2 who is responsible for production works are under the management of procurement and finance section. The project organizational (figure 4.2) illustrates the organizational structure of enterprises in the project.

Figure 4.2 structure of AAHDPO



Thus, the works contract is cooperated contracts signed between the client, the contractor and MSEs-1. The contractor's main responsibility is to construct structures that are listed under table 4.1.

Table 4.1: Main duties and responsibility of parts of the structure

No.	Stakeholders	Duties and responsibility
1	AAHDPO (Head Office)	Select and send lists of contractors Prepare the contract document Prepare specification Fix unit rate
2	AAHDPO (MSE Development Office "Addiss Ketema and Nifas Silk Lafito" sub-city)	Recruit MSEs Provide support to MSEs (loan, equipment, working place, training)
3	Addis Ababa "Addiss Ketema and Nifas Silk Lafito" sub city Housing Development Project Office - Construction follow up office	Perform contractual agreement and contract administration Assigning of contractors Supervision of works (responsibility for quality of work) Check and approve payments (contractors, consultant and MSEs-1) submitted by consultant Request demand for MSEs (type and quantity) Control and manage distribution of productions (construction material)
4	MSEs follow up office	Facilitate working atmosphere for MSEs Give information and advisory service Sometimes gives MSEs on-site training or guidance
5	Construction material procurement and finance office	Responsible for procurement of the prefabricated material from MSEs
6	Small Contractors	Substructure construction- site preparation and foundation Super structure construction- columns, beams, slabs, HCB walls Finishing works (plastering, cement screed and terrazzo)
7	MSEs-1 (labour)	Electrical installation Sanitary installation Roof fixing Metal door and window production Handrails for stairs Painting
8	MSEs-2 (production)	HCB production Pre-cast concrete Concrete walls (Partition wall agro-stone)

4.2 Major quality challenges of 20/80 condominium housing

To identify defects in newly constructed condominium houses, site visits and survey questionnaires for owners and inhabitants who are living currently on that site were undertaken.. During observation, breakdown of door handles, door mirrors, window mirrors, irregular plastering, loosened fix of the kitchen sink, and breakdown of toilet fixtures tiles on the stairs and corridors were highly evident.

The respondents in this survey are all age groups bigger than 18 years old. However, the majority of the respondents are from age 30-35 years. All types of houses varying from studio to three-bedroom located on every floor are included in the survey.

According to the survey, the most identified defects during handing over, are defects related to sanitary fixtures (as shown in the picture under figure 4.3). This includes improper placement of kitchen sinks and toilet fixtures, improper functioning of a toilet flush, leaking of plumbing pipes and hand wash basins. Likewise, more than 70% of respondents replied that their door handle was not functioning well.

Figure 4.3: Improper sanitary fixtures and broken toilet sink



Defects by the time of handing over are tiles delimitation of toilet floor, stained concrete ceiling, stained wall, and leaking from shower tray and toilet seat and inward tilted windowsill. The last most observed defects, which still account for 33% of respondents, are broken window and door (see figure 4.4 below), malfunction of handle, ceiling deflection, spilling of concrete ceiling.

Figure 4.4: Shows defects on door and window mirror broken



Similarly, the defects observed after habitation of the houses shows there is still a problem of sanitary fixtures and door lock and door handle. Main additional defects identified here is problem related to electric lines (see figure 4.5 below). According to the survey 89% of respondent observed major and minor defects in their house.

In addition to the checklist provided some respondents identified defect they observed; for instance, breaking down of plumbing parts, problem in the sewage system, and smell through shower tray. Furthermore, existence of unfinished works, defect floor, door without glazing, gutter from the outside splash water to the house, uneven floor level which affects the opening and closing of the door, and leveling problem are common characteristics of the houses they are living in. Some respondents also encountered problems such as the splashing of rainwater through the veranda, socket defects, roof leakage, absence of toilet doors, handrails defect, high sound transmission between adjacent houses, irregularity of wall level and unevenness of wall level.

Figure 4.5: Show defects on electrical fittings.



The other defects that were not provided in the checklist but found to be the main concern of the respondents are defects observed on the common spaces like corridors, defect on wall and unfit window. As shown in the picture (figure 4.6) most of the floor tiles in the corridors and staircases are broken and delaminated.

After handing over of condominium houses in Addis Ababa, owners are obliged to change certain housing parts due to malfunctioning. The finding in this research also shows most people do change some of the housing parts. Almost all door handles and door locks got breaks immediately after the owner start using them. Hence, more than 86% of respondents were forced to change the door handle and the lock.

The sanitary parts are another concern of the respondents but they were not able to change it because of its own complications during maintenance and higher cost requirement. The sanitary parts include toilet seat, hand wash basin, hand wash plump, and kitchen sinks. (Figure 4.6) shows the housing parts in which majority of respondents forced to change.

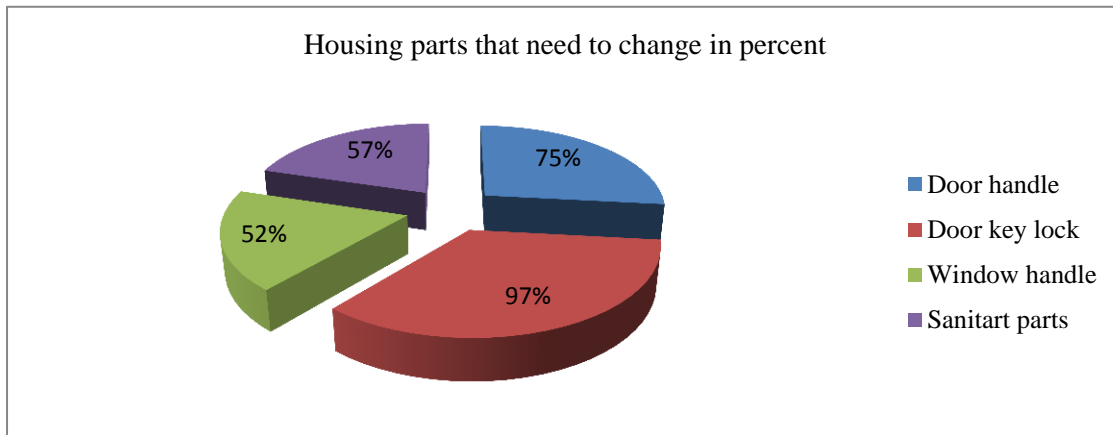
Figure 4.6: Show defects on wall, unfit window and staircases.



The project is to let owners to execute the finishing work by themselves. This is one of the mechanisms adapted in order to minimize the overall costs of the houses. During finishing works the majority of the owners (figure 4.7 shows) found the irregularity of wall, floor and leaking of sanitary pipes difficult to perform painting and tiling works. Likewise fixing of inside door was a challenge for most of the respondents because of the leveling problem on the wall and floor.

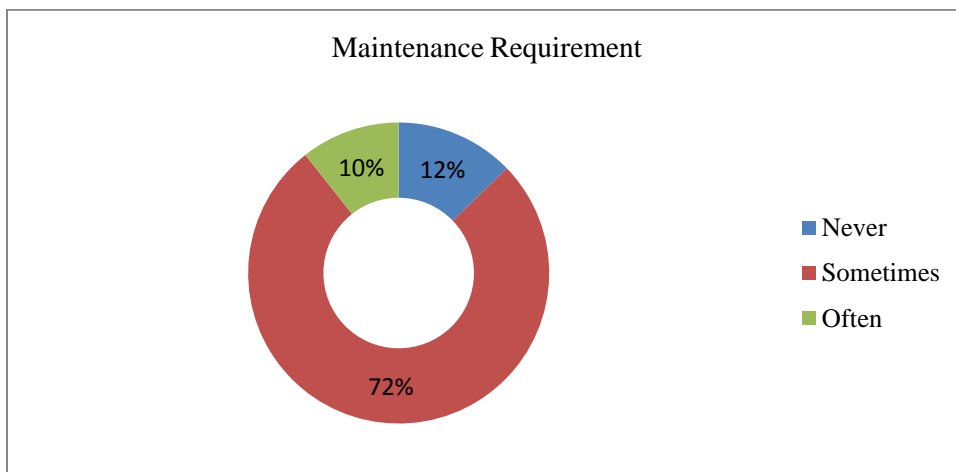
Sudden or frequent fuse circuit breaking, heating of switches and wires are the most identified electricity supply problems. There is also an electricity supply problem caused by electrical sparks or shocks.

Figure 4.7: housing parts owners required to change



After identifying defects, the next step was to find out how often occupants do maintenance. Accordingly, from the survey made majority of respondents, as shown in the (figure 4.8), are subjected to maintenance related to sanitary and electrical utilities. Most of the houses included in this research have defects of similar kinds. Thus, residents incurred additional maintenance costs. In general, the research revealed that due to construction defects, the majority of occupants are required to perform maintenance one time or another. The chart below summarizes how often the occupants undertaken maintenance for the defects caused by malfunctioning.

Figure 4.8: Overall maintenance requirement

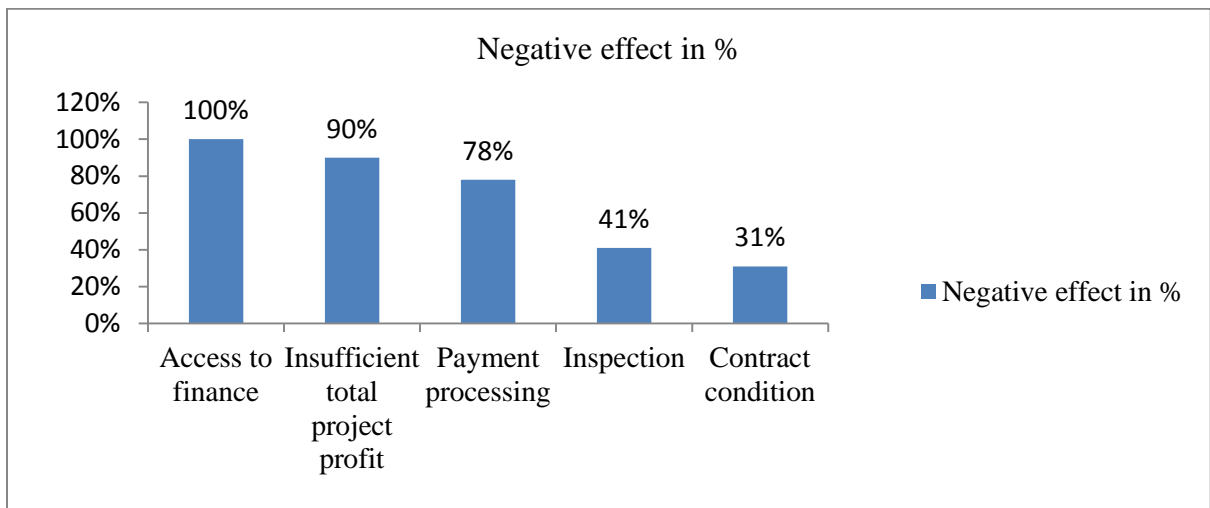


4.2.1 Motivation to improve quality of housing

All respondents of contractors agree that lack of access to finance has negative impact on their motivation to work and in addition, long time payment processing and insufficient profit also sometimes budget problem from AAHDPO the project also affect.

SMEs were asked about what factors affect their motivation most often, the majority of SMEs reply that the profit is too small only 19% are satisfied, and when they try to request AAHDPO for unit rate revision, they never get an appropriate response. Besides around 54% of SMEs states that the idleness of equipment, delay in delivery of raw material, contract type, payment condition, accessibility to finance, and a dividend of profit among members in the enterprise, has a large impact on their motivation to work. Due to AAHDPO attention now largely diverted to newly recruited SMEs, the existed SMEs are worrying about losing their jobs; the survey shows that about 61% of SMEs are worried about the sustainability of their job.

Figure 4.9: Problem to motivation to quality of housing



As with most construction projects, each stakeholder has their own priorities. AAHDPO officer criticize contractors because of their priority to maximize profit at any cost. Even if 51% of contractors agree profit as their priority, also 49% of respondents agree completion on time and gaining experience are their highest priority.

From the survey made on customer satisfaction, more than 51% of Inhabitants are not satisfied with the quality of the houses they are living in. Yet there is no independent office to report their

complaint. Thus, customer satisfaction is addressed in the survey because meeting customer satisfaction is one of the performance indicators. The consultant stated that they are trying to meet customer satisfaction through undertaking performance measurement and give the feedback to contractors every two weeks. The construction officer from AAHDPO added that it is difficult to satisfy all the customers with all the constraints the project has. He also argues that not all the defects inside the houses are caused by construction fault, it could sometimes cause by misuse of the utilities and fixture by the household.

4.3 Quality standard guidelines related to low cost housing

In construction, the most possible sources of quality defects are poor quality construction materials and poor workmanship. The construction projects in Ethiopia usually follow a number of procedures to ensure the quality production. The most widely used procedures include technical specification prepared as a guideline for detail of the works, undertake tests for major construction material at the time of delivery, close-up inspection, risks allocates and clearly.

In the project most construction materials are supplied by AAHDPO itself, for instance cement and prefabricated material supplied to the main contractor. All material except sand are delivered to SMEs-1 for the production of prefabricated materials. The responsibility of approving the quality of the material is consultant. While conducting site visits it was observed that three types of gravel with similar grain-size dumped side by side in front of one of SMEs-1 (responsible for the production of pre-cast beam) production sites. Concrete mix needs different sizes of gravel to ensure bondage between different materials used. However, what was observed on the site was similar large size gravels and the SMEs were manufacturing pre-cast beam using what is available on site. The supervisor explains the situation that it is difficult for them to reject the material delivered because the client itself supplies the material. He also added that we tried to notify the client (AAHDPO) about the quality of construction material so many times but the situation never was improved. Conversely the AAHDPO SMEs coordinator argues that they are satisfied with quality of material they are supplying thus the office believe there is no need to undergo any tests.

The researcher raise the coordinator whether tests are available for prefabricated materials or not. The coordinator replied that it is not necessary to undertake tests since the raw materials are

delivered by their office. He further explains that in the previous projects they sometimes undergo tests, however, since SME-1 in this project are new the chance of SMEs to cheat on mix ratio to get money is less rather they have technical problem to produce quality product.

The AAHDPO stated that the consultant is responsible for the approval of material delivered and for supervision of quality works. The procedure the project follows to ensure quality is rather easy upon completion of work AAHDPO check the work and give the remarks to the consultant for correction. The officer added that even if there is no quality control team established independently, we have a weekly management meeting held on site to discuss about the progress of work and any problem encountered during the week. The meeting is led by the consultant and involves consultant's project coordinators and management personnel from AAHDPO.

As per AAHDPO project coordinator of the consultant found it difficult to conclude there is no quality control team. He argues that in the weekly meeting they discuss what they observe concerning material delivery, and work progress. In principle there are also meetings which involve contractors and SMEs especially sanitary and electrical workers every two weeks concerning of the project progress.

From the interview made with the AAHDPO officer and the project coordinator, performance of contractors and SMEs measured and give rewards for good work and penalizes for failure to comply with the contract. The reward is to give contractors and SMEs more jobs and the penalty is to terminate them from the work they were engaged. The performance is measured weekly based on the progress of the work with mainly focus on physical progress.

The contractors and SMEs were also asked the availability of Total Quality Management (TQM) in their respective work. Around 65% of respondent from contractors and 70% from SMEs assured there is TQM system in place and its objective and focus is clearly stated. However, around 55% of both respondents affirmed that there is no quality control team independently established. The majority of the respondents (contractors) also added that they promote quality construction through quality workmanship, performance measurement, and through implementing quality assurance system.

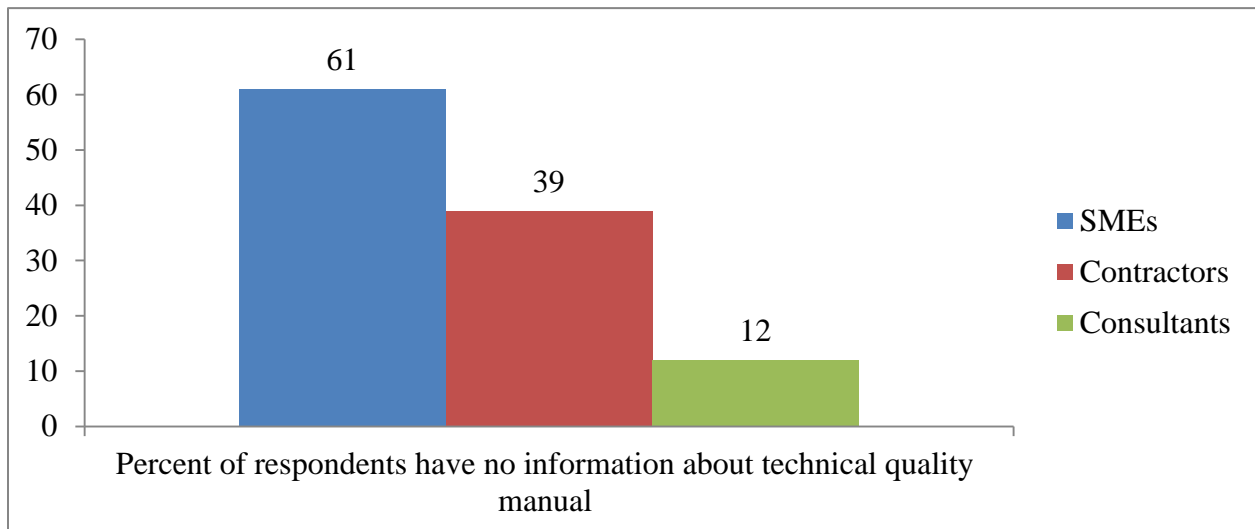
4.3.1 Quality standard Technical manual for 20/80 condominium housing

AAHDPO encompass equipped standard on 20/80 condominium housing in 2004, it also comprises quality standard of condominium housing, following to the standard the office equipped with technical manual of volume 1 to volume 4 on April, 2005. The technical manual is prepared with participation and collaboration of ministry of federal affaire, Addis Ababa city government, GTZ/low-cost housing project, AAHDPO and MH engineering consulting plc. From the four technical manual volume 2 is focusing on quality standard of low cost housing.

The manual has put standard for concrete work including mixing, hollow block concrete, metal work, electrical installation, sanitary installation, pre-fabricated construction material, flooring, painting, plastering, and ceramic tile laying.

According to the study, 61% of SMEs, 39% of contractors and 12% of consultants have no information about technical quality standard manual of low cost housing. Non existence of testing mechanism for raw materials and prefabricated building components this expose to use in inappropriate materials to the housing construction projects.

Figure 4.10: Respondents have no information about quality standard technical manual



4.3.2 Project awarding system of AAHDPO

Most widely used procurement method in the construction sector of Ethiopia is tendering. Sometimes the direct award is used for special type of projects. For instance, if the project is urgent and to avoid time spent in a tendering procedure, if the project is too small, if eligible participants are few, or if the project is unique in its character direct award is used. The tendering procedure follows the Ethiopian construction laws for procurement of services or procurement of works and the selection is normally based on technical or financial capability of the participant or both.

The AAHDPO considered as a special type of project because it was formulated through a policy. The policy has two intentions, one is obviously to construct houses with low cost and the other is to create employment. No tendering procedure was necessary because the price is already set by the office and the intended participants are already available.

Any contractor who has a construction license of less than grade-6 can register to participate in the construction of condominium houses in Addis Ababa. Civil engineers who have the educational background related to construction and the necessary work experience have the right to get a construction license from their respective Sub-Cities. However, the type of the license varies from Building Contractor/General Contractor of grade 9 to grade 1 (BC/GC 9- 1) based on the educational level of the manager, educational level and number of key employees, and own capital of the company.

Up on registration, interested contractors are only expected to present their company profile, VAT registration and renewal certificate together with their license. After registration, the housing Development Office prepares training program for 3-5 days. The training is prepared to give insight and knowledge about the project. Following the training, the contractors are assigned to different project sites through the lottery drawn at the AAHDPO main office. Contractual agreement for works contract are then signed between AAHDPO and the contractors.

A total of 44 contractors were assigned to "Addiss Ketema and Nifas Silk Lafito" project and only 38 are proceeding to work and the rest 6 contractors got terminated. AAHDPO indicate the

contractors as a defaulter for the termination. From their explanation, many contractors ceased the work because of their incapability (financial constraints or lack of management) to cope with the project.

On the other hand, In Ethiopia, there are no specific criteria to establish SMEs and it is done voluntarily. Any interested citizens who wish to participate in the project can register individually in their respective sub-cities based on their area of interest. No educational background is required to select an area of specialization except for electrical works, which sometimes require some experience or vocational school certificate. After registration, the MSEs, development office prepares training program with the intention to build technical and management capability of MSEs. The training is given for only 3-7 days based on their selection of specialization, upon completion of the training, the sub-cities give certificate for the participants. The trainees then form an association, which consists of two to twenty members or can start working individually. The sub-city's SMEs development office then certifies and gives recognition to the association formed.

The MSEs Development office then forwards the lists of the certified SMEs to the project office upon request. Based on their area of specialization the MSEs are assigned to different blocks through the lottery drawn on the project site.

4.3.3 Technical perspective

AAHDPO were asked for their observation on the technical capability of contractors and SMEs. Accordingly, both project coordinator and construction officer responded that the technical skill of the contractors is different among different contractors; some have good technical knowledge while others struggle to apply quality system because of lack of technical skills. Technically majority of contractors have problem in following up on the project as required.

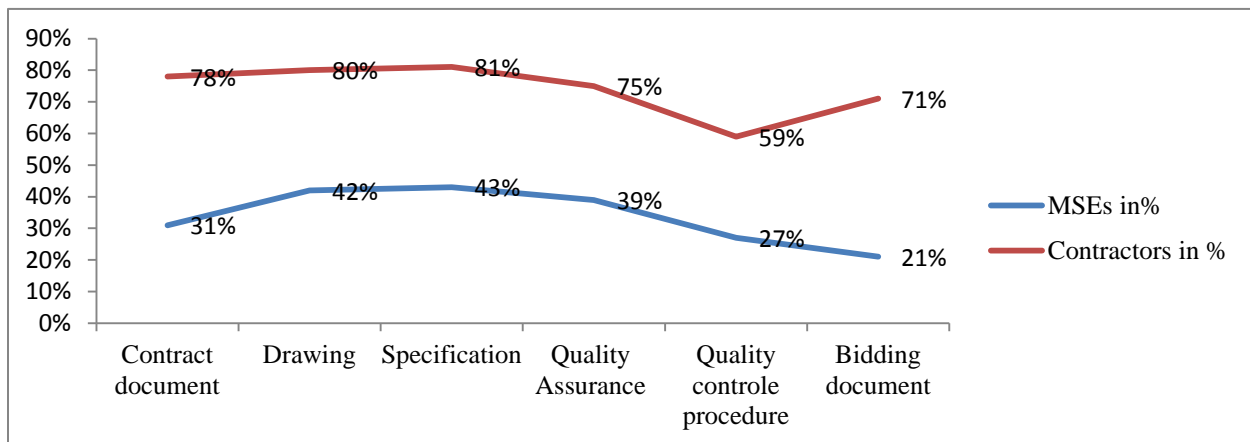
Consultants found the technical skill of most SMEs inadequate. The coordinator of the AAHDPO by its representative explains that when MSEs start to work they need to train and guide them. Thus, the engineers from the consultants of and the client (AAHDPO) do most of the job to show techniques and methodologies in the construction processes to the SMEs. The knowledge transfer also depends on SMEs interest and readiness to learn and accept. The

construction officer from AAHDPO also added that for most SMEs it is difficult to even read drawings and understand the moulds of construction material they are producing.

AAHDPO rate technical know-how of the majority of SMEs and some contractors as poor. What do the contractors and SMEs say about their own technical skill? To find out this the survey uses indicators of technical skill adapted from the literature review as a checklist. The most important indicator is how well they understand the contractual and technical documents they are required to use while executing their work.

Contractors have the required educational background and work experience of similar nature. As this is the case, the majority of the respondents (contractor) find the contractual and technical documents clear and easy to understand. On the other hand, in relation to their less educational background and lack of work experience, the majority of SMEs found it difficult to understand the contracts and technical documents. (Figure 4.11) summarizes the difference in the number of contractors and SMEs agreement on the clarity of different types of contractual and technical documents.

Figure 4.11: Technical quality of SMEs and Contractors



4.4 AAHDPO endeavor to develop quality of housing

AAHDPO agree that many contractors lack quality management skill. One of the AAHDPO management member points out that there are different types of contractors; some contractors used to be employees and few have some experience in fieldwork before joining this project. Thus, there is knowledge and experience gap between the contractors themselves. Contractors

who have experience perform well and carry out their task with due care and diligence. On the contrary, there are contractors who do not feel responsible and may disappear ignoring the contract agreement they signed. The AAHDPO officer added that many contractors do not check quality of material request and work progress and many are not well organized in their working methodology and keeping data. Furthermore, MSEs also have a problem with quality of work for condominium housing at large.

4.4.1 Communication and controlling quality of housing

As the project involves so many stakeholders, it is necessary to identify the type of relationship and flow of communication among project participant. From the survey data collected to find out when and how often each stakeholders usually communicates, the majority of (more than 65%) SMEs affirm they communicate with AAHDPO for payment follow up, material request, and for other type of meetings (out of the issue of housing quality).

Nevertheless, only 46% and 40% of respondents communicate to AAHDPO when there is a problem and when they have complaints concerning the project respectively. During the communication 54% of SMEs found the AAHDPO supportive.

All contractors also communicate with AAHDPO for the same reason as SMEs SEs, in addition, contractors do communicate with AAHDPO during provisional and final acceptance. Of the respondents 70% of contractors found AAHDPO response supportive.

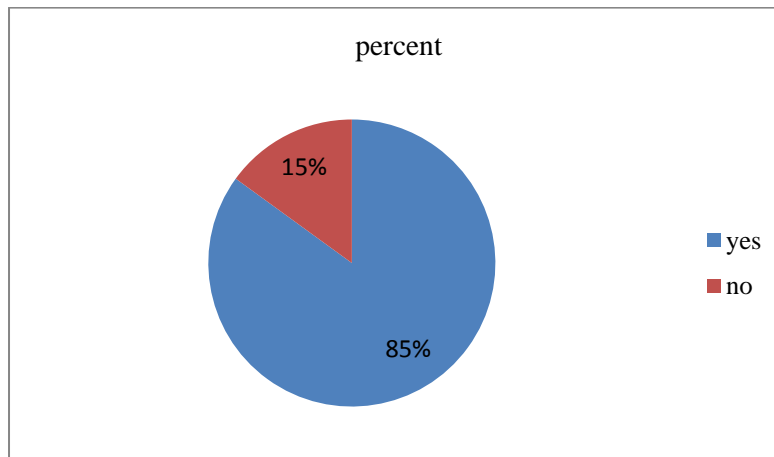
The other most important communication is between contractors and SMEs s because they have a tied relation with each other to build quality housing. In the eyes of the contractors, communicating with the SMEs s is difficult while SMEs perceive they have good relation with the contractors. These varying opinions of stakeholders in the communication flow reveal that there is a communication gap between stakeholders involved in the project. Contractors were asked to identify the type of relationships exists on site. According to the majority of the respondents 80%, blaming culture between them and the MSEs does exist but they work jointly with the rest of the stakeholders. The AAHDPO also confirm the existence of blame culture between contractors and SMEs.

Thus, when problems arise on site project offices need to solve it at the lowest level as possible. However, 65% respondent of the contractors complains that whenever there are problems or issues that need immediate measures and decisions they always need to wait long. Thus, according to them effective problem solving mechanism is not practiced on site.

4.4.2 Capacity building for SMEs and contractors by AAHDPO

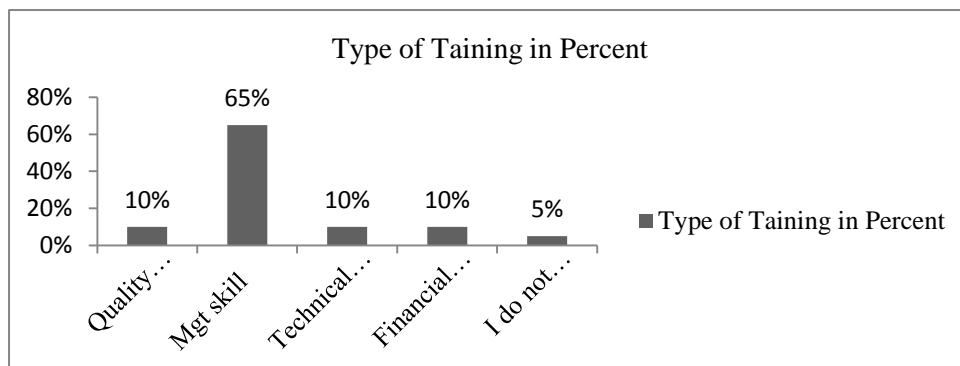
Training support for contractor is 85% take the training and the remaining 15% area not taken the training (see figure 4.12). The contractors receive different types of support from HDPO. For instance, prior to the beginning of the project, AAHDPO organized a 3-4 days training mainly concerned with improving management skill and introducing the program to contractors.

Figure 4.12: Training support for small contractor



One of the support program by AAHDPO in order to improve the performance of the contractor is types of training to improve capacity building. According to respondent data less wait is given to Quality management training type (figure 4.13 show you below).

Figure 4.13: Type of training support for contractor by AAHDPO



The training which was given by AAHDPO, the change on their quality performance (80% disagree and neutral only 10% are agree) of their quality performance.

The contractors even argue that there has been no training instead it was just the orientation of the program thus; it does not have anything to do with capacity building. They added that the training organized is too short and not quality performance oriented. Most of them criticized the training that it is mainly focused on introducing to the program. AAHDPO also confirm that due to the limited budget and professionals, they are only able to prepare 3-4 days training.

There is a SME development office in every sub-city, which are responsible for recruiting and facilitating training services for newly recruited SMEs. The training organized in collaboration with AAHDPO and TVET. The training given is two types one is managerial and the other is technical. The theory part of the training delivered by sub-sites focus on management aspects that includes administration, accounting, profitability, and saving and it takes up only 4-5 days. The duration for technical part is different for different specialization. For instance, pre-cast beam production takes 5-10 days and electrical and sanitary installation take about 10-30 days.

The findings reveal that they are quite a large number of SMEs who found the training not easy and difficult to understand 52%. In addition, many SMEs found the training not adequate to assure quality of housing; even it could not be applicable to this project.

From the survey made to find out the effect of other supporting schemes (financial, material and equipment), the majority of the respondents either disagree or neutral in their opinions. In the overall analysis, while 20% of SMEs confirm the supporting schemes have a positive effect on their quality performance, 40% of SMEs believe it has neither minor nor moderate effect. Especially for equipment support, only 12% agree the support has no effect on their quality performance. One of the reasons some of the respondents give for disagreeing is that the equipment they have been provided with through loan gets broken so easily and needs continuous maintenance.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary

Quality, in housing projects should be regarded as the fulfillment of expectation of those contributors involved in such projects. Although a significant amount of quality practices have been introduced within the industry, attainment of reasonable levels of quality in housing projects continues to be an ongoing problem. To date, some research into the introduction and improvement of quality practices and stakeholder (contractors, SMEs and consultants) management has been undertaken, but so far no major studies have been completed that comprehensively examine how greater consideration of stakeholders' perspectives of quality can be used to contribute to final project quality outcomes. This paper aims to examine the requirements for development of a framework leading to more effective involvement of stakeholders in quality practices thus ultimately contributing to higher quality outcomes for 20/80 condominium housing projects. Through an extensive literature review it highlights various perceptions of quality, categorizes quality issues with particular focus on benefits and shortcomings and also examines the viewpoints of major stakeholders on project quality. It proposes a set of criteria to be used as a basis for a quality practice improvement framework, which will provide project managers and clients with the required information and strategic direction to achieve their own and their stakeholders' targets for implementation of quality practices leading to the achievement of housing quality.

5.2 Conclusion

The IHDP is a government led program administered and managed by the Housing Development Office to supply mass housing stock and to create job opportunities for thousands of people especially the youths, hence quality of housing is not considered. Good quality management and full participant involvement are clearly regarded by many authors and researchers as two major success factors in quality of housing projects. The research described in this paper has extracted and indentified current housing quality defects, quality standard guidelines related to 20/80 condominium housing and effort to increase quality of housing.

Based on this set of classifications a number of surveys from which to develop a framework for identifying quality challenge for better and more focused implementation of quality practices on housing projects, designed to encourage and utilize better participant integration within critical quality management procedures on housing projects.

Associated with all these defects, the households find the quality of the houses fair to poor in terms of its construction. As a result, the Inhabitants are not at all satisfied with the houses they are living in. However, AAHDPO gives slight concern for customer satisfaction instead give priority to fulfill the policy to supply more houses within a short time period. IHDP on one hand does meet its objective on housing delivery but fail to ensure delivery of quality houses.

The paper also affirms the role of project participants as having an undeniable impact on quality of housing and highlights the fact that whilst lack of stakeholder involvement is indeed a major problem and results in subsequent defects found within housing projects, incorporation of greater stakeholder involvement into quality practice is a immense help in solving considerable amount of quality failure issues and accordingly improving quality housing project.

Most of the project participant have no information with standard for quality of low cost housing technical manual, non existence of testing mechanism for raw materials and prefabricated building components this expose to use in inappropriate materials to the housing construction projects. And the AAHDPO structure are also not appropriate for checking and rechecking quality of housing.

Selection and award system of 20/80 condominium housing projects for SMEs have no any criteria and contractors are not selected on computational way, this allow the project to end with poor quality of housing. AAHDPO is not consider quality of housing in its mission and objective, rather its mission and objective is mass supply of housing and creating employment.

5.3 Recommendation

- Initially the objective the IHDP is a government led program administered and managed by the Housing Development Office to supply mass housing stock and to create job opportunities for thousands of people especially the youths. So that, it is better to include quality of housing in its objective to tackle quality challenges of low cost housing.
- Consultants are representative of AAHDPO. So that, consultants are done for the interests of AAHDPO. In other way AAHDPO is a sole provider of input material for SMEs and contractors. This means it is difficult for the consultant to expose the quality defect of material input. In addition, if public say on quality of housing before delivered to the owner minimize compliant from inhabitants.
- All participant in the project need to understand the importance of quality standard and inculcate it throughout the production phases of low cost housing projects.
- The capacity building which is given by AAHDPO to SMEs and contractors is better more weight to technical especially on the improvement of quality housing.
- Close follow up and communication by AAHDPO to SMEs and contractors throughout each phase of the housing project cycle is important to solve quality problem on the spot without further complain and cost.
- There should be constant evaluation of contractors & SMEs, and also their organizations to determine their level of compliance to quality standards as set down by government regulations and/or regulatory bodies by the public, private professional bodies and government agencies.
- Selection of contractors should no longer be based mainly on speed of delivery but rather should be based on competency and potential for performance and quality. And selection of SMEs also should have to consider quality criteria.
- One of the solution for quality of low housing is benchmarking, so that AAHDPO can have a practice from other country, which have good experience on the area.
- Updating and enforcement of quality standards must be given urgent attention and those that will be appointed to enforce quality must be professionals with integrity.
- Enforcement of total quality management system to SMEs and contractors is a crucial issue otherwise quality of housing will compromise.

- According to international studies and researchers it seems as construction parties are increasingly realizing that the quality bar must be raised higher, quality must be improved and defects and rework reduced. The results of doing so would lead to better effectiveness and efficiency within the sector. Moreover, more emphasis must be put on creating value for the customer by meeting his needs and demands. Successfully implemented quality management has been proven to be a useful tool helping to obtain quality housing goals.

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ANNEXES

Annex 1

Questionnaire for SMEs

Thanks you for taking time to fill this questionnaire. This survey questions are a research instrument for the fulfillment of my MA program on Project Management at Saint Marry University and of the study of factors affecting quality performance of low cost housing construction, the case of Addis Ababa 20/80 Condominium project your response will be completely anonymous and confidential, and will not be identified by individual. All response will be compiled together and analyzed as a group.

In circle yours choose/answer

1. Sex?

1. Female

2. Male

2. Age in year

1. 18-23

2. 24-29

3. 30-35

4. 36-41

5. >41

3. What is the highest level of education you have completed?

1. High school diploma

2. TEVT certificate

3. College diploma

4. University degree

5. Other.....

4. What is your position or responsibility in the association?

1. Manager

2. Accountant

3. Member

4. Coordinator

5. Other.....

5. For how many years does your association participating in the construction of condominium house?

1. < 2 year

2. 2-3 years

3. 3-4 years

4. 4-5 years

5. > 5 years

6. In which aspect of the construction work your association performing in the project;

1. HCB manufacturing

4. Electricity installation

2. Slab manufacturing

5. Sanitary installation

3. Door and window manufacturing

6. If other specify.....

7. With which of the stakeholders, does your association have work relation? (more than one response is possible)

1. Contractor 2. Consultant 3. Other SMEs 4. Raw material suppliers 5. Other

8. How do you rate the communication between you and the rest of stakeholders in the project? (please respond on the category in which you have work relation with)

AAHDPO

1. V. negative 2. Negative 3. Neutral 4. Positive 5. V. positive

Consultant

1. V. negative 2. Negative 3. Neutral 4. Positive 5. V. positive

Contractor

1. V. negative 2. Negative 3. Neutral 4. Positive 5. V. positive

9. When do you usually communicate with AAHDPO?

When we have problem concerning the project

1. Yes 2. No

When there is a meeting

1. Yes 2. No

When we have complaint

1. Yes 2. No

When raw material delivery needed

1. Yes 2. No

For payment processing

1. Yes 2. No

If other please specify.....

1. Yes 2. No

10. How does AAHDPOs response when you approach them for assistance/help?

1. V. unsupportive 2. Not supportive 3. Neutral 4. Supportive 5. V. supportive

11. Which of the following condition has negative impact on your motivation to execute your duties?

22. If the answer for your question No. 21 is yes, what type of training? (More than one response is possible?)

1. Quality system

4. Financial system

2. Management skill

5. I do not know

3. Technical skill

if other

specify.....

23. Do you think the training program improved your performance?

1. No effect 2. Minor effect 3. Neutral 4. Moderate effect 5. Major effect

24. If you would like to add, any final comment or points that you think it should have been included in this survey, please use this space below.

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Thank you again for your time in completing survey, if you have any question please do contact me.

Annex 2

Questionnaire for Contractors

Thanks you for taking time to fill this questionnaire. This survey questions are a research instrument for the fulfillment of my MA program on Project Management at Saint Marry University and of the study of factors affecting quality performance of low cost housing construction, the case of Addis Ababa 20/80 Condominium project your response will be completely anonymous and confidential, and will not be identified by individual. All response will be compiled together and analyzed as a group.

In circle your choose/answer

1. Sex?
 1. Female
 2. Male
2. Age in year
 1. 18-23
 2. 24-29
 3. 30-35
 4. 36-41
 5. >41
3. What is the highest level of education you have completed?
 1. High school diploma
 2. TEVT certificate
 3. College diploma
 4. University degree
 5. Other.....
4. What is your position or responsibility in the association?
 1. Manager
 2. Accountant
 3. Member
 4. Coordinator
 5. Other.....
5. For how many years does your association participating in the construction of condominium house?
 1. < 2 year
 2. 2-3 years
 3. 3-4 years
 4. 4-5 years
 5. > 5 years
6. What is the type of your organization?
 1. General Contractor (GC)
 2. Building Contractor (BC)
7. What is the category of your organization?
 1. BC/GC-3
 2. BC/GC-4
 3. BC/GC-5
 4. BC/GC-6
 5. BC/GC-7
8. How does HDPOs response when you approach them for assistance/help?
 1. V. unsupportive
 2. Not supportive
 3. Neutral
 4. Supportive
 5. V. supportive
9. When do you usually communicate with HDPO?

When we have problem concerning the project

 1. Yes
 2. No

When there is a meeting

1. Yes 2. No

When we have complaint

1. Yes 2. No

When raw material delivery needed

1. Yes 2. No

For payment processing

1. Yes 2. No

If other please specify.....

10. How do you rate the communication between you and the rest of stakeholders in the project?

AAHDPO

1. V. negative 2. Negative 3. Neutral 4. Positive 5. V. positive

Consultant

1. V. negative 2. Negative 3. Neutral 4. Positive 5. V. positive

Contractor

1. V. negative 2. Negative 3. Neutral 4. Positive 5. V. positive

11. Does AAHDPO worker or consultant ever as you a favor?

1. Yes 2. No

If yes what kind?.....

12. Which of the following conditions has negative impact on your motivation to execute your duties?

Contract condition

1. No effect 2. Minor effect 3. Neutral 4. Moderate effect 5. Major effect

Payment process/schedule

1. No effect 2. Minor effect 3. Neutral 4. Moderate effect 5. Major effect

Access to finance

1. No effect 2. Minor effect 3. Neutral 4. Moderate effect 5. Major effect

Inspection

1. No effect 2. Minor effect 3. Neutral 4. Moderate effect 5. Major effect

Insufficient total project profit

1. No effect 2. Minor effect 3. Neutral 4. Moderate effect 5. Major effect

22. Do you think the training program improved your performance?

1. No effect 2. Minor effect 3. Neutral 4. Moderate effect 5. Major effect

23. If you would like to add, any final comment or points that you think it should have been included in this survey, please use this space below.

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Thank you again for your time in completing survey, if you have any question please do contact me.

Annex 3

Questionnaire for condominium inhabitants

Thanks you for taking time to fill this questionnaire. This survey questions are a research instrument for the fulfillment of my MA program on Project Management at Saint Marry University and of the study of factors affecting quality performance of low cost housing construction, the case of Addis Ababa 20/80 Condominium project your response will be completely anonymous and confidential, and will not be identified by individual. All response will be compiled together and analyzed as a group.

In circle your choose/answer

1. Sex?
 1. Female
 2. Male
2. Age in year
 1. 18-23
 2. 24-29
 3. 30-35
 4. 36-41
 5. >41
3. What is the type of house?
 1. Studio
 2. One bedroom
 3. One bedroom
 4. Two bedroom
 5. Three bedroom
4. On what floor is your home?
 1. Ground
 2. First floor
 3. Second floor
 4. Third floor
 5. Fourth floor
5. What kind of defects you face?

Broken door handled

 1. Yes
 2. No

Door handle not function well

 1. Yes
 2. No

Tiles delaminating (toilet)

 1. Yes
 2. No

Deflection roof

 1. Yes
 2. No

Spilling of concrete ceiling

 1. Yes
 2. No

Wall crack

 1. Yes
 2. No

Ceiling crack

- 1. Yes
- 2. No

Broken window glass

- 1. Yes
- 2. No

Improper placement of kitchen dishwasher

- 1. Yes
- 2. No

Improper placement of toilet fixtures

- 1. Yes
- 2. No

Stained wall

- 1. Yes
- 2. No

Plumping leaks

- 1. Yes
- 2. No

Leaking of shower

- 1. Yes
- 2. No

Leaking of hand wash basin

- 1. Yes
- 2. No

Leaking of toilet seat

- 1. Yes
- 2. No

If other, please specify

.....

6. Which of the following housing part are required or forced to change because of malfunction?

Door handle

- 1. Yes
- 2. No

Door key lock

- 1. Yes
- 2. No

Window handle

- 1. Yes
- 2. No

Window glass

- 1. Yes
- 2. No

Toilet seat

1. Yes 2. No

Hand wash basin

1. Yes 2. No

Plumbing parts

1. Yes 2. No

Kitchen sink

1. Yes 2. No

If other, please specify

.....

7. What was the most difficult part when you start executing finishing works?

Irregularity of wall level

1. Yes 2. No

Irregularity of floor level

1. Yes 2. No

Irregularity of ceiling level

1. Yes 2. No

It was difficult to fix inside doors

1. Yes 2. No

If other, please specify

.....

*Thank you again for your time in completing survey, if you have any question please
do contact me.*

Annex 4

Questionnaire for consultants

Thanks you for taking time to fill this questionnaire. This survey questions are a research instrument for the fulfillment of my MA program on Project Management at Saint Marry University and of the study of factors affecting quality performance of low cost housing construction, the case of Addis Ababa 20/80 Condominium project your response will be completely anonymous and confidential, and will not be identified by individual. All response will be compiled together and analyzed as a group.

In circle your choose/answer

1. Sex?

1. Female

2. Male

2. Age in year

1. 18-23

2. 24-29

3. 30-35

4. 36-41

5. >41

3. What is the highest level of education you have completed?

1. High school diploma

2. TEVT certificate

3. College diploma

4. University degree

5. Other.....

4. What is your position or responsibility in the association?

1. Manager

2. Accountant

3. Member

4. Coordinator

5. Other.....

5. For how many years does your association participating in the construction of condominium house?

1. < 2 year

2. 2-3 years

3. 3-4 years

4. 4-5 years

5. > 5 years

6. Is there any Quality Management System (QMS) in place in this project? if yes answer question No. 7

1. Yes

2. No

3. Difficult to say

7. If your answer for question No. 6 yes which of the following Quality Management System (QMS) indicators do you check?

Are they clearly understood objective of QMS?

1. Yes

2. No

3. I do not know

Focus of the QMS is clear for me

1. Yes

2. No

3. I do not know

1. No effect 2. Minor effect 3. Neutral 4. Moderate effect 5. Major effect

Application of quality system

1. No effect 2. Minor effect 3. Neutral 4. Moderate effect 5. Major effect

Poor handling during material handling

1. No effect 2. Minor effect 3. Neutral 4. Moderate effect 5. Major effect

Labor availability

1. No effect 2. Minor effect 3. Neutral 4. Moderate effect 5. Major effect

11. Are contractors cooperative to correct remarks observed during acceptance?

1. Never 2. Rarely 3. Sometimes 4. Often 5. Always

12. Has AAHDPO ever give feedback concerning quality of the work?

1. Never 2. Rarely 3. Sometimes 4. Often 5. Always

13. If you would like to add, any final comment or points that you think it should have been included in this survey, please use this space below.

.....
.....
.....

Thank you again for your time in completing survey, if you have any question please do contact me.

Annex 5

Questionnaire Interview for AAHDPO

Thanks you for taking time for the interview. This interview questions are a research instrument for the fulfillment of my MA program on Project Management at Saint Marry University and of the study of factors affecting quality performance of low cost housing construction, the case of Addis Ababa 20/80 Condominium project your response will be completely anonymous and confidential, and will not be identified by individual. All response will be compiled together and analyzed as a group.

1. Personal
 - I. Name:
 - II. What is your main task in AAHDPO
2. Employing contractors and SMEs
 - I. The selection procedure
 - II. Criteria for selection
 - III. What tender procedure the program follows
 - IV. Who are involved in tendering procedure
3. What are the benefit of involving small contractors?
4. What are the benefit of involving SMEs in the project?
5. About compliant on the project
 - I. Have you received compliant from contractors concerning the project?
 - II. If yes what was the common compliant of the contractors?
 - III. Have you received compliant from SMEs concerning the project?
 - IV. If yes what was the common compliant of the SMEs?
6. Quality of construction
 - 6.1. Is there quality system management (QMS) in place during construction? If not please go to question 6.2
 - I. What is the focus of QMS in the construction process?
 - II. What quality control procedure the project follows?
 - III. Who is responsibility to develop quality assurance system?
 - IV. Is the objective of QMS is clearly stated/
 - V. Is there a strategy for continuous improvement?

6.2. Is there any other quality control mechanism in the construction process?

6.3. Is there a strategy for continuous improvement of quality? If yes please answer the two questions below.

I. What quality procedure you follow?

II. Is there a strategy for continuous improvement of quality?

III. Who is responsible for delivery of prefabricated construction material?

IV. Have you received any complaint about the quality of prefabricated construction material from the contractor/consultant?

6.4. How do you rate the supervisor?

6.5. How do you allocate risk of quality defect during construction for different parties?

I. Contractors

II. SMEs

III. AAHDPO

6.6. Who is liable for defects observed during construction period?

6.7. Can you tell me about the warranty of construction?

7. Capacity building

7.1. Can you tell me about the capacity-building program for contractors?

I. Type (technical, managerial,)

II. Duration

III. Who is responsible

IV. Have you ever evaluated the program?

V. When do they start the job after the training?

VI. Do you think the support is sufficient enough to allow them execute quality construction?

7.2. Can you tell me about the capacity-building program for SMEs?

I. Type (technical, managerial,)

II. Duration

III. Who is responsible

IV. Have you ever evaluated the program?

V. When do they start the job after the training?

VI. Do you think the support is sufficient enough to allow them execute quality construction?

8. About customer satisfaction

8.1. What mechanism do you use to make sure the contractors are performing well?

- I. Do you measure performance? if no go to question No. 8.2
- II. How do you measure performance?
- III. How often you measure performance?
- IV. Do you give feedback to the contractor?
- V. Are improved observed after the feedback?
- VI. Is there a reward for performing well?

8.2. Concerning defect of construction, what do you observe most often?

8.3. How do you make sure the remarks taken, are later corrected?

8.4. Do you consider satisfy owner concerning providing quality houses?

8.5. Have you ever consider getting a feedback from occupants about the quality of houses you delivered?

Would you like to add, any final comment or point before we conclude the interview?

Thank you again for your time in completing survey, if you have any question please do contact me.