



Jimma University

School of Graduate Studies

Jimma Institute of Technology

Faculty of Civil and Environmental Engineering  
Construction Engineering and Management Chair

**Assessment of the Impact of Unfinished Private Building Construction  
Projects and Its Mitigation Measures: A Case Study in Jimma Town**

A Final Thesis submitted to the School of Graduate Studies of Jimma University in  
Partial Fulfillment of the Requirements for the Degree of Master of Science in Civil  
Engineering (Construction Engineering and Management)

By:

Samuel Alemu

March 2019  
Jimma, Ethiopia

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Co-Advisor: Engr. Mamuye Busier (Assistant Professor)

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## DECLARATION

I declare that this research report entitled “ **Assessment of the Impact of Unfinished Private Building Construction Projects and Its Mitigation Measures: A Case Study in JimmaTown**” is the result of my work, it contains no materials previously published or written by another person except where due reference is made. This report has not been previously submitted for any degree at other higher education institutions.

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The undersigned confirmed that this thesis is an original work and conducted under their strict supervision and guidance.

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**03/05/2019**

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## ABSTRACT

*Unfinished buildings cost huge sums of money which cannot be divested. There were several major factors which may affect the smooth implementation of building projects, but the gravity of its impact had been seen to be very challenging, especially when it comes to the progress and economic development of a city or town as in the case of Jimmatown. The study aimed to assess the causes and impacts of unfinished private building construction in Jimma town. The research methods used literature review through desk study, personal interviews, and questionnaire survey to identify the causes of unfinished building construction and their impacts as perceived by the respondents. The results of this study indicated that the factors such as discrepancies between contract documents, delay fixing the right of way problem, late identification and resolution of drawings and specification errors and omissions had the same Relative Index (RI) of 0.800. Likewise, regulatory changes and awarding the project for lowest bidder showed with a Relative Index (RI) ranging from 0.760 to 0.750. The results also revealed that an increase in project cost with the Relative Index of 0.822, quality degradation with the Relative Index of 0.800, the effect on progress with the Relative Index of 0.778, an increase in overhead expenses with the Relative Index of 0.733, and logistics delays with Relative index of 0.700. These were ranked major factors impacting of unfinished building construction. Hence, it is concluded, based on the findings of the research that an increase of the project cost was the main cause of the problem of unfinished private building. In addition, the findings also suggested the most recommended strategies by the respondents to minimize the problem. These strategies indicated the consultant should produce a concluding design and contract documents. It included drawings that should be completed at the tender stage; works should be supervised with an experienced and dedicated supervisor, enhance communication between all parties and carry out a detailed site investigation, including detailed soil investigations and consider it during tendering stage to minimize the problem of the unfinished building on private building projects.*

**Keywords:** Cause and impact of unfinished building, Major factors, Implementation, Project cost, Strategies.

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## ACRONYMS

|       |  |
|-------|--|
| EEA   | Ethiopian Economic Association                 |
| DC    | Data Collector                                 |
| GDP   | Gross Domestic Product                         |
| MoUDC | Ministry of Urban Development and Construction |
| NGOs  | Non Governmental organizations                 |
| PI    | Principal Investigator                         |
| RII   | Relative Importance Index                      |
| UNEP  | United Nation Environmental Program            |

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background of the study

The construction industry makes significant contributions to the socio-economic development process of a country. Its importance emanates mostly from the direct and indirect impact it has on all economic activities. It contributes to the national output and stimulates the growth of other sectors through a complex system of linkages. It is noted that about one-tenth of the global economy is dedicated to constructing and operating homes and offices (UNEP, 1996). Thus, the abandonment of the construction sector directly or indirectly will affect the socio-economic development process of a country.

