ADDIS ABABA UNIVERSITY
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The Assessment of Addis Ababa Housing Development project with particular reference to delays and constraints in its implementation: The Case of HDPO

A Thesis Submitted in Partial Fulfillment of the Requirements for the Master of public managements and policy (MPMP) degree

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Addis Ababa, Ethiopia              Jun, 2017
Statement of Declaration

I hereby declare that this research project, entitled “The Assessment of Addis Ababa Housing Development project with particular reference to delays and constraints in its implementation: The Case of HDPO” is my original work submitted for the award of the for Master of public managements and policy (MPMP) degree at the College of Business and Economics of the Addis Ababa University. It has not been presented for the award of any degree or other similar titles in any other institution of higher learning to the best of my knowledge, and all resources used have been accordingly acknowledged.

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ABSTRACT

Housing projects have an impact on personal, socio-economic as well as political conditions. As a result, it is essential to assess the actual causes of delay and constraint in order to minimize the delays and their corresponding costs and time. Successful completion of projects leads to socio economic growth and helps to provide good social welfare. The objective of this thesis is to investigate the main causes of delays and constraints as well as effects of delays in AAHDPO project. The study were used both Primary and secondary data sources to collect the necessary information. Two type of sampling techniques were used namely random and purposive sampling. Two Projects specifically Koye feche (10/90) and Kileto (20/80) were selected randomly based on the lists from HDPO office. The respondents were contractors, consultants and clients who worked in the Koye-feche and Kileto projects. The structured questionnaire in Likert scale was distributed and collected at a selected site of the case study. There are many causes that induce delay in HDPO construction projects. Before identifying the causes of delays the study was to test whether delay in HDPO had been found/ existing or not. From the above sample survey results understand that more than 78.18 percent of the respondents agreed the HDPO construction is exposed to delay. Moreover, Interviews conducted with some of the officials in HDPO indicated that delay is the main challenge for construction projects. The relative important index (RII) was computed for each cause to identify the most significant causes and later the causes of delays were ranked based on the RII; results showed that the ten critical factors that contribute to project delays in HDPO are; delays in the payment for services, Shortages in basic materials, Slow decision making by all functional group, inaccurate cost and time estimate, poor infrastructure development, poor capacity of contractor and sub-contractor, Poor risk management and inadequate financial availability as planned through project duration. The critical effects of delays are time overrun, cost overrun, litigation/ legal action, Public dissatisfaction or loss of belief of citizen, termination and disputes. After the causes and effects could be observed and provide a clue to minimizing delay on construction sites. This study has also delivered recommendation, all of that will assist client organizations to curb the problems associated with delays and constraints in its project implementation.

Key words: constraints, delay, cause, effect, mitigation, construction, project implementation.
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Acronyms

AAHCPO          Addis Ababa Housing Construction Project Office
AAHDPO          Addis Ababa Housing Development Project Office
CBE             Commercial Bank of Ethiopia
DFID            Department for International Development
ECSU            Ethiopian civil service University
GTZ             German Technical Corporation
HDB             Housing Development Board
IHDP            Integrated Housing Development Program
MUDC            Ministry of Urban Development, Housing and Construction
MSEs            Micro and Small Enterprises
NHBRC           National Home Builder’s Registration Council
PMI             Project Management Institute
PMs             Project Management
PPPs            public-private partnerships
RII             Relative importance index
UNHABITAT       United Nations Human Settlement Program
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CHAPTER ONE

1. INTRODUCTION

1.1 Background of the study

In Addis Ababa there is an ever growing mismatch between the size of population and its demand for basic service (Yinebeb G, 2015). Adequate housing is one of enormous importance to all family members, lack of adequate housing can lead to various problems (M.Alhubashi, 2012). Insufficient housing has contributed to health problems, it is a major cause of environmental hazards and health threatening factors due to lack of habitability, overcrowding, and inadequate services (Habitant III issue paper. 2015).

Sustained high urbanization and population rates derived to extra pressure on already failing and deteriorated urban infrastructure, services, and housing stock. The massive housing needs are unlikely to be met by the small scale housing cooperative, government, and upgrading approaches prevailing from the late 1970s until the mid-2000s, especially considering the high demand by the low-income sector of the population for affordable housing (UN-HABITAT, 2010).

In response to this challenge, the Ethiopian government outlined an ambitious vision for low-income urban and housing development, formulated as the Integrated Housing Development Programme (IHDP). IHDP is a government-led and financed housing provision programme for low-and middle-income households in Ethiopia. The programme was launched in 2004 (1996 in the Ethiopian calendar) by State Minister Arkebe Equbay, then the Mayor of Addis Ababa (UN-HABITAT, 2010). However, assessment of schedule delays and constraints has not been performed by professionals and other organs so far.

Schedule delay is a very frequent phenomenon and is almost associated with nearly all projects in the housing construction industry. This trend is more severe in developing countries where time and cost overruns sometimes exceed 100% of the anticipated cost of the project (Abd El–Razek et al., 2008; Le Hoai et al., 2008).
Schedule delay is a condition when a project is not complete within the settled planned time. The project is slip over its planned schedule and is considered as common problem in housing construction projects. It is very infrequently to see a housing construction project is completed on time. Delays can make the trouble of work and loss of efficiency, other than that completion of project are late, increased time related costs and third party claims and termination of contract. Delays are very costly and always result in disagreements and claims. Therefore, it is important to keep track of project progress to avoid the possibility of delay occurrence or identify it at planning-implementation stages.

Housing construction project comprises two main distinct phases: the preconstruction phase, the period between the initial conception of the project and the signing of the contract; and the construction/implementation phase, during which the contractor must complete construction subject to the conditions of the contract. There is no particular element in any project solely responsible for time overruns however; the construction or implementation phase holds a wider proportion of major troubles (Ghaleb J, 2013)

The risk of the delay in the project creates different by parties involved. For the client or owner, delay means that when intend to use the asset, it's cannot be used, leading alternative accommodation costs to be certified or a delay in receiving income from the asset. Financing cost of the project could also increase, and depending upon the contractual allocation of risk causing the delay, the delay could increase the claims by the contractors.

The responsibility of time overruns is distributed over several causes. Therefore, aim of this research is to identify the main causes of delays and constraints as well as effects of delays in the HDPO construction projects. Consequently this research will be undertaken to give framework that yields new insights towards HDPO construction delay and constraints.

1.2 Condominium development in Addis Ababa

State Minister Arkebe Equbay was the driving force behind the programme during his time as Mayor of Addis Ababa between 2003 and 2005. His main goal was to build low-
cost housing in Addis Ababa. He made a proposal to the German Technical Corporation (GTZ) office to which they responded by setting up an office in Addis Ababa (UN-HABITAT, 2010) and the city administration has undertaken a pilot project, which constitute the construction of 700 housing units to test the effectiveness of the program. After the successful completion of the pilot project, the programme has been scaled-up to its full scale and become one of the major tasks of the city administration in each fiscal year (Solomon k. 2014).

The pilot project consisted of 700 residential units along with office and commercial units. GTZ managed the project on behalf of the city government and the project was extremely successful in terms of cost and time. When the government suggested building upwards of 40,000 houses every year, GTZ declined to continue their direct involvement with project design and implementation, instead taking an advisory role. To achieve such ambitious targets, GTZ recommended that the government create a new office specifically for housing development, which they did in 2005 by establishing the Addis Ababa Housing Development Project Office (HDPO) (UN-HABITAT, 2010).

The HDPO has been implemented with multiple objectives, namely increasing the urban housing stock; upgrading dilapidated neighborhoods; achieving economic use of land; improving the image of cities; generating employment for the youth and women by encouraging their involvement in small and micro enterprises (SMEs) engaged in construction, wood and metal works and that supply different inputs to the construction of condominium apartments; empowering the youth and women by providing them better access to jobs and housing; promoting private and national saving; building the asset base of individual families by making them home owners; promoting low cost housing construction technologies; and contributing towards developing a modern construction sector. Thus the project intends to contribute towards alleviating poverty (Ministry of urban development, housing and construction (MUDHC0) and Ethiopian Civil Service University ECSU (2015), and ethiopianreview.com [Accessed: 5th Oct 2016]).

The Addis Ababa City Administration has managed to transfer a total of more than 173,000 units via 11 rounds of lottery draws until 2016, without including those under
construction, but more than one million people of Addis Ababa are waiting for condominium capitalethiopia.com [Accessed: 5th Oct 2016]). So far the implementation of the HDPO in Addis Ababa is still in the big demand for housing.

Praising this project does not mean that it absolutely clean of any kind of problems or face no challenges. Being the first in its kind and massive in its scale, the program has encountered the following problems:- Almost all of the target residents are used to live their entire life at ground level where they have a strong attachment to the natural ground. The houses constructed in the project are G+4 and above that force people to live on floors contrary to their way of life is not used to be. At initial times complaints are heard and people have resisted living on floors and on the other hand, private owners are complaining about the amount of compensation they are paid as it is less than the market price, and the other problem that many are sharing is that the program has not included the poorest of the poor; residents with no or limited income which have difficulty to fulfill the minimum upfront payment, which is set as requirement (UN-HABITAT 2010).

Generally, asset in the shelter (house) not only improve or expand available stock of housing unit, but improve both the working and living environment. Even if shelter is a basic human need, it is also more than housing, is about everything other than houses, it provide different facility like making privacy, decreasing exposure risk and other, and the city administration started the Project primarily to reduce this shortage of housing and provide a house that meets the minimum standards (kitchen, toilet and bath facilities) to low and middle income people and achieve its target in reducing poverty. To this end, the construction of condominium houses is under way.

1.3 Statement of the Problem
The urban population of the world has grown rapidly, from 746 million 1950 to 3.9 billion in 2014. Continuing population growth and urbanization are projected to add 2.5 billion people to the world”s urban population by 2050 (UN department of economic and social affairs, 2014). Every day, people are born in or move to urban centers in search of various opportunities, the demand for housing grows by 2025 globally billion new houses are needed to accommodate 50 million new urban dwellers per year costs are estimated at
USD 9 to 11 trillion by 2025 (UN-Habitant and African development bank, 2015). As a result, urbanization and population growth are already huge factors in housing provision; an increases in the urban population of countries have intensely increased the demand for housing.

Housing problem is one of the key problems facing in Addis Ababa; the housing stock is by far inadequate in quantity and quality to meet the need of the residents (UN HABITANT, 2010). In Addis Ababa there is a shortage of 400,000 units (Solomon k. 2014). The housing deficit is set to increase concurrently with the foreseen high population and urbanization growth. In reaction to this challenge the city administration organized housing development project office (HDPO). However; assessment of delays and constraints has not been performed.

Time delays and cost overrun are closely associated with the construction of residential projects (Koushki, Al-Rashid and Kartam 2004), delay in project results increase of project time and cost, which is undesirable for all beneficiaries, they all lost, people because of unavailability of social benefits of the project, contractors because of increase recourses cost and the employers because of lost profit. When the execution time of project increases, the following financial changes happen in the projects: - increases materials and facilities cost of inflation and increases in current expenditure of projects (Abdollah Sepahi, Safiya Bakhshani and Nasser Dehani 2016). Increases the price of resource sharply and continuously makes client not to afford to buy them at the time needed (E. Asnaashari, A. knight & A. Hurst, 2010).

From the above interpretation this study understands that delayed or poor project performance delivery and constraints particularly in housing sector usually results:

- The difficulty of getting affordable rental housing units remains the most significant problem for low-income class. These groups spend more than what they expected the rental costs would be. This cost- burden will affect the purchasing power of clients to get units of house (condominium).
As long as there is delay of housing construction, the houses continue overpriced and out of reach for the lower income group. The risk is that as housing prices increase, the society will be forced to additional cost (affordability will be significantly worsen).

The city administration allocate huge share of annual financial budget to the HDPO. If these projects are delayed, it will not only slow down economic growth in the city but it will also increase the city administration expenditures. This will be due to increasing of market price; the cost for the construction also will increase because the price to buy the material and to pay the labor salary will increase too. The result will be wastage of city’s resources that could have been used to for other welfare purposes. Furthermore, if these problems continue, it will lead to more serious problems in the future upcoming HDPO construction project in the city.

In addition, housing problem is going to be one of the biggest social and political issues, there is evident that majority of people are living in overcrowded environments, this has pull undesirable living condition, and this will lead to public dissatisfaction.

Therefore, housing projects have an impact on personal, socio-economic as well as political conditions. As a result, it is essential to assess the actual causes of delay and constraint in order to minimize the delays and their corresponding costs and time. Successful completion of projects leads to socio economic growth and helps to provide good social welfare.

Earlier studies focused on financial aspect project and objective of condominium or public construction project, for example “major challenges of accessing housing project finance in Addis Ababa” by Yinebeb G. (2015).And “Assessment on the Performance of integrated Housing Development Program with Particular Reference to the Objectives of the Program: Focusing on Addis Ababa” by Kidst M.(2014), kidst M. has noted that AAHDPO has encountered a number of problems related to finance, and she tried to explain objective of IHDP program and availability of resources particularly financial resources for the construction of condominium houses. According to her findings, most of
the condominium houses have been constructed using poor quality or substandard construction materials and finishing items which in most cases fail to operate immediately upon completion of construction or shortly after they are put in use. However, she didn’t identify the main causes of delays and constraints in HDPO projects.

Most studies conducted in the area of project delay in public building construction project in Ethiopia are more than 9 years old, for instance “Cause and effect of cost overrun on public building construction project in Ethiopia” by Fetene N. Still there is a lot public building construction projects run behind schedule and suffer with cost overrun. Therefore, public building constructions or similar undergoing projects and HDPO need up to date investigation.

The reason to conduct this study largely depends on personal observation and different sources guessing that there are a lot of HDPO projects lagging behind (guessing without investigation), in addition housing construction delay and constraints in HDPO has not given sufficient attention from research professionals and other organs so far. Therefore there is need to assess the causes of delays and constraints in HDPO project implementation. This will be useful to the owners and/or contractors for timely completion of the projects at a reasonable cost and time.

1.4 Research Questions

This study aims at raising the following basic questions and responds to them based on the data,

1. Are the HDPO construction projects affected by time overrun so far?
2. If so, what are the major causes to such schedule delays?
3. What are the consequences of delays of HDPO?
4. What are the achievements of HDPO?
5. What are the main constraints faced during the implementation process of HDPO projects?
1.5 Objective of the study

1.5.1. General Objectives
The aim of this research is to identify the main causes of delays and constraints as well as effects of delays in the HDPO construction projects.

1.5.2. Specific Objectives
Deriving from the above, the study sets out to examine the following specific objectives.
1. To check whether the HDPO projects are behind schedule.
2. To identify the cause and consequences of delays in the HDPO projects.
3. To see the HDPO project achievement.
4. To assess main constraints faced during the implementation process of HDPO projects.

1.6 Significance of the study
The findings of this research will add to the relevant knowledge on the cause and effects of delays and constraints in HDPO projects execution. The study can be used as an input to the stakeholders who look for to skills an occupational ideal that is capable of developing housing schemes.

As HDPO, exploring its cause and effect of delays, and constraints in its implementation of housing projects, that will help to improve the capacity and competency of project implementation in the future. This will further help the project to meet its objective. Moreover, this study could also contribute solutions to similar undergoing projects in the country as a whole.

Also findings from this study will develop framework for future studies, and help to assist or detect areas of further research.

1.7 Limitation of the study
It is important to know that the findings of this study cannot be generalized due to its limited scope.

1. This study reviews some of the major causes of delays in the HDPO construction and the effects of these delays on projects. Therefore, the study did not cover the quality of housing project.
The findings are based on analysis of data collected from only two HDPO sites.

Again the study is focused on the causes and effects of delays by project parties (namely; contractors, consultants and clients) which tends to vary and may not always be reliable, the study did not contact other stakeholder like end user and other

Furthermore, the study did not distinguish between ranking by individual project parties. However, the findings are consistent with similar studies assessing the causes and effects of construction project delays

1.8 Scope of the study

This study focuses on the causes, effects and delays and constraints of HDPO condominium projects in Koye-feche and Kilinto site, the population of the study comprises the stakeholders of HDPO construction projects such as owners (selected HDPO projects), contractors and consultants who were involved in the construction process of HDPO construction projects, and this research thesis will be taken (considered) for the study completed HDPO projects from year 2004-2008 Ethiopian Calendar.

1.9 Organization of the study

This study paper is organized into five chapters. Each chapter focuses on the below points as follows:

The first chapter provides the introductory aspect of the study which encompasses the background of the study, statement of the research problem, the research question, and objective of the study, significance of the study, scope of the study and limitation of the study.

The second chapter explores the related literature on the subject matter: - From the available literature, this chapter composed an overview of the definition and various types of delay that can encountered in a projects. It also includes the overall delays concept along with the causes, effect and further classification of delays, responsibilities that the parties have in a delay, mechanism to minimize taken when delays happen.
Chapter three explains method / methodology:-This chapter gives an overall view of research methodology for the research and includes the method of data collection and questionnaire type

Chapter four presents the data analysis:-This chapter focuses on analyzing collected data and discussing the findings. It contains the analysis of the information gathered through the questionnaire, interview and document review survey, identifies the critical causes, effect and mechanism minimize delays of HDPO based on RII, and analysis that support the recommendation and conclusion of the study.

The last chapters end-up the study with a conclusion and recommending a solution to the problem
2. LITERATURE REVIEW

This part will give a holistic view as to how effective project tools and techniques are applied, how to attain the objective of project. More attention will be paid to theoretical project life cycle and project delays and constraints.

2.1 Overview of project and project management

According to Kerzner (2009) the term project can be considered to be any series of activities and tasks that:

- Have a specific objective to be completed within certain specifications
- Have defined start and end dates
- Have funding limits (if applicable)
- Consume human and nonhuman resources (i.e., money, people, equipment)
- Are multifunctional (i.e., cut across several functional lines)

Project, was also defined as collection of linked activities carried out in an organized manner with clearly defined start point and finish point, to achieve some specific results that satisfy the needs of an organization as derived from the organization’s current business plans (Trevor L. 2007). This is what clearly entails a project; it’s a unique undertaking, with defined beginning, ending and allocated resources, aiming to bring about change in an organization for the better result. Kerzner (2009) Successful project management can then be defined as having achieved the project objectives:

- Within time
- Within cost
- At the desired performance/technology level
- While utilizing the assigned resources effectively and efficiently
- Accepted by the customer

If a project is defined in such a way, project management is then the application of knowledge skills, tools and techniques to project activities to meet project requirements. This is accomplished through the use of initiation, planning, execution, monitoring and controlling, and closure process (PMI, 2013).
In the study of Westland j. (2006) Project Management was defined and briefly explained as the skills, tools and management processes required to undertake a project successfully. These skills, tools and processes are three components that are required to set up a project keep it on track and close it successfully. The roles of the three components are identified as follows:

- **Skills**: Special knowledge, skills and experience are required to reduce the level of risk and increase the likelihood of success of a project.
- **Tools**: Tools are used by project management (PMs) to improve the chance of success. Examples are checklists, specific software, templates etc.
- **Processes**: Various processes and techniques are used to monitor and control time, cost, quality and scope of projects.

Therefore Project manager should improve its skills, tools and processes in order to improve the success rate of a project, these project management’s skills, tools and processes are used to manage an every project, this is accomplished through the use of initiation, planning, execution, monitoring and controlling and closure process. On the other hand, Kerzner (2009) this Project management process as identified as the Guide, namely:-Project initiation, Project planning, Project execution, Project monitoring and control and Project closure.

These processes (the five life cycles) have been organized into ten knowledge areas; these are Project Integration Management, Project Scope Management, Project Time Management, Project Quality Management, Project Human Resource Management, Project Communications Management, Project Risk Management, Project Procurement Management and Project Stakeholder Management (PMI, 2013). These ten knowledge areas are applicable to every project management and identified these ten knowledge areas that a project manager must be familiar with for a successful implementation of a project work (PMI, 2000).

Project is typically of shorter duration and more risky than any business, so projects will be paying attention on the formation of a set of deliverables within agreed cost, time and
quality parameters. The vital goal of a PMs is to recognize output and returns of strategic consequence, to achieve this a project is designed as a temporary flexible organization structure created to coordinate, direct and oversee the implementation of a set of related projects and activities in order to deliver output and returns related to the organization’s strategic points.

Project usually requires the dedication and active participation of more than one organization to achieve the desired output. A project delivers, or enables one or more profits i.e. measurable result from an output and perceived as an advantage by one or more stakeholders.

2.2 Construction project life cycle
Project Life Cycle explains the entire developmental history of project in detail, provides a comprehensive description for each of the critical project activities. According to Trevor L. (2007) project has such specific characteristics, all limited by time; it naturally goes through a life cycle, just as a product does. The difference here is that the life cycle is dynamic and subject to reiteration at any time during the project. All projects given an initial approval to start go through a similar life cycle. According to ec.europa.eu/regional [Accessed: 5th Oct 2016] has drafted a construction project life cycle in which all stages of a typical project life cycle are:-

2.2.1 Project Specification and feasibility
Project initiation is the first stage of every project, after the individual or the organization has recognized the need to carry out a project for a specific purpose. This Process Group includes all processes related to answering the question „„what do you need to do?“” (Wysocki, 2009). It consist of such processes of initial scope definition, identification of stakeholders, (both internal and external), as well as the selection of project manager. All this information is captured in the project charter and the stakeholder register (PMI, 2013)

At this stage the project cycle is the definition of what the requirement is and how it can be satisfied. This includes deciding on the size and quality of facility that is required. Different options will be discussed at this stage and evaluated in terms of broad cost
estimates, expected operational performance and economic benefit. Preliminary cost estimates may be attempted at this stage (ec.europa.eu/regional [Accessed: 5th Oct 2016]).

According to Umhlaba consulting group (2013), is a stage providing input and opinion on feasibility of projects. Assist with beneficiary information gathering. Assist with general data gathering. Comment on more technical feasibility studies. Commission and provide alternative feasibility analysis where deemed appropriate

Although the economic and financial evaluation of the project is probably the most obvious element of the feasibility stage, external factors can play a major role in determining whether a project will proceed. The project’s political context, its relationship with the local community, the general economic environment, its location and the physical conditions in which it will be built, are the most important external factors will be analyzed (ec.europa.eu/regional [Accessed: 5th Oct 2016]).

Figure 1 construction project life cycle

2.2.2 Outline design/planning
According to Wysocki, the planning process group includes all processes related to answering the question „how will you do it?””. These processes are as follows: Defining all of the tasks in the project, estimating how long it will take to complete each task and the entire project, estimating the resources required to complete the work, estimating the total cost of the work, sequencing the work, building the initial project schedule, analyzing and adjusting the project schedule, writing a risk management plan, documenting the project plan, gaining senior management approval to launch the project.

PMI (20013), also describes that planning process group as those processes performed to establish the total scope of the effort, define and refine the objectives, and develop the course of action required to attain those objectives. This process helps develop the project management plan and the project documents that will be used to carry out the entire project work.

2.2.3 Consent and site acquisition
Before construction work can start, the necessary consents and authorizations must be in place. The time taken to obtain these is probably the most unpredictable element of a large infrastructure project and can have a significant effect on the timetable and costs. In addition to institutional approval, consents may also need to be obtained for health and safety, water, sewerage, waste disposal, fire certification, gas, electricity and highways rights. A project cannot proceed if the project sponsor does not own or have development rights for the land. With projects implemented by local government authorities, the compulsory free/purchase of land can be undertaken. (ec.europa.eu/regional [Accessed: 5th Oct 2016]).

2.2.4 Detailed design
The detailed design of a project is used to assess the quantities of materials required and the actual construction work involved in implementing a project. Drawings and lists of quantities are then used to produce detailed project costs and to establish an implementation timetable (ec.europa.eu/regional [Accessed: 5th Oct 2016]).
2.2.5 The construction contract/ execution process

The PMI(2013) defines the execution process group as those processes performed to complete the work defined in the project management plan to satisfy the project specifications. This Process Group involves coordinating people and resources, managing stakeholder expectations, as well as integrating and performing the activities of the project in accordance with the project management plan. It is a stage that many changes do occur to the initial project plan which requires the necessary updates to meet the project specifications.

This includes changes to expected activity durations, changes in resource productivity and availability, and unanticipated risks. These changes usually affects the project management plan in such a way that it may require further analysis and actions which can lead to a change to the project plan. It is worth noting that, it is a stage that the major part of expenses of the project occurs and the responses to the new changes affect the deliverables of the project negatively or positively depending on how the project manager response to those changes

According to Umhlaba consulting group (2013), Implementation / Construction stage is gaining of construction (and other) training and provide labor for housing projects. Provide assistance to emerging contractors, where possible. Assist in sourcing labor and materials for Human Settlement development projects

According to ec.europa.eu/regional [Accessed: 5th Oct 2016], this stage involves the actual construction of the project. Contractors can be legally bound to undertake the work under a number of different contractual arrangements. Before a contract is agreed, a decision must be taken about the basis upon which the contractor will be paid. The factors which may affect the decision on payment method will include:

- The degree to which design information is available when contract documents are prepared;
- The institutional rules of the public sector funding parties (including the Commission);
- The nature and size of the project;
• The general economic context;

• The time period available to produce tender documentation; and

• The time available to undertake the work.

The following are some different methods of actually paying the contractor for the construction work:

• fixed lump sum, with payment usually on completion;

• target lump sum (as above but with more flexibility);

• Progressive payment according to tasks completed, (based on agreed rates for specified tasks or quantities of materials used);

• Progressive payment according to human resources expended, (based on an agreed schedule of hourly/daily rates).

2.2.6 Project Handover
This is the final stage of a project where all the necessary activities are carried out across all the project management process groups to officially bring the project to an end. This is done to make sure that all the defined activities are completed within all the process groups to formally conclude that the project is complete.

The PMI (2013), identified the following as the activities perform to bring a project to a closure:

- Obtain acceptance by the customer or sponsor to formally close the project or phase.
- Conduct post-project or phase-end review.
- Record impacts of tailoring to any process.
- Document lessons learned.
- Apply appropriate updates to organizational process assets.
- Archive all relevant project documents in the project management information system
➢ (PMs) to be used as historical data,
➢ Close out all procurement activities ensuring termination of all relevant agreements, and
➢ Perform team members’ assessments and release project resources (PMI, 2013).

The above processes are done irrespective of whether or not the project was fully completed. In instances where there is termination or conciliation of a project the necessary closing procedure must be taken to document the reasons why the project was terminated.

In the study of ec.europa.eu/regional [Accessed: 5th Oct 2016] is date for the handover of a project from the contractor to the project sponsor is usually included as an element of the contract. For many reasons this may vary from what was originally agreed in the contract. Many projects include financial penalties (or rewards) for late (early) completion of a project. A percentage of the total project costs may also be retained until the project sponsor is satisfied that the project has been completed as specified.

Together, project feasibility study must receive a serious attention and must do carefully, particularly for government funded project. Design stage or planning at the early stage of construction is crucial to minimize any major risk of difficulties during the execution or construction of works. Effective project planning and implementation require a competent and experience personnel. Where possible, project managers need to have experience and qualifications in project or construction management so that we can effectively utilize well the project management tools that are available.

Monitoring is part of good project management tool and should take place throughout the project cycle and culminate in formal annual reviews and project completion reviews. A continuous process of monitoring helps to track the performance of implementing partners, strengthen feedback loops and ensure that project adapt to changing realities on the ground (DFID Smart rule, 2014).

Project gets closed once they achieved the intended purpose as articulated in the design stage. Project closure should follow well-planned activity.
A well planned and clean close down of project gives a sense of a job well done and satisfaction for everyone who has been involved. This phase requires ensuring that closure is carried out in a controlled and organized manner, just like all the work that was done before, and preparing a final summary report of the project’s performance.

2.3 Project constraints
According to Westland j. (2006), Development Project requires analyzing and identifying problems, constraints and opportunities which should be address.

Every project has a definite start date and end date, yet the specific activities and deliverables that take place in between vary from one project to the next. Development project have lifecycles which serve as a framework for managing problems, constraints and opportunities

Constraint is an applicable restriction that wills affects performance of the project. For example a predefined budget is a constraint that is highly likely to limit the team’s option regarding scope, staffing and schedule. When a project is performed under contract, contractual needs will be generally being constraints. Another example is requirement that the product of the project be socially, economically and environmentally sustainable, which will also have on project scope, staffing and schedule (PMI, 2008).

Project can be influence by constraint (cost, time and quality). The relationship among these factors is such that if any one factor changes, at least one factor to be affected. For example if schedule is shortened, often the cost needs to be increased to add additional resources to complete the same amount work in less time- if a cost increase is not possible , the scope or quality may be reduced to deliver a product is less time for the same budget. Project stakeholder may have differing ideas as which factors are the most important, creating an ever greater challenge. Changing the project requirement may credit an additional risk. The project manager must able to assess the situation and balance the demand in order to successful project (PMI, 2008).
Triple constraint or project management triangle (cost, time and quality) are heavily linked during project planning and execution cycle. Managers must understand the impact of the change on the remaining constraints:-cost, time and quality. Equipped with this information the project manager will be able to determine if implementing the proposed change would be beneficial. When change is determined to be beneficial to the outcome of the project, the project manager must track the method defined in the project plan to implement the change.

On the other hand, Wysocki (2009) identified five constraints that every project faces in its life cycle. These are: Scope, Quality, Cost, Time and Resources. The project plan will have identified the time, cost, and resource availability needed to deliver the scope and quality of a project. In other words, the project is in equilibrium at the completion of the project planning session and approval of the commitment of resources and money to the project. That will not last too long, however. The scope triangle offers a number of insights into the changes that can occur in the life of the project.

![Figure 2. The scope triangle](image)

Source: (Wysocki, 2009).
Managing project constraints of time, budget and scope is important, but managing these constraints effectively does not guarantee success in the eyes of all project stakeholders. Other constraints mix into these and affect a project’s success. Ellen I. and Janet J. (2007) suggest that important other constraints should be considered.

2.3.1 Resource constraints

2.3.1.1 Financial/Economical
The economic constraints mainly happened with budget limit and allocation of the money. Due to the budget limit, the adopted construction system may not be the best option for achieving the project goal and quality. It will affect the proceeding of the project. As for the allocation of money to be used in the project, if the money is not effectively allocated, it will affect the progress of the project. The effect on the project is the product quality and performance of the project. In summary, if economic constraints for the project could not be managed well, the product/performance/function/quality of the project will be affected (Ellen I. and Janet J., 2007).

Funding Problems:

Overall lack of finance to complete a project or delays in the payment for services by the project sponsor can lead to significant problems arising. If the costs of a project have increased significantly beyond the original estimate, then work on the project may have to stop or be delayed until additional funds can be found. Funding problems can also arise if funds allocated to one project have been diverted to other projects within a project of development. If the payment of invoices by a project sponsor is slow, the contractor may begin to commit less resource to a project, and may even cease work if cash flow becomes a problem. ec.europa.eu/regional [Accessed: 5th Oct 2016].

2.3.1.2 Lack in construction materials and equipment management
According to Joseph A. and his colleague (2007), aspects of project management that are particularly challenging are availability of raw material that can affect project schedule. For instance steel and cement are not as readily available. Since many construction projects use steel (for piping, racks, supports, scaffolding, etc.) and cement, this material shortage can also contribute to increasing project costs and schedule delays.
During periods where the level of development activity is unusually high in a particular region, there may be shortages of some construction materials, construction plant (machines and equipment used during construction) and service plant (equipment used in the operation of the infrastructure project). If this was not anticipated in the original cost estimate, delays may occur and/or the prices of these elements increase.

So that delivery of construction materials to a site should not be late, that work may be executed in the planned order. Materials related constraints are shortage of materials, material fabrication delay, slow delivery of ordered materials, and noncompliance of material to specification, unforeseen material damages and material procurement problem.

2.3.1.3 Manpower factors
Joseph A. and his colleague (2007) reported that there are also factors that can affect schedule, which the Project Manager has no control over. One is the workforce in the area that the project is being undertaken. If that particular area is undergoing a labor shortage, then the Project Manager should realistically build that into their initial project schedule. If the workforce isn‟t available at the ideal numbers required, then the schedule will be impacted. Unless the project management team is prepared to import workers (from another area of the country) then they have to add the cost of project delays into the overall cost and schedule. Will not have enough skilled workers in construction industry to meet the needs on project is another challenge.

The availability, quality and experience of the labor force can have a major impact on projects. Unqualified workers may lead to inefficient work, cause accidents and low productivity during construction. Labor related constraints are labor injuries/accident in site, Low productivity, Labor disputes and strikes, weak motivation, unskilled labor, Shortage of manpower and Absenteeism.

2.3.2 Legal constraints
Ellen I. and Janet J., 2007 (2007) reported that legal constraints exist because there are many regulations that are ruling the construction project. The legal constraints are mainly
related to work law, safety regulations, and supervision plan. As for the impact of the legal constraints, from one side, it may affect the schedule and lead to project delay. From the other side, it may affect the planning and progress of the project.

2.3.3 Environmental constraints
The public concern and regulations require the environment to be protected such as air protection, tree preservation, traffic limit, noise control and so on. In the planning and design stage of the project, the responsible people need to go to the “Environmental Department” to apply for the approval/justification for the project. This takes time and will affect the project progress. If the approval is not obtained on time, the whole project will be delayed, or could not be carried out. There are also other technical constraints arising from air protection, tree preservation, traffic limit, limit due to excavation permit for works, etc. (Ellen l. and Janet J., 2007)

2.3.4 Technical constraints
Ellen l. and Janet J., 2007 (2007) reported there are quite a few technical constraints arising from restrictive site area and congested surroundings which are particularly applied. On one hand, building projects are usually constrained with restrictive site area where storage space, transportation and temporary works require input of careful planning by design engineers, while the design and construction of the building works itself can be fairly certain at the outset. On the other hand, coordination of services works also poses technical constraints in construction. While having electrical wiring, ventilation duct work, fire services and plumber works with further complication of broadband alignment, telephoning system and security system give rise to technical constraints that demand coordination and collaboration of multi parties in terms of design and construction. Technical constraints are more readily recognized at the outset and at the stage of design, but this does not mean that all constraints can be overcome.

2.3.5 Social constraints
According to Ellen l. and Janet J., 2007 (2007) Social constraints include factors that may arise as a result of wider interest in or opposition to a project. Public concern and media can often impose greater scrutiny/examination and tighter constraint on project. Project funded using public money are often subject to social constraint, as there tends to be
greater interest in cost escalations, delay and so on. The social factors constitute constraints in the construction working environment, social constraints usually come from the people. Inadequate assumptions or bad judgment arising from human constraints can bring disaster. Frustration, lack of motivation and mistrust will destroy morale and commitments to work.

Together, all of the efforts that managing these constraints result in accomplishment of the project objective, leaving the management satisfied that full scope of work is completed in a quality manner, within budget and on time.

2.4 Risk management
Dealing with the risk inside project is not much differed from dealing with any business; business risk is more general and relates to the organization whereas project risk relates to the specific project objectives (Paul n. 2015).

Kerzner (2009) cited that risk is a measure of the probability and consequence of not achieving defined project goal. Westland j. (2006) also said that risk management process is a method by which risks to the project are formally identified, quantified and managed during the execution of the project. The process entails completing a number of actions to reduce the likelihood of occurrence and the severity of impact of each risk. A risk process is used to ensure that every risk is formally identified, quantified, monitored, avoided, transferred and/or mitigated.

According to Interact (2007), basic risk management is important for every project, but the level of detail needed varies depending on the size of the project and the number of risks and possible impacts on the achievement of the objectives. Identifying risks and outlining contingency measures should be a task for every partnership, regardless of whether this is required by the program or not. This process involves three steps:

1. Risk management planning
2. Identifying risks
3. Assessing risks
4. Risks response here are four possible strategies for dealing with project risk that may negative impact s on the project (Paul n. 2015):-
Managing project risk requires that we spend some time envisioning (picturing) those factors that could cause the project to fail or to be compromised.

Once we have identified those factors, we need to create response plan or mitigation strategies to reduce their potential impact or probability. The goal is to manage risk proactively rather than being passive to risk, which places in the position of reacting to conditions that we might have been able to anticipate and plan for.

### 2.5 Project delay

Delay is considered as most important cause of construction badly-behaved, before defining the causes and effect of a delay on the project, one must recognized type of delay. According to Ahmed et al., (2002), delays can be grouped in the following four broad categories:- Non-excusable delays, Excusable non-compensable delays, Excusable compensable delays and Concurrent delays, from the literature cited by Abd Majid (1997), delays classified three type- excusable delay with compensation delays, excusable delay without compensation delays and non-excusable delays. For the purpose of this research, the types of delay that been established by Shaikh Asif Abdus (2009):

1. **Critical delays and Non-critical delays**
2. **Excusable Delays and Non Excusable (Contractor Caused) Delays**
3. **Compensable (Owner Caused) Delay and Non-Compensable Delays.**
4. **Concurrent delay & Non concurrent delay**

**2.5.1 Critical delays and non-critical delays**

Shaikh Asif Abdus (2009), defined that baseline master program prepared in line with the conditions of contract has a CPM. The critical path is the longest path in the network. The delay to the project occurs when an activity on the critical path is delayed and they have an impact on the success of activities and the overall project. Such activities known as critical activities are important and it should be ensured that his activities on the critical path are not delayed.
Therefore, delays that affect completion time are known as critical delays and which do not affect project completion time which mentioned in contract is known as non-critical delays

2.5.2 Excusable delays and non-excusable (contractor caused) delays
According to Ahmed et al., (2002) Non-excusable delays are delays, which the Contractor either causes or assumes the risk for. These delays might be the results of underestimates of productivity, inadequate scheduling or mismanagement, construction mistakes, weather, equipment breakdowns, staffing problems, or mere bad luck. Such delays are inherently the Contractor’s responsibility and no relief is allowed. These delays are within the control of the Contractor, factor that contributes to the non-excusable delay:-
• The usual weather and as expected whether,
• Delay cause by subcontractor,
• The inefficiency of contractor to manage the construction site.
• The financial of contractor.
• The lack of labor.
• Failure to manage their work according to the contract schedule.
• Always make mistake or failure to fulfill of owner specification.

Shaikh Asif Abdus (2009) added that any delay to the project which is solely due to the contractor is regarded as a non-excusable delay. It becomes the responsibility of the contractor and entirely his risk for the delay and the owner is entitled to claim any delays to the project in line with the terms and conditions as stipulated in the contract. The claim by the owner in such cases of delay the contractor is normally related to penalty and or liquidated damages. The owners claim for the contractors delay usually range from delayed commencement of work at site, failure in proper coordination affecting progress of works, inability to finalize, order and procure in time and insufficient manpower to carry out the works in line with the program of works.

Therefore, Excusable delay is unforeseen activity which is beyond control of contractor. In this type of delays nobody is liable for penalty. Non-excusable delays are within control of
contractor and Non excusable delays are responsibility of contractor and client may be entitled for the compensation

2.5.3 Compensable (owner caused) delays and non-compensable delays
Dayang Sabriah Safri (2009) explains delay that is compensable is compensable to the contractor but non-excusable to the employer. On the other part, a delay believed as non-excusable is compensable to the employer because it results in levying of liquidated damages. compensable delay is when the contractor will be receives payment due to the additional cost of delay and as well as addition to a time extension for contract performance, if there is any change inscape of work, late supply of owner materials or information, delayed site access, differing site conditions and failure to provide timely and review drawings.

The major elements that represent of non-compensable excusable delays include events such as following
1) Unforeseen events. Unforeseeable causes generally refer to future events, not existing causes. By contrast, conditions of which the contractor should have been aware are not considered unforeseeable.
2) Events beyond the contractor's control. These are cases in which work on the project is impossible.
3) Events without fault or negligence. Such events are those in which the contractor is blameless, such as acts of god and labor or material shortages beyond what was expected at the time the contract was made

According to Shaikh Asif Abdus (2009), the owner is responsible for both the time and cost effect of the delay. The contractor may claim the owner interfered with the work, did not deliver owner-purchased equipment or supplies on site as promised, or that the owner’s actions or inaction caused other delays. An owner cannot contract out of its obligation to pay for compensable delay, although it may be able to limit its liability for such delays.
2.5.4 Concurrent delays and non-concurrent delays
In these situations neither party is responsible to the other for any costs associated with the delay. These delays are those that are typically included in force majeure clauses abnormal weather, labor strikes, acts of God, acts of war, etc.

According to Ahmed et al., (2002), until the development of CPM schedule analysis, there was no reliable method to differentiate the impact of Contractor caused delays from Owner-caused delays. With the sophisticated computerized techniques now available, however, it has become possible to segregate the impacts of apparently concurrent Owner and Contractor delays. Concurrent delays refer to delay situations when two or more delays occur at the same time or overlap to some degree.

However, if there are two concurrent causes of delay, one of which is a relevant event, and the other is not, then the contractor is entitled to an extension of time for the period of delay caused by the relevant event anyhow the concurrent effect of the other event.

There are many factors that contributed to causes of delays in construction projects, these from factors inherent in the technology and its management.

2.6 Causes of project delay
A number of studies have been conducted in regard to delays in projects for many decades with scholars advancing various factors and groups of factors that contribute to causing delays.

According to Abdul-Rahman H. (2006) delays in projects are considered one of the most common problems causing a multitude of negative effects on the project and its participating parties. Along with delay, the frequently faced consequences are project failure, reduction of profit margin, and loss of belief of citizen in government funded projects, etc.

According to Ahmed et al. (2002), there are two kinds of causes for delays in projects: external and internal causes. Internal causes of delays include the causes, which come
from four parties involved in that project. These parties include the Owner, Designers, contractors, and consultants. Other delays, which do not come from these four parties, are based on external causes for instance from the government, material suppliers, or weather. For the purpose of this study cause delays generally fall into four categories:

2.6.1 Delays due to client related factor
Shaikh Asif Abdus(2009) in his study the case of projects where there are contracts that are awarded solely on the basis of the cost then these projects are likely to suffer delays as proper of evaluation of the subcontractors has not been done. The subcontractors who have quote low or simply missed out on any items will fail to perform thereby delaying the project. In fact the owner may end up losing more money if the project is delayed and the returns expected from the project get delayed. Also, by deploying the contractors or subcontractors without checking their credentials and performance, the owner is risking the quality of the project and his reputation.

Kerzner (2009) has added the companies provide services or products based on the requirements set forth in invitations for competitive bids issued by the client or the results of direct contract negotiations with the client. One of the most important factors in preparing a proposal and estimating the cost and profit of a project is the type of contract expected. The confidence by which a bid is prepared is usually dependent on how much of a risk the contractor will incur through the contract. Certain types of contracts provide relief for the contractor since heavy risks exist. The cost must therefore consider how well the contract type covers certain high- and low-risk areas. Prospective clients are always concerned when, during a competitive bidding process, one bid is much lower than the others. The client may question the validity of the bid and whether the contract can be achieved for the low bid. In cases such as this, the client usually imposes incentive and penalty clauses in the contract for self-protection. Because of the risk factor, competitors must negotiate not only for the target cost figures but also for the type of contract involved since risk protection is the predominant influential factor. The size and experience of the client’s own staff, urgency of completion, availability of qualified contractors, and other factors must be carefully evaluated. The advantages and disadvantages of all basic
contractual arrangements must be recognized to select the optimum arrangement for a particular project.

from the view of Shaikh Asif Abdus (2009) The successful completion of the project in terms of cost and time has an influence which can be a positive factor as well as a negative factor is the decision making process which is greatly influenced by the owner. Sometimes the owner’s influence is also taken as the owner’s interference. Dayang Sabriah Safri (2009) in his study has described the Clients must make quick decisions regarding any matter that arise during the project execution. Low speed of decision is due to incompetent person who handle the project from the side of client, also the person might be having too much project to be handled in at the same time. Therefore, Government establishes a standard number of projects to be handled in one time; one staff should handle appropriate number of project and sufficient number of professionals should be provided in client part. Hence, this can avert the slowness of decision making made by client.

Some study expose that financial difficulties of owners and contractors, contractor's inadequate experience, and shortage of materials are the main causes of delay on projects. According to Joseph A. and his colleague (2007) Project Managers are challenged throughout the life of a project is that of finance-cost. In some cases, projects are started out with misinformation, because the project estimate is made to appear lower than it would be in reality, in order to get final project approval. In order to maintain a more accurate picture of project costs project controls and project accounting must be involved from the very beginning. There also needs to be a process in place for tracking any changes in scope, and forecasting any additional cost that may arise from scope change. In order for project controls to be effective, the project management team should have regularly scheduled update meetings (with a consistent structure) and standardized reporting formats. This will help ensure that information is clear and unaffected by varying ways of tracking and reporting cost and schedule. Certain portions of a project may be more easily managed in pieces, rather than putting it all together and trying to track and manage costs. For example, having a scaffolding coordinator to oversee the needs and costs may be end up being cost-effective in the long run. In addition, for resources like
cranes and pool vehicles, having a designated individual to coordinate usage can reduce overall costs and usage over the life of a project.

Ahmed et al., (2002) identified that causes of client related delay are Poor planning, highly bureaucratic nature of client, Poor coordination, lack of control, poor communication. Shaikh Asif Abdus (2009) also described that some external factors that were responsible for the profitability of the firm which were related to the economic factors but most of the causes related to the business functioning of the company and the absence of a workable business proposal.

According to ec.europa.eu/regional [Accessed: 5th Oct 2016]).The role of the project manager or project management team is probably the most important element in containing the costs of a project. It is often true that a poor project with a good project manager will be completed satisfactorily. But even a good project, if combined with poor project management, will almost always face serious difficulties. A poor project management structure will have an impact at all stages of the construction process leading to:

• A lack of planning and coordination;

• Poor communication between members of the project team and the project sponsor;

• Failure to identify problems and institute necessary design and programming changes;

• A lack of control over time and cost inputs.

Delays in deliveries to construction sites, approval of design documents, and progress payments are delay factors caused by owners. Sites should receive deliveries as soon as possible after a project is awarded. Design documents should be approved promptly; otherwise, work progress could be delayed. Progress payments should be made on time to contractors to finance the work. The cause of client delay are: poor project management, Poor planning, highly bureaucratic nature of client/uncooperative client, poor coordination, poor communication, slow decision making, slow payment of completed works, unrealistic contract duration and financial difficulties.
2.6.2 Delays due to consultant related factor
Ahmed et al., (2002), cited that consultants play a very important role in Design-Related delays because as they are in charge of the design process in conjunction with the owner of the project. Dayang Sabriah Safri (2009) added that monitoring for workmanship quality during construction phase is one of the major tasks for the consultants.

Ahmed et al., (2002) briefly explain that design related issues such as changes in drawings, incomplete and faulty specifications have a very damaging effect on project completion times and invariably lead to cost escalations as well. These are issues that can be controlled with proper design process management and timely decision making. It is a well-known fact that decisions made early in the life of a project have the most profound effect on the project’s objectives of delivering a safe, quality project within the time and budget allocated Shaikh Asif Abdus (2009) display that delay may be non-excusable (contractor caused) for which the client and the consultant need to have project management tools to effectively manage the delays or compensable (client caused) delays which are due to the client. The delays may be by either parties and can be concurrent.

Inspection and testing by consultants is an important activity during construction since poor quality inspection may result in lower quality of work. The cause of consultant delays that has been established by Dayang Sabriah Safri (2009): defects in design, Changes in drawings and specification, mistake in design, incomplete document/drawing, slow inspection of completed works, inadequate supervision to contractor, late preparation of interim valuation, late valuation work, late issue of instruction and Delay of work approval

2.6.3 Delays due to contractor related factor
In the study of Shaikh Asif Abdus (2009) subcontractors are often faced with the threat of financial difficulties in case of delayed payments which may result in the failure of the subcontractor. According to Dayang Sabriah Safri (2009) interprets poor subcontractor performance is among of the significant causes in causing the construction delays in both regions. The incapability of subcontractor to complete the work can result problems to the main contractor. The project can be delayed if the subcontractor under performs because
of inadequate experience. Therefore, the selection of subcontractor must consider the past records particularly on their performance.

Shaikh Asif Abdus (2009) presented that an inexperienced contractor working on project may not know the loss of revenue for a day and may delay the works to an extent that the project revenue loss is enormous. In case of knowledgeable contractors, adequate acceleration measures will be made in their programs if needed.

According to Dayang Sabriah Safri (2009) contractor related delays are poor site management/coordination on site, poor site management/ supervision, unsuitable construction method, inadequate experience, construction mistakes, poor subcontractor performance, defective of works and improper planning.

Shaikh Asif Abdus(2009) also cited that contractor had delays related to overambitious estimates and incorrect task assessment which lead to delays and affect the project. In case of lack of task clarity (methods, techniques, procedure and coordination), an inexperienced contractor or subcontractor are continuous challenges to management sources.

Contractors should pay more attention to preparing effective planning and scheduling. During construction, planning and scheduling may be revised if necessary conditions occur. Only a project that is well planned and scheduled can be well executed.

Projects may entail having many subcontractors working under main contractors. If a subcontractor is capable and reliable, the project can be completed on time as planned. If the subcontractor underperforms because of inadequate experience or capability, the project may face delays. The use of many subcontractors may lead to a high risk of delays. The cause of contractor delays that has been established by Dayang Sabriah Safri (2009): poor site management/coordination on site, poor site management/supervision, unsuitable construction method (technology), inadequate experience, construction mistakes, poor subcontractor performance, defective of works and improper planning.
2.6.4 Delays due to external or force majeure related factor
External factor, from the view point of Ahmed et al., (2002) the causes of external related delay are: rainy/hotly weather condition, civil disturbance, unforeseen site condition, government regulation, and slow process of building permit, price fluctuation and act of God. Also include revolution, war, riot, extreme weather, earthquake, landslide fire, political and economic instability ensures the causes of delay.

According to Interact (2007), some factors cannot be planned for; bad weather is a typical example in infrastructure projects. The only thing to do is to include this type of problem in project risk assessments and try to develop project activities so all project progress does not depend on the completion of the activities that may be affected. Another common externality, in particular when it comes to implementation work, is if the project’s work depends on the work of others. Here a typical example is when the project’s material investment represents part of a large national scheme or arrangement: If the large project is delayed it usually obstructs (hinders) the project plan as well. In this case, leaving some flexibility for unforeseen delays or regular updates on the progress of the other project might be necessary.

From the view of Joseph A. and his colleague (2007), one factor that Project Managers have no control over at all is weather. If a project is being built in areas that can extreme weather, the weather can have an impact on project schedule. In extreme cold and heat, workers cannot work outside for extended periods of time. Stormy weather can also affect work schedules, depending on the severity of the storms. Project Managers that are planning work in areas known for extreme weather conditions should build some extra stuffing into their schedule, to accommodate for time lost due to weather conditions. Some research into typical weather patterns for the area should provide a foundation for an estimate of how much stuffing to add to a schedule estimate.

Delay that not caused by project participants are demarcated as external causes. Following are the identified factors that arise from the external factors: poor infrastructure development, rainy weather condition, Government regulation, slow process of Building permit, exchange rates and price fluctuation or inflation.
2.7 Effect of delays
According to Abdul-Rahman H., (2006) as cited in Dayang Sabriah Safri (2009) delays in construction projects are considered one of the most common problems causing a multitude of negative effects on the project and its participating parties. Along with delay, the frequently faced consequences are project failure, reduction of profit margin, and loss of belief of citizen (public dissatisfaction) in government funded projects, etc. When delays do occur, they are either accelerated or have their duration extended beyond the scheduled completion date. These are not without some cost consequences. Delays also give rise to disruption of work and loss of productivity, late completion of project increased time related costs, third party claims, abandonment and termination of contract. For the purpose of this research, the effects of delay are-
1. Time Overrun
2. Cost Overrun:
3. Public dissatisfaction or loss of belief of citizen
4. Disputes
6. Litigation (legal action)
7. Total Abandonment (leaving)

2.8 Mitigation of delays
Delay can be mitigated in a different method. Mitigating delay mostly costs of resources (financially, manpower and so on). However, mitigation efforts are essential to minimize damages due to major cause of delay. Delays can be mitigated only when the causes are recognized. Olawale and Sun (2010) as cited in Chang Saar Chai1, Aminah Md Yusof and Hadina Habil (2015), classified delay mitigation measures into predictive measures, preventive measures, corrective measures and organizational measures.

2.8.1 Predictive Measures
The predictive measures are then defined as proposals, plans, steps and suggestions taken in to consideration proactively before the projects start. From the project management point of view, predictive measures minimize the disruption of project operation while allowing for budgeted, scheduled time for reaction. Predictive measures in the construction industry provide a delay allowance to prevent affecting the project
completion time. Such allowances are normally allocated beyond the critical path of the project.

The predictive measures are identified through a predictive analytical process based on future behavior characteristics. They are concerned with forecasting probabilities and trends that create dummy or model delays to avoid delays on critical path activities. The data are collected from relevant predictors who have experienced the delays in previous construction projects.

2.8.2 Preventive Measures
Preventive measures against housing delivery delays refer to precautionary measures that are prepared as defiance against inhibiting factors. These measures are active measures that are implemented during the planning stage of a project. Preventive measures are always favorably put into practice by construction parties before construction to minimize project risk. Any project risk in the project can lead to project delay, which puts pressure on the project time and cost.

In terms of project management, preventive measures are defined as scheduled maintenance action plans aimed at preventing breakdowns, delays and failures. Preventive measures are based on the prediction of problems to avoid their occurrence through self-initiated actions and analysis procedures. The initiative to provide better preventive measures can involve the active participation of staff through the contributions of the team, improvement of knowledge sharing, management reviews and feedback. Construction players have learned lessons to minimize project delays through experience in previous projects. Experience and project documentation play a vital role in preventive measures, as the majority of project delay factors are fundamentally similar.

2.8.3 Corrective Measures
Corrective measures are used to mitigate the effects of project controlling factors by acting as a remedy. Corrective measures normally take place after an event to eliminate the cause of a detected nonconformity or another undesirable situation. These measures are used to handle delays after the occurrences to stop, track, and reduce the effects of the Corrective measures normally take action after the root causes are identified. Delays in construction have long been discussed, and delay causes have been tabulated to simplify their
identification process. Corrective measures can be further classified as corrective predictive measures, which remedy the current situation and predict upcoming issues based on the current scenario, or corrective preventive measures, which are meant to correct the current issues and at the same time prevent the same problem from occurring in the future.

**2.8.4 Organizational Measures**
Organizations in the construction industry are segmented due to the involvement of several construction parties with different interests. Thus, a temporary organization itself has a high potential for causing project delays due to communication and coordination factors and decision-making by different parties. To effectively control and mitigate the delay issues resulting from the segmented construction organization, Olawale and Sun suggested targeting the particular company organization rather than focusing on the temporary construction team. Thus, organizational measures in delay mitigation play an important role to controlling the effects of project delay due to the company's beliefs, orientation, management style or philosophy, which normally will not affect only one project but rather can affect all projects being undertaken by the company.

**2.8.5 Knowledge Management**
According to Shaikh Asif Abdus (2009) The knowledge management is the utilization of knowledge gained in numerous projects and various situations to tackle a specific problem. The knowledge gained can be implemented by various people who can improve the construction systems and thus save time and cost of solving problems. The knowledge can be stored and used in future for projects in the construction phase by implementing the knowledge based mapping and web technology. Knowledge management is a new concept in information systems area whereas knowledge management is well recognized in the intelligent information systems. Knowledge management is used to reduce the impact of construction projects delay using a project learning approach. There is a universal concurrence that the delay in construction projects is a common phenomenon worldwide. Project delays are generally related to the inadequate project knowledge management.
There is universal agreement that construction delay is a common phenomenon in the construction industry worldwide. Poor or lack of project knowledge management continues to plague the construction industry, especially in relation to project delays.

2.8.6 Project learning
Kerzner (2009) explained that Experience curves are based on the old adage that practice makes perfect. A product can always be manufactured better and in a shorter time period not only the second time, but each succeeding time. This concept is highly applicable to labor-intensive projects like construction. In some projects situations develop and the action can only be taken based on the available information which is project learning and improving with time. This is called as the experience or learning curve usually applied to works which are undertaken for the same time. Work, such as those in initially the outputs and results are low and gradually improvements are noticed as the activities are frequent.

2.8.7 Liquidated Damages and Acceleration
Project control consists of two components: - ones accurate information about the schedule status of a project, and the other, actions taken in response to the status reports. The driving force for keeping a project “on schedule” is money. Typically, contracts include liquidated damages for a project not being completed on time or bonus/penalty clauses that provide an incentive to the Contractors to complete the project as soon as possible (Ahmed, S.M., et al 2002).

2.8.7.1 Liquidated Damages
The word “liquidated” is a legal concept, which means the amount of money to be paid for late-completion, if fixed. A company seldom (if ever) signs a contract that does not have a specified completion date. The combination of that specific date and time is of essence in the contract, which means that if the company fails to complete the work on time – and that the causes of the delay are due company’s fault the company is liable for all of the Owner’s damages that occur because of that delay (Ahmed, S.M., et al 2002).

2.8.7.2 Acceleration
Events may delay the job and shorten the Contractor”s time to accomplish his work. Or the Owner may require the Contractor to finish his work sooner than initially scheduled. Either of these cases may call for an acceleration of Contractor”s work – that is, Contractor
may need to make up time to avoid damages (liquidated or actual) payable to the Owner for the late completion of the project. It is often carried by working overtime and on weekends by adding manpower or even by placing extra shifts and equipment. (Ahmed, S.M., et al 2002).

2.9 Empirical study
Chang Saar Chai1, Aminah Md Yusof and Hadina Habil (2015), discovered and exposed that, the housing industry is one of the major contributors to the economy in Malaysia due to the constantly high housing demand. The housing demand has increased due to the rapid growth in population and urbanization in the country. One of the major challenges in the housing industry is the late delivery of housing supply, which in some instances leads to sick and abandoned housing projects. Despite being extensively investigated, this delay is still a common phenomenon of the housing industry in Malaysia. As delay in delivery could result in a negative impact, there is a strong need to review the housing delay mitigation measures practiced in Malaysia.

It is discovered that preventive measures are the most effective mitigation measures practiced in Malaysia, as they recorded the highest index coefficient. There are seven mitigation methods classified as preventive measures, namely a comprehensive contract document, competent project team, effective strategic planning, clear information and communication channels, ensuring timely delivery of materials, availability of resources and lastly, selection of a competent consultant and a reliable contractor. As preventive measures are predictions of problems to avoid the occurrence of delays through systematic safety measures and past experience, construction players should emphasize evaluating past projects and strategic planning to enhance housing delivery performance.

Singapore Housing and Development Board (housingauthority.gov.hk [Accessed: 5th Nov 2016]), revealed that Public housing in Singapore is managed by the housing development board HDB, HDB focused on rising up its building programme to address the shortage of housing in Singapore. The quality of the flats/rooms built in the first and second stages were not of ideal quality as HDB had to make do with cheaper materials. This was addressed in the consolidation stage, where better quality materials were used.
With Singapore’s rising income also came a drive for excellence, as seen in the provision of better amenities in the New Towns. HDB flats also became an appreciating asset for the people over time.

When HDB started planning New Settlements, it conducted numerous interviews with businessmen and government officials. Sociologists were also engaged to conduct research and investigations, to provide feedback to architects, engineers and planners. Soon after, HDB estate officers also played an important role in providing feedback to the architects and the engineers, thus “perpetuating a virtuous cycle” leading to continuous improvements in the design and management of estates.

The HDB keeps the cost of production low, so that the low cost can be passed on to the consumer, which keeps provision of public housing in Singapore the price of housing units commensurately low. This is achieved through a whole host of measures which increase efficiency and keep costs to a minimum. The scale of the projects, the repetitive nature of the work, tight control over building contracts and on time payment are major cost-control factors. For large quantities of housing, it is necessary to adopt standardized building plans with a short construction period. Design takes into account durability and minimum maintenance costs. The HDB designs and supervises all of its projects. The HDB is thus the developer; it however engages private contractors to undertake the construction. Construction costs are kept down through technological innovation, which includes the increasing use of the metal form concrete framework system since 1974 and the various projects that have made use of the prefabricated system.

The HDB also manages and produces its own materials required for construction. Brickworks, tile works and sand and granite quarries have all been set up. This ensures adequate supply to meet the needs of the construction industry at reasonable costs. The HDB also helps local and foreign material manufacturers develop suitable new materials for HDB use. Since the early 1960s, the HDB has also managed its own pool of labor, with the setting up of the Work Brigade which was established to provide elementary training for workers to become semi-skilled tradesmen in the building industry. The HDB has also
been authorized since 1984 to assist the Ministry of Labor in processing work permit applications for foreign workers, due to the labor shortage situation at that time.

The earlier Singapore Improvement Trust could not build more housing because of a lack of professionalism in the building industry. When it was formed, HDB invited all contractors to provide construction works, even those without experience. In the process, HDB were substantially improved. Construction site gradually helps to upgrade the industry. By the 1980s, Singapore’s construction techniques and safety standard was recognized as one of the best in the world.

Today, flat buyers no longer ask about the contractors behind HDB projects. HDB has introduced workmanship quality control, such that quality in the construction is now a given. This was developed through careful documentation of processes through the years, where HDB engineers and architects built upon the knowledge of past projects.

Further, due to the extreme scarcity of land in Singapore, the price of land rises very quickly. To allow the authorities to acquire land quickly and cheaply for public-housing purposes, various legislations were passed regulating compulsory land acquisition. Compulsory land acquisition has been the most effective way of obtaining land for public development. The Land Acquisition Act also establishes resettlement policies which enable large areas of squatter land to be cleared and for the squatters to be re housed in low-cost flats. This has given the squatter population a chance to enjoy better housing and living standards.

2.10 A Conceptual model of delay factors affecting housing construction projects.
Based on the literature review and pilot study, 26 delay factors/constraints were extracted and divided into 4 groups of factors/causes of delay. They were identified as major groups of delay causes and were categorized as owner-related, consultant-related, contractor-related, and external related factors. Proposed in Figure 2.3
The theories of the above model are described as follows:

- The more negative owner related factors are, the more delay/constraints project completion is
The more negative consultant related factors are, the more delay/constraints project completion is
The more negative contractor related factors are, the more delay/constraints project completion is
The more negative external factors are, the more delay/constraints project completion is

Fig 2.3: conceptual model of delay/constraints
CHAPTER THREE

3. THE RESEARCH METHODOLOGY
This chapter shows what methodology is used to analyze and present the cause and effect of the delay in HDPO projects. It is essential to describe the methodologies used throughout this research to ensure all the data and information gathered is reliable and to show that it is scientifically collected and analyzed in depth.

3.1 Research design
The study is exploratory in nature; therefore survey approach for data gathering is used. Surveys represent one of the most common types of quantitative research. In survey research, the researcher selects a sample of respondents from a population and administers a standardized questionnaire to them. The questionnaire, or survey, can be a written document that is completed by the person being surveyed or can be a face-to-face interview. Using surveys, it is possible to collect data from large or small populations. As a result of the diversity in the types and sources of data required for answering the research questions, the study uses both qualitative and quantitative research methods.

3.2 Data sources
The study uses both Primary and secondary data sources to collect the necessary information. Questionnaires and direct interviews are used as primary data sources and annual published and unpublished HDPO reports as secondary data sources. Both are applied to find out execution capacity of project activities. These collected data are both qualitative and quantitative in nature.

The questionnaire was distributed to and collected at a selected site of the case study. For the purpose of ensuring validity and to triangulate the data, interviews are made with HDPO managers and representative of consultant organization. Furthermore, to control the impact of respondent (contractors) bias, the research has believed to manage the interview in person to the client and consultant office managers. In the interview the respondents were requested to verify their response with detailed explanation of overall practices of the projects management implementation and experienced of delay.
This paper assesses the annual published and unpublished HDPO reports (documents). The purpose of this document review is to offer additional detailed insight and information on project execution as well as to indicate the problems experienced (delays and constraints) in the projects.

3.3 Data collection Technique
The researcher has collected the data through Questionnaire survey approach, interview and secondary data gathering of documents like annual published and unpublished HDPO reports.

Therefore, the data is gathered in three ways:
1. Document review: Compiled reports of HDPO construction projects were reviewed to disclose the extent of projects activities in the HDPO.

2. Questionnaire: questionnaires are prepared and distributed to project participant respondents (to contractors, owners and consultants of the HDPO construction projects). The questionnaires consist of two main parts. The first part elicit from respondents standard demographic or background information: Job title, years in HDPO project activity, and the second part of the survey asks detail questions which require respondent to rate the frequency of occurrence and impact of a set of causes, effect of delays and constraints

3. Interview: To investigate more and to minimize contractor’s biases, interviews are arranged and conducted.

3.4 Sampling
Two type of sampling techniques are used to select respondents; namely:-purposive and random sampling.
Two Projects Koyefeche (10/90) and Kileto (20/80) projects are selected randomly based on their lists from HDPO (ten completed HDPO projects from year 2004-2008 Ethiopian Calendar). The stakeholders were (contractors, consultants and owners or client) who worked in the Koye-feche and Kileto projects.
A purposive sampling approach is used to get the right information from the right persons to make the study totally fact based. The sample encompasses experts (knowledgeable) working in the HDPO.

A purposive sampling technique can help to reduce time and cost compared with other sampling method, but a disadvantage is the difficulty in reaching a large sample size and low level of reliability and high levels of bias. Defining the target for purposive samples can be difficult, as all targets may not be known, therefore, difficult to generalize research findings.

Purposive sampling method involves a purposive or deliberate selection of particular units of the universe for constituting a sample which represents the universe. When population elements are selected for inclusion in the sample based on skill, experience and knowledge.

The respondents included HDPO/clients, consultants and contractors are believed to have project management and in-depth knowledge of the causes, effects and constraints of HDPO construction projects.

3.5 Sample size
There were 2 project managers and 6 employees (engineers- who know the area or subject matter very well) under the department of HDPO. In HDPO project office managers and employees are considered as a client or owner. 140 contractors under the contract administration of Koye-feche and 121 contractors under the contract administration of Kileto, and there were 2 consultants under contract administration of Koye-feche and other 2 consultants under contract administration of Kileto, each consultants had 3 engineers” (engineers- who know the area or subject matter very well) under their department were engaged in the work.

The researcher believe that these were the only participants who know about delay and constraints factors for the house construction projects as they were involved in the housing construction process of the understudy’s projects. In the case of this research population, it
did not mean that all members of housing Projects construction stake holders in koyefech and kiletoare possible respondents for the questionnaire. 6 questionnaires were distributed to employee (engineers) of project office, 40 questionnaires were distributed to the contractors who involved in the construction process and 12 questionnaires were distributed to engineers under contract department of consultants. Therefore, a total of 58 sets of questionnaires were distributed to client, consultant, and contractors in selected HDPO. A total of 55 completed questionnaires were received, it representing a 94% response rate.

To investigate more and to minimize contractors”” biases, interviews were arranged with 2 project office managers in the HDPO office as a client””s (project owners) and 4 relevant consultant office managers.

Sample size calculation
As mentioned the above, the target groups in this study were professionals from owners, contractors and consultants. There are 140 contractors under Koye-feche and 121 contractors under the Kileto project, and there were 2 consultants under contract administration of Koye-feche project and other 2 consultants under contract administration of Kileto, each consultants had 3 engineers”” (engineers- who know the area or subject matter very well), besides each HDPO project offices had 3 engineers””.

Kish (1965) showed that the sample size can be calculated as following equation for 94% confidence level (Assaf et al 2001, Israel 2003):

\[ n = \frac{n'}{1 + \left(\frac{n'}{N}\right)} \]

Where:

- \( N = \) total number of population
- \( n = \) sample size from finite population
- \( n' = \) sample size from infinite population \( = \frac{S^2}{V^2} \); where \( S^2 \) is the variance of the population elements and \( V \) is a standard error of sampling population. (Usually \( S = 0.5 \) and \( V = 0.06 \))
So, for 279 target group:

\[ n = \frac{n'}{1 + \left(\frac{n'}{N}\right)} \]

\[ N' = \frac{S^2}{V'^2} = \frac{(0.5)^2}{(0.06)^2} = 69.44 \]

\[ N = 279 \]

\[ n = \frac{69.44}{1 + \left(\frac{69.44}{279}\right)} = 56 \]

This means that the questionnaire should be distributed to 56, in order to achieve 94% confidence level

According sample sizes, 55 questionnaires were collected as follows: 6 from client/HDPO organization, 12 from consultant’s office and 37 from contractors. Totally 55 questionnaires were received. That mean 11(11%) from owners or client, 12 (22%) from consultants and 37(67%) from contractors as respondents. A sample size of 55 was considered acceptable.

3.6. Data analysis
Data were analyzed using Microsoft Excel to produce the summaries of the various responses. The relative important index (RII) as shown in the equation below, for each factor on delay cause and effect were calculated using the frequency data for each response category generated from spreadsheet,

\[ RII = \sum_{i=1}^{5} a_i * x_i/N*5 \]

EXAMPLE 5*x_i+4*x_i+3*x_i+2*x_i+1*x_i/N*5

Where RII is the relative important index;
ai the weight of the ith response;
xi the frequency of the ith response; and
ai the weight of the ith response;
xi the frequency of the ith response; and
i the response category index;
And N the number of respondents.
The questionnaire is mainly based on Likert’s scale of 5 ordinal measures from 1 to 5 according to level of contributing. The Likert scales were selected because they take less time and are easy to answer.

(5) = Strongly Agree
(4) = Agree
(3) = Moderate
(2) = Disagree
(1) = Strongly Disagree

A spreadsheet is created to summarize the data and conduct further descriptive analysis. From an extensive literature review, a number of causes of delays, effect, and constraints were extracted, questionnaire based on the complete list of causes, effects, and constraints. The process of collecting primary data can be completed by distributing of the questionnaires using random (selected sites) and the purposive sampling consists of clients, consultants, and contractors representing HDPO project implementation actors, who were willing to participate. After collecting and securing the relevant data, the data are analyzed using relative importance index (RII). To calculate the weight indexes for importance and frequency of variables, the variables were ranked according to their Severity Index.
CHAPTER FOUR

4 DATA PRESENTATION AND ANALYSIS
The study adapted exploratory and descriptive type of research by using some quantitative and qualitative data analysis. The researcher analyzed the data gathered based on the surveys employed through a questionnaire, document review and an interview on schedule delay.

The questionnaire administered for this study was informed under review of literature summarized on chapters one and two. Further clarification on the method of delay analysis and identification was required; therefore few key persons on project management and consultant administration were selected for an interview. Generally, this chapter presents the results and analysis.

4.1 Characteristics of the respondents and their organization
Table 4.1 Respondents profile

<table>
<thead>
<tr>
<th>Type of organization</th>
<th>no</th>
<th>experience</th>
<th></th>
<th></th>
<th></th>
<th>Educat. level</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>&lt;1 year</td>
<td>1-3 year’s</td>
<td>3-5 year’s</td>
<td>&gt;5 years</td>
<td>&lt;12 grade</td>
<td>12 grad</td>
<td>Diploma</td>
</tr>
<tr>
<td>Client</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Contractor</td>
<td>37</td>
<td>0</td>
<td>12</td>
<td>6</td>
<td>19</td>
<td>0</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Consultant</td>
<td>12</td>
<td>0</td>
<td>2</td>
<td>6</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>55</td>
<td>0</td>
<td>14</td>
<td>16</td>
<td>25</td>
<td>0</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>%</td>
<td>0</td>
<td>25.45</td>
<td>29.10</td>
<td>45.45</td>
<td>0</td>
<td>12.72</td>
<td>23.64</td>
<td>63.64</td>
</tr>
</tbody>
</table>

Source: Field Survey (2017)
Respondents’ organizational profile
The first section of the demographic information shown in table 4.1 classifies respondents according to their job category. Accordingly, 66 percent of the respondents were contractors, 23 percent consultants and 11 percent clients. Most of the groups were made up of selected professional staff. Regarding their professional background, majority of respondents was from civil/structural engineering. These groups of professionals gave sufficient response to the information sought which further validate the outcome of the analysis. Again, it was observed that respondents were very familiar with the technical terms used; they were involved in the management of projects at the operational and administration levels.

Experience of respondents in the construction in HDPO
In accordance to working experience of respondents, (14) 25.45% of the respondents have 1-3 years working experience, (16) 29.10% of the respondents have 3-5 years working experience, and (25) 45.45% of the respondents have five (5) years and above working experience in the HDP projects. All respondents had an experience working on city housing project.

Educational level of respondents
The above table shows that all of the respondents were beyond 12th grade. 7(12.72%) of the respondents were completed their 12th grade, 13(23.64%) of the respondents were diploma holder, and 35 (63.64%) of the respondents were degree holders and above. Therefore, the questionnaire was distributed to respondents who know the area or subject matter very well.

4.2 Analysis of the Project planning and implementation
The following analysis focused on the planning, implementation, project constraints, and overall performances well as achievement taking into the explanation of housing construction project management systems in the whole approach. This will help to create holistic view of the factors that caused the delays in the realization of the projects as compared to the initial plan and how those challenges affect achievement of the projects.
Table 4.2, Level of project goal achievement in terms of housing stock

<table>
<thead>
<tr>
<th>SN</th>
<th>PROJECTS ACHIVMENT LEVEL</th>
<th>FREQUENCY</th>
<th>PERCENTAGE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Excellent</td>
<td>1</td>
<td>1.82%</td>
</tr>
<tr>
<td>2</td>
<td>Very good</td>
<td>3</td>
<td>5.45%</td>
</tr>
<tr>
<td>3</td>
<td>Good</td>
<td>24</td>
<td>43.64%</td>
</tr>
<tr>
<td>4</td>
<td>Poor</td>
<td>26</td>
<td>47.27%</td>
</tr>
<tr>
<td>5</td>
<td>Very poor</td>
<td>1</td>
<td>1.82%</td>
</tr>
</tbody>
</table>

Source: Field Survey (2017)

Table 4.2 indicates that the overall performance of housing development offices are in between good 24(43.64) and poor 26(47.27%) from the respondent point of view.

Table 4.3 Housing prices.

<table>
<thead>
<tr>
<th>SN</th>
<th>HOUSING PRICES IS HIGH</th>
<th>FREQUENCY</th>
<th>PERCENTAGE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes</td>
<td>34</td>
<td>62%</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
<td>21</td>
<td>38%</td>
</tr>
</tbody>
</table>

Source: Field Survey (2017)

The table 4.3 shows that 34 (62.0 %) of the respondent attested to the fact that HDPO housing prices was high. For example when people registered for the 20/80 scheme in 2013 the price for three bed room was around 304,000 Birr but now the cost has increased to 512,000 Birr(unpublished source).. Therefore, 68% additional costs covered by people who won the condominium house draw this due to the cost of time delay during the construction process.
The above figure (512,000) indicated that delay can be costly for end user. As it is discussed in the theoretical part of this thesis, in some cases, work on a project may take a lot longer than expected because it is dependent on other requirements and activities. A project which involves non-continuous phase is usually more expensive than one undertaken without interruption because of the additional costs involved in re-mobilizing plant and contractors. When projects stopped because of procurement problem and financial challenges, the price of raw material, labor and other can rise.

The longer the expected construction period, the more relation to unexpected inflationary price that increases over time. The continuous grow in the inflation rate would increase the cost of implementation, if the projects are not completed on scheduled time. Inflation usually leads to the escalation of prices of materials, equipment and other inputs to the projects. The risk of inflation in costs of building was taken by beneficiaries/public/end user or other.

Table 4.4 the cause to high pricing.

<table>
<thead>
<tr>
<th>NO</th>
<th>CAUSES TO HIGH PRICING</th>
<th>FREQUENCY</th>
<th>PERCENTAGE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>delays delivery time</td>
<td>27</td>
<td>79.5%</td>
</tr>
<tr>
<td>2</td>
<td>other</td>
<td>7</td>
<td>19.5%</td>
</tr>
</tbody>
</table>

Source: Field Survey (2017)

Table 4.4 above shows that 27(79.5%) of the respondent attested to the fact that the delays delivery time is the cause to high pricing, while 7(19.5%) of the respondent attested to the fact that the other issue as cause to high pricing.

Construction delay and its causes (like inflation and inaccurate cost estimate) result in price increment of housing units. Increase in price of housing units seriously affects the affordability of low income group. HDPO definitely pushed the cost of these projects to the city administration that was collected in the form of subsidy. City Administrations which is used to cover administrative costs like employee’s salary, office equipment,
shades, and other costs normally related to housing construction projects. Then the remaining it’s going to cost beneficiaries/public/end user.

Table 4.5 projects are behind schedule and the existence of constraints

<table>
<thead>
<tr>
<th>SN</th>
<th>OPTIONS GIVEN</th>
<th>PROJECTS ARE BEHIND SCHEDULE</th>
<th>EXISTANCE and CONSTRAINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>FREQ</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>Yes</td>
<td>43</td>
<td>78.18%</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
<td>12</td>
<td>21.82%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>55</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Field Survey (2017)

**HDPO projects are behind schedule:**

The above table shows there is delay in housing development projects. From the above sample survey result indicate that more than 78.18% percent of the respondents agreed that HDPO construction is exposed to delay. Moreover, interviews conducted with some of the officials in HDPO specified that delay is the main challenge for construction projects. This suggests that construction delay and constraints in HDPO’s project implementations was not given sufficient attention from research professionals and other organ so far. Therefore, there is need to assess the causes of delays and constraints in HDPO project implementation. This will be useful to the owners and/or contractors for timely completion of construction projects at a reasonable cost and time.

**The existence of constraints:**

Table 4.5 above shows that 49 (89.09%) of the respondent attested to the fact that there were the cause of constraints. In HDP constraints have great impact on project performance. When the project works under these constraints all the projects had been delayed. If HDPO project managers handle their project constraint and assumption
accurately, it would help them deliver their project on the time, while meeting stakeholders’ expectations.

Table 4.6 the time spent for the most delayed projects in HDPO.

<table>
<thead>
<tr>
<th>SN</th>
<th>THE TIME SPENT FOR MOST DELAYED PROJECTS</th>
<th>FREQUENCY</th>
<th>PERCENTAGE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Less than 6 month late</td>
<td>1</td>
<td>1.82%</td>
</tr>
<tr>
<td>2</td>
<td>6 to 12 month late</td>
<td>15</td>
<td>27.27%</td>
</tr>
<tr>
<td>3</td>
<td>More than 12 month late</td>
<td>39</td>
<td>70.91%</td>
</tr>
</tbody>
</table>

Source: Field Survey (2017)

Table 4.6 above shows that 39(70.91%) of the respondent attested to the fact that the projects were more than 12 month late. On time completion of the projects is one of the guide in project management and the sign of project efficiency. Therefore, project sites had lagged behind schedule because of poor project performance and other factor. From the clients or end user side, time delay in these projects means increasing purchasing cost of condominium.

Table 4.7 bearers of the cost of delay.

<table>
<thead>
<tr>
<th>SN</th>
<th>PARTICULAR</th>
<th>FREQUENCY</th>
<th>PERCENTAGE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HDPO</td>
<td>15</td>
<td>27.27%</td>
</tr>
<tr>
<td>2</td>
<td>Contractor /sub-contractor</td>
<td>2</td>
<td>3.64%</td>
</tr>
<tr>
<td>3</td>
<td>Beneficiaries/public/end user</td>
<td>35</td>
<td>63.64%</td>
</tr>
<tr>
<td>4</td>
<td>Others</td>
<td>3</td>
<td>5.45%</td>
</tr>
</tbody>
</table>

Source: Field Survey (2017)

The majority of cost fails on individual, while end user and government bear of the additional costs of delay. The City Administration which is used to cover administrative costs like employees’ salary, office equipment, shades, and other costs normally related to
housing construction projects. Many causes of delays lead to the incremental cost, for example inaccurate cost estimate which affect the procurement process especially when the bids submitted are far higher than the estimate. This could be caused by poor estimation or market unpredictability.

Table 4.8 delivery of construction materials (inputs) on time and project time with escalating cost

<table>
<thead>
<tr>
<th>SN</th>
<th>OPTIONS GIVEN</th>
<th>DELIVERY OF MATERIAL INPUT</th>
<th>CONST. UT</th>
<th>PROJECT COST</th>
<th>TIME WITH ESC.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FREQ %</td>
<td>FREQ %</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Yes</td>
<td>45 (81.82%)</td>
<td>18 (32.73)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>No</td>
<td>10 (18.18%)</td>
<td>37 (67.27)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>55 (100%)</td>
<td>55 (100%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Field Survey (2017)

**Delivery of construction materials:**

Table 4.8 above shows that 45 (81.82%) of the respondent attested to the fact that there were constraints in delivery of construction materials (inputs). As discussed in the theoretical part of this thesis, there are a number of constraints that can affect the construction projects; these constraints forced that hinders the growth of projects. Therefore, constraints should be assumed, identified, and analyzed as much detail as possible during the planning phase of the project, so that awareness of them and their potential impact can be managed. This also includes understanding the changing aspects of the project environments.

**Project time with escalating cost:**

Table 4.8 above shows 37(67.27. %) of the respondents attested to the fact that there was escalating cost. It is crucial that the project managers are in identifying the cost of the
project base on their estimations. This can affect the objectives of the projects at the right performance level and on time.

HDPO project manager’s inability to properly schedule project activities is another indication that proper project management method was not used in the planning process leading to the difficulties in the realization stage.

HDPO projects was planned to complete one year and six month for 20/80 scheme and one year for 10/90 scheme, with a limited fund and budget. The project execution took place as scheduled with all the defined activities performed to meet the objective of the project. However, this did not go according to the initial plan as the project managers and their team needed three more years to enable them complete the building. This automatically affected the initial budget that was planned.

Table 4.9 participation of stakeholder during project plan

<table>
<thead>
<tr>
<th>SN</th>
<th>STAKEHOLDER PARTICIPATION LEVEL</th>
<th>FREQUENCY</th>
<th>PERCENTAGE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Strongly disagree</td>
<td>3</td>
<td>5.45</td>
</tr>
<tr>
<td>2</td>
<td>Disagree</td>
<td>25</td>
<td>45.45</td>
</tr>
<tr>
<td>3</td>
<td>Have no idea</td>
<td>7</td>
<td>12.73</td>
</tr>
<tr>
<td>4</td>
<td>Agree</td>
<td>19</td>
<td>34.55</td>
</tr>
<tr>
<td>5</td>
<td>Strongly agree</td>
<td>1</td>
<td>1.82</td>
</tr>
</tbody>
</table>

Source: Field Survey (2017)

Table 4.9 above shows 3(5.45%) of the respondents strongly disagree that there were systems/mechanisms for the stakeholder participation in project plan, 25 (45.45%) of the respondents disagree that there are systems/mechanisms for the stakeholder participation in project plan, 7 (12.73%) of the respondent have no idea about systems/mechanisms for the stakeholder participation in project plan, 7 (12.73%) of the respondents agree for the existence of systems/mechanisms that allows stakeholder participation in project plan, and
the remaining 1 (1.82%) of the respondent strongly agree for the existence of systems/mechanisms that take stakeholder participation in project plan. Their ability to identify all stakeholders and collect their needs is crucial for a good planning of a project.

The difficulties in the project realization could be avoided using proper project management methods that can be utilized in stakeholder and requirements analysis and the planning as a whole. For instance, certain key stakeholders (like infrastructure developers) are not cooperating effectively in the requirement collection process. This resulted in lack of proper identification of stakeholders in planning stage, since the whole project and the planning itself was set without certain important elements.

Table 4.10 monitoring and evaluation and reporting activities.

<table>
<thead>
<tr>
<th>SN</th>
<th>PERCEPTION LEVEL</th>
<th>MONITORING and EVAL.</th>
<th>REPORTING SYSTEM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>FREQ</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>Excellent</td>
<td>3</td>
<td>5.15%</td>
</tr>
<tr>
<td>2</td>
<td>Very good</td>
<td>10</td>
<td>18.18%</td>
</tr>
<tr>
<td>3</td>
<td>Good</td>
<td>23</td>
<td>41.82%</td>
</tr>
<tr>
<td>4</td>
<td>Poor</td>
<td>19</td>
<td>34.55%</td>
</tr>
<tr>
<td>5</td>
<td>Very poor</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

Source: Field Survey (2017) Perception RATE

**Monitoring and evaluation:**

Table 4.10 above shows that 23 (41.82 %) of the respondent attested to the fact that there was good proper monitoring and evaluation, while 19 (34.55%) of the respondents attested to the fact that there was good proper monitoring and evaluation. Entire results indicated that there was lack of proper monitoring and evaluation.

**The reporting activities:**
Table 4.10 above shows that 26 (47.27%) or almost half of the respondent attested to the fact that there has been poor reporting mechanism. Entire results indicated that there was lack of proper reporting regarding the status and progress of the project, which usually helps the project manager determine whether the project is going according to the initial plan or not. Therefore, the actual execution confirms that there were no standard project reporting mechanism and procedures. This because of the project teams and stakeholders followed of poor reporting mechanism and system.

### 4.3 Causes of Delays in HDPO projects

The relative importance index RII was computed for each cause to identify the most significant causes. The causes are ranked based on RII values. From the ranking assigned to each cause of delays, the study able to identify the most important causes (the top ten causes) of delays in HDPO construction sites. The top ten causes of delays as per the respondent’s agreement are:-

Table 4.11, the causes of delay in HDPO projects

<table>
<thead>
<tr>
<th>Causes of delays of the projects</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>mod erate</th>
<th>Agre e</th>
<th>Stron gly Agree</th>
<th>RII</th>
<th>RAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor project management</td>
<td>5</td>
<td>8</td>
<td>1</td>
<td>26</td>
<td>15</td>
<td>0.738</td>
<td>11</td>
</tr>
<tr>
<td>Poor coordination, communication and reporting system</td>
<td>1</td>
<td>9</td>
<td>4</td>
<td>35</td>
<td>6</td>
<td>0.731</td>
<td>13</td>
</tr>
<tr>
<td>Lack of systematic project control and monitoring mechanism</td>
<td>6</td>
<td>8</td>
<td>0</td>
<td>31</td>
<td>10</td>
<td>0.713</td>
<td>15</td>
</tr>
<tr>
<td>Slow decision making by all functional group</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>26</td>
<td>19</td>
<td>0.789</td>
<td>3</td>
</tr>
<tr>
<td>Slow payment</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>21</td>
<td>25</td>
<td>0.829</td>
<td>1</td>
</tr>
<tr>
<td>Unrealistic contract</td>
<td>3</td>
<td>8</td>
<td>12</td>
<td>23</td>
<td>09</td>
<td>0.698</td>
<td>17</td>
</tr>
<tr>
<td>Issue</td>
<td>First</td>
<td>Second</td>
<td>Third</td>
<td>Fourth</td>
<td>Fifth</td>
<td>Sixth</td>
<td>Seventh</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>-------</td>
<td>--------</td>
<td>-------</td>
<td>--------</td>
<td>-------</td>
<td>-------</td>
<td>---------</td>
</tr>
<tr>
<td>Financial Shortage</td>
<td>2</td>
<td>7</td>
<td>11</td>
<td>19</td>
<td>16</td>
<td>0.745</td>
<td>10</td>
</tr>
<tr>
<td>Uncooperative client</td>
<td>11</td>
<td>17</td>
<td>4</td>
<td>21</td>
<td>2</td>
<td>0.549</td>
<td>25.5</td>
</tr>
<tr>
<td>Inadequate experience of consultant</td>
<td>6</td>
<td>13</td>
<td>3</td>
<td>29</td>
<td>4</td>
<td>0.644</td>
<td>22</td>
</tr>
<tr>
<td>Late valuation work</td>
<td>5</td>
<td>9</td>
<td>3</td>
<td>32</td>
<td>6</td>
<td>0.691</td>
<td>18</td>
</tr>
<tr>
<td>Poor project feasibility study and site investigation</td>
<td>3</td>
<td>9</td>
<td>12</td>
<td>23</td>
<td>8</td>
<td>0.687</td>
<td>19</td>
</tr>
<tr>
<td>Unsuitable construction method (technology)</td>
<td>7</td>
<td>5</td>
<td>3</td>
<td>28</td>
<td>12</td>
<td>0.720</td>
<td>14</td>
</tr>
<tr>
<td>Inadequate experience of contractor</td>
<td>1</td>
<td>7</td>
<td>1</td>
<td>39</td>
<td>7</td>
<td>0.760</td>
<td>6</td>
</tr>
<tr>
<td>Poor subcontractor performance</td>
<td>6</td>
<td>5</td>
<td>2</td>
<td>25</td>
<td>17</td>
<td>0.753</td>
<td>8</td>
</tr>
<tr>
<td>Poor infrastructure development</td>
<td>1</td>
<td>7</td>
<td>6</td>
<td>28</td>
<td>13</td>
<td>0.764</td>
<td>5</td>
</tr>
<tr>
<td>Rainy weather condition</td>
<td>8</td>
<td>22</td>
<td>6</td>
<td>14</td>
<td>5</td>
<td>0.549</td>
<td>25.5</td>
</tr>
<tr>
<td>Government regulation</td>
<td>10</td>
<td>7</td>
<td>10</td>
<td>20</td>
<td>8</td>
<td>0.633</td>
<td>24</td>
</tr>
<tr>
<td>Slow process of Building permit</td>
<td>4</td>
<td>10</td>
<td>14</td>
<td>21</td>
<td>6</td>
<td>0.655</td>
<td>21</td>
</tr>
<tr>
<td>Exchange rates</td>
<td>6</td>
<td>10</td>
<td>14</td>
<td>18</td>
<td>7</td>
<td>0.636</td>
<td>23</td>
</tr>
<tr>
<td>Price fluctuation or inflation</td>
<td>3</td>
<td>10</td>
<td>12</td>
<td>22</td>
<td>8</td>
<td>0.680</td>
<td>20</td>
</tr>
<tr>
<td>inaccurate cost estimate</td>
<td>1</td>
<td>7</td>
<td>6</td>
<td>26</td>
<td>15</td>
<td>0.771</td>
<td>4</td>
</tr>
<tr>
<td>inaccurate time estimation</td>
<td>2</td>
<td>10</td>
<td>5</td>
<td>21</td>
<td>17</td>
<td>0.749</td>
<td>9</td>
</tr>
<tr>
<td>Shortage of resources (materials, equipment, workmen, etc.)</td>
<td>0</td>
<td>8</td>
<td>2</td>
<td>26</td>
<td>19</td>
<td>0.804</td>
<td>2</td>
</tr>
<tr>
<td>Poor risk management</td>
<td>1</td>
<td>5</td>
<td>8</td>
<td>32</td>
<td>9</td>
<td>0.756</td>
<td>7</td>
</tr>
</tbody>
</table>
Delays in the payment for services by the projects with relative important index (RII) equal to 0.829 is suggested as the most preferred factor as causing delay on construction projects (as it has the first rank among all causes).

In HDPO Work progress can be delayed due to the late payments from the clients, because there is inadequate financial availability to funding construction expenses especially for those contractors who are not financially strong. Delay in payment leads to negative impact of contractors' performance and wastage of time. This may also lead to disagreements between HDPO and contractor. This problem would affect the overall performance of project.

Availability of construction materials was identified as the second major cause of project delay with RII equal 0.804. Shortages in basic materials like cement, iron and other can cause major delays in projects. This problem heavily affects constructing of houses. In HDPO, sites suffered with shortage resources, because there is inadequate financial availability to funding construction expenses. In addition, inadequate construction material availability is a key cause as the risk of the projects by escalation of material prices, which affects the cost performance of project.

Slow decision making by all functional group (group stuck to give final decision or decision take longer time) has been ranked by the respondents in the third position with RII equal to 0.789. Late decision making by all functional groups play a major role for time overrun. From the survey, the study understands that HDPO projects strived with speedy decision for the proper implementation of the projects.

Decision making heavily linked with poor human capacity, lack of communication and poor reporting mechanism. Since the time when there are many stakeholder involved in a
project (client, consultant, contractor, sub-contractors, bank, city administration and other), proper reporting and communication networks among the various stakeholders must be proven during the planning stage. Any problem with human ability, communication networks and reporting mechanism can result in late decision making.

Inaccurate cost and time estimate had been ranked by the respondents in the fourth and ninth position with RII equal to 0.771 and 0.749 respectively.

A problem related to cost overrun heavily linked with inaccurate cost estimate. Unexpected additional costs, refer to costs that are added to the initial estimated cost, not as stated within the specification (were not included in the initial expectation), because the need for the unexpected expenses are unknown during planning stage. There are many factors that will affect the cost estimate such as: - inflation, funding problem, exchange rate, poor project management; design change, mistake in construction, inexperienced contractor, shortage of materials in market, poor infrastructure and so on. It’s noticed by HDPO project managers” that almost half of the additional costs are due to unexpected additional expenses.

Lack of finance to complete a project, or delays in the payment for services by the project can lead to a significant problems arising. If the costs of a project have increased significantly beyond the original estimate, then the project work may have to stop or be delayed until additional funds can be allocated.

As discussed in the theoretical part of this thesis, in some cases of working on a project may take a lot longer than expected (inaccurate time estimate), because it is dependent upon other requirements and activities, for example supply (availability) of construction materials, financial challenges and so on. A project which involves non-continuous phases is usually more expensive than one undertaken without interruption/continuous, because of the additional costs needed to re-mobilizing the work and contractors.

Poor infrastructure development has been ranked by the respondents in the fifth position with RII equal to 0.764. It create inconvenient for construction, slowing its construction development and can have significant and direct effect on cost and time over run. From the
survey, most HDPO projects are still away from the city without infrastructure growth. Therefore, access roads might need to build for the project work and transportation, the projects should also be connected to the city utilities like water, electricity, telephone service and so on. Besides, the projects need site preparation, and these infrastructures can influence the time to start the projects.

Inadequate experience of contractors and subcontractors performance had been ranked by the respondents in the sixth and eighth position with RII equal to 0.760 and 0.753 respectively. If the contractors and subcontractors are capable, the project can be completed on time as planned. The project can be delayed, if the contractor and subcontractor are not done their works properly; because of inadequate experience or capability. Availability of subcontractors and contractors with high experience and qualification lead to better performance of quality, time, and cost of projects.

Based on the data collected from the project offices, in HDPO there are many contractors and subcontractors (40% of the project done by subcontractors); this leads to high risk of delays and inefficiencies in project implementation. In HDPO bids awarded the project to lowest bidder. Most of the lowest bidders may lack management skills and less capable to timely completion.

Poor risk management had been ranked by the respondents in the seventh position with RII equal to 0.756, uncertainties that can negatively affect the projects by challenging the project’s schedule. This was one of the reasons why the projects were delayed, then certain risk elements were not identified by the project managers. For example in HDPO projects there were lack of fund or finance (the project managers also revealed that banks provide always less fund than what they need), this is due to lack of proper risk analysis in the planning stage of the project. Therefore, there were certain important risk elements in the project that needed proper analysis.

In relation to clients, consultants and contractors; inadequate financial availability as planned through project duration has been ranked by the respondents in the tenth
position with RII equal to 0.745. This problem heavily affects supply (availability) of construction materials and readiness in the payment for services.

The project managers also revealed that the bank provides them always less fund than what they need. Currently, both the city administration and commercial bank of Ethiopia (CBE) are working together to solve the problems.

When we come to sources of finance, Kidst M.(2014) explained that, the major financial source for construction of condominium houses are bonds issued to Commercial Bank of Ethiopia by Regional Governments or City Administrations. The bonds are expected to be paid within five years. The 2nd source is budget from the Regional Governments and City Administrations which is used to cover administrative costs like employees’ salary, office equipment, shades, and other costs normally related to housing construction projects. The fund from the bond is used only for construction related expenditures and administrative costs are covered from the budget. Condominium houses were distributed when they are about 80% completed, additional costs necessary for finishing purposes or cost of maintenance are born by the beneficiaries.

4.4 Effects of Delay in HDPO Projects.

In the subsequent sections, the study analyzes the impact of delay on the projects.

Table 4.12, the effect of delay in HDPO projects

<table>
<thead>
<tr>
<th>Effect of delays of the projects</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Moderate</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>RII</th>
<th>RANK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time overrun</td>
<td>2</td>
<td>6</td>
<td>1</td>
<td>27</td>
<td>19</td>
<td>0.80</td>
<td>1</td>
</tr>
<tr>
<td>Cost overrun</td>
<td>0</td>
<td>8</td>
<td>2</td>
<td>29</td>
<td>16</td>
<td>0.79</td>
<td>2</td>
</tr>
<tr>
<td>public dissatisfaction/lack of trust of citizen</td>
<td>3</td>
<td>8</td>
<td>11</td>
<td>26</td>
<td>7</td>
<td>0.69</td>
<td>4</td>
</tr>
</tbody>
</table>
The effects of delays were ranked based on the RII. The top six effect of delay in HDPO projects have been identified. The highest consequences of delays are as follows:

Based on Table 4.12, time and cost overrun were the top two effects of the project delays in the HDPO projects. Time overrun has been ranked by the respondents in the first position with RII equal to 0.80; it is one of the highest consequences of delays.

The time overrun happen when the construction process is delayed and the time of the construction process become longer than expected. From the survey, the study understand that all of the causes of project delays contribute to the time overrun in the construction project such as delay in delivery materials to site, delays in the payment for services, inadequate experience or capability of subcontractors and contractors, and so on.

Cost overrun has been ranked by the respondents in the second position with RII equal to 0.79. The cost overrun happens because of contractual factors for example faulty cost estimates or unavoidable additional expenses and inexperienced contractors and subcontractors.

The third consequences of delay that has been ranked based on the respondent’s perspective were litigation/ legal action with RII equal to 0.71. It is last option to settle disputes; legal action is often caused by absence of alternative dispute resolution clauses in the contract. It is key causes as the risk of the projects by escalation of material prices affects the cost performance of project extend the construction processes.

The fourth consequences of delay that has been ranked based on the respondent’s opinion were Public dissatisfaction or loss of belief of citizen with RII equal to 0.69. Housing
problem is going to be one of the biggest socio-economic and political problems, there is evident that majority of people are living in overcrowded environments, this has pull undesirable living condition and will result in to public dissatisfaction.

The fifth consequence of delay that has been ranked based on the respondent’s attitude was total termination of project with RII equal to 0.67. It is extend construction activity, also incur additional costs to remobilize new contractor.

The sixth consequences of delay that has been ranked by client, consultant and contractor were disputes with RII equal to 0.66. It is a key cause as the risks of the projects by escalation of prices affects the cost performance of project and extends construction activity

4.5 Methods of Minimizing Delays
Mitigating delay mostly costs of resources (financially, manpower and so on). However, mitigation efforts are essential to minimize damages due to major cause of delay. Delays can be mitigated only when the causes are recognized.

Table 4.13, Methods of Minimizing Delays

<table>
<thead>
<tr>
<th>Proposed Methods to minimize delay</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>moderate</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>RII</th>
<th>RANK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilization of the latest construction technology method</td>
<td>5</td>
<td>8</td>
<td>1</td>
<td>25</td>
<td>16</td>
<td>0.742</td>
<td>23</td>
</tr>
<tr>
<td>Ensure the availability of resources (materials, equipment, workmen, etc.)</td>
<td>1</td>
<td>7</td>
<td>2</td>
<td>16</td>
<td>29</td>
<td>0.836</td>
<td>2</td>
</tr>
<tr>
<td>Develop proper stakeholder analysis and management</td>
<td>0</td>
<td>9</td>
<td>4</td>
<td>27</td>
<td>15</td>
<td>0.775</td>
<td>15</td>
</tr>
<tr>
<td>Issue</td>
<td>Rank</td>
<td>Priority</td>
<td>Impact</td>
<td>Cost</td>
<td>Probability</td>
<td>Duration</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------</td>
<td>----------</td>
<td>--------</td>
<td>------</td>
<td>-------------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td>Realistic contract</td>
<td>1</td>
<td>8</td>
<td>5</td>
<td>28</td>
<td>13</td>
<td>0.760</td>
<td>18</td>
</tr>
<tr>
<td>Increase productivity by working overtime, shift, etc</td>
<td>3</td>
<td>10</td>
<td>8</td>
<td>25</td>
<td>09</td>
<td>0.698</td>
<td>25</td>
</tr>
<tr>
<td>Offer incentive for early project completion</td>
<td>4</td>
<td>9</td>
<td>4</td>
<td>20</td>
<td>18</td>
<td>0.742</td>
<td>22</td>
</tr>
<tr>
<td>Ensure the availability of finance</td>
<td>1</td>
<td>5</td>
<td>2</td>
<td>24</td>
<td>23</td>
<td>0.829</td>
<td>3</td>
</tr>
<tr>
<td>Developing human resources management</td>
<td>2</td>
<td>6</td>
<td>2</td>
<td>29</td>
<td>16</td>
<td>0.785</td>
<td>10</td>
</tr>
<tr>
<td>Timely decision making by all functional group</td>
<td>1</td>
<td>6</td>
<td>3</td>
<td>2</td>
<td>18</td>
<td>0.800</td>
<td>5</td>
</tr>
<tr>
<td>Proper project planning and scheduling</td>
<td>2</td>
<td>7</td>
<td>4</td>
<td>24</td>
<td>18</td>
<td>0.778</td>
<td>13</td>
</tr>
<tr>
<td>Developing appropriate coordination and communication and reporting system</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>25</td>
<td>16</td>
<td>0.749</td>
<td>20</td>
</tr>
<tr>
<td>Fast and proper permit and approval from relevant authority</td>
<td>1</td>
<td>10</td>
<td>7</td>
<td>22</td>
<td>15</td>
<td>0.745</td>
<td>21</td>
</tr>
<tr>
<td>Careful project feasibility study and site investigation</td>
<td>0</td>
<td>8</td>
<td>8</td>
<td>21</td>
<td>18</td>
<td>0.778</td>
<td>13</td>
</tr>
<tr>
<td>Accurate project cost estimation</td>
<td>2</td>
<td>7</td>
<td>3</td>
<td>22</td>
<td>21</td>
<td>0.793</td>
<td>6</td>
</tr>
<tr>
<td>Hire experienced personnel,</td>
<td>2</td>
<td>8</td>
<td>2</td>
<td>27</td>
<td>16</td>
<td>0.771</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.754</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>-------</td>
<td>----</td>
<td></td>
</tr>
<tr>
<td>project manager, contractor, consultant and sub-contractor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Build a systematic project control and monitoring mechanism</td>
<td>0</td>
<td>12</td>
<td>4</td>
<td>20</td>
<td>16</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Accurate time estimation</td>
<td>1</td>
<td>9</td>
<td>1</td>
<td>25</td>
<td>19</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>competent project management</td>
<td>1</td>
<td>7</td>
<td>2</td>
<td>25</td>
<td>20</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>speedy payment</td>
<td>2</td>
<td>8</td>
<td>3</td>
<td>19</td>
<td>23</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Strong risk management</td>
<td>0</td>
<td>7</td>
<td>8</td>
<td>23</td>
<td>17</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Improve infrastructure</td>
<td>1</td>
<td>6</td>
<td>5</td>
<td>25</td>
<td>18</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>adequate contingency plans</td>
<td>2</td>
<td>7</td>
<td>13</td>
<td>21</td>
<td>12</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Knowledge Management</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>20</td>
<td>21</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Project learning</td>
<td>0</td>
<td>5</td>
<td>2</td>
<td>24</td>
<td>24</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
This study also suggested mitigation measures for reducing construction project delays. The mitigation measures were ranked based on the RII; based on table 4.13, the top ten mitigation measures for reducing construction project have been identified as follows:

<table>
<thead>
<tr>
<th>Acceleration</th>
<th>2</th>
<th>5</th>
<th>6</th>
<th>24</th>
<th>18</th>
<th>0.785</th>
<th>10</th>
</tr>
</thead>
</table>

Source: Field Survey (2017)

Project learning has been ranked by the respondents in the first position with RII equal to 0.844.

Based on Table 4.13, ensure the availability of resources (materials, equipment, workmen, etc.) has been ranked by the respondents in the second position with RII equal to 0.836.

It is also revealed that banks provide sufficient fund/Ensure the availability of finance has been ranked by the respondents in the third position with RII equal to 0.829.

It was established that competent project management has been ranked by the respondents in the fourth position with RII equal to 0.804.

Based on Table 4.13, timely decision making by all functional group has been ranked by the respondents in the 5th position with RII equal to 0.80.

Three of the mitigation measures were ranked in the 6th position with RII equal to 0.793. These are accurate project cost estimation, Improve infrastructure and speedy payment.

Based on Table 4.13, accurate time estimation has been ranked by the respondents in the 9th position with RII to equal 0.789.

Two mitigation measures had the same ranking 10th position with RII equal to 0.785; these are: developing human resources management and Acceleration.

In order to test the degree of agreement between the three groups of respondents (contractors, consultants and clients), a correlation analysis using Spearmen’s rank
correlation coefficient is used. According to (www.bochemia-medca [Accessed: 5th Oct 2016] [Accessed: 5th Oct 2016]) when interpreting the value of the Spearmen’s rank correlation coefficient, the following rules are valid.

- From 0-0.25 or from 0 to – (0.25) are commonly regarded to indicate the absence of correlation.
- From 0.25 to 0.5 or from or(- 0.25) to (-0.5) indicate to weak correlation
- From 0.5 to 0.75 or from or(- 0.5) to(-0.75) indicate moderate to good correlation
- From 0.75 to 1 or from or(- 0.75) to (-1) indicate good to excellent correlation

Table 4.14 ranked cause of delay based on contractor, consultant and client

<table>
<thead>
<tr>
<th>SN</th>
<th>DESCRIPTION</th>
<th>contractors</th>
<th>consultants</th>
<th>clients</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Poor infrastructure development</td>
<td>1</td>
<td>20.5</td>
<td>17</td>
</tr>
<tr>
<td>2</td>
<td>Slow payment</td>
<td>2</td>
<td>1</td>
<td>2.5</td>
</tr>
<tr>
<td>3</td>
<td>Shortage of resources</td>
<td>3</td>
<td>3</td>
<td>4.5</td>
</tr>
<tr>
<td>4</td>
<td>inaccurate time estimation</td>
<td>4</td>
<td>13.5</td>
<td>21</td>
</tr>
<tr>
<td>5</td>
<td>Poor subcontractor performance</td>
<td>5</td>
<td>13.5</td>
<td>14.5</td>
</tr>
<tr>
<td>6</td>
<td>inaccurate cost estimate</td>
<td>6</td>
<td>7.5</td>
<td>7</td>
</tr>
<tr>
<td>7</td>
<td>Slow decision making by all functional group</td>
<td>7.5</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>Poor risk management</td>
<td>7.5</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>9</td>
<td>inadequate contingency plans</td>
<td>9</td>
<td>18.5</td>
<td>10.5</td>
</tr>
<tr>
<td>10</td>
<td>Inadequate experience of contractor</td>
<td>10</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>11</td>
<td>Poor coordination, communication and reporting</td>
<td>11</td>
<td>10</td>
<td>19</td>
</tr>
<tr>
<td>12</td>
<td>Financial Shortage</td>
<td>12</td>
<td>5</td>
<td>4.5</td>
</tr>
<tr>
<td>13</td>
<td>Lack of systematic project control and monitoring</td>
<td>13</td>
<td>13.5</td>
<td>10.5</td>
</tr>
<tr>
<td>14</td>
<td>Unsuitable construction method (technology)</td>
<td>14.5</td>
<td>10</td>
<td>10.5</td>
</tr>
<tr>
<td>15</td>
<td>lack of proper stakeholder analysis</td>
<td>14.5</td>
<td>13.5</td>
<td>10.5</td>
</tr>
<tr>
<td>16</td>
<td>Unrealistic contract</td>
<td>16</td>
<td>7.5</td>
<td>25</td>
</tr>
<tr>
<td>17</td>
<td>Poor project feasibility study and site investigation</td>
<td>17.5</td>
<td>17</td>
<td>19</td>
</tr>
<tr>
<td>18</td>
<td>Price fluctuation or inflation</td>
<td>17.5</td>
<td>20.5</td>
<td>19</td>
</tr>
<tr>
<td>19</td>
<td>Poor project management</td>
<td>19.5</td>
<td>3</td>
<td>2.5</td>
</tr>
<tr>
<td>20</td>
<td>Late valuation work</td>
<td>19.5</td>
<td>10</td>
<td>23</td>
</tr>
<tr>
<td>21</td>
<td>Slow process of Building permit</td>
<td>21</td>
<td>22</td>
<td>23</td>
</tr>
<tr>
<td>22</td>
<td>Inadequate experience of consultant</td>
<td>22</td>
<td>25.5</td>
<td>14.5</td>
</tr>
<tr>
<td>Column 1</td>
<td>Column 2</td>
<td>Column 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>---------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.565217</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0.493985</td>
<td>0.621221</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Source: Field Survey (2017)

Table 4.15 Correlation test on the ranked cause of delay based on contractor, consultant and client

<table>
<thead>
<tr>
<th>SN</th>
<th>Respondent</th>
<th>Correlation coefficient</th>
<th>Direction of the relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Contractor and consultant</td>
<td>0.62</td>
<td>moderate to good relationship</td>
</tr>
<tr>
<td>2</td>
<td>Contractor and Client</td>
<td>0.57</td>
<td>moderate to good relationship</td>
</tr>
<tr>
<td>3</td>
<td>Client and consultant</td>
<td>0.49</td>
<td>weak to good relationship</td>
</tr>
</tbody>
</table>

Source: Field Survey (2017)

Almost there is moderate to good relationship /correlation on the responses of respondents, i.e. between clients and contractors; between contractors and consultants; and between clients and consultants in ranking causes of delay.

4.6 Presentation and Analysis on interviewed and document reviewed

The subsequent section of the study discusses the results gathered thorough reviewing documents and reports. It also discussed about results gathered using interview as a data collection instrument.
4.6.1 HDPO project performance and success in terms of housing construction execution

The study understands from the table 4.16, almost all of the projects will be completed beyond their planned completion period. As it is clearly displayed on the table 4.16, there is a significant difference between the plan and the actual performance of projects in terms of time requirements. The study reviewed table 4.16 and table 4.18, project efficiency/success is measured by its actual performance compared with what was planned in terms of time, cost and quality requirements (iron triangles). If any project failed to meet its planned requirement in terms of time, cost and quality, that project will be assumed as inefficient/unsuccesful/unachievable. HDPO projects that researcher focused on for this study were completed beyond their plan in terms of time, the study can argue that all those projects are inefficient in terms of time and cost. It is possible to assume different causes/factors for the inefficiency of the above projects in terms of their time and cost requirement.

Table 4.16 Under construction Condominium

<table>
<thead>
<tr>
<th>Branch</th>
<th>Site</th>
<th>Block</th>
<th>H. unit</th>
<th>June 30 2017 E.C</th>
<th>Current status</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>BATCH 2</td>
<td>G+7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Kality</td>
<td>Koye-feche 2</td>
<td>22</td>
<td>1408</td>
<td>100%</td>
<td>54%</td>
<td>delayed</td>
</tr>
<tr>
<td>Project 11</td>
<td>Koye-feche 3</td>
<td>70</td>
<td>4514</td>
<td>100%</td>
<td>50%</td>
<td>delayed</td>
</tr>
<tr>
<td>Project 12</td>
<td>Koye-feche 3</td>
<td>70</td>
<td>4568</td>
<td>100%</td>
<td>54%</td>
<td>delayed</td>
</tr>
<tr>
<td>Project 16</td>
<td>Koye-feche 3</td>
<td>110</td>
<td>7090</td>
<td>100%</td>
<td>59%</td>
<td>delayed</td>
</tr>
<tr>
<td>Project</td>
<td>Area</td>
<td>Unit</td>
<td>Value</td>
<td>Completion</td>
<td>Delay</td>
<td>Destination</td>
</tr>
<tr>
<td>-------------</td>
<td>---------------</td>
<td>------</td>
<td>-------</td>
<td>------------</td>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>Project 17</td>
<td>Koye-feche 3</td>
<td></td>
<td>80</td>
<td>5130</td>
<td>100%</td>
<td>55%</td>
</tr>
<tr>
<td>Project 18</td>
<td>Koye-feche 3</td>
<td></td>
<td>69</td>
<td>4496</td>
<td>100%</td>
<td>54%</td>
</tr>
<tr>
<td>Arada</td>
<td>Bole bulb.</td>
<td></td>
<td>8</td>
<td>426</td>
<td>100%</td>
<td>54%</td>
</tr>
<tr>
<td><strong>BACH 2</strong></td>
<td><strong>G+4</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project 14</td>
<td>Yeka-abado</td>
<td></td>
<td>47</td>
<td>1090</td>
<td>100%</td>
<td>61%</td>
</tr>
<tr>
<td>A. Kality</td>
<td>Koye-feche 1</td>
<td></td>
<td>315</td>
<td>9442</td>
<td>100%</td>
<td>45%</td>
</tr>
<tr>
<td>Project 12</td>
<td>Koye-feche 3</td>
<td></td>
<td>64</td>
<td>2160</td>
<td>100%</td>
<td>61%</td>
</tr>
<tr>
<td>Project 16</td>
<td>Koye-feche 1</td>
<td></td>
<td>138</td>
<td>5458</td>
<td>100%</td>
<td>61%</td>
</tr>
<tr>
<td>Project 17</td>
<td>Koye-feche 1</td>
<td></td>
<td>44</td>
<td>1740</td>
<td>100%</td>
<td>61%</td>
</tr>
<tr>
<td>Project 18</td>
<td>Koye-feche 1</td>
<td></td>
<td>50</td>
<td>1965</td>
<td>100%</td>
<td>54%</td>
</tr>
<tr>
<td>Project 11</td>
<td>Koye-feche 1</td>
<td></td>
<td>48</td>
<td>1870</td>
<td>100%</td>
<td>61%</td>
</tr>
<tr>
<td>Arada</td>
<td>Bole Bulbula</td>
<td></td>
<td>36</td>
<td>888</td>
<td>100%</td>
<td>61%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>1170</td>
<td>52245</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: IHDP Unpublished Data (2016)

The project managers approve that the housing construction execution was not strong as expected, since its launch in 2005 G.C HDPO has been completed only about 181,000 low
cost houses compared with the plan to construct 480,000 (40,000 per year) low cost houses.

Table 4.17 Condominium units completed up to the year 2016

<table>
<thead>
<tr>
<th>Round</th>
<th>Studio</th>
<th>1 Bedroom</th>
<th>2 Bedroom</th>
<th>3 Bedroom</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>4118</td>
<td>5677</td>
<td>6548</td>
<td>2645</td>
<td>18,988</td>
</tr>
<tr>
<td>2nd</td>
<td>2592</td>
<td>5070</td>
<td>6263</td>
<td>1106</td>
<td>15,031</td>
</tr>
<tr>
<td>3rd</td>
<td>2695</td>
<td>3679</td>
<td>3626</td>
<td>735</td>
<td>10,735</td>
</tr>
<tr>
<td>4th</td>
<td>2797</td>
<td>6755</td>
<td>4108</td>
<td>1372</td>
<td>15,032</td>
</tr>
<tr>
<td>5th</td>
<td>3088</td>
<td>4719</td>
<td>2028</td>
<td>934</td>
<td>10,769</td>
</tr>
<tr>
<td>6th</td>
<td>1255</td>
<td>4467</td>
<td>2747</td>
<td>1531</td>
<td>10,000</td>
</tr>
<tr>
<td>7th</td>
<td>2952</td>
<td>3594</td>
<td>433</td>
<td>321</td>
<td>68,058</td>
</tr>
<tr>
<td>8th</td>
<td>1326</td>
<td>4665</td>
<td>2952</td>
<td>2952</td>
<td>10,098</td>
</tr>
<tr>
<td>9th</td>
<td>2570</td>
<td>4423</td>
<td>2330</td>
<td>934</td>
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<tr>
<td>10th</td>
<td>6734</td>
<td>15670</td>
<td>7309</td>
<td>4327</td>
<td>34,040</td>
</tr>
<tr>
<td>11th</td>
<td>23016(10/90)</td>
<td></td>
<td></td>
<td></td>
<td>23,016</td>
</tr>
<tr>
<td>competed</td>
<td>2449</td>
<td>3316</td>
<td>2489</td>
<td>6262</td>
<td>19,416</td>
</tr>
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<td>--------</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>181,742</td>
</tr>
</tbody>
</table>

Source: IHDP Unpublished Data (2016)

The study understand from the above table 4.17, the numbers are representing accomplished in each lottery round. HDPO sum up that no more than 173,000 houses were delivered to the people who won the condominium house draw through the 20/80 and 10/90 schemes within 12 years. There is a big difference between what was planned and accomplished during those condominium lottery round years (2005-2016 G.C). HDPO plan to build and deliver 40,000 houses per year (UN HABITANT), in the last 12 years HDPO has been completed an average about 15,000 houses/year that is far from the plan. Likewise, in the last five years HDPO has been completed an average about 19,000 houses. This fact prevails about how HDPO project delay (time overrun) is a common and understandable problem.

In the GTP 1 period a total of 335,000 condominium houses are planned to be constructed in Addis Ababa. However, there are 76,564 houses has been completed and over 52,245 houses already in progress (on average 54% completed) across several corner of the city.

In general, from 2012-2016 G.C about 76,000 houses were started and all of which were completed. Currently, the city administration allocates over 6.3 billion Birr/year for the construction of 10/90 and 20/80 condominium houses.

Together, the overall performance of housing development project was unsuccessful in terms of planning and realization.

4.6.2 The cause of poor performance in HDPO
HDPO Projects are unsuccessful for many reasons. Cross-examined with the project managers and consultant office managers, the following reasons are main challenges that cause projects to be unsuccessful: lack of inadequate financial resources is a major problem that prohibits completion of projects on time. In addition lack of technical
expertise, poor construction skills and labor intensive as oppose to capital intensive strategy are extra causes of poor performance. Furthermore, lack of commitment is also established as a potential cause for poor performance.

Another very obvious cause is the shortage of materials and supplies, most requirements are not produced by locally rather bulk requirements are being imported from other countries. There are a number of additional factors like infrastructure problems, group stack to give final decision, inexperience of contractors and consultants and so on.

4.6.3 The over ambitious plan

Interview conducting with project managers in selected sites specified that their offices plan was not over ambitious, from the beginning the projects were envisaged as a normal plan, but poor capacity of contractor and consultant, lack of inadequate financial resources, inadequate supervision and unforeseen circumstance are the causes for most of the projects delay.

The study approved that, the housing development plan is over ambitious plan. Based on the collected data, HDPO plan to build 40,000 houses per year (UN HABITANT), in the last 12 years HDPO has been completed an average about 15,000 houses/year that is far from the plan. Likewise, in the last five years HDPO has been completed on average about 19,000 houses. The objective of low cost house building is to reduce the shortage of houses in the city, creates jobs, encourage SMEs performance, develop saving culture and reduce slum area by half.

Client is very ambitious, even though they do not understand the nature of the work. The large number of projects holds regularly beyond their capacity may cause delay.

Overambitious plan and incorrect task assessment which lead to delays, also affect the projects. The study thought that ambitious plan can be good, if it is well planned and there is a strong leadership and commitment to implement it.
4.6.4 Procurement and finance activity in HDPO

As per the project managers” explanation, until now any procurement related to housing projects including ceramic tiles, reinforcement bars and electrical equipment was done by a project office under Addis Ababa housing project office and contractors are engaged on fixed-cost contracts. Due to delay in purchase and supply of materials, HDPO was unable to meet its house construction building goal. Therefore the city administration is considering transferring the purchasing of construction materials for projects to be handled by contractors themselves.

Currently, there are nearly 2,500 contractors participating in housing project across the city, who are awarded housing projects in Addis Ababa will be able to make the procure their own. Transferring the procurement activity to contractors will minimize frequent delays in procurement process. According to project managers last year the government supply 86% of cement, 69% of agro stone partition boards and 44% of gravel required by housing projects. Around 6.5 billion birr/year budget is allocated to the HDPO over the last12 years. However, the Office saves 10% to 15% cost advantage from bulk purchases.

Currently, the Office prepares a fixed material price list that contractors will use as a guide. Except from purchases of steel bar and electrical materials, the rest will be left to contractors. Contractors cannot manage the price and purchase of steel bars and electrical materials. The Project Offices will only be mandatory of controlling the quality of materials which will be purchased by contractors. In addition, materials like gravel and sand for the projects were supplied by SMEs.

At this time, there are more than 1300 SMEs involved in different capacities and aspect of the housing projects. Last year, the Office employed 4311 enterprises.

4.6.5 General opinion about project delays

HDPO Project office managers admitted and confirmed that the completion of housing projects were delayed, but their offices are working to their full potential to speed up the construction. Furthermore, they said that every HDPO housing construction sites are
always busy, professionals and laborers always at work, even though every projects are surrounded by several problems that forces to put extra effort, cost and time. In addition, the project managers blamed lack of finance, infrastructure problems, and so on.

4.6.6 Selected project sites practiced delays
Table 4.18, selected sites (Koye-feche and Kilinto) experienced delays /implementation.

<table>
<thead>
<tr>
<th>Site</th>
<th>House hold unit</th>
<th>Construction started</th>
<th>Const. end date/planed</th>
<th>Actual end date</th>
<th>experienced delays</th>
<th>Contractor in number</th>
<th>Consultant</th>
</tr>
</thead>
<tbody>
<tr>
<td>KILETO</td>
<td>7307</td>
<td>2012 may</td>
<td>June, 1 2013</td>
<td>Jan. 30 2015</td>
<td>19 months</td>
<td>121 contractors</td>
<td>Block fine cons. and Thewodros Consultant.</td>
</tr>
</tbody>
</table>

Source: IHDP Unpublished Data (2016)

The study understand from the table 4.18, HDPO projects that researcher focused on for this study were completed beyond their plan in terms of time, the study can argue that all those projects are inefficient in terms of time From the above sample study results (table4.18), one can generalize that the selected project sites practiced time overrun.

Based on project manager’s response, several houses are lagging behind schedule, often blamed on shortage of supply, lack of finance, infrastructure problem, poor capacity of most contractors and subcontractors and so on. Registered clients have criticized the office
for delays, while hundreds of thousand eagerly expect the quick completion of the housing construction projects.

4.6.7 The city administration strategy to increase the housing stock

Almost one million people have registered in the condominium scheme. Because of this, city administration plan to call local investors to participate on the construction of low cost houses. Likewise, the city administration has willing to give them lease free land, if they are interested to build those houses.

Furthermore, the city administration is considering calling foreign investors to construct condominium houses. Foreign investors have shown their interests to build low cost houses, but the city administration and the government are now trying to check their policy, the job creation mechanism and the cost of the construction; before allow them to enter in to activity.

The participation of investors’ particularly foreign investors in low cost housing construction will create an opportunity for experience sharing and technology transfer to the local contractors and sub-contractors.

4.6.8 Problems related to contractors and consultants

The Project managers approved that, another major factor that negatively affected the projects are the inability of the project team to adequately pre-assess the capacity, skill and knowledge of the contractor and consultant before planning the project. This of course affected the original project schedule plan. Inefficient capacity related to consultants is: lack of monitoring and supervision contractors’ operation, inability of timely reviewing the work progress, improper design, and so on.

The project managements currently are taking fundamental measures like training (capacity building training, workshops and so on), besides termination of contract for the contractors and consultants.
2.6.9 Summary for finding

2.6.9.1 Summary for HDPO causes that induce delay in HDPO construction projects
There are many causes that induce delay in HDPO construction projects, Ten critical factors that contribute to project delays in HDPO are:-

- Delays in the payment for services(1th)
- availability of inadequate construction materials(2th)
- slow decision making by all functional group(3th)
- Inaccurate cost estimate and inaccurate time estimate(4th and 9th)
- Poor infrastructure development (5th)
- Inadequate experience of contractors and subcontractors(6th and 8th)
- Poor risk management (7th)
- inadequate financial availability as planned through project duration(10th)

2.6.9.2 Summary for HDPO effects delay in HDPO construction projects
The highest consequences of delays are as follows: time and cost overrun were the top two effects of the project delays in the HDPO projects.

2.6.9.3 Summary for HDPO achievements
The other objective of this study was to see the HDPO project achievement, that was carried out by comparing it with was yearly planned. This comparison was done and the result did indicate that, the objective of the project was achieved but the realization of the project did not go as what was planned, and that was as a result of lack of proper planning and over ambitious plan.

Table 4.19 HDPO achievements comparing it with what was yearly planned

<table>
<thead>
<tr>
<th>Periods</th>
<th>Units constructed</th>
<th>Achievement</th>
<th>Planed per year</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>20114-2011</td>
<td>105,000</td>
<td>15,000</td>
<td>40,000</td>
<td>-25,000</td>
</tr>
<tr>
<td>2012-2016</td>
<td>76,000</td>
<td>19,000</td>
<td>50,000</td>
<td>-31,000</td>
</tr>
</tbody>
</table>

Source: IHDP Unpublished Data (2016)
2.6.9.4 Summary for Constraints that affect HDPO construction projects

From the sample survey results understand that more than (89.09%) of the respondent attested to the fact that there was the cause of constraints. Particularly resources constraints were heavily affect HDPO projects, if necessary resources are not available, time to deliver will be increase. This may also increase cost, because late resources delivery may lead to more expensive than planned. These resources constraints are:

- Financial/Economical- The project managers also revealed that the bank provides them always less fund than what they need.
- Lack in construction materials- most requirements are not produced by locally rather bulk requirements are being imported from other countries.
- The availability, quality and experience of the contractor and subcontractor force,
CHAPTER FIVE

5. CONCLUSIONS AND RECOMMENDATIONS

5.1. Conclusions
Housing projects have an impact on personal, socio-economic as well as political conditions. As a result, it is essential to assess the actual causes of delay and constraint in order to minimize the delays and their corresponding costs and time. Successful completion of projects leads to socio-economic growth and helps to provide good social welfare.

Delay is one of the biggest problems often experienced in HDPO sites. This delay particularly in housing sector usually results: the difficulty of getting affordable rental housing units remains the most significant problem for low-income class. These groups spend more than what they expected the rental costs would be. This cost-burden will affect the purchasing power of clients to get units of house (condominium). The city administration allocate huge share of annual financial budget to the HDPO. If these projects are delayed, it will not only slow down economic growth in the city but it will also increase the city administration expenditures. The result will be wastage of city’s resources that could have been used for other welfare purposes. Furthermore, if these problems continue, it will lead to more serious problems in the future upcoming HDPO construction project in the city. Therefore, the objective of this thesis is to investigate the causes and effects of delay in Addis Ababa housing development project with particular reference to delays and constraints in its implementation.

From the sample survey results understand that more than 78 percent of the respondents agreed that HDPO construction is exposed to delay. Moreover, document review and interviews conducted with some of the officials in HDPO indicated that delay is the main challenge for the construction projects.

Factors causing delay in construction project is presented in Table 4.11. Delays in the payment for services by the projects with 0.829 RII is suggested as the most preferred factor as causing delay on construction projects, this may also lead to disagreements between HDPO and contractor; availability of inadequate construction materials.
availability as planned through project duration has been ranked by the respondents in the second position with RII equal to 0.804, it is a key cause as the risk of the projects by escalation of material prices affects the cost performance of project; slow decision making by all functional group has been ranked by the respondents in the third position with RII equal to 0.789, it shows a major role for time overrun; Inaccurate cost estimate and inaccurate time estimate had been ranked by the respondents in the fourth and ninth position with RII equal to 0.771 and .0749 respectively, these is very risky. Poor infrastructure development has been ranked by the respondents in the fifth position with RII equal to 0.764, it creates inconvenient for construction, slowing its construction development and can have significant and direct effect on cost and time over run; Inadequate experience of contractors and subcontractors had been ranked by the respondents in the sixth and eighth position with RII equal to 0.7600 and .0753 respectively, availability of subcontractors and contractors with high experience and qualification lead to better performance of quality, time, and cost of projects; Poor risk management had been ranked by the respondents in the seventh position with RII equal to 0.756, uncertainties that can negatively affect the projects by challenging the project’s schedule; and inadequate financial availability as planned through project duration has been ranked by the respondents in the tenth position with RII equal to 0.745, this problem heavily affects supply (availability) of construction materials and readiness in the payment for services. Likewise, time and cost overrun were the top two effects of the project delays in the HDPO projects.

The other objective of this study was to see the HDPO project achievement, that was carried out by comparing it with was yearly planned. This comparison was done and the result did indicate that, the objective of the project was achieved but the realization of the project did not go as was planned and that was as a result of lack of proper planning and over ambitious plan.

Particularly resources constraints were heavily affect HDPO projects, if necessary resources are not available, time to deliver will be increase. This may also increase cost, because late resources delivery may lead to more expensive than planned.
5.2 Recommendations
Based on the findings of the research, the following recommendations are proposed:

- Client should have adequate finances in order to pay timely to the contractors after completion of the work. Therefore, client should work closely with the financing bodies and institutions to release the payment on schedule. It also arranges quick payment mechanism and minimize rigid in payment issue; that minimize unnecessary and excessive administrative procedures in the client organization. Client should have accomplished contractual responsibilities, especially as concerns to payment of contractor's works accordingly implemented.

- Client should manage and produces its own materials required for construction. Consequently, Client should transfer the procurement of construction materials for contractors. These will help to curb the problem associated with shortage of construction materials.

- Shareholders must make quick decisions to solve any problem that arise during project execution stages.

- Client has to make sure that the contractors are not selected based on the lowest bid. The selected contractors must have sufficient experience, technical capability, and financial capability to execute the project. Consequently, create opportunity for Public-private partnerships between HDPO and private developers can be achieved through a combination of competitive bids on the construction of a large number of low-cost social housing units.

- Project manager should consider all the necessary requirements in the project, and should be give attention for many factors that will affect cost and time such as: - inflation, funding problem, exchange rate, poor project management; design change, mistake in construction, inexperienced contractors, subcontractors, and consultants as well as shortage of material in the market and so on.
➢ In the future, project manager should list out the Infrastructure development offices and the project management team strongly cooperate with these office to solve the problem. Infrastructure development offices are the key stakeholders in the HDPO project and needed much closer attention as far as their capacity should be concerned.

➢ Client should be preparing appropriate risk planning and mitigation measures in future projects. Identification and assessments of all risk elements for proper analysis to determine their influence on the project is important for the success of the project. This could help the project manager to think through how these risk elements can be managed for a successful result. Accordingly, adequate contingency allowance budget should be allocated in order to cover unexpected increase in cost during the project implementation.

➢ Finally, the study suggested that effective management and control, and paying special attention to HRD, procurement and finance source, these will improve time performance of projects thereby decreasing these causes and their corresponding effects on project performance.
References:


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ANNEXES

Questionnaire
The aim of this questionnaire is to study the causes of delays and constraints in its implementation of Hdpo. This questionnaire is required to be filled with exact relevant facts as much as possible. All data included in this questionnaire will be used only for academic research and will be strictly confidential. After all questionnaires are collected and analyzed, interested participants of this study will be given feedback on the overall research results. Thanks for your cooperation.

Part 1. Please thick the box and fill in the blanks if you select others.

Personal information
1. State the type of your organization or company.
   - Client (HDPO project engineer)
   - Contractor
   - Consultant
2. State the number of years that you were involved in HDPO construction sector.
   - 1-3 year’s
   - 3-5 year’s
   - More than 5 years
3. State your education level.
   - Less than 12 grade complete
   - 12 grade complete
   - diploma
   - degree and above

Part 2
Read through the list. For each option, please tick to show your response based on the rating scale given below
1. How do you rate the Housing development Project offices towards meeting its project achievement?
   - Excellent
   - Very good
   - Good
   - Poor
   - Very poor

2. Do you think that Housing development Project offices housing prices are high?
   - Yes
   - No

3. If yes, what is the cause to high pricing?
   - delays of delivery time
   - others.................................

4. Are the HDPO construction projects behind schedule so far?
   - Yes
   - No

5. In your opinion what is the percentage of cost of time delay to the total construction cost?
   - Less than 9%
   - 10 - 30%
   - More than 30%
6. State the actual time spent for the most delayed projects.

☐ Less than 6 month late  ☐ 6 to 12 month late  ☐ More than 12 month late

7. Who will bear the cost of delay?

☐ HDPO  ☐ Contractor/sub-contractor  ☐ Beneficiaries/public/end user  ☐ Others

8. How do you rate the Housing development Project offices towards risk management system?

☐ excellent  ☐ Very good  ☐ Good  ☐ Poor  ☐ Very poor

9. Were there constraints in delivery of construction materials (inputs or requirement)?

☐ Yes  ☐ No

10. Do you think that the projects were delayed because of constraints?

☐ Yes  ☐ No

11. Do you agree or disagree the projects were successfully performed or performing on housing construction project life cycle?

☐ Strongly Agree  ☐ Agree  ☐ Have no idea  ☐ Disagree  ☐ Strongly Disagree

12. How much do you agree or disagree that there are systems/mechanisms for the stakeholder participation in project plan?

☐ Strongly Agree  ☐ Agree  ☐ Have no idea  ☐ Disagree  ☐ Strongly Disagree

13. Do you think that the building can be constructed with proper project time without escalating cost?

☐ Yes  ☐ No

14. How do you rate the project management or team does formally meet for discussion of monitoring and evaluation, updating and controlling the progress?

☐ excellent  ☐ Very good  ☐ Good  ☐ Poor  ☐ Very poor

15. How do you rate the systems/mechanisms to submit the detail activities and progress report?

☐ excellent  ☐ Very good  ☐ Good  ☐ Poor  ☐ Very poor
16. How much do you agree or disagree with the causes of HDPO affecting the performance of construction of HDPO projects, from your experience, please rate each factor (causes of delay) by ticking the appropriate boxes. N.B: Rating Scale for Question 16-18

(5) = Strongly Agree (4) = Agree (3) = have no idea (2) = Disagree (1) = Strongly Disagree

<table>
<thead>
<tr>
<th>Causes of delays of the projects</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>moderate</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor project management</td>
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<tr>
<td>Poor planning and scheduling</td>
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<tr>
<td>Highly bureaucratic nature of client</td>
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<tr>
<td>Poor coordination, communication and reporting system</td>
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<td>Lack of systematic project control and monitoring mechanism</td>
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<td>Slow decision making by all functional group</td>
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<td>Slow payment</td>
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<td>Unrealistic contract</td>
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<td>Financial Shortage</td>
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<td>Uncooperative client</td>
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<td>Slow inspection of completed works</td>
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<td>Inadequate supervision of contractor</td>
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<td>Inadequate experience of consultant</td>
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<td>Late valuation work</td>
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<td>Delay of work approval</td>
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<td>Poor project feasibility study and site investigation</td>
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<td>Unsuitable construction method (technology)</td>
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<td>Inadequate experience of contractor</td>
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<td>Construction mistakes</td>
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<tr>
<td>Poor subcontractor performance</td>
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<td>Poor infrastructure development</td>
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<td>Rainy weather condition</td>
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<td>Government regulation</td>
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<td>Slow process of Building permit</td>
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<td>Exchange rates</td>
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<td>Price fluctuation or inflation</td>
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<td>inaccurate cost estimate</td>
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<tr>
<td>inaccurate time estimation</td>
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<tr>
<td>Shortage of resources (materials, equipment, workmen, etc.)</td>
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<tr>
<td>Poor risk management</td>
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<tr>
<td>inadequate contingency plans</td>
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<td>lack of proper stakeholder analysis</td>
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</table>

If there are other causes of delays, please specify and indicate each by ticking the appropriate boxes:

<table>
<thead>
<tr>
<th>Effects of delays on the projects</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>moderate</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Overrun</td>
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</tbody>
</table>
Cost Overrun

Public dissatisfaction or loss of trust of citizen

Disputes

Litigation (legal action)

Total Abandonment (leaving)

If any Other, please specify and indicate each effect by ticking the appropriate boxes:

<table>
<thead>
<tr>
<th>Proposed Methods to minimize delay</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilization of the latest construction technology method</td>
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<tr>
<td>Ensure the availability of resources (materials, equipment, workmen, etc.)</td>
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<tr>
<td>Develop proper stakeholder analysis and management</td>
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<td>realistic contract</td>
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<tr>
<td>Increase productivity by working overtime, shift, etc</td>
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<tr>
<td>Offer incentive for early project completion</td>
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<tr>
<td>Bank provides sufficient fund/ Ensure the availability of finance</td>
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<tr>
<td>Developing human resources management</td>
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<tr>
<td>(training, day courses, etc)</td>
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<tr>
<td>Timely decision making by all functional group</td>
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<tr>
<td>Proper project planning and scheduling</td>
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<tr>
<td>Developing appropriate coordination and communication and reporting system</td>
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<tr>
<td>Early in obtaining permit and approval from relevant authority</td>
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<tr>
<td>careful project feasibility study and site investigation</td>
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<tr>
<td>Accurate project cost estimation</td>
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<tr>
<td>Hire experience personnel, project manager, contractor, consultant and sub contractor</td>
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<td>Build a systematic project control and monitoring mechanism</td>
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<td>Absence of bureaucracy</td>
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<tr>
<td>Accurate time estimation</td>
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<tr>
<td>competent project management</td>
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<td>speedy payment</td>
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<td>Strong risk management</td>
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<td>Improve infrastructure</td>
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<td>adequate contingency plans</td>
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<tr>
<td>Knowledge Management</td>
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<td>Project learning</td>
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</table>
Lessons learned feedback

Acceleration

Thank you for completing this questioner

Interview question

1. Do you think HDPO has been successful/achievements?
2. Why HDPO was not successful? And what were the major challenges?
3. The over ambitious plan of client (the city administration) would cause an impact in delay of the project?
4. How do Housing development Project offices manage its procurement and finance activity? And what measures were taken to resolve these problems or challenge?
5. Are there any adequate contingency plans in the event of unforeseen circumstance?
6. What is your general opinion on/about the HDPO project regarding construction practice and delays and constraints in its implementation?
7. How many HDPO projects experienced with delays?
8. How much time did you spend for the most delayed project?
9. What your organizations or the city administration strategy towards is to increases the housing stock?
10. How contractors affect the project? To what level were prevailing measures taken from?
11. How consultants affect the project? To what level were prevailing measures taken from?
12. What were the positive results in HDPO?
13. Anything you want to add about the HDPO construction delay, constraints . . . ?
Thank you for your precious time.