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**Assessment of Quality Performance on the Housing Construction project in Addis Ababa  
city Administration: Case of Jemo Condominium Houses in Addis Ababa**

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**A Paper Submitted to the Partial Fulfillment of MA in Project Management School of  
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## **DECLARATION**

This thesis is written by myself, the undersigned, and was supervised by **Abebaw Kassie** (PhD). The thesis was properly acknowledged all source of information used in it. I further affirm that the thesis has not been submitted in whole or in partial to any other institution of higher education with the intention of obtaining a graduate degree.

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**MARCH, 2023**

## **ENDORSEMENT**

This thesis has been submitted to St. Mary's University College School of Graduate Studies for Examination with my Approval as a University Advisor.

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**ADDIS ABABA, ETHIOPIA**

**MARCH, 2023**

## APPROVED BY BOARD OF EXAMINERS

*We, the undersigned certify that we have and here by recommendation to the Saint Mary's University to accept the thesis submitted by **GemechuAyenoTeso** entitled "Assessment of Quality Performance on the Housing Construction in Addis Ababa city Administrations : Case of Jemo Condominium Houses in Addis Ababa." Evidence from Addis Ababa Integrated Housing Development Project Office case study of Jemo Condominium for the Fulfilment of the Requirement for the Award of a Master's Degree in Project Management.*

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## **ABSTRACT**

*In Ethiopia construction performance quality is evident in the construction of condominium houses. The main objective of this study is to identify why the quality of housing constructions struggle to deliver good quality houses despite the AAHDP Office's efforts to promote them and to draw conclusions about what needs to be improved for them to be able to improve their performance. This research involves both qualitative and quantitative approaches for data collection and analysis. In addition, observation, film and data were collected from documents. The main activities in the research design are core problem identification, research objective to tackle the problem, operationalize the variables through intensive literature review, identify population, data collection and data analysis and conclude the research. The findings concerning the support programs indicate that HDPO provides capacity building schemes to small-scale and MSEs. The findings further reveal that the training provided to both small-scale contractors and MSEs is too short and only means introducing them into the program. Thus, the training has major effect on improving the performance of small-scale contractors and MSEs during executing their tasks. The research finally analyses the constraints that could contribute to the poor performance of small-scale contractors and MSEs. The main constraints identified are technical incapability of MSEs and managerial incapability of both small-scale contractors and MSEs. Besides more constraints related to stakeholder management, culture, material, environment and equipment are identified.*

***Key Words: MSEs, Small-Scale Contractors, AAHDP, Construction Performance, and Defects and Capacity Building***

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## ACRONYMS

AACA	Addis Ababa City Administration
AAHA	Addis Ababa Housing Agency
AAHDPO	Addis Ababa Housing Development Project Office
AAIHDP	Addis Ababa Integrated Housing Development Program
CIB	Construction Industry Board
CSA	Central Statistical Authority
DEG	Deutsche Investitions- und Entwicklungsgesellschaft mbH, Cologne, Germany
DFID	Department for International Development
DWCP	Decent Work Country Program
GDP	Gross Domestic Product
HDPO	Housing Development Project Office
ILO	International Labour Organization
KfW	Kreditanstalt für Wiederaufbau,
MDGs	Millennium Development Goals
MFIs	Micro Finance Institutions
MSME	Medium, Small and Micro Scale Enterprises
SMEs/MSEs	Small and Micro Scale Enterprises/Micro and Small Scale Enterprises
TVET	Technical Vocational Education Training
UN	United Nations
UNDP	United Nations Development Program

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# CHAPTER ONE

## Introduction

### 1.1. Back ground of study

#### 1.1. Housing Condition in Addis Ababa

The study made by AAHA in 2003 reveals that out of the total houses in Addis Ababa 76% of Kebele houses, which account for 47% of the total housing stocks, are very old, very dilapidated, and highly congested in which infrastructure is overloaded or in deficit. The same study revealed that out of the total houses in Addis Ababa 31% of the houses are single room, 25% of the houses have no toilet facilities, 26% of the houses has no kitchen, 75% of the houses are constructed from mud and many houses have no private electricity and water connections (AAHA 2012).

In 2000 the informal settlements accounted for 20% (60,000 squatters) of the city's housing stock which are classified as a spontaneous settlement in the inner city, regular residential area with informal housing development and peripheral spontaneous settlements (UN-HABITAT 2011a). Currently the housing deficit is estimated to be 380,000 units (AAHA, 2012). As a result, residents resort to live in slum area or settle informally to access housing and are subjected to high rent. To tackle housing and poverty problems AACA launched a program called Addis Ababa Integrated Housing Development Program (AAIHDP).

Addis Ababa Integrated Housing Development Program was inaugurated after successful completion of Bole Gerji pilot apartment's 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 whereas KFW and DEG provided financial support (GTZ-IS 2005).

The project only took eight months to construct 28 buildings with 700 housing units. After successful completion of the pilot project, the municipality adapted this low cost housing development program to implement it in different parts of the city with different implementation phases and GTZ- IS continued to be technical advisor (UN-HABITAT 2011a).



According to UN-HABITAT (2011a), the reason is that the approach was large scale, pro-poor, advocating slum prevention and access to home ownership. The approach also had integrated housing and economic development. The program has different phases of implementation and provides a window for review every five years. After intervention by the federal government, the project was duplicated in every sub city of Addis Ababa with a total 100 construction sites. Currently the selling price of the house on average is 1571 ETB (72 EURO) per m<sup>2</sup>, which is 40% lower than the free market price (AAHDPO, 2012).

To meet its main objective of affordability and employment creation, the program adapted low cost technology through alternative construction methodologies, 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 small-scale contractors and MSEs. A small - scale contractor is broadly defined as one with limited capital investment, who may need financial and managerial support to effectively run their business, (Sibanda 1999, pp.8). In Ethiopian context small-scale contractors are those whose capacity in relation to financial, human and equipment place them in grade 6-9. MSEs are established by urban youth who are recruited, trained and get financial and technical support from the program to manufacture and provide prefabricated buildings materials. The program is administered and managed by the Housing Development Project Office (UN-HABITAT, 2011a).

AAIHDP incorporated various governmental institutions for directing, managing, implementing, and supporting the program. Private sector enterprises participated in designing phase, in supplying constructing materials and in the actual construction works (UN-HABITAT, 2011a). Ministry of Works and Urban Development (MWUD) is the owner of the project and there are also partners on regional and local level, (GTZ-IS/ Ethiopia 2003). The institutional framework is illustrated in figure 1. The program also outlined condominium regulations, building standards and beneficiary eligibility regulations (Proclamation Number 172/2002, 272/2002, 370-2003, 79/2005, 15-2004).

The project has an overall impact on stimulating the economy by enhancing the construction industry through mass construction of buildings, introducing new technology, capacity building of contractors, creating skilled and semi-skilled professionals and MSEs (GTZ-IS 2005). The city also benefits from generation of additional income from taxes and related fees; an increase

in efficiency and effectiveness of urban service provision and achievement of political stability. Moreover, by promoting MSEs, young and active generation is utilized and employment opportunities are created (UN-HABITAT, 2011).

A building project involves several factors such as the client, designers, contractors, project managers and users and each of them have their own role, requirement and objective (Wang & Huang 2006). The process becomes complicated when investors, subcontractors, suppliers of equipment and materials, potential users of facilities, and Government agencies that regulate nearly every step of the process are involved (Moavenzadeh, 1987).

## **1.2. Statement of the problem**

In Ethiopia, the present state of the construction industry falls short of meeting domestic and international quality standards and the performance demand expected from the sector (MoWUD, 2006). In general, construction projects experience time overrun and cost overruns during their execution phase. An examination of the records of more than four thousand construction projects by Morris *et al*, (1998), showed that projects were rarely finished on time or within the allocated budget.

Many researches have been undertaken to assess and evaluate the application of the AAIHDP, mainly focused on its contribution towards employment opportunity, on addressing housing shortages and slum reduction. Criticism has also made on the un-affordability of the houses to low income residents, for lack of clear and updated compensation and relocation schemes, and its inability to network the urban poor to access loans from financial institutions to make the down payments to purchase the houses (UN-HABITAT, 2011a).

The construction industry in developing countries faces challenges of different kinds. To tackle the problems and to improve their performance developmental activities. Likewise, in Ethiopia poor construction performance is evident in the construction of condominium houses. Major and minor construction defects are observed in completed housing units and households.

As it is shown from previous studies (Karim and Marosszeky, 1999; DETR, 2000; Lehtonen, 2001; Samson and Lema, 2002; Kuprenas, 2003; Cheung, 2004; Iyer and Jha, 2005; Navon, 2005; Ugwa and Haupt, 2007) that the failure of any project is mainly related to the problems and failure in performance. Most of these studies mainly focus on one aspect of performance issues mainly Cost and Time instead of their overall performance. In addition, there very few

studies were conducted on Ethiopia context (Merid, (2016); Shambel, (2018); Fetene, (2008); Tadesse, (2009)) and none on specific non-governmental implemented construction projects.

Therefore, this study intends to identify major factors; roles of relevant key players; evaluate the overall quality performance of the project specifically focusing on construction performance by identifying common housing quality yardsticks. and forward the recommendations to appropriate stakeholders.

### **1.3. Research Questions?**

The study was guided by the following key research able questions:

1. How quality performance management was implemented on the housing project?
2. What was the main problems observed in terms of quality of construction of the condominium houses?
3. What an effort made by Addis Ababa housing development project offices in order to improve the quality of housing with level of customer's satisfactions?

### **1.4. Research Objectives**

#### **1.4.1 Main Objective**

The main objective of this research was Assessment of Quality Performance on the Housing Construction project in Addis Ababa City Administration: Case of Jemo Condominium Houses in Addis Ababa.

#### **1.4.2. Specific Objective**

- To pinpoint the major factors that affects the performance of the construction projects.
- To identify relevant institutions involved in the performance of the housing project.
- To examine quality performance of the project using identified housing quality standards.

### **1.5. Significance of the Study**

The housing shortage in Addis Ababa is significant. Housing delivery is heavily dependent on AAIHDP, which despite being a reliable source for low cost housing supply, has generated

employment opportunity and job creations for thousands of youths in the city. Identifying causes that lead to poor performance of small-scale contractors and MSEs will help the program to identify its weak sides, which hinder achievement of its goal on supplying quality houses. Moreover, as construction industry has an enormous impact on economic development, improving performance of the project parties will have an impact on improving the sector, which in turn affects the economy of the country positively.

It is hoped that this study will increase awareness of the program in quality defects. Then if corrective measures are taken, it will ensure sustainability of the program in delivering quality low cost houses in Addis Ababa. The result of the study also anticipated to be positive, but if not then, another study will be necessary to explore possible sources of defects in construction of condominium houses.

### **1.6. Delimitation**

The research was focus on solitary to assess the project quality performance of Addis Ababa city housing construction project in the city the study was conducted in the nifa silk sub -city that founding location area of the project site of jamo 1,jamo 2 and jamo 3. In this regards the study addressed quality defects of the project, the cause of quality problems ,the solutions under taken. The over all project quality management works on the project and customers satisfaction.

Also the study would gathered data from the Addis Ababa housing development project office and dwellers of the project to generate relevant data for the study .

### **1.7. Limitations**

The study had faced several limitations to the study. Firstly, the research population is too large to cover thus sampling is required which might have an impact on the general output of the study, the program has political implications and finally the issue of defects might not be sound for the HDPO officials thus they might be reserved to cooperate with this study. The last but important limitation was a language problem. Since most of the survey made using local language translations of the entire questionnaire was necessary. While doing so sometimes it was too difficult to get the appropriate word in the local language. Time and budget was also additional limitation.

## **1.8. Organizational of the Study**

The research has organized in five chapters. Chapter one introduction to the study . This provides back ground of the study, statement of the problem, the research questions, objectives of the study ,significance of the study, delimitation of the study ,limitation of the study and organizational of the study. Chapter two was literature review. The chapter discusses theories related to objective of the study and provides literature previously done by others authors on the quality performance area were presented . The third chapter was deal about research methodology ,research design, research approach, sampling population, method of data collection, research validity and reliability . Chapter four had presented results and discussion the relation to the research questions. Chapter five contains conclusions or summarized of findings and recommendations presented based on the results.

## **CHAPTER TWO**

### **2. LITERATURE REVIEW**

#### **2.1. Introduction**

This chapter focuses on the following: - General overview of contractor performance and Micro and Small-Scale Enterprises, support, construction industry development, some of the theoretical concepts and factors and finally deals with project performance issues. These specific sections together with sections dealing with contractor performance helps to provide academic ground to base the research's objective. A conceptual framework is then built after summarizing the literature review.

#### **2.2. Construction Industry Development**

The construction sector is characterized by many small enterprises and high labour intensity; it is also highly dependent on public regulations and public investments. Many authors agree on the impact of the construction industry on the economic development of a country. Wells (1984) stated that construction is an activity that plays a very vital role in the process of economic growth. Moavenzadeh (1987) adds that construction has positive effects on the economy of a country by increasing GDP and employment. In Ethiopia, the construction industry contributed about 5.6% to the national GNI in 2006/2007 (AfDB/OECD 2008).

The technological changes observed are mainly appropriateness and mix of technologies, selection of methodologies using the nation's particular circumstances and need of support of several sectors of the economy. Financial assistance schemes, distribution centers, supply credit terms to help construction enterprises and improvement in effectiveness of the dissemination of construction technology are some of the changes identified in the financial status of the construction industry.

Many writers state that governments are responsible for the construction industry development however; Ofori (1994) argues that not only government but also construction enterprises and practitioners can contribute to efforts to improve the industry. He suggested two improvement areas one is the need of continual reviewing of building regulations and standards drafted in the form of technical aids rather than restrictive rules and in a language appropriate to the educational background of the majority of the users.

Development activities include material development, human resource development, contract document development, contractor development, technology development and institution building (upgrading and expansion of micro-units and cooperatives) (Ofori, 1994). In general, the practice of construction industry development mainly related to enabling approach of the process; governments shall improve their enabling approach to the industry and enterprises shall improve their productivity for the overall improvement of the construction industry.

### **2.2.1. Contractors Performance and Development Programs**

Contractor performance has a direct impact on project performance for instance poor contractors' performance can lead to poor project performance. From the SWOT analysis made in European construction sector low productivity, little interest in education and training among small construction companies, and SMEs lack of marketing skills (ICT and management skills) are among the identified weaknesses in the construction sector (Jankovichova, 2010).

The other factor that negatively affects contractor performance is that contractors are not customer oriented and focused, service and quality seems to be ignored. 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).

Due to the above constraints, it is difficult for the contractor to deliver quality production, which then affects the construction sector as a whole. These attract international organizations to develop improvement program, as the construction sector is important to economic development since it comprises a wide variety of activities, products and actors. Thus, development programs have to consider management options that encourage development, institutional roles that ensure coordination and project success and project options that match the project with development objectives (Krooden, Milne & Atkins 1995).

The programs established have to be people focused and satisfy developmental objectives over the creation of physical assets such as socio-economic benefit, which include job creation, entrepreneurial development and increased economic activities (Krooden, Milne & Atkins 1995). Hence, in line with these objectives and in response to the challenge of unemployment, underdevelopment and poverty in developing countries, International Labour Office has formulated guidelines, which deals with labour-based contractor development projects.

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).

### **2.2.2. Small and Medium Enterprises (SMEs)**

*“An enterprise is considered to be any entity engaged in an economic activity, irrespective of its legal form. This includes, in particular, self-employed persons and family businesses engaged in craft or other activities, and partnerships or associations regularly engaged in an economic activity” (EU 2003, Annex: Article PP.39).*

"SME" stands for small and medium-sized enterprises or micro and small-sized enterprises. A generic definition is not easy to find; any definition or classification of SMEs can only be considered particular to the country in question. Clear description of the name MSEs is not yet defined in Ethiopia, both MSEs and SMEs has been used interchangeably to refer to small and micro scale enterprises. Sometimes MSE is used to refer to micro and small-scale enterprise, while SME used to refer to small and medium scale enterprise, and MSME used to refer medium small and micro enterprise, (DWCP 2009).

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 labour. 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 (UNCTAD/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 employs fewer than 250 persons and has 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 categorized as follows: enterprise with capital below Euros 2,300 or Birr 50,000 and have less than 5 employees considered as micro enterprise and enterprise with capital below Euros 70,000 or Birr 1,500,000 and have 6-30 employees considered as small enterprise.

### **2.2.3. SMEs' Supporting Program**

Because of its benefit to the economy, governments of different countries have been undertaking SME development activities. However, the emphasis may not only be on economics but also other normative goals like political stability, social cohesion, remediation of racial discrimination, cultural pluralism, fair distribution of wealth, rapid increase in employment potential and balanced regional growth. Thus, the issue associated SME development may not be explicitly economic but may have political, social and emotional overtones (UNCTAD/WTO 1999).

SMEs have the potential to become significant exporters, to promote economic growth, and to alleviate poverty among various groups in a society (Badrinath&Kirpal 1997). Moreover study on the SMEs' impact on the EU labour market reveal that 85% of net new jobs in the EU between 2002 and 2010 were created by small and medium sized enterprises which resulted in net employment in the EU's business economy to rise substantially (an average of 1.1 million new jobs each year) (EIM 2011). Recognizing the benefit of SMEs and understanding the need to assist them UNCTAD/WTO 1999 prepared guidelines, which serve a multitude of purposes in developing countries:

- To assist government in understanding how to structure and implement SME programs in public procurement.
- To provide information to industry associations and chambers of commerce so that they may more effectively work with government and industry to assist SMEs.
- To serve as a training tool during the public procurement process

- To extend the current levels of understanding of the public procurement program to develop needed business and production skills in SMEs in order to make them more competitive.

#### 2.2.4. Low Cost Housing

There has been considerable debate over definition of low cost housing. Lewale (2011) specify the existence of huge misconception on low cost housing. He asserts that people think low cost housing is only suitable for substandard works constructed by utilizing cheap building materials of lower quality. Cost reduction is achieved through proper management of resources, postponing finishing works and the use of locally available materials along with improved skills and technologies without sacrificing the strength, performance and life of the structure (Lewale 2011 & Kumar 1999). In a study made in India, using low cost housing technologies can save construction cost of walling and roofing by 26.11% and 22.68% compared to the traditional construction methods. For instance in the case of Addis Ababa, cost efficiency is achieved through mass production of condominium houses, use of local skills and mostly by using prefabricated building components manufactured by man power specifically MSEs, (GTZ-IS 2003).

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.

Therefore, reducing material cost results in a vital change in the overall construction cost. Moavenzadeh (1987) for instance suggested that certain standards could be forgone during low-cost housing construction, as using high-grade building material may not be appropriate in local context. To sum-up, low cost housing is designed and constructed as any other houses concerning quality and strength. The main difference as identified by the authors above is its aim to cut down construction costs by adapting alternative conventional methods. Thus, cost reduction during low cost housing technology can be achieved through:

- Proper resources management

- Postponing finishing work
- Use of locally available building material
- Use of local skill
- Reduce plinth area
- Use of energy saver construction material
- Use of environmentally friendly construction material

Cost reduction in low cost housing is mainly achieved through cost reduction related to the material cost because the material cost comprises the majority of the construction cost. Besides, usage of prefabricated building component largely reduces material cost thus adapting these building components to low cost housing technology is vital.

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 labour. Moavenzadeh (1987) also suggests remedial action to the specified constraints.

Overall, there are two key points discussed in the above paragraphs concerning bottlenecks of low cost housing construction process. One is the constraints during low cost housing construction and the other is supporting schemes to alleviate such constraints. Summary of both points is presented below. The main constraints of low cost housing supply are:

- Financing, (late payment, unavailability of credit)
- Idleness of equipment
- Transportation of building components
- Lack of repairmen and supplies for equipment

Some remedial measures suggested by Moavenzadeh (1987) are:

- Timely payment
- Facilitate access to credit
- Give Training to workers
- Apprenticeship system for skilled workers
- Incorporate workers from the informal sector
- Enabling policies that favour small-scale production

From the constraints and remedial actions mentioned above it is clear that most of the problems are associated with the contractor. The suggested remedial measures also imply that a contractor participating in low cost construction has limited capacity, thus need financial, technical and administrative support.

#### **2.2.5. Prefabricated Building Technology**

Prefabrication defines as a manufacturing process, generally taking place at a specialized facility, in which various materials are joined to form a component part of a final installation (Tatum et al 1987). The techniques for prefabrication were established in the United Kingdom immediately after World War I. It was used to replace large housing stock destroyed during the war and to provide housing for soldiers who got back from war. It was also favoured because it uses less skilled labour. The houses were single detached houses and the building components were manufactured in factories and later assembled on site (Waskett, 2003).

The sensitivity analysis made by differing all unit costs and production rate, also shows material cost is the most sensitive of various construction costs, (Scott, 1980). However, this prefabrication method requires technical knowledge, large initial investment, good organizing and management (Scott, 1980). Some of the common and widely used form of building and civil engineering prefabricated building materials are concrete and steel section such as columns, beams, HCB for Slabs and walls, metal doors and windows (Lal 1995, Friedman &Cammalleri, 1997).

Nevertheless, in a country like Ethiopia where the labour force is abundant and cheap the technology is adapted differently. Therefore, the program adopts a labour-intensive prefabrication methodology rather than equipment intensive. Listed below are the advantages

and disadvantages of prefabricated housing technology based on factory manufactured building components (Waskett, 2003, Friedman & Cammalleri 1997, Lal, 1995, Carl *et al.*, 2000 & Tatum *et al.*, 1987).

Advantages;

- Reduces on-site construction and congestion
- higher quality product and reduction in defect at completion
- Time spent in bad weather at the construction site is minimized
- Less waste
- The need for form work and scaffolding is greatly reduced

The practice of using prefabrication in many countries for instance the United States, Hong Kong, Thailand, and India construction industries is described as a successful experience (Tatum *et al.*, 1987).

### **2.2.6. Affordability**

UN-HABITAT (2011) demonstrates that affordable land and housing in Africa is a serious and increasing problem because of the mismatch of incomes and input required for construction. Affordable housing is broadly defined as housing which is adequate in quality and location and does not cost so much in the way it prohibits its occupants meeting other basic living costs or threatens their enjoyment of basic human right (UN-HABITAT 2011b). In Ethiopia like some other countries, cost efficiency of low cost housing is achieved through standardization of building elements and reducing the number of different items needed. Prefabrication and the use of machines and special tools to produce these standardized elements maximize productivity, resulting in lower costs per unit (GTZ-IS/Ethiopia 2003).

### **2.3. Poor construction Performance, Causes and Effects**

Construction projects often suffer from poor performance in terms of time delays, cost overruns and quality defects because completion on time, within budget and with the required quality has been widely recognized as the three primary goals of project success. Meng (2011) identified time, cost and quality as major indicators to measure poor project performance. Rwelamina&Savile (1994) further divided the methods of measurement into two: traditional project performance, which measures cost, quality and time; and non-traditional performance that measures health and safety, environment, management, worker skills, industrial relations and facilities.

So far, different causes are identified as causes of poor performance in construction. Rwelamina&Savile (1994) identified a lack of management expertise and worker participation, and Tam & Harris (1996) added equipment and quality management of the team as a major cause. Atkinson (1999), Love & Li (2000), and Odeh&Battaineh (2002) further identify major causes of quality defects as human error, poor workmanship and contractual relationship respectively.

Since construction is undertaken as teamwork, it has incorporated actors with different role and responsibilities thus, collaborative working atmosphere is required. Partnering is widely recognized as a collaborative supply chain relationship where, supply chain relationship refers to the linkage in the network of an organization (Christopher, 1992). Meng (2011) identified three types of relationships in construction supply chain: traditionally adversarial (TAR), short-term collaboration (STC) and long-term collaboration (LTC). Based on the analysis of both the

traditional and the collaborative approaches within existing literature, Meng (2011) identified ten key indicators that describe supply chain relationship of a construction. The following are list of relationship indicators together with their definition provided by different authors.

**Mutual objective-** is shared commitment in which the interest of every party involved will be best served by concentrating on the overall success of the project (Bennett & Jayes, 1995; Walter *et al.*, 2002).

**Gain and pain sharing** – is a risk/reward scheme that allows the parties in a construction project to share profits or cost savings and to share losses (risks) due to errors or cost increases (CIOB, 2010; Rahman & Kumaraswamy 2004).

**Trust-** can be defined as disposition and attitude concerning the willingness to rely upon the actions of or to be vulnerable towards another party with the potential for collaboration (Smyth *et al.* (2010).

**No-blame culture-** is a culture in which parties concentrate on finding the best possible solution instead of allocating the blame (Bennett & Peace, 2006). Abandoning the blame culture helps to create an opportunity of joint working, communication, effective problem solving, risk allocation, advocate total quality management (TQM) to prevent errors in the construction process (Levitt & Samlson, 1993).

**Joint working-** is working atmosphere reflected by joint decision making based on a clear understanding of mutual objectives (Chan *et al.*, 2004); joint effort for problem solving (Cheng *et al.*, 2000); and joint effort for continuous improvement (Larson, 1997).

**Communication-** open communication is effective communication that facilitates the exchange of ideas and visions, which can result in fewer misunderstanding (Cheng *et al.*, 2000) and can, avoid failure in project collaborating (Ng *et al.*, 2002).

**Problem solving-** effectiveness in problem solving obtained by solving problems at the lowest possible level to minimize disputes (Ogunlana, 1999) and to avoid major dispute (Bennett & Jayes 1995; Jones *et al.*, 2003).

**Risk allocation-** is assigning of risk to the party who is best able to manage it (Cheung 1997). It should be clearly stated in the contract to avoid later stage claim and dispute (Zaghloul & Hartman 2003).

### 2.3.1. Quality Practices in Building Projects

Although a significant amount of quality practices has been introduced within the industry, attainment of reasonable levels of quality in construction projects continues to be an on-going problem” (Heravitorbatiet *al.* 2011, pp. 265).

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). The system is also defined as being prescribed quality objective of the company (Oztaset *al.*, 2005).

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).



### **2.3.2. Stakeholder Involvement**

A building project involves several factors such as the client, designers, contractors, project managers and users and each of them have their own role, requirement and objective (Wang & Huang 2006). The process becomes complicated when investors, subcontractors, suppliers of equipment and materials, potential users of facilities, and Government agencies that regulate nearly every step of the process are involved (Moavenzadeh, 1987).

Key stakeholders are usually considered responsible for many of the current quality problems or defects that occur in construction building projects. Jha&Lyer (2006) identify that one of the most important factors, which has an indisputable effect on project quality is efficient communication between parties involved in construction projects. Arditi&Gunaydin (1998) also affirm that high quality projects mainly depend on the relationship among the parties involved. Thus, Heravitorbatiet *al.*, (2011) concluded that stakeholder incorporation within quality management planning and proceeding would facilitate greatly in solving large numbers of quality problems in building projects.

### **2.3.3. Measure Project Performance**

It is important to measure project performance in the agreed areas, at the agreed intervals, and to give feedback to the project team (CIB, 1997). Benchmarking allows a project team to learn from best practice by comparing its own performance with others (Kelly *et al.*, 2002). 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 (Cain, 2004).

Measuring quality enable managers to know how close they are to their target and how to make the right decisions for improving work process (Oztaset *al.*, 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.

### **2.3.4. Customer Satisfaction**

Successful companies need to meet their customer expectations through superior implementation of their quality policies; however, currently many customers are still not satisfied with the quality of constructed projects (Seaver, 2001). Customer satisfaction model (Cook *et al.*, 2000) consists of five satisfaction quality dimensions: safety, project management (ability to plan

schedules, manage and execute), contractor/customer relationship, cost, and prepared/skilled workforce. Clients have a substantial role to play in setting demanding and insisting upon improvements. Ultimately, they have the most to gain from ensuring the implementation of the best practice (Latham, 1994).

## **2.4. Defects in Building Construction**

Defects in newly completed buildings are becoming a serious phenomenon as lower cost and medium cost houses are being built (Alsadey, Omran&Pakir 2010). Construction defect according to Alsadey, Omran&Pakir (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. Construction 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 starting to appear after 2 years of occupancy (Chong & Low, 2006).

Construction 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. Construction defects typically involve some or all of the following conditions (Chew, Wong & Kang 1998; Alsadey, Omran&Pakir, 2010).

## **2.5. Theoretical review**

### **2.5.1. The Theory of Performance**

The Theory of Performance develops and relates six foundational concepts to form a framework that can be used to explain performance as well as performance improvements (Don, 2010). A performer can be an individual or a group of people engaging in a collaborative effort. These involve a performer's mindset, immersion in an enriching environment, and engagement in reflective practice. Performance advancing through levels where the labels "Level 1," "Level 2," etc. are used to characterize effectiveness of performance. That is, a person or organization at Level 3 is performing better than a person or organization at Level 2.

Performing at a higher level produces results that can be classified into categories: (i) quality increases; results or products are more effective in meeting or exceeding the expectations of stakeholders; amount of waste goes down, (ii) capability increases; ability to tackle more challenging performances or projects increases, (iii) capacity increases; ability to generate more

throughput increases, (iv) knowledge increases ; depth and breadth of knowledge increases, (v) skills increase; abilities to set goals persist, maintain a positive outlook, etc. increase in breadth of application and in effectiveness and (vi) identity and motivation increases; individuals develop more sense of who they are as professionals; organizations develop their essences.

### **2.5.2. Construction Projects and Performance**

Project success is almost the ultimate goal for every project. Success of construction projects depends mainly on success of performance. Many previous researches had been studied on performance of construction projects. Dissanayaka and Kumaraswamy (1999) remarked that one of the principle reasons for the construction industry's poor performance has been attributed to the inappropriateness of the chosen procurement system. Thomas (2002) identified the main performance criteria of construction projects as financial stability, progress of work, standard of quality, health and safety, resources, relationship with clients, relationship with consultants, management capabilities, claim and contractual disputes, relationship with subcontractors, reputation and amount of subcontracting.

### **2.5.3. Construction project performance measurement models**

Two models developed for measuring construction project performance are integrated performance index (Pillai *et al.*, 2002) and key performance indicator (Construction Industry Task Force, 1998). Integrated Performance Index was developed initially for performance measurement of R&D projects, based on their real-life experiences of working on the management system for the integrated guided missile development programme of India. Key Performance Indicators (KPIs) is the UK construction industry's response to Egan's report (Construction Industry Task Force, 1998) to measure project performances, based on 10 identified parameters.

### **2.5.4. Performance Measurement Theory**

Mbugua *et al.*, (1999) have identified a distinction between performance indicators, performance measures and performance measurement. On the other hand, performance measurement is a systematic way of evaluating the inputs and outputs in manufacturing operations or construction activity and acts as a tool for continuous improvements (Sinclair and Zairi, 1995; Mbugua *et al.*, 1999). Some examples include: the financial measures (Kangari *et al.*, 1992), client satisfaction measures (Walker, 1984), employee measures (Abdel-Razek, 1997), project performance measures (Belassiet *et al.*, 1996) and industry measures (Egan, 1998).

### **2.5.5. Measurement of Project Performance**

The purpose of performance measurement is to help organizations understand how decision-making processes or practices led to success or failure in the past and how that understanding can lead to future improvements. Tangen (2004) obtained that performance measurement is a complex issue that normally incorporates at least three different disciplines: economics, management and accounting. Pheng and Chuan (2006) stated that project performance can be determined by two common sets of indicators. Ugwu and Haupt (2007) developed and validated Key performance indicators for sustainability appraisal using South Africa as a case study. Luu *et al.*, (2007) provided nine Key performance indicators which can be applied to measure project management performance and evaluate potential contractors as well as their capacity by requesting these indices.

### **2.5.6. Problem of Performance in Construction Industry**

The failure of any construction project is mainly related to the problems and failure in performance. Moreover, there are many reasons and factors which attribute to such problem. Long *et al.*, (2004) stated that the construction industry performance problems in developing economies can be classified in three layers: problems of shortages or inadequacies in industry infrastructure, problems caused by clients and consultants, and problems caused by contractor incompetence/inadequacies. Okuwoga (1998) identified that the performance problem is related to poor budgetary and time control.

### **2.5.7. Factors Affecting Cost and Time Performance**

Pheng and Chuan (2006) stated that there have been many past studies on project performance according to cost and time factors. Chan and Kumaraswamy (2002) remarked that studies in various countries appear to have contributed significantly to the body of knowledge relating to time performance in construction projects over the past three decades, while Iyer and Jha (2005) remarked that project performance in term of cost is studied since 1960s.

### **2.5.8. Factors Affecting Quality Performance**

Arditi&Gunaydin (1998) find that management commitment to continuous quality improvement, management leadership in promoting high process quality; quality training of all personnel; efficient teamwork to promote quality issues at the corporate level; and effective cooperation between parties taking part in the project are generic factors that affect process of quality. Pheng and Chuan (2006), through case studies, has shown that total quality management a successful management philosophy in the manufacturing and service industry could be replicated in the

construction industry with similar benefits. The benefits may be in terms of reduction in quality costs, and better employee job satisfaction.

## **2.6. Empirical Review**

Enshassiet *al.*, (2009) in his thesis on factors affecting the performance of construction projects in the Gaza Strip, found out that the most important factors agreed by the owners, consultants and contractors were: average delay because of closure and materials shortage, availability of resources as planned through project duration, leadership skills for project manager, escalation of material prices, availability of personals with high experience and qualification and quality of equipment and raw materials in project. Bui *et al.*, (2010) in their study carried out in Vietnam on factors affecting construction project outcomes discovered that major enablers that lead to project success are foreign experts' involvement in the project, government officials inspecting the project and very close supervision when new construction techniques are employed. Amusan and Adebile, (2011) studied factors affecting construction cost performance in Nigerian construction sites.

Iyagba, Odusami and Omirin, (2003) did a research on the relationship between project leadership, team composition and construction project performance in Nigeria. Iyer and Jha (2005) did a research on factors affecting cost performance evidence from Indian construction projects and found out that the project manager's competence and top management support are found to contribute significantly in enhancing the quality performance of a construction project. Nyangilo, (2012) did an assessment of the organization structure and leadership effects on construction projects' performance in Kenya, he found out that lack of appropriate project organization structures, poor management systems and leadership are the major causes of poor project performance.

Chan and Kumaraswamy (2002) remarked that project performance measurement includes time, budget, safety, quality and overall client satisfaction. Kuprenas (2003) stated that project performance measurement means an improvement of cost, schedule, and quality in design and construction stages. Navon (2005) defined performance measurement as a comparison between the desired and the actual performances.

The pace of the economic growth of any nation can be measured by the development of the physical infrastructure such as buildings, roads and bridges (Takin and Akintoye, 2004). Successful building construction projects are those projects finished on time, within budget, in

accordance with specifications and to stakeholders' satisfaction (Chua *et al.*, 1999; Puspasari, 2005, Ogunsemi, 2006; Yaman, 2007). Studies were conducted to examine factors impacting on project performance in developing countries. Shortage of skills of manpower, poor supervision, poor site management, unsuitable leadership, shortage and breakdown of equipment among others contribute to construction delays in the United Arab Emirates (Faridi and El-Sayegh, 2006).

According to Ajayiet *al.*, (2010) the choice of contractor(s) is a critical factor for the project manager and usually has a significant impact on the success or failure of a project. The performance of a contractor will definitely correlate with the performance of the contract. He further observed that the evaluation of performance has been a challenge for the construction industry for decades.

Ling *et al.*, (2007) remarked that architectural, engineering and construction (AEC) firms may face difficulties managing construction projects performance in China because they are unfamiliar with this new operating environment. Kim *et al.*, (2008) stated that international construction projects performance is affected by more complex and dynamic factors than domestic projects; frequently being exposed to serious external uncertainties such as political, economic, social, and cultural risks, as well as internal risks from within the project.

## **2.7. Conceptual Framework**

In citation of previous studies, little attention is being paid to construction performance in Ethiopia and generally on non-governmental organization implemented projects. Based on a literature review of the existing factors affecting performance of construction projects, they can be grouped as project characteristics related factors, labor and material related factors, contractual relationship, project procedures, external environment, clients' related factors and contractors' related factors. These categories form the basis by which research model developed to measure their effect on construction performance of this study.

A number of authors have provided different categorizations of quality problems. Based on extensive review Heravitorbatiet *al.*, (2011) identified four main sources of quality defects namely, stakeholder's managerial, technical, environmental, material and equipment culture and politics. In addition, this extensive review encompasses all the identified causes of defects identified and discussed in previous sections of this literature review. The figure below summarizes the concept proposed by Heravitorbatiet *al.*, (2011).

Impact of project performance on the achievement of AAIHDP in case of condominium house construction in Addis Ababa

**Figure 1: Framework for Quality Defects (Source: Adapted from Heravitorbati et al., 2011)**

Due to its unique characteristics of involving so many actors in construction projects, stakeholder management appears to be one of the most fundamental and important factors of a project (Heravitorbati et al., 2011). Common factors that attribute to the major sources of construction defects stipulated in the table-1 below.

**Table 1: Sources of Quality Defects in Construction Projects**

Stakeholder Managerial	Technical
<ul style="list-style-type: none"> <li>•Lack of contractor supervision</li> <li>•Poor relationship and collaborating</li> <li>•Poor communication</li> <li>•Reduced subcontractor responsibility</li> <li>•Inappropriate method of contractor selecting</li> <li>•Poor quality procedure and department</li> <li>•Poor training system</li> <li>•Low effective project management system</li> <li>• Bureaucracy Supplier impact</li> </ul>	<ul style="list-style-type: none"> <li>•Low quality</li> <li>•Drawing and specificatin</li> <li>•Design complexity</li> <li>•Difficult data collection system</li> <li>•Poor performance of quality tools</li> <li>•Lack quality management</li> <li>•Difficult application of quality system</li> <li>•Lack of technical talent</li> <li>•Human Error</li> </ul>

<b>Environmental, Material and Equipment</b>	<b>Culture and Politics</b>
<ul style="list-style-type: none"> <li>•Nature uniqueness</li> <li>•Project size and complexity</li> <li>•Material/Equipment specification</li> <li>•Project Environment</li> <li>•Poor quality and unavailability of resource</li> <li>• Equipment idleness and inefficiency</li> </ul>	<ul style="list-style-type: none"> <li>•Lack of motivation</li> <li>•Incompatible tendering procedures</li> <li>•Lack of collaborative working atmosphere</li> <li>•Emphasis on production and project duration</li> <li>•Corruption</li> </ul>

Impact of project performance on the achievement of AAIHDP in case of condominium house construction in Addis Ababa (*source: Heravitorbati et al., 2011, Latham 1994 & Moavenzadeh, 1987*).



## **CHAPTER THREE**

### **3. RESEARCH METHODOLOGY**

#### **3.1. Introduction**

This chapter discussed the research design and methodology used in acquired the necessary information to answer the research questions. It specifically presents the research questions, describes research approach and techniques, operationalize variables and indicators, presented sampling techniques in terms of sample size and selection, validity and reliability of the research, data collection methods and data analysis methods.

#### **3.2. Research Design**

This study employed descriptive types of research design was considered by the researcher for the study . This approach was chosen to describe major quality defect problems and identifies dependent and independent variables relation ship between AAH DO,,Small scale contractors and MSE.

#### **3.3. Research Approach and Techniques**

The research used both qualitative and quantitative data with the aim to find factors that lead to quality performance of house during the construction process and examine the AAIHDP support and its effect on their performance. On the other hand, by using the same technique this research identified the quality defects related to poor performance during construction.

#### **3.4. Data Collection Method**

The research used both primary and secondary data collection methods as a tool to gather the necessary information. The primary data was collected using three methods and mainly through a survey by administering questionnaires (four) to selected respondents. In depth interview of some of the respondents; and on-site observation of the on-going and a finished construction site and the handed over buildings are other sources of primary data.

Translation of survey questionnaires to local language (Amharic) was mandatory especially for occupants and MSEs. This is because the English language is not widely used by the majority of the people in Ethiopia and also to let the interviewed personnel knew what they were replying and to reach finally unbiased conclusion. Moreover, the entire interview was conducted in local

languages for ease of communications. This implies the need of translating the questionnaire and interview guides to local language prior to starting data collection. Secondary data was obtained from contract agreement, site reports, policy document and organizational records of the project.

### 3.5. The Study Population and Sample

Following the purposive sampling technique, a project for the study was selected. Project selection was based on the following criteria: a finished project handed over to the occupants . Accordingly, occupants who lives in the finished condominium houses and contractors and MSEs who participated in the finished project and now working on the finished projects were selected as primary respondents.

All HDPO officials and one of the consultants who are currently working on the project selected as another set of respondents were also part of the previous project. Drawing a sample from the occupants was not an easy task because of its big size of population. Yet, a large size sampling approximately 164 respondents are selected to ensure representative of the sample. Two research assistance were engaged in this data collection. Purposive sampling was employed to select respondent from the whole population for in-depth interviews and questionnaire. Table-3 below shows the framework for the sampling and data collection techniques.

**Table 2: framework for Sampling and Data Collection**

Item No.	Type of respondent	Sample size(enterprise )	Sample size(persons )	Sampling technique	Data type	Data collection method	Research instrument
1	Small-scale contractors	16	96	Purposive -Random	Primary	Survey	Questionnaire
		1	6	Purposive -Random	Primary	In-depth interview	Interview guide
2	MSEs	17	102	Purposive -Random	Primary	Survey	Questionnaire
		1	6	Purposive -Random	Primary	In-depth interview	Interview guide
3	Consultant	2	12	Purposive	Primary	Survey	Questionnaire

		1	6	Purposive	Primary	In-depth interview	Interview guide
4	HDPO	2	12	Purposive	Primary	In-depth interview	Interview guide
				Purposive	Secondary	Documentary analysis	Document review checklist
5	Occupants	0	164	Purposive -Random	Primary	Survey	Questionnaire
		0	9	Purposive	Primary	In-depth interview	Interview guide
		0	8	Purposive -Random	Primary	Observation	Checklists

Sources : questionnaire analysis 2023

### 3.6. Validity and Reliability

To ensure validity and reliability of the research, variables were comprehensively defined. This also helps to reduce misunderstand thus increased the reliability of the measured instruments. Moreover, triangulation of results employed to ensure reliability of the data collected. Thus, all the data acquired from different sources compared and cross checked.

Besides, to ensure reliability of the data, the questionnaires were tested prior to distributed to the intended respondents. The questions then amended based on the comment collected from those who participated in the test. The validity of the data was also acquired through careful selection and use of appropriate size of the sample. To avoid misunderstandings, the questionnaires were translated into the language (Amharic) understandable for the respondents.

### 3.7. Data Analysis Method

The collected data Would be analyzed using SPSS and Atlas-ti computer program for qualitative and quantitative data respectively. This computer program was helped researcher to reduce the occurrence of error during data analysis. Besides, it was fast and more accurate. CHAPTER FOUR

## CHAPTER FOUR

### 4. RESULTS AND DISCUSSION

#### 4.1. Introduction

This chapter comprises of the following: - short description of the study followed by introduction of general characteristics of research respondents is presented, developmental activities or supports the program provides to MSEs and small-scale contractors, analyze the responsiveness of the small-scale contractors and MSEs after receiving the supports, the project limitations mainly the constraints of MSEs and small-scale contractor and finally findings and analysis.

#### 4.2. The Project description

##### 4.2.1. The project

After AAIHDP inauguration, a total of 50,945 houses had been built. Up to date 37,179 houses had been completed and transferred to occupants, 1235 houses are in the process of transferring and 5,767 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-scale 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 is Jemo site in Nifas silk lafto sub-city located 11kilometres to south from the city center. The project started in 2007 and has two construction phases “Jemo I” and “Jemo II” (see the picture 3 below). In the project a total of 148 small-scale contractors, 162 MSE, 82 hauling and handing enterprises, two consulting firms and one Housing development Project Office has been involved.

##### 4.2.2. Project participants

A total of 395 enterprises and in population 2376 people are participating in Jemo project where temporary and permanent jobs for 6317 people have been created. A summary of stakeholders involved in the project together with the type of work they are engaged in and the number of job opportunities created are presented in table 4 below.

The respondents in this research are drawn from the population listed in table-4. Sample respondents are taken from every enterprise. To make the selected sample more representative of the population, the number of the respondents taken is a minimum of 10% of the population.

Accordingly, 16 small-scale contractors randomly selected as primary respondent. On the other hand, 17 MSE respondents purposely selected from 162 MSEs participating in production, installation and finishing works. It is purposive sampling because careful consideration was needed to include different types of MSEs from different areas of expertise.

Four HDPO officials who have different responsibilities in the project were selected to give insights 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.

**Table 3: Jemo II Housing Project Stakeholder Involvement and Job Creation**

No.	Type of Work	Type of Enterprise	No. of enterprises	population	Job creation		
					permanent	Temporary	Total
	<b>Construction works</b>						
1	Sanitary installation	<b>MSEs-1</b>	16	96	86	46	132
2	Electrical installation		31	192	160	23	183
3	Agro stone (partition) wall manufacturing and installation		2	12	19	0	19
	<b>Total</b>		<b>49</b>	<b>300</b>	<b>265</b>	<b>69</b>	<b>334</b>
	<b>Construction material production</b>						
4	Pre-cast beam	<b>MSEs-2</b>	23	138	271	65	336
5	Hollow block		51	306	668	108	776
6	Steel work		39	234	39	156	195
<b>Total</b>	<b>113</b>	<b>678</b>	<b>978</b>	<b>329</b>	<b>1307</b>		
7	Constructing	Small scale contractors	148	888	1085	1010	2095
8	Consulting	Consultant	2	12	67	0	67
9	Client	Housing development Project Branch Office	1	6	83	0	83

10	Hauling, Handling and transporting of construction material	MSEs and Transporters	82	492	355	2076	243 1
<b>Total</b>	<b>395</b>	<b>2376</b>	<b>2833</b>	<b>3484</b>	<b>6317</b>		

**Table 4: Jemo II Housing Project Stakeholder Involvement and Job Creation (Source: MSEs Work Progress Follow up Report, 2013)**

Another set of respondents was taken from occupants 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.

#### 4.2.1.1. Description of project participants

##### 4.2.1.1.1. Small scale contractors

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

**Table 5: Respondents of contractors**

Respondents	sex		Age(year)				Highest level of education			Construction Work experience (year)	
	Female	Male	24 - 29	30 - 35	36 - 41	>41	diploma	degree	Ms c	4-5	>5
Number of respondents	4	12	3	7	3	2	4	11	1	4	12

Sources : questionnaire analysis 2023

Look at their company profile the majority of the contractors (85%) fall under the category of GC/BC3 grade 5-6 and only a few falls under category GC/BC grade 3-4. The majority of the

contractors or 50% 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. In addition, currently all contractors are participating in other construction projects besides condominium projects.

**Table 6: Organization profile of contractors**

Respondent s number	Type of Organizatio n		organization Category/ grade(BC/GC )		Firm's establishmen t (year)			Other project	Years of participate in condominiu m projects			No. of key employees of the company			
	GC	BC	3-4	5-6	3- 4	4- 5	>5		Besides condominu m	2- 3	3- 4	4- 5	< 5	5- 10	15- 20
	9	7	3	13	3	9	4		16	4	9	3	7	7	2

Sources : questionnaire analysis 2023

#### 4.2.1.1.2. Micro and Small Scale Enterprises (MSEs)

The 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.

**Table 7: Respondent of MSES**

Respondents number	Respondent sex		Respondent Age(year)					Respondent Highest level of education			
	female	Male	18 -	24 -	30- 35	36- 41	>41	High school	TEVE T	Diplom a	Degree
	5	12	2	8	2	3	2	8	3	5	1

Sources : questionnaire analysis 2023

Like contractors, year of enterprise's 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. It is because this area of expertise is new since using Agro stone as partition wall started in Jemo-II projects and MSEs who are part of manufacturing and installing of this wall are new, and they had not started operating fully at the time of data collection.

**Table 8: Company profile of MSEs**

Resp. no.	Enterprise's establishment (year)					No. of members	Work order besides condominium		Works specialization							Years of experience				
	<2	2-3	3-4	4-5	>5		Other	Yes	No	HC B	Pre cast slab	Door&window	electrical	sanitary	Concrete pipe	<2	2-3	3-4	4-5	>5
2	5	1	3	6	1	6	7	10	4	2	1	4	4	2	2	4	4	1	6	

Sources : questionnaire analysis 2023

#### 4.2.1.1.3. Consultant

There are two consulting firms in this project: GATMES is responsible for supervision of 100 buildings and Gejaw is responsible for supervision of 113 buildings at the project site. They are responsible for construction management issues; works inspection and approval, material approval, payment approval and manage contractual issues. The project coordinators of the two firms are the main respondents of this research. They acquired a high level of education and have work experience of more than five years in construction projects of similar nature. One of the coordinators has been working since the commencement of the project. He also participated in the previous projects Jemo-I and II thus, besides the questionnaire in-depth interview with him has taken place.

#### 4.2.1.1.4. Addis Ababa Housing development project Office (AAHDPO)

AAHDPO is the responsible body for the administering and regulating the whole of the work. The project office on site is responsible for the follow up and administration of the specific site



under the supervision of head office. The respondents are one engineer from construction follow up office and head of MSEs Work progress from head office. Moreover, there are two respondents from the project site: the construction officer and MSEs follow up and work progress coordinator.

#### **4.2.3. Organizational Structure, Work Relationships and Role of Stakeholders**

According to the organizational structure, “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. 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 assists 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.

There are three types of subcontracting:-

- Domestic subcontractor is a subcontractor appointed by the main contractor at his discretion.
- Nominated subcontractor is a subcontractor nominated by the employer, which the contractor is obliged to appoint as a subcontractor.
- Selected subcontractor is the subcontractor selected by the main contractor in consultation with the employer as regards to the requirements of the contract.

Among the above stated subcontracting options usually whether it is a public or private building construction contract, domestic subcontracting is common in Ethiopia. However, in case of condominium housing projects the employer breaks down the work and gives it to different subcontractors (MSE-1), with the capacity of the housing development agency to supervise the works. 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-5. The main duties of MSE-1 are installation of building fixtures and utilities and painting works. The three parties (HDPO, Contractors and MSEs) sign an agreement on the same contract.

The contractor is entitled to 5% of management fee for managing the subcontractor (MSE-1) under his supervision. The other set of contract is a production agreement between Addis Ababa Nifas silk Lafto sub-city Housing Development Project Office- procurement section and MSEs production workers (MSE-2). This contractual agreement is signed for MSEs to manufacture and supply building components for the project.

**Table 9: Summary of Duties and Responsibility of Each Stakeholder**

Stakeholders	Duties and Responsibility
AAHDPO (Head Office)	<ul style="list-style-type: none"> <li>•Select and send lists of contractors</li> <li>•Prepare the contract document</li> <li>•Prepare specification</li> <li>•Fix unit rate</li> </ul>
AAHDPO (MSE Development Office , 'Nifas-silk Lafto' sub-city)	<ul style="list-style-type: none"> <li>•Recruit MSEs</li> <li>•Provide support to MSEs (loan, equipment, working place, training)</li> </ul>
Addis Ababa Nifas-Silk lafto sub-city Housing Development Project Office - Construction follow up office	<ul style="list-style-type: none"> <li>•Perform contractual agreement and contract administration</li> <li>•Assigning of contractors</li> <li>•Supervision of works (responsibility for quality of work)</li> <li>•Check and approve payments (contractors, consultant and MSEs-1) submitted by consultant</li> </ul>
MSEs follow up office	<ul style="list-style-type: none"> <li>•Facilitate working atmosphere for MSEs</li> <li>•Give information and advisory service</li> <li>•Sometimes gives MSEs on-site training or guidance</li> </ul>
Construction material procurement and finance office	Responsible for procurement of the prefabricated material from MSEs
Consultant	<ul style="list-style-type: none"> <li>•Work inspection</li> <li>•Payment (contractors and MSEs-1) approval</li> <li>•Construction material approval</li> <li>•Responsible for quality of work</li> </ul>
Small Scale Contractors	<ul style="list-style-type: none"> <li>•Small Scale Contractors Substructure construction- site preparation and foundation</li> <li>•Super structure construction- columns, beams, slabs, HCB walls</li> <li>•Finishing works (plastering, cement screed and terrazzo)</li> </ul>
MSEs-1 (labour)	<ul style="list-style-type: none"> <li>•Electrical installation</li> <li>•Sanitary installation</li> <li>•Roof fixing</li> <li>•Metal door and window production</li> </ul>
MSEs-2 (production)	<ul style="list-style-type: none"> <li>•HCB production</li> <li>•Pre-cast concrete</li> </ul>

- |  |   |
|--|---|
|  | <ul style="list-style-type: none"> <li>•Concrete walls</li> <li>•Partition wall (agro-stone)</li> </ul> |
|--|---|

Sources :-Summary of Duties and Responsibility of Each Stakeholder report from AAHDP 2016.

#### 4.2.4. Employing project participants

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 eligibility criterion for participation of small-scale contractors and MSEs is discussed in the subsection below.

##### 4.2.4.1. Small-Scale Contractors

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 vary 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.

A total of 172 contractors were assigned to Jemo I and II project and only 148 are proceeding to work and the rest 24 contractors got terminated. Both HDPO’s construction officer and the consultant 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.

### 4.3. The Project Supports and Its Effect

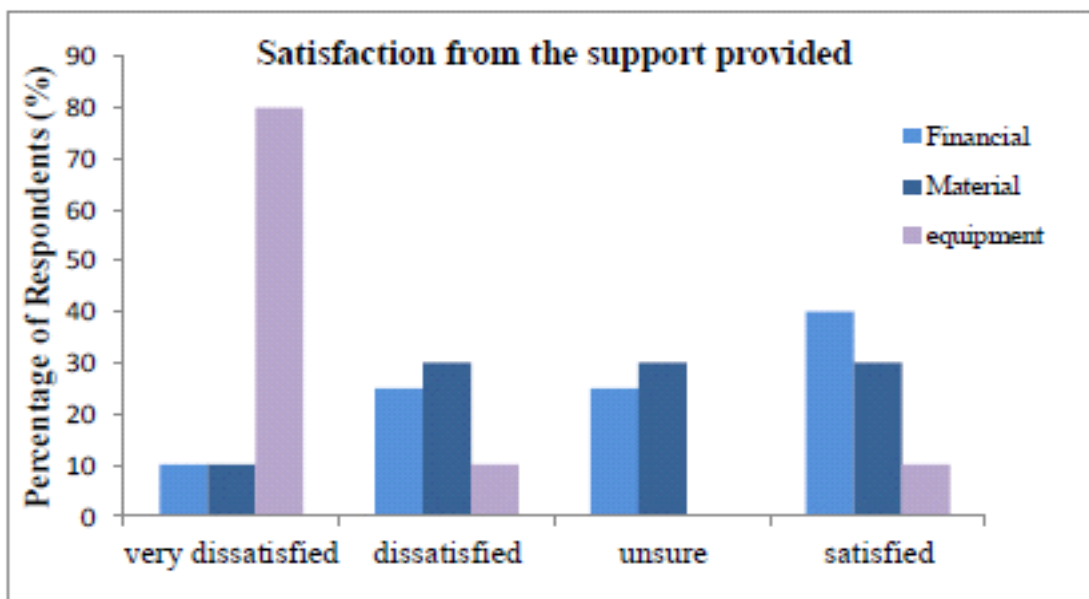
This section deals with the capacity-building program to find an answer for the first research question: *“Does the mechanism introduced to enhance capacity of small-scale contractors and MSEs have an impact on their responsiveness in carrying out their duty?”* It is an assessment of the program in terms of its extent, effect and outcome done by the contractors and MSEs themselves. In addition, for the purpose of cross tabulation the opinion of HDPO officials and the consultants is added. The evaluation was further done through assessment of the outcome of

the project, in this case the constructed houses. The quality of the constructed houses, which is addressed in the subsequent section, helped the researcher to measure the performance of small-scale contractors and MSEs. From the survey made to find out the effect of the support contractors and MSEs have been provided, about 8(50%) of contractors and 4(25%) of MSEs believe that it has a moderate effect on improving their performance. The majority of MSEs commented that the support actually has only a minor effect.

#### 4.3.1. Support for the contractors

The contractors receive different types of support from HDPO. For instance, prior to the beginning of the project, HDPO organized a 3-4 days training mainly concerned with improving management skill and introducing the program to contractors. In addition, there is financial support in the form of advance and construction material support. The contractors are supplied with almost all-major construction material (up to 90%) except sand, wood and other miscellaneous material.

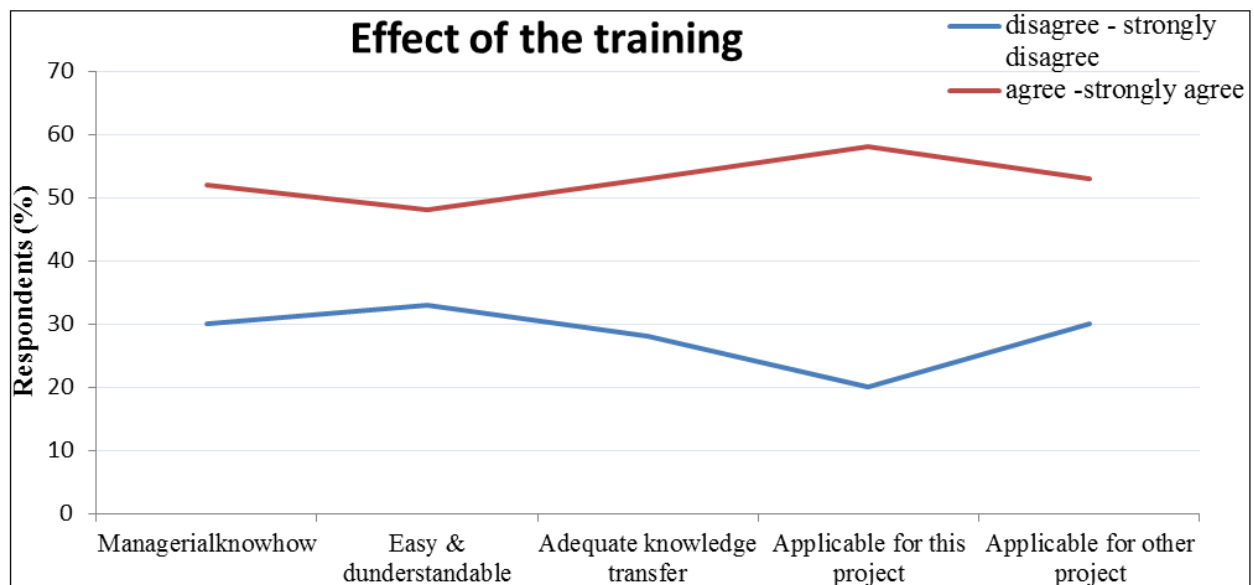
Even if 60% of the respondent are agreeing that the overall support program has improved their performance only 35% of the respondents are satisfied with the financial and material supports and few satisfied with the training provided to them (see chart-1 below). Thus, the duration is too short to equip the contractors with sufficient managerial and technical expertise. The majority of respondents (80%) is very dissatisfied with the equipment support. From the interview, it is found that the equipment support was adequately available at the beginning of the program when HDPO used to facilitate loan to contractors to buy major equipment necessary for their works.



### Chart 1: Contractors Level of Satisfaction with the Support Program

To learn whether the above stated supports have an impact on the performance of MSEs a survey was conducted and only 10% of the respondents agree on the training effectiveness to improve their technical knowhow. However, around 50% of the respondents found the training easy, understandable, and it helps them to improve their managerial know how.

The findings reveal that they are quite a large number of MSEs who found the training not easy and difficult to understand 13(74%). In addition, many MSEs found the training not adequate for knowledge transfer thus; it could not be applicable to this project also to other projects. The relationship analysis shows that the majority of the respondent, whose highest level of education is high school, found the training difficult to understand.



### Chart 2: MSEs Responses on the Effectiveness of the Training

From the interview made with the head of MSEs' work progress office, the HDPO is also aware of the training's inadequacy to equip MSEs with the necessary knowledge and to enable them to stand by their own. HDPO identified the constraints of MSEs development program not to provide satisfactory training. Some of these constraints are the short training period, unavailability of professional, and shortage of material to give practical training. On the other hand, MSEs follow up and work progress project office coordinator said that the training they have been given at the sub-city level is adequate.

The consultants also confirm that the training given is not adequate to create skilled workers. The technical know how they are acquiring in the training would not enable them to work on a single building let alone on huge projects like this. One of the project coordinators also underlined that with one week training it is difficult for MSEs to learn how to read plans (drawings) and installation techniques.

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 5(24%) of MSEs confirm the supporting schemes have a positive effect on their performance, 6(33%) of MSEs believe it has neither minor nor moderate effect. Especially for equipment support, only 3(14%) agree the support has an effect on their 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.

#### **4.4. Defects Observed in “Jemo- I” and “Jemo-II” Condominium Sites**

To identify defects in newly constructed condominium houses, site visits and survey questionnaires for owners and occupants who are living currently on that site were undertaken. The survey was also supported by observation whose guide was developed from the literature. During observation, breakdown of door handles, door mirrors, irregular plastering, loosened fix of the kitchen sink, breakdown of toilet fixtures, and breakdown of terrazzo tiles on the stairs and corridors were highly evident. This survey had two intentions first to find out defects observed during the time of handing over the houses. Secondly, to find out defects exists after the occupant move in the house. For this set of questions, owners were selected to identify defects before occupancy and any tenants who are currently living in the houses are selected to find out the defect observed while using the installed fixtures and utilities. The respondents in this survey are all age groups greater than 18 years old. However, the majority of the respondents are from age 24-35 years with a family size of an average 2-4. All types of houses varying from studio to three-bedroom located on every floor are included in the survey.

According to the first analysis, the most identified defects during handing over, are defects related to sanitary fixtures (as shown in the picture under figure 4). This includes improper placement of kitchen sinks and toilet fixtures, improper functioning of a toilet flush, leaking of plumbing pipes and hand wash basins.



**Improper fixing of kitchen-sink fitting**



**Improper placement of kitchen sink**

**Figure 1: The Pictures Shows Defects on Sanitary Appliances in a Kitchen**

Likewise, more than 80% of respondents replied that their door handle was not functioning well.





**Figure 2: Photographs Showing Defects on Door Handle Door-1 Handle is Broken and has no Mirror and Door -2 the Handle is Broken**

The second most observed defects by the time of handing over are tiles delamination of toilet floor (see figure 6 below), 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 42% of respondents, are broken window handle, ceiling deflection, spalling of concrete ceiling.



**Figure 3: The Photograph Show Tiles Delamination of Toilet Floor**

Similarly, the defects observed after occupancy 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 7 below). According to the survey 89% of respondent observed major and minor defects in their house.





#### **Figure 4: The Photographs Show Defects on Electrical Fittings**

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.

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 and staircases. As shown in the picture (figure 8 and 9) most of the floor tiles in the corridors and staircases are broken and delaminated. In addition, the balustrades of the staircases are not fixed firm enough.

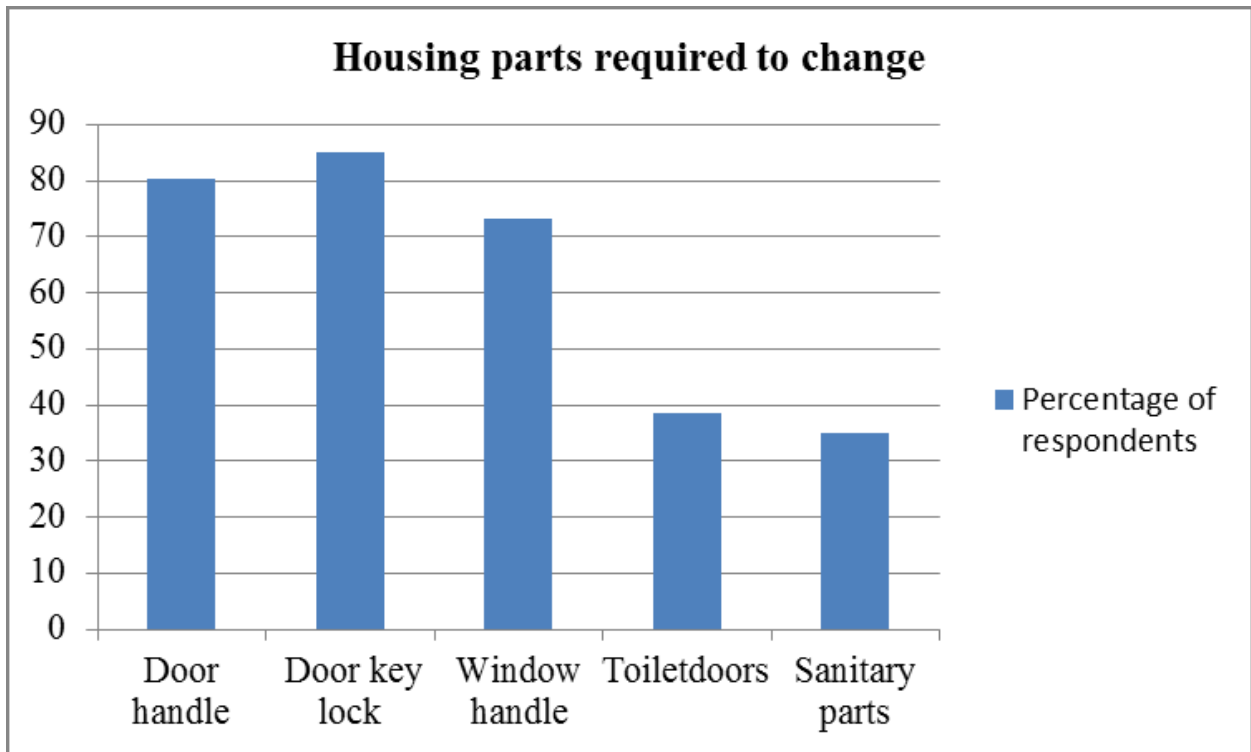


**Figure 5: Photographs Shows Defects on Corridor Floors**



**Figure 6: Photographs Show Defects on the on the Treads of the Staircase**

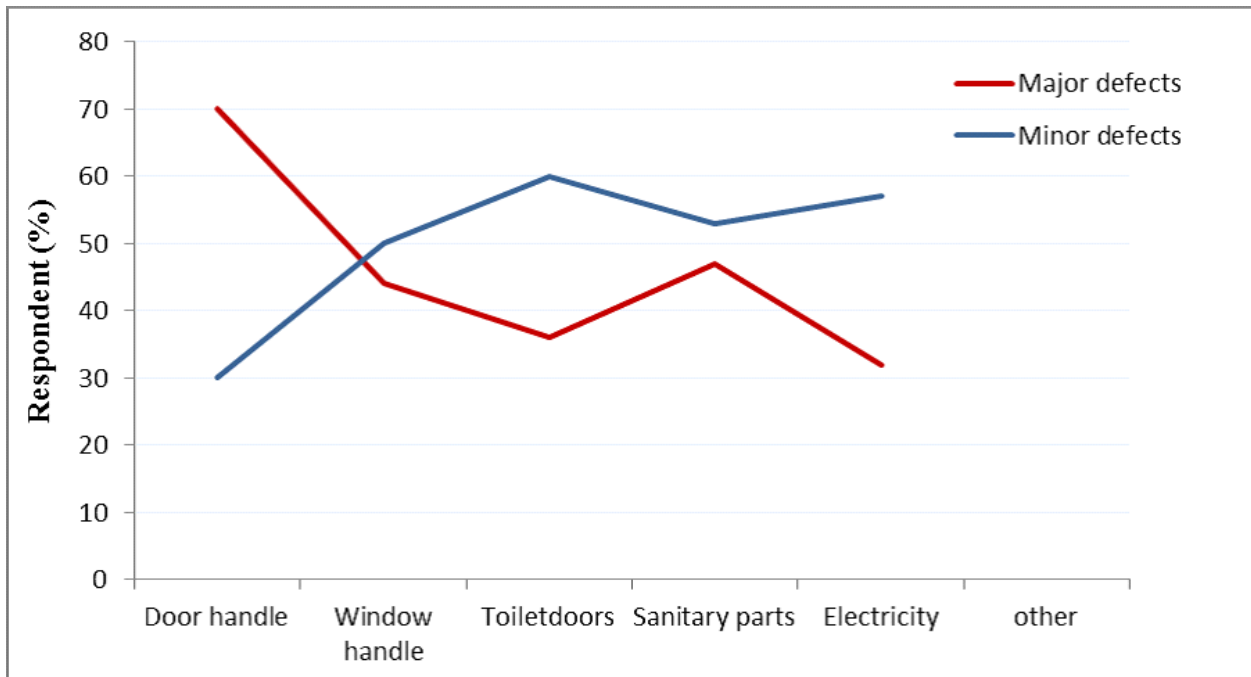
After handing over of condominium houses in Addis Ababa, owners are obliged to change certain housing parts due to malfunctioning. The finding in this research also shows most people do change some of the housing parts. Almost all door handles and door locks got breaks immediately after the owner start using them. Hence, more than 80% 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. Chart -3 below shows the housing parts in which majority of respondents forced to change.



**Chart 3: Housing Parts Owners Required to Change**

One of the unique parts of this 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 found the irregularity of wall, floor and leaking of sanitary pipes difficult to perform painting and tiling works.

While living in the house, almost 148(90%) occupants confirm the occurrence of defects. The major defects identified by the occupants and confirmed by the consultant and the HDPO construction officer are defects that relate to sanitary fixtures, electrical utilities, door handles and door locks. Chart-4 below shows the most identified major and minor defects.



**Chart 4: Defects Mostly Observed by the Respondents**

It was observed that most of the door handles and key lock were broken and the researcher was able to enter and observe unoccupied houses that had broken doors locks. From the inside as seen in the picture below, most of the toilet's doors were either fixed inappropriately or have broken door handles.



**Figure 7: The Photo Shows a Toilet Door without the Door Handle**

Besides as shown in the picture below the windows are fixed improperly thus has wide openings. The majority of windowsill is tilted toward the houses. This together with wider openings exacerbates inflows of rainwater towards the houses.



**Figure 8: The photograph shows wide opening left between the window frame and window sill**

Water can easily penetrate through the hole. In most condominium houses residents are subject to water leaking problem arises from different sources. While conducting the survey one of the occupants tells of an incident that had happened to him. The story is narrates in box below.

**Incident caused by water leakage**

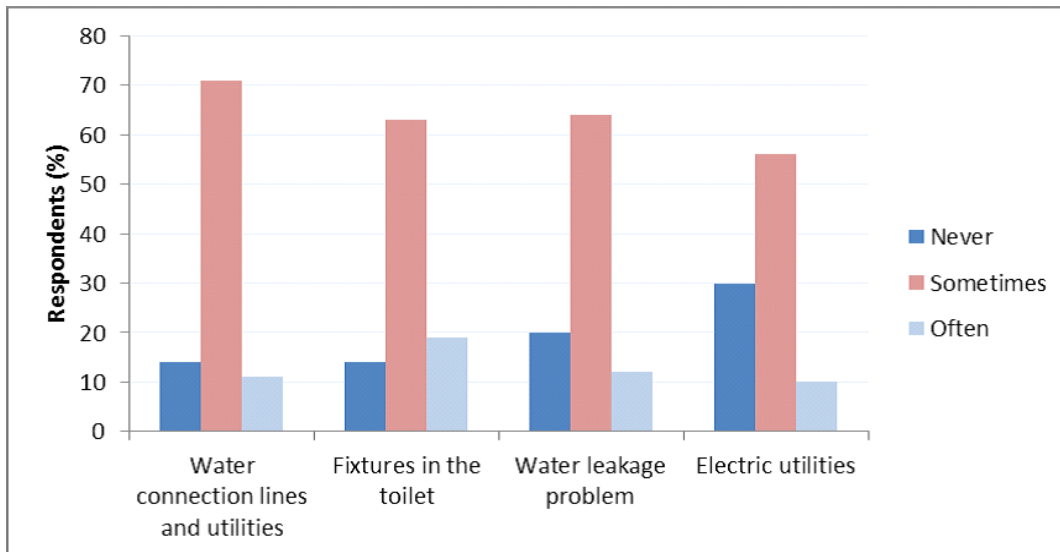
One day while we were asleep I heard an unusual sound coming from the living room and I rushed to see what's happening, I found the living room flooded with water and most of the furniture was soaked by the water. I rushed to the toilet and could not find any open plumbing, I checked the kitchen, and there is no water coming from the kitchen either. I rushed back to the living room; I manage to see the water come from the ceiling. It did not take me a minute to realize it is from the neighbor's house

located one level up from my house. The respondent then added that there are many of such cases caused by improper fitting of pipelines and loosen of pipes at the joints. (**Source:** Narrated from one of the residents living in the condominium house)

**Box 1: Incident Caused by Water Leakage**

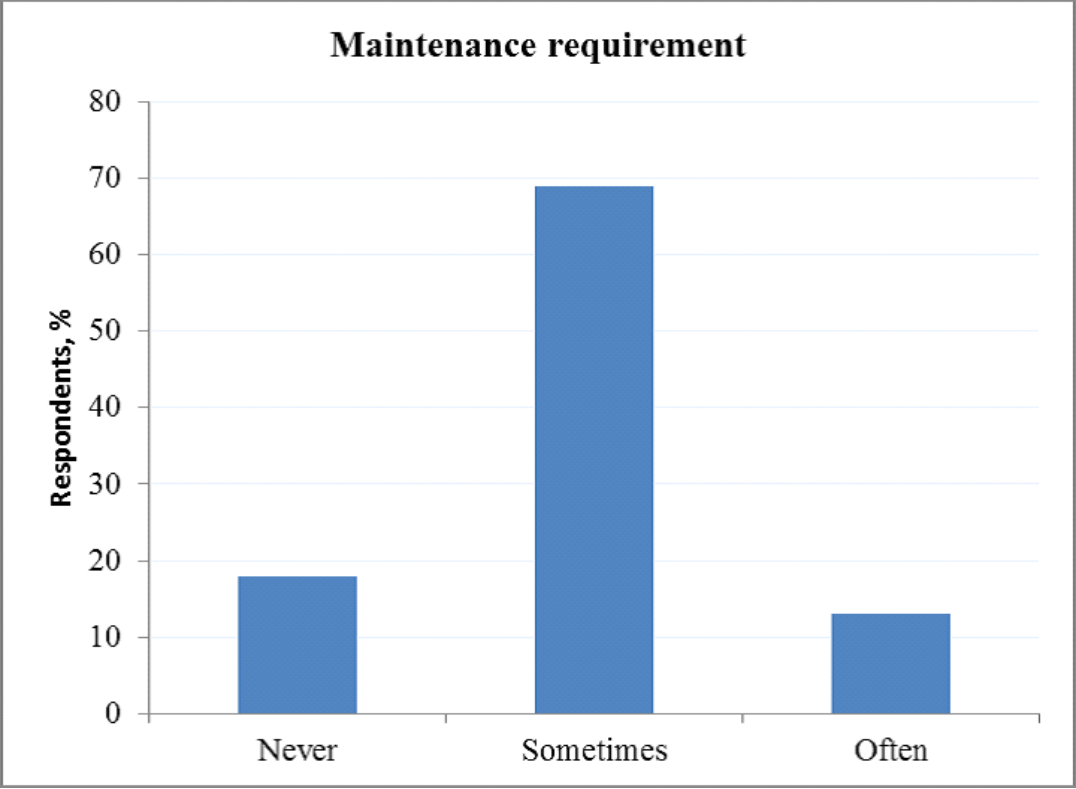
Where are the seepage usually observed? The survey data reveal that the majority of the seepage comes from window opening, from the roof, and through the door. Besides majority of the respondent, identify leakage inside the kitchen and toilet fittings. Possible sources for the water supply problem as identified by the respondents are blockage and leakage of pipes. Through the analysis made more than 56(30%) of respondents encountered water supply problems because of the blockage and leakage of pipes.

Sudden or frequent fuse circuit breaking, heating of switches and wires are the most identified electricity supply problems. However, the study did not find out how occupants carryout maintenance. 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 chart-5 below, are subjected to maintenance related to sanitary and electrical utilities.



**Chart 5: Maintenance Conducted For Certain Defects**

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.



**Chart 6: Overall Maintenance Requirement**

Finally, an assessment was made to find out satisfaction of the occupants about the houses they are living in in terms of its construction. Over 115(70%) of occupants rate the quality of houses fair to poor, as a result, the majority of the respondent is not satisfied with the houses they are living in. The next section then will reveal potential factors that might contribute to the construction of less quality houses. By doing so the last research question, which intends to find out the constraints of small-scale contractors and MSEs during the construction process will be addressed in the section proceeding. Before going to the next section, one might ask how all these defects pass inspections.

In accordance with the main contract document, provisional and final acceptance should be undertaken and the necessary correction should be made for the defects observed. The

construction officer in HDPO states that they attend both provisional and final acceptance and the consultant noted down the defect observed and forward it to the contractors for correction. Most of the times contractors are willing to do the correction work. However, the final acceptance is undertaken after occupant has started living in the house so it is difficult for them to distinguish defects caused by construction faults. Moreover, he strongly argues that except for minor defects HDPO tries to hand over defect free houses.

## **4.5. Constraints in the Project Sites**

This section presents the overall picture of the project site during the construction process. The survey was intended to discover constraints that possibly affect the performance of small-scale contractors and MSEs and causes poor quality construction reflected in the previous section. Samples of all stakeholders involved in the construction process participated in this part of the research.

### **4.5.1. Stakeholder managerial**

#### **4.5.1.1. Managerial skill**

Both the HDPO's construction officer and the consultant agree that many contractors lack management skill. The consultant 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. Furthermore, MSE's coordinator commented that most MSEs has coordination problem that affects their overall performance at large.

#### **4.5.1.2. Working atmosphere of the project**

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 12(70%)) MSEs affirm they communicate with HDPO for payment follow up, material request, and for meetings.

Nevertheless, only 9(52%) and 8(48%) of respondents communicate to HDPO when there is a problem and when they have complaints concerning the project respectively. During the communication, 11(62%) of MSEs found the HDPO's office supportive. All contractors also

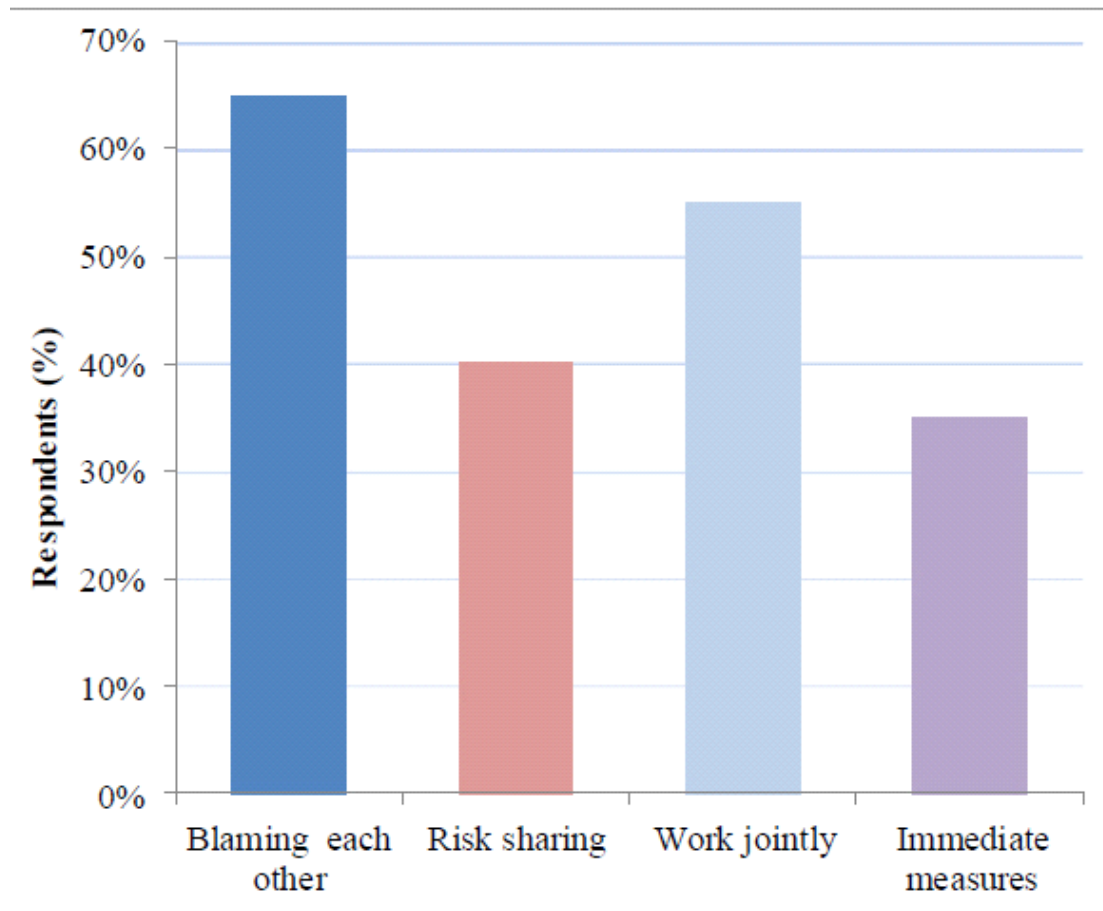


communicate with HDPO for the same reason as MSEs, in addition, contractors do communicate with HDPO during provisional and final acceptance. Of the respondents 10(65%) of contractors found HDPO's response supportive. According to the survey data collected, more than 8(50%) of the contractors rate their communication with HDPO and consultant very easy but 6(40%) of respondents found it difficult to communicate with MSEs. The rest 10(60%) rate their communication with MSEs as neither good nor bad.

On the other hand, the majority of MSEs who participate in works contract rate their communication with the contractors as positive. Around 50% of MSEs' respondents also rate their communication with HDPO and the consultants as positive. But still some contractors and MSEs (almost half of the respondents) are reserved to contact HDPO when there is a problem or complaint. Even if HDPO seems supportive and positive for the majority of the respondents still almost half of the contractors' respondent found communicating with HDPO difficult. Similarly, HDPO rate the overall communication between project participants as medium.

According to the majority of the respondents (70%, blaming culture between them and the MSEs does exist but they work jointly with the rest of the stakeholders. The consultants also confirm the existence of blame culture between contractors and MSEs. Thus, when problems arise on site project offices need to solve it at the lowest level as possible. However, 11(70%) respondent of the contractors complains that whenever there are problems or issues that need immediate measures and decisions they always need to wait long.

As shown in the chart-7 below only 6(35%) of respondent agree there is a risk-sharing practices. The project coordinator of the consultant on the other hand argued that despite the involvement of the high number of stakeholders in one project, the risk - sharing mechanism does exist. He explained that before taking any decisions we look at the project constraints that might affect the performance of the contractors and MSEs. The coordinator further explained that they consider things that would not happen in normal building projects unless there is good justification. For instance, if a delay occurred, they consider the unavailability of labour, the unavailability of access road and difficulty to work with so many subcontractors before concluding the contractor is the defaulter.



**Chart 7: Type of Relationship Identified by Contractors**

#### 4.5.1.3. Relationship among members of MSEs

It is possible that members in one association will not know each other before the association is established. As said by MSE’s coordinator in HDPO office, this might be one of the factors that coordination is not much observed among member in an association. The result shows that 71% the association confirm that some of their members know each other before the association is established. Out of the associations where some of their members know each other, 60% of the association has a very good working relationship. The analysis to find out the type of relationship existing between members of MSEs reveals that majority of MSEs (around 70%) neither have a common objective nor have risk sharing practice. MSEs also find it difficult to work jointly while they have different objectives.

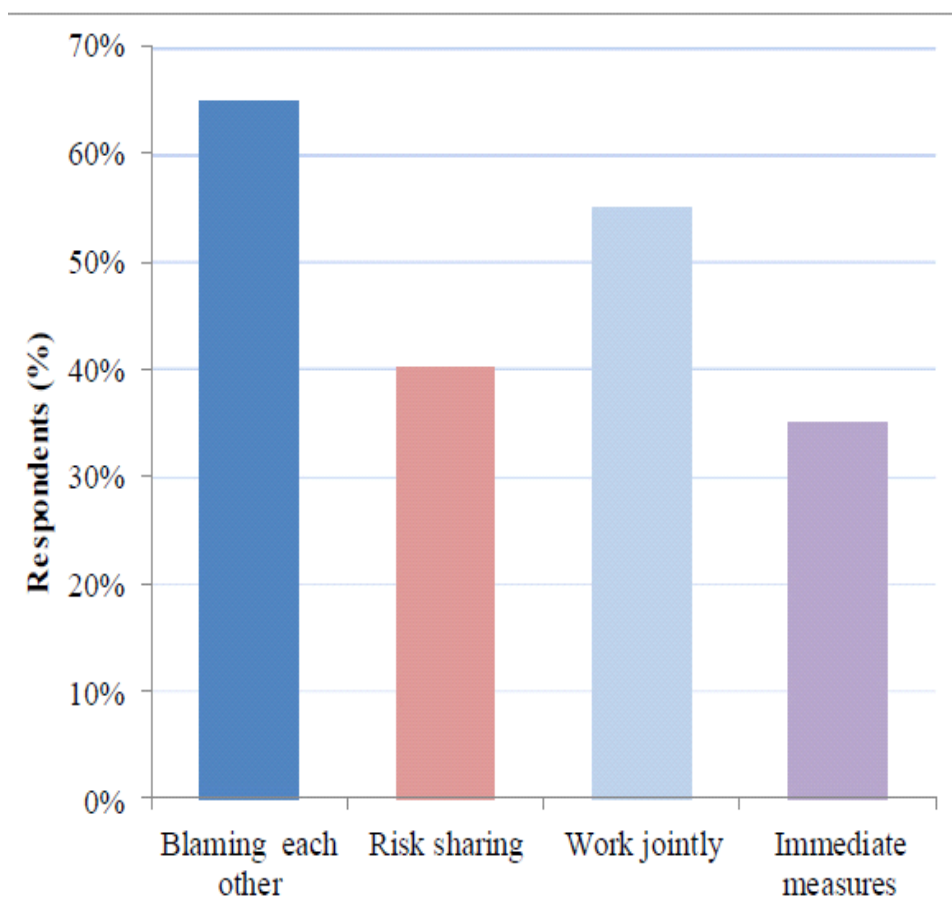
## 4.5. Ambiguities at the project site

### 4.5.1.. Between project Stakeholders

The project coordinator comments that “Ambiguities are sometimes unavoidable especially when there are a lot of actors involve in a project”. The cause may be arising from one or multiple stakeholders; according to the contractor’s opinion (65% of respondents), MSEs are likely the causes for most of the disagreements. In addition, half of the respondents agree that the consultant could also be the cause. According to 65% of respondent from contractors, delay during material delivery, defects on material delivered and poor workmanship are the reasons for the disagreements.

#### 4.5.1.2.2. Among members of MSEs

While working in groups there might be a high degree of divergences between members in the association, this also is the case for most MSEs participating in this project. MSEs identified possible causes for ambiguities. Of all the identified causes, being reluctant (see chart 8 below) in keeping working hours found to be the most important and common cause for most



associations.

## **Chart 8: Possible Causes of Ambiguities among Member in MSEs**

### **4.5.1.2. 3. Quality procedure**

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 clearly, and etc. The consultant is then responsible for approval of such construction materials. 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 MSEs-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 MSEs 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.

The HDPO's construction officer 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 HDPO 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 consultants' project coordinators and management personnel from HDPO.

The 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, work progress, and quality of the overall construction.

The contractors and MSEs were also asked the availability of Total Quality Management (TQM) in their respective work. Around 60% of respondent from contractors and 76% from MSEs 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

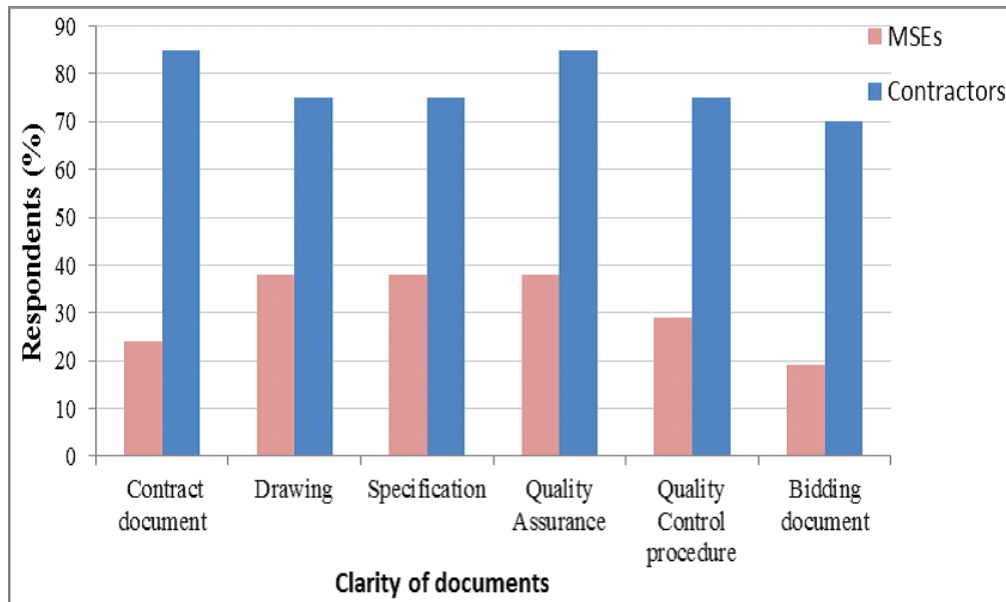
established. The majority of the respondents (contractors) also added that they promote quality construction through quality workmanship, performance measurement, and through implementing quality assurance system. Based on the feedback 40% of them review their performance regularly. MSE also receives feedback from HDPO and around 50% of them state they try to improve their performance through the performance review they made regularly.

#### **4.5.2 Technical Skill**

Consultant and HDPO were asked for their observation on the technical capability of contractors and MSEs. 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. The consultants found the technical skill of most MSEs inadequate.

The coordinator of the consultant explains that when MSEs start to work they need to train and guide them. Thus, the engineers from the consultant and the client (HDPO) do most of the job to show techniques and methodologies in the construction processes to the MSEs. The knowledge transfer also depends on MSEs' interest and readiness to learn and accept. Both the consultant and HDPO rate technical know-how of the majority of MSEs and some contractors as poor. What do the contractors and MSEs 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.

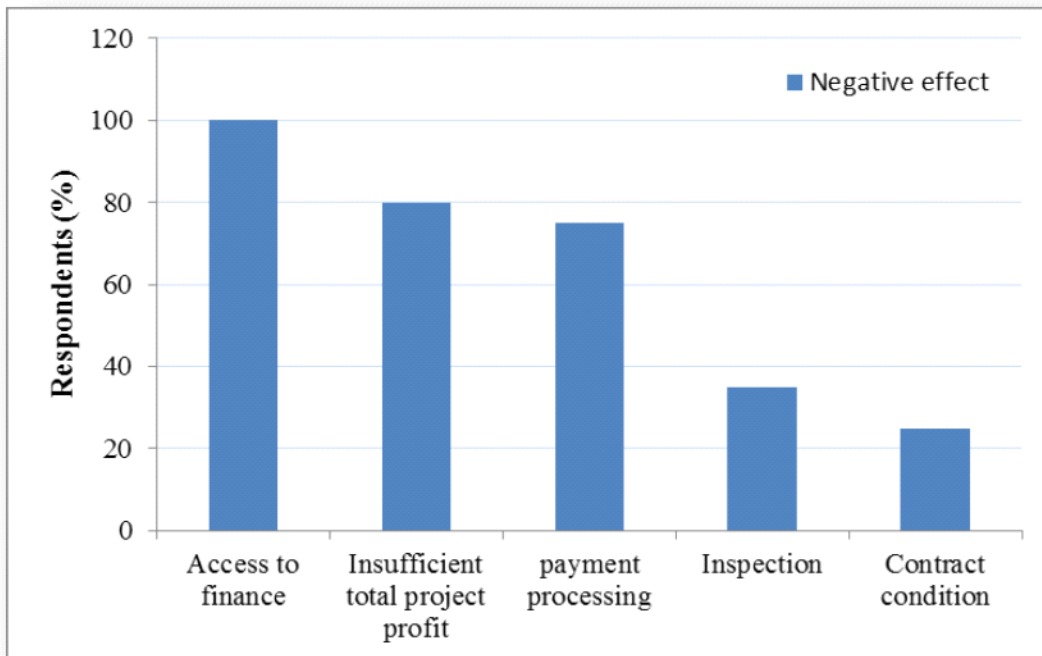
The most important indicator is how well they understand the contractual and technical documents they are required to use while executing their work. The chart below summarizes the difference in the number of contractors and MSEs agreement on the clarity of different types of contractual and technical documents.



**Chart 9: Levels of Agreement for Clarity of Contractual and Technical Documents**

#### 4.5.3. Culture and politics

Although, as discussed in chapter-2 of this paper, cultural and political issues do not expect to bring large effect on project performance they still need to be considered. Using indicators of culture and politics from the literature review, the respondents (contractors and MSEs) were asked different sets of questions. All respondents of contractors agree that lack of access to finance has negative impact on their motivation to work despite HDPO. In addition, long time payment processing and insufficient profit from the project also affect more than 75% of the contractors.



**Chart 10: Conditions, Which Affect Contractors' Motivation to Work**

MSEs were asked about what factors affect their motivation most often, the majority of MSEs reply that the profit is too small (only 19% are satisfied), and when they try to request HDPO for unit rate revision, they never get an appropriate response. Besides around 45% of MSEs 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 HDPO's attention now largely diverted to newly recruited MSEs, the existed MSEs are worrying about losing their jobs; the survey shows that about 53% of MSEs are worried about the sustainability of their job. As with most construction projects, each stakeholder has their own priorities. Both the consultant and HDPO officer criticize contractors because of their priority to maximize profit at any cost. Even if 55% of contractors agree profit as their priority, also 45% of respondents agree completion on time and gaining experience are their highest priority.

From the survey made on customer satisfaction, more than 75% of occupants (the respondents) 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 findings include all

stakeholders" opinion on customer satisfaction. Accordingly, 80% of contractors mention that customer satisfaction is their priority.

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 HDPO added that it is difficult to satisfy all the customers with all the constraints the project have. 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. He also added that there are times that they vanished from the site for a long time so that they need to search them through phone.

In general, the findings in culture and politics reveal that there are conditions that affect the motivation of contractors and MSEs, each stakeholder has their own priority, customer satisfaction is not the main concern, and there is a coordination problem between contractors and MSEs.

#### **4.5.4. Environment, material and equipment**

Compared to other construction projects in Ethiopia, this project is unique in its character. In this survey stakeholders were asked why they think the project is unique.

Almost all of the stakeholders agree that the project is unique because it involves MSEs, has a different organizational structure, adapt different procurement method, and has a capacity-building program. The consultant added that it is not a full construction work agreement; instead, it is a labour base agreement with the main intention of solving the housing problem and unemployment. Moreover, this housing development program is one of the capacity building programs in which the government intends to ensure development of contractors, MSEs and other individuals by investing a large amount of money.

Availability of construction material is not a problem for this project because such kind of development programs has priority for purchasing the main construction materials such as cement and reinforcement bars. However, the location and inaccessibility of the project site make delivery of those materials more difficult. Besides it, discourage labour to come and work in this peripheral location of the project site.



#### **4.5.5. Summary of constraints of each stakeholder**

The construction industry in Ethiopia as a whole has many constraints with respect to material, labour, equipment, and finance. Due to the Government's high priority for development, currently huge constructions are undergoing in the whole part of Ethiopia.

For instance, construction of infrastructure like dams, bridges, and roads, and construction of buildings like universities, houses and commercial buildings. Undertaking of all the activities at the same time causes the specified scarcities in the construction sector in Ethiopia.

Besides the common constraints all construction projects are facing in Ethiopia, this project has many constraints driven from each stakeholder involved.

As discussed in the above sections the project is subject to managerial, technical, cultural and environmental, material and equipment constraints. The MSEs coordinator identifies MSEs lack of commitment and responsibility, lack of education, lack of experience, lack of work motives, management and technical skill, finance, and coordination between members, as major constraints.

#### **4.5.6. HDPO's constraints and the consultant**

The construction head of HDPO refers that they have work force problems to handle cases of contractors and MSEs. The construction officer also added the shortage of raw material (construction) to supply it to contractors and MSEs, and inconvenience of project site.

The MSEs' work progress head underline on the short time period given for the training and lack of professionals to give the training as the major constraints to equip MSEs with the required knowledge.

The consultant coordinator on the other hand mentions that, the technical incapability of MSEs cause them to be overburdened with work because they need to show and guide MSEs while performing their task.

He also added that the burden would be multiplied when new MSEs engage in the project. The consultant also finds it difficult to manage the scattered works that are handled by different stakeholders.

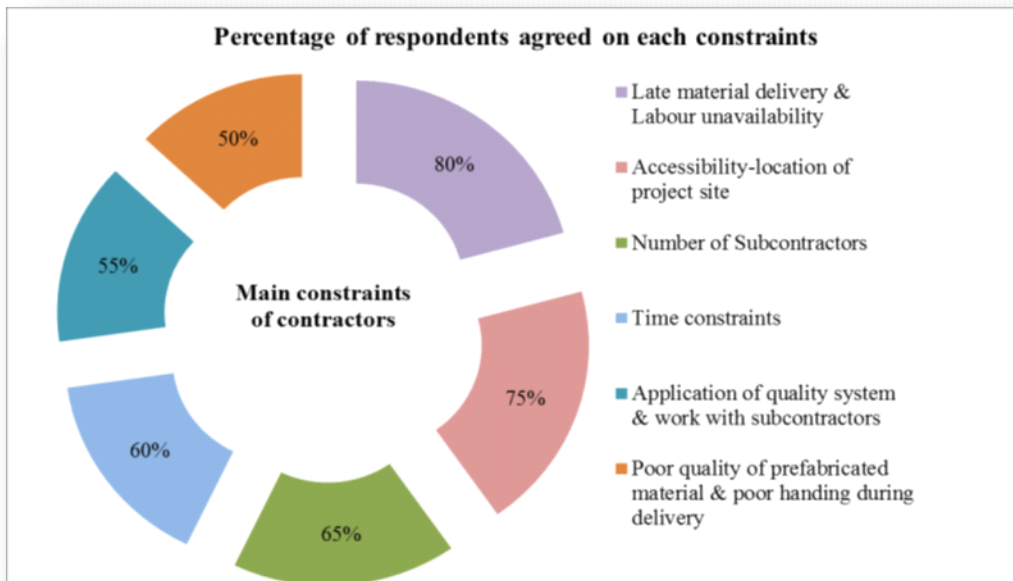
#### 4.5.7. Contractors' constraints

The HDPO's construction officer states profit maximizing, lack of skilled professional, lack of management skill, and material scheduling is the main constraints of the contractors.

The consultant also underlines the lack of capable personnel and lack of construction management as the main constraints of many contractors. Of the respondents in this survey, the majority of the contractors have an academic background and professional experience in construction.

They also confirm that technically, they are not having major difficulties rather they have other problems that affect their performance negatively.

The common constraints that most contractors face are labour unavailability, inaccessibility of the project site, late material delivery and working with large number of subcontractors. Thus, it is difficult to find labourers with the given labour price in the contract. Besides, labours are not attracted to work on this site due to inaccessibility of the site. The location of the site and lack of access road inside the project site affect their performance due to limited mobility. The chart below summarizes the main constraints that the contractors are facing on site.



**Chart 11: Main Constraints Identified by Respondents (Contractors)**

#### 4.5.8. MSEs' constraints

From the interview made with two members of MSEs and from observation and site visit, it was learnt that MSEs have as well many constraints. For instance, one MSE's who participate in a pre-cast production state that the profit margin is too low and it is really difficult to produce the material according to specification and quality.

He also added that the shed they have supplied with is not large enough to produce and store their products, thus most often they wait until the materials transported to the project site before they continue in production.

He also mentioned that they have problem in payment processing and communicating with the client. The other member who produces HCB state that nowadays work order are reduced because of engagement of new MSEs in the project.

During site one of MSEs was asked what kind of problem his association is facing, the member said that HDPO does not keep its word, for example in the contract it is stated MSEs are not responsible for handling of prefabricating material during transportation.

## **CHAPTER FIVE**

### **5. SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1. Summary of Findings**

This chapter presents conclusion arrived based on the research finding in relation to the literature studied in chapter two of this paper which had mainly discussed the constraints of construction industry in developing countries, developmental activities of contractors and MSEs, the practice of prefabricated technology, low cost housing, types of defects in building facade and possible causes of quality defects. The findings were based on the research questions to find out the effect of the capacity-building program on enhancing the performance of small-scale contractors, to find out the main problems observed in terms of quality of construction of the condominium houses and to explore the constraints of small-scale contractors and MSEs face during the construction process.

#### **5.2. Project Structure**

The Addis Ababa Integrated Housing Development project office 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. Capacity building programs to train and assist small-scale contractors and MSEs in the construction process support the program. One of the unique characteristics of the program is that it has a variety of large numbers of stakeholders with distinct job specifications. The HDPO project office manages and administers the project as a client. MSEs are responsible for the production of construction material and installation works. The contractors on the other hand are responsible for the construction of major structures of the building with the material provided to them by HDPO and MSEs.

To ensure affordability of the houses the program engaged labour intensive construction for the production of building components and construction works.

This result engaging so many MSEs and small-scale contractors in the project, which then results in complexity of the project. The vast number of stakeholders together with complex work relation makes the management of the project difficult.

The analysis in this research reveals that there is some communication gap among the stakeholders especially between the small-scale contractors and MSEs. In addition, as in many

construction projects in Ethiopia discrepancy between stakeholders is a common characteristic of this project. The common causes for the disagreements in AAIHD project are delays in material delivery, defects on material delivered, poor workmanship and unavailability of MSEs from the work place.

The procurement method to engage contractors and MSEs in the project opens a space for anybody who wants to participate in the project. Thus making the procurement method open has its own benefits and shortcomings in meeting the overall goal of the program. The benefit is that the program can achieve its goal of creating jobs and the disadvantage is that it allows engaging anybody including those whose technical capability is insufficient to be part of the project

### **5.3. Capacity Building**

In practice and as discussed in chapter two of the literature review, the contractors' development program must include trainings and other capacity building schemes. Further, the training given should consist of both managerial and technical supports of different level based on the level of the contractors. The personal and company profiles show that almost all contractors participated in this research have good educational and professional background.

The training, as agreed by many contractors should be called training; instead, it is should be called an orientation program to project. The contractors together with HDPO and the consultant agree that the only support provided to the contractor is material support and financial support in a form of advance payment.

The capacity-building program for MSEs is quite better since MSEs join the program empty handed. At least they are provided with a few days training which includes lessons on how to administer and manage their association. However, the technical support is still controversial and believed to be not sufficient to equip them with the necessary knowledge. Despite their poor educational background, MSEs are left to struggle by themselves to produce quality work with only three to four-day lesson on technical support.

Reviewing the overall developmental program supplied to both contractors and MSEs, the mechanism to improve their technical and managerial skills is poorly designed. The training given to MSEs as condemned by the consultants, head of MSEs Construction officer in HDPO and MSEs themselves it is not enough or not even close to equips MSEs with sufficient technical and managerial knowledge. Similarly, the contractors are not supplied with the necessary support

to improve their performance thus; the majority of contractors are not satisfied with the support. Therefore, the mechanisms introduced to enhance capacity of small-scale contractors and MSEs are not adequate to bring impact on their responsiveness in carrying out their duty. This shows that the support program design by AAIHDP does not meet the program's objective to develop the technical and managerial capacity of small-scale contractors and MSEs. This also reflected through the quality of the works they are executing and the quality of products there are manufacturing.

#### **5.4. Quality Defects**

Most of the houses as identified by the occupants observed by the researcher and later confirmed by the consultant and HDPO have defects. The most identified defects during handing over, are defects related to sanitary fixtures, door handles and locks and vertical and horizontal cracks. Besides owners found the deflection on ceiling, irregularity of wall and floor and leaking of sanitary pipes difficult to undertake finishing works. After occupancy, more defects such as those related to electrical utilities and sanitary fittings especially leaking of water inside the house start to appear. Most of the defects are major defects, which need replacement of the whole or some parts. Accordingly, the study reveals that the majority of respondents are forced to replace their door and window handle, door locks and sanitary fixtures.

Similarly, in connection with electrical and sanitary supplies and utilities defects, occupants are forced to undergo maintenance. This in turn brings additional cost of purchasing appliances and repairing the defects. 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 occupants are not at all satisfied with the houses they are living in. However, HDPO gives slight concern for customer satisfaction instead give priority to fulfill the policy to supply more houses within a short time period. AAIHDP on one hand does meet its objective on housing delivery but fail to ensure delivery of quality houses.

#### **5.5. Main constraints of project participants**

Addis Ababa Integrated Housing Development project is weakened in providing a financial mechanism to lift up the contractors and in providing adequate training to equip both contractors and MSEs with technical and managerial capability. Because of their satisfactory educational and professional experience, most contractors are rated technically capable to undergo

construction. However, due to lack of experience in handling a project of their own, managerial problems were observed on most contractors.

They also have constraints caused by the disagreement of membership in the association. Access to finance, insufficient profit and long payment processing are also the main constraints of the contractor, which affect their motivation to carry out their duties. Similarly, the majority of MSEs were concerned and worried about the stability of their job. This together with insufficient profit from the project, lack of working space and supply of less quality raw material affects their performance negatively.

Administering a large project like this has its own difficulties. The consultants are being helpful in assisting HDPO with supervision and contractual matters however; it does not help the project to avoid major defects during construction. Non-existence of testing mechanism for raw materials and prefabricated building components also allows the usage of non-suitable materials in the construction. The last but important constraints are lack of collaborative working atmosphere at the project site. Lack of good communication between project participants, coordination problem between contractor and MSEs and having different priority might create non-conducive working atmosphere in the project site.

## **5.6. Recommendation**

As concluded in the above sections the “Nifas Silk Lafto, Jemo” condominium project has so many shortcomings especially on its capacity building programs, recruitment of project participants and the management of the project. The sample is too small to conclude that the entire projects AAHDPO running has identical problems and shortcomings. However, it can be an indication for further studies of other sites for comparison and draw conclusion of the overall program and hence the following the way forward is recommended to the concerned body as follows:

- The training organized for both small scale contractors and MSEs must be based on their level of competence. Because of their poor educational background, the training given to the MSEs need to incorporate technical and management program. Consultants need to carry out their duties to assure quality construction in accordance with the contract and also they need to affirm that all material delivered to the site need to be tested and approved by their supervisors.

- The program meets its objective in providing a large number of houses to the urban population and in recruiting a large number of young people. However, it forgoes the need of providing quality houses. Thus, it is important for the program to note that quality construction is also one of the success factors for any construction as well as for the program.

- Last but not least, yet importantly, all parties in the project need to coordinate all their efforts for the construction of quality houses for the better and developed housing delivery system.

### **5.7. Recommended for further study**

This study focused on examining the factors, which lead to assessment quality performance by small-scale contractors and MSEs during the construction process. This is done because they are the key players in the construction process. The following recommendation is forwarded for Further study:

- The aim of HDPO to administered and managed the project during the project cycle in order to improve quality performance housing constructions the project which have good quality controlled helps to satisfied customers..

- The stake holders involved on the housing constrictions project understand the quality standard rules and responsible to improved quality defect made at stages of project executions phases by giving attentions works throughout took corrective actions to delivers quality house to public dwellers.

The finding shows that quality management improvement activities were implemented during the project implementation phase, there was problems continuous improvement applied quality management in all the process. By trained small scale contractors and have good communications inter relationship with the concerned body.

- Follow up .and communication by AAHDPO with MES, contractors during project phases to improve quality of housing through lead strong guideline on each stake holders involved on the projects to tackle .through daily report a consideration to meet quality performance level of satisfaction for consumers.

- There is a need to carry further studies to find out how the defects observed during handing over of the houses pass final inspections by HDPO and the consultants.



- Additionally, further study is also recommended to identifying the type of defects that are related to structural defects like columns beams and slabs.
- The construction material used in the project need to be assessed and study should be made on the quality of the material provided or to find out whether the materials meet the specification in the building codes of the country.

## REFERENCE

- AAHA, 2012, progress report of condominium houses
- AAHA, AA Adlakha, P.k et Puri, H., 2003, “Prefabrication building methodologies for low cost housing”, IE (I) Journal AR- Vol. 84, India
- Aibinu , A and Jagboro GO. The effects of construction delays on project delivery in Nigerian construction industry. *International Journal of Project Manage* 2002; 20:593–9.
- Ajanlekoko JO. Controlling cost in the construction industry. *Lagos QS Digest*, Lagos 1987; 1(1):8–12.
- Ali, S. and Wen, H., *Building Defects: Possible Solution for Poor Construction Workmanship. Journal of Building Performance*, 2(1), 59-69 (2011).
- Al-Khalil, M. and Al-Ghafly, A. “Important Causes of Delay in Public Utility Projects in Saudi Arabia.” *Construction Management and Economics*, 17(5), 647- 655 (1999).
- Alsadey, S., Omran, A. and Pakir, A. 2010, *Defects in the Libyan construction industry: A case study of BaniWalid city, faculty of engineering,*
- Amusan A. S, Adebile O. A, (2011): “ The Non-Oil Sector and the Nigeria Economy a Case Study of Cocoa Export Since 1960 ” *International Journal of Asian Social Science*, Vol.1, No.5, PP. 142- 151.
- Arditi D., Akan G., and Gurdamar S., 1998, Incentive/disincentive contract: Perception of owners and contractors, *Journal of Construction Engineering and Management*, 124 (5): PP. 361- 373.
- Atkinson, R, 1999, “The role of human error in construction defects”, *Structural Survey*, Vol. 17, No 4, pp. 231–236,
- Baiden, B., Price, A. & Dainty, A. 2006, “The extent of team integration within construction Projects”, *International Journal of Project Management*, vol. 24, no. 1, pp. 13–23

- Belassi, Walid&Tukel, Oya.(1996). A New framework for determining critical success/failure factors in projects.International Journal of Project Management. 14. PP. 141-151.
- Bentall, P., Beusch, A and Veen 1999, Employment-intensive infrastructure programs: capacity building for contracting in the construction sector, Geneva the ILO, Turin Centre, Italy.
- Bubshait, A. 1994, “Owner involvement in project quality“, International Journal of Project Management, vol. 12, pp. 115-117.
- Campanella, J. (1999). Principles of Quality Costs: Principles, Implementation and Use. Milwaukee, Wisconsin: ASQ Quality Press.
- Carl, T. and Al. 2000, Prefabrication and preassembly trends and effects on the construction workforce Austin, Texas: Centre for Construction Industry Studies, 2000.
- Chan, A. and Al., 2004, Exploring critical success factors for partnering in construction projects“, Journal of Construction Engineering and Management.
- Cheung Sai On, Suen Henry C.H. and Cheung Kevin K.W., (2004), PPMS: a Web- based construction Project Performance Monitoring System, Automation in Construction, Vol. 13, PP. 361-376
- DissanayakaSunnil M. and Kumaraswamy Mohan M., (1999), Comparing contributors to time and cost performance in building projects, Building and Environment, Vol. 34, PP. 31- 42
- Doloi, H. (2009). Analysis of pre-qualification criteria in contractor selection and their impacts on project success. Construction Management and Economics 27, 1245–1263.
- Doloi, H., and K.C. Iyer (2012) "Analyzing factors affecting delays in Indian construction projects”, International Journal of Project Management 30(4), 479-489.

- Durdyev, S. and Ismail, S. (2012). Role of the construction sector in the economic development of Turkmenistan'. *EEST Part A: Energy, Science and Research*, 29, 883–890.
- Durdyev, S., and Ismail, S. (2016). On-site construction productivity in Malaysian infrastructure projects. *Structural Survey*, 34, 446–462. Doi: 10.1108/SS-12-2015-0058
- Durdyev, S., Omarov, M. and Ismail, S. (2016, November 9–10). SWOT Analysis of the Cambodian construction industry within the ASEAN economic community, *Proceedings of the 28<sup>th</sup> International Business Information Management Association Conference*, Seville.
- Egan, J. (1998) *Rethinking construction: report of the construction task force on the scope for improving the quality and efficiency of UK construction*. Department of the Environment, Transport and the Region, London
- FeteneNega, (2008), *Causes and effects of cost overrun on public building construction projects in Ethiopia*, MSc thesis, AAU, Civil Engineering Department, Addis Ababa.
- Hunedoara Romania , Arditi, D. and Gunaydin, H. 1998, “Factors that affect process quality in the lifecycle of building projects”, *Journal of Construction Engineering and Management*, ASCE, vol. 124, pp. 194-203
- Iyer, K. and Jha, N., (2005). Factors affecting cost performance: evidence from Indian construction projects. *International Journal of Project Management* 23, 283–295.
- Karim K. and Marosszeky M., (1999), Process monitoring for process reengineering using key performance indicators, *International conference on construction process reengineering, CPR 99, Sedney UNSW 12-13 July, Building Research center*.
- Karim K. and Marosszeky M., (1999), Process monitoring for process reengineering using key performance indicators, *International conference on construction*

process reengineering, CPR 99, Sedney UNSW 12-13 July, Building Research center.

Kuprenas, John. (2003). Project Management Actions to Improve Design Phase Cost Performance. *Journal of Management in Engineering - J MANAGE ENG*. 19. 10.1061/(ASCE)0742-597X (2003)19:1(25).

Lehtonen Tutu Wegelius, (2001), Performance measurement in construction logistics, *International Journal of Production Economics*, Vol. 69, PP.107-116

Lehtonen Tutu Wegelius, (2001), Performance measurement in construction logistics, *International Journal of Production Economics*, Vol. 69, PP.107-116

Long Nguyen Duy, Ogunlana Stephen, Quang Truong and Lam Ka Chi, (2004), large construction projects in developing countries: a case study from Vietnam, *International Journal of Project Management*, Vol. 22, PP. 553-561

Luna-Ryes, F Luis, and Andresen, Deborah L (2003), Collecting and analyzing qualitative data for system dynamics: methods and models, *System Dynamics review*, V 19, No 4, 271-296 and Andersen (2003)

Mbachu, J. and Nkando, R. (2007). Factors constraining successful building project implementation in South Africa, *Construction Management and Economics* 25(1): 39-54.

NavonRonie, (2005), Automated project performance control of construction projects, *Automation in Construction*, Vol. 14, PP. 467- 476

OkuwogaAdeyinka A., (1998), Cost ñ time performance of public sector housing projects in Nigeria, *Habitat Intl.*, Vol. 22, No. 4, PP. 389 – 395

Pheng Low Sui and ChuanQuek Tai, (2006), Environmental factors and work performance of project managers in the construction industry, *International Journal of Project Management*, Vol. 24, PP. 24-37

- Pillai, A. S., Joshi, A., Rao, K.S. (2002). Performance measurement of R&D projects in a multi-project, concurrent engineering environment. *International Journal of Project Management*, Vol. 20: PP. 165-177
- Reichelt, J. (1999) "The dynamic of project performance benchmarking the drivers of cost and schedule overrun", *European Management Journal*, 17(2), 135-150.
- Shenhar, A., O. Levy, and D. Dvir, "Mapping the dimensions of project success," *Project Management Journal*, vol. 28, no. 2, pp. 5- 13, 1997.
- TadesseAyalew, (2009), *Causes and Effects of Variations in Ethiopian Federal Road Projects*, MSc thesis, Addis Ababa University, Civil Engineering Department.
- Ugwu O. and Haupt C., (2007), Key performance indicators and assessment methods for infrastructure sustainability - a South African construction industry perspective, *Building and Environment*, Vol. 42, PP. 665-680
- UN-HABITAT 2011b, "Housing affordability: its component and measures", in *Affordable Land and housing in Africa*, vol. 3, pp. 9, UNON publishing services section, Nairobi.
- UN-HABITAT, 2011a, *Condominium Housing in Ethiopia: the integrated housing development program*, UN on publishing services section, Nairobi.
- Wang, X. and Huang, J. 2006, "The relationships between key stakeholder's project performance and project success: Perceptions of Chinese construction supervising engineers," *International Journal of Project Management*, vol. 24, pp. 253-260

## APPENDIX

### Annex-1 Questionnaires



St. Mary's University  
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*Committed to Excellence*

#### **Assessment of Quality Performance on the Housing Construction project in in Addis Ababa city Administrations: Case of Jomo Condominium Houses**

#### **Questionaries'**

#### **Questionaries' for condominium house occupants**

Thank you for taking time to fill these questionnaires. This survey questions are a research instrument for the fulfillment of my MSc program and of the study on “impact of project performance on the achievement of AAHDP, the case of Jomo condominium house construction in Addis Ababa “. Your responses will be completely anonymous and confidential, and will not be identified by individual. All your responses will be compiled together and analyzed as a group. If you were not there or were not responsible to hand over this house from HDPO, please go to part II of these questionnaires.

#### **•House occupants who handed over condominium house from HDPO**

#### **•General**

- What is your sex? A. Female B. Male
- What is your age (in years)? A. 18-23 B. 24-29 C. 30-35 D. 36-41 E.>41
- Do you have background knowledge about building construction? A. Yes B. No
- What is the type of the house? A. studio B. one bedroom C. two bedroom  
D. Three bedroom

#### **•General defects on newly handed over house**

- What kind of defects you observed when you first handed over the house from HDPO:

(more than one choice is accepted)

Type of defects	Response	
	Yes	No
Broken door handle		
Door handle not functioning well		
Broken window handle		
Tiles of delamination (toilet)		
Deflection of roof		
Spalling of concrete ceiling		
Wall crack		
Ceiling crack		
Floor crack		
Broken window glass		
Improper placements of kitchen dishwasher		
Stained concrete ceiling		
Stained all		
Plumping leaks		
Leaking of shower		
Leaking of hand wash basin		
Leaking of toilet seat		
If other , please do not hesitate to specify		

- Which of the following housing part you are required or forced to change because of malfunctioning?

Types of Defect	Response	
	Yes	No
Door handles		
Door key lock		
Window handles		
Window glass		
Toilet doors		
Toilet seat		
Hand wash basin		



Plumping parts		
Kitchen sink		
If other , please do not hesitate to specify		

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

Types of defects	Response	
	Yes	No
Irregularity of wall level		
Irregularity of floor level		
Irregularity of ceiling level		
It was difficult to fix inside doors		
If other , please do not hesitate to specify		

Thank you again for taking your time in completing this survey, if you have any questions please feel free to ask!

**•House occupants who are currently reside in the condominium houses**

**•General**

•What is your sex? A. Female B. Male

•What is your age (in years)? A. 18-23 B. 24-29 C. 30-35 D. 36-41 E.>41

•Do you have background knowledge about building construction?

•Yes B. No

•Are you the head of the house? ..., if not what is your status in the house?.....

•What is the size of your family living in this house?.....

•What is the type of housing ownership? A. owned B. rental C. other specify

•What is the type of the house?

A. studio B. one bedroom C. two bedroom D. three bedroom

•Have you ever lived in another condominium houses before you reside here? (If yes please answer question number 3.9) A. yes B. No

•For how long have you been living in this house?

A. five months B. 1-2years C. 2-3years D. 3-4years E.>5years

•How was the condition of the defects relative to the current house you are residing?

•Much worse B. somewhat worse C. about the same D. somewhat better E. much better

•Overall, how would you rate the quality of the building in terms of its construction? A. poor B. fair C. good D. very good E. excellent

•What is your level of satisfaction about the quality of the condominium houses you are living in?

•Very dissatisfied B. dissatisfied C. unsure D. satisfied E. very satisfied

•**General defects observed after residing in the house**

•Have you ever detected any construction defects inside the house? (If yes , please answer questions 4.1.1 and) A. Yes B. No

•Which of the following defects you observed more

•What problems related to water seepage you observed inside your house?

Types of defects	Response	
	Yes	No
Leakage through door		
Leakage through window		
Leakage through roof		
Leakage inside the kitchen		
Leakage inside bathroom		
Leakage from ceiling		
Leakage through wall		

**•Defects related to water and electricity supply**

•Do you have water supply problems because of blockage or leakage of pipes?

A. Never B. rarely C. sometimes D. often E. always

•Have you ever detected the following electricity supply problems in the house?

•Sudden or frequent circuit breaker B. heating of switches and wires C. electric sparks/shocks D. high power consumption E. no problem

•How often do you required to maintain water connection lines and utilities?

•Never B. rarely C. sometimes D. often E. always

•How do you often maintain fixtures in the toilet (shower tray, toilet seat, and hand wash basin)?

•Never B. rarely C. sometimes D. often E. always

•Overall, how often do you required to maintain due to water leakage problem?

•Never B. rarely C. sometimes D. often E. always

•How often do you required to maintain electric utilities?

•Never B. rarely C. sometimes D. often E. always

•Overall, how often do you required to perform maintenance due to construction defects in your house?

•Never B. rarely C. sometimes D. often E. always

**Questionaries' for SMEs**

•What is your sex? A. Female B. Male

•What is your age (in years)? A. 18-23 B. 24-29 C. 30-35 D. 36-41 E.>41

- What is the highest level of education you have completed?
- Elementary B. high school C. certificates D. diploma E. Degree F. others
- What is your position or responsibility in the association?
- Manager B. accountant C. member coordinator D. other
- When does the association established?
- <2years B. 2-3years C. 3-4years D. 4-5years E. >5years
- How many members are there in the association?.....
- What is the right of about members in your association?
- Do you have any work order other than the condominium project?

A. Yes B. No

- For how many years does your association participating in the construction of condominium house?
- <2years B. 2-3years C. 3-4years D. 4-5years E. >5years
- In which aspect of the construction work your association performing in this project?
- HCB manufacturing B. slab manufacturing C. door and window manufacturing D. electrical installation E. sanitary installation F. if other specify...
- How do you rate the communication between members in your association?

A. Very good B. good C. neutral D. poor E. very poor

- Which of the following types of relationship between members of your association exists?

Types of relationship	Response				
	Extremel	Unlikel	Neutr	Like	Extrem

	<b>y</b> <b>unlikely</b>	<b>y</b>	<b>al</b>	<b>ly</b>	<b>ely</b> <b>likely</b>
Blaming each other for mistake made					
Risk sharing for defects					
Mutual objective for quality production					
High degree of trust					
Parties work jointly					
Take immediate measure to solve problems					
If other please specify.....					

•Were there any ambiguities with members in the association?

A. Never B. rarely C. sometimes D. often E. always

•If there were ambiguities within the members in your association, what were the most significant causes most often?

<b>Types of ambiguities</b>	<b>Response</b>				
	<b>Extremely unlikely</b>	<b>Unlikely</b>	<b>Neutral</b>	<b>Likely</b>	<b>Extremely likely</b>
Being late from work					
Dividend on share					
Poor workmanship					
If other specify please .....					

•Are you aware of any activities undergoing on site?

A. Never B. Rarely C. sometimes D. often E. always

•With which types of the following stakeholders, does your association have work relation? (More than one response is possible)?

A. Contractor B. consultant C. others SMEs D. raw material suppliers E.

other

•When do you communicate with HDPO?

Times of communication	Response	
	Yes	No
When we have problem concerning the project		
For payment processing		
When there is meeting		
When we have complaint		
When raw material delivery needed		
If other please specify .....		

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

Types of factors that affect motivation	Response				
	No effect	Minor effect	Neutral	Moderate effect	Major effect
Contract condition					
Payment process					
Access to finance					
Profit sharing with large group member					
Insufficient total project profit					
If other please specify....					

•What is your level of satisfaction about profitability of this project?

A. Very dissatisfied B. dissatisfied C. unsure D. satisfied E. very satisfied

•Are you worried about the sustainability of your job?

- A. Not at all concerned B. slightly concerned C. somewhat concerned D. moderately concerned  
E. extremely concerned

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

Types of impacts	Response				
	No effect	Minor effect	Neutral	Moderate effect	Major effect
Design complexity					
Complexity of the project					
Communicate to the client					
Poor material quality					
Late material delivery					
Idleness of equipment					
Financial constraint					
Time constraint					
Work in group					
Application of quality system					
Poor material handling during delivery					
Accessibility –location /convenience of project site					
Contract type (conditions)					
Payment condition					
Access to finance					
Dividend on profit					
Less profitability					
If other specify .....					

•Is there any total quality management (TQM) system in place to ensure quality of your production? If yes please answer question number 27.

•Yes B. No C. difficult to answer

•In which of the following activities concerning performance improvements exist in your association?

Activities	Response		
	Yes	No	I do not know
Objective of the TQM is clearly stated			
Focus of the TQM is clear for me			
There is a team established to ensure TQM			

•Which of the following activities concerning performance improvement exist in your association?

Activities	Response				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Performance reviewed in a regular basis					
Free feedback of reviewed performance					
Improvement was made throughout the project					
If other please specify ....					

•Have you HDPO ever given you a feedback concerning the quality of your work?

•once a month B. at provisional acceptance C. at final acceptance D. never E. other

### Survey Questionnaire for Consultants

•What is your sex? A. Female B. Male

•What is your age (in years)? A. 18-23 B. 24-29 C. 30-35 D. 36-41 E.>41



- What is the highest level of education you have completed?
  - Elementary B. high school C. certificates D. diploma E. Degree F. others
  - For how many years have you worked in the construction of condominium house?
- A. <2years B. 2-3years C. 3-4years D. 4-5years E. >5years

5. What is your position in this project? .....

6. Which of the following types of relationship between project participants exists that you are aware?

Types of relationship	Response				
	Extremel y unlikely	Unlikel y	Neutral	Likely	Extremely likely
Blaming each other for mistakes made at site					
Risk sharing for defects					
Mutual objective for quality of construction					
high degree of trust					
Parties work jointly					
Take immediate measure to solve problems					
If other specify.....					

- How do you find yourself communicating with the rest of the stakeholders?

Types of communication	Response				
	Very difficult	Difficult easy	Neutral	Very easy	No relation
HDPO					
Contractor					
SMEs					

8. When do you usually communicate the contractor?

Types of communication	Response	
	Yes	No
When they have problem concerning the project		
When there is a meeting		
When there is provisional acceptance		
When there is final acceptance for the part of the work		
For processing payment		
If other please.....		

9. At the project site, were there any ambiguities between different stakeholders?

(If No, please does not answer question number 10 and 11) A.yes B. No

10. In your opinion, who do you think is the cause of most of ambiguities?

11. Which of the following do you think is the most significant causes for ambiguities?

Types of Ambiguities	Response				
	Extremely unlikely	Unlikely	Neutral	Likely	Extremely likely
Payment delay					
Delay in material delivery					
Defects on the material delivered					
Poor workmanship					
If other please specify and rank them under.....					

12. In case of any problems arise at site, what is your first reaction?

Types of problems site	Response				
	Never	Rarely	Sometimes	often	Always
Call a meeting immediately and discuss about it					
Wait for monthly meeting and discuss about it					
Inform HDPO and wait for solution from them					
Resolve at site if it is under your capability					
Transfer the case to head office , if it is difficult to resolve at site level					
Inform HDPO if it is beyond your organization's capacity					
If other please specify .....					

13. In your opinion, you do think the project is correctly formulated to suit the capability of the contractors? A. yes B. No

14. Where the following contractual documents and guidelines clear for the contractor from the beginning of the project up to now:

Types of document	Response				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Contract agreement					
Drawing					
Specification					
Quality assurance					
Quality control procedure					
If other please.....					

16. Which of the following activities concerning performance improvement exist in this project?

Types of activities	Response				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Performance received in regular basis					
Fare feedback of received performance					
Improvement was made throughout the project					
If other please specify....					

17. How does this project promote quality construction?

Types of promote quality	Response				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Continuous supervision					
Performance measurement					

Feedback if performance measurement undertaken					
Implement quality assurance system					
Continuous feedback for any poor workmanship exist					
If other please specify....					

18. Is there any TQM system in place in this project? If yes, please answer question number 19.

A. Yes B. No C. difficult to answer

19. Are the contractor's cooperative to correct the remarks observed during acceptance?

A. never B. rarely C. Sometimes D. Often E. always

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

### Interview Questionnaires – HDPO

- Personal

- Name

- What is your main task in HDPO

- Employing contactors and SMEs

- How many small scale contractors are involved in all projects currently (November 2022)

- How many SMEs are involved in all projects currently (november2022)

2.2. a) Can you tell me how you involve small scale contractors in the project?

1. The selection procedure

2. Criteria for selection

3. What tender procedure the program follows

4. Who are involved in tendering procedure?

2.3. Can you tell me how you involve SMEs in the project?

a) The selection procedure

b). Criteria for selection

c) What tender procedure the program follows

d) Who are involved in tendering procedure?

2.4. a) what do you think are the benefits of involving small scale contractors?

b) What is the short coming of involving SMEs in this project?

2.5. a) What are the short comings of involving small scale contractors?

b) What are the short comings of involving SMEs in this project?

2.6. a) Have you ever received complaint from contractors concerning the project?

b) If yes what was the common complaints of contractors?

c) Have you ever received complaints from the SMEs concerning the projects?

### **3. Capacity building**

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

a) Type (technical, managerial)

b) Duration

c) Who is responsible?

d) Have you ever evaluated the program?

e) When do they start the job after the training?

f) do you think the support is sufficient enough to allow them execute quality construction?

3.2. Can you tell me about capacity building program for SME?

- a) Type (technical, managerial)
- b) Duration
- c) Who is responsible?
- d) Have you ever evaluated the program?
- E) When do they start the job after the training?
- f) Do you think the support is sufficient enough to allow them execute quality construction?

#### **4. Quality of construction**

4.1. Is there TQM, TQM in place during construction? If not please go to question 4.2

- a) What is the focus of TQM in the construction process?
- b) What quality control procedure the project follows?
- c) Who is responsible to develop quality assurance system?
- d) Is there a team established from each part to ensure TQM?

4.2. Is there any other quality control mechanism for the construction process?

4.3. How do you rate supervisor?

4.4. How do you allocate risks to different parties for the defects during construction?

a) Contractors

b) SMEs

c) HDPO

4.5. Who is liable for defects observed during defect liability period?

4.6. Can you tell me about warranty of construction?

#### **5. Customer satisfaction**

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

a) Do you measure performance o to question? If no please go to question number 5.2

b) How do you measure performance?

c) How often does performance measured?

d) Do you give the feedback to the contractor? If yes answer question e

e) Are improvement observed after the feedback?

f) Is there a reward for performing well?

5.2. Are you attending provisional or final acceptance?

5.3. Concerning defects of construction, what do you observe most often?

Thank you again for taking your time for the interview, if you have any questions please be feel free to ask!!!!

**7.3. Annex 3 –Checklist for observation**

**Annex 1: Annex 4 –Checklist For Observation**

Common defects in building	Building facade									
	wall	Floor	Tiles	Metal sheet	Glass	Roof	window		door	
							glass	handle	Glass	handle
cracking										
Loose plaster in ceiling										
Delamination										
Surface appearance •Surface abrasion •Surface etching										
Corrosion										
Physical appearance •Dentage •Deflection •Wrapping and buckling										
Water penetration/damp										
Sealant defects										
staining										

**7.4. Annex 4 – Field data analysis**

**HDPO and Consultant officer profile**

**Annex 2: Annex 5– Field Data Analysis**

Name	Their position
Mr. Eliyas	Construction follow up and supervision officer

Mr. Girma	Head of MSEs' work progress
Mr. Nagu	MSEs follow up and work progress coordinator
Mr. Tilahun	Consultants' project coordinator
Mr. Tolera	Consultants' project coordinator