UNEP further observes that the industry consumes one-sixth to one half of the world's wood, minerals, water, and energy. It contributes to employment and creates income for the population and has multiplier effects on the economy. The construction industry employs considerable unskilled labor. Throughout the developing world, the majority of employees in the sector are unskilled. Women are also found to be beneficiaries of employment in the industry. However, the employment in the industry is mainly temporary, and once the job is over, the workers are obliged to find other jobs or return to their place of origin (EEA, 2006/07). When the construction is unfinished, it does not contribute to employment and creates income for the population and has multiple effects on the economy of the country.

Services are neither paid for nor provided. They are unoccupied, vandalized, boarded-up, deteriorated or those who have unmaintained grounds.

"Abandonment" can mean an owner was ceasing to provide maintenance and operating services to a building, or the loss of an owner's legal right to a building, or the demolition of a building."

An abandoned construction project is an uncompleted project in the time frame of a contract. Hence, there is an urgent need to look inward and examine critical factors militating against project completion and occupation per its conception

Similar to all other socio-economic activities, another essential contribution of the construction industry is revenue generation to government. The construction industry

contributes to economic activity through generation of revenue for government from corporate income taxes of companies, the rental income, sales tax, capital gain tax and employees income tax from those employed in the construction industry, which in turn goes to the financing of public services such as schools and health institutions among others. To identify and estimate the total economic contribution of the construction industry to an economy, one has to look beyond the direct expenditures made by the industry itself, since there is a ripple effect of the expenses made for goods and services supplied to the industry.

Construction activities in Ethiopia are generally financed by government budgets and private equity capital, NGOs and banks. Government budget funds public infrastructures and other general constructions such as schools, clinics, etc. Government budget consists of resources originating from government treasury, domestic borrowing, and foreign loans and grants. The private sector, on the other hand, finances buildings for residential and business purposes. Private sector's sources of financing originate from their capital and loans from formal and informal money markets (EEA, 2006/07). Effective monitoring of financial outlay for construction projects should be put in place by various agencies concerned to reduce instances of project abandonment.

## **1.2 Statement of the Problem**

Problems arising in construction projects are complicated and usually involve large uncertainties and subjectivities. Compared to many other industries, the construction industry is subject to more risks due to the unique features of construction activities, such as long duration of construction projects, with complicated processes, abominable environment, financial intensity, and dynamic organizational structures. To address the issues brought about by the property crisis, different countries have used different priorities and adopted various approaches for crisis management in the sphere of construction and real estate. It is therefore not surprising that different countries have widely divergent views and interpretations, which are the reflection of their economic, market, legal, institutional, technological, technical, cultural, psychological, and other differences. Furthermore, not all countries understand construction and real estate crisis management in the same way; thus they also adopt differing strategies. The traditional analysis of a crisis in construction and real estate is based on economic, legal/regulatory, institutional, and political aspects. The social, cultural, ethical, psychological, and educational issues of crisis management tend to receive

less attention. Since, economic and financial processes (bankruptcies, unemployment, increasing amounts of bad bank loans, decreasing salaries, and dropping real estate prices, and different expectations) (Lazauskas, 2015).

The construction industry has essential contributions to the Ethiopian economy, as demonstrated by its share in the GDP. The sector has registered a remarkable growth; over the last 11 years, there has been increased investment in the development and expansion of various infrastructure projects. Since 2005 there have been several initiatives geared towards fostering the local construction industry. Despite such interventions, the state of the local construction industry has remained weak. Performance constraints include the low capacity of local contractors and consultants, low public sector delivery capacity, corruption, erratic work opportunities, use of outdated technologies and practices, lack of effective supporting policies and the poor state of the economy, this may result in non completion of the building (MoUDC, Construction industry policy, 2012).

Scholars have carried out invaluable investigations regarding the problems affecting the construction industry, but, left out numerous unfinished buildings with very little attention. All important information presented in the documentation will be extracted and combined with the data collected during the field investigations and from local offices to describe the baseline condition and identify potential issues/impacts. (George Otim, 2009).

Nowadays, unfinished building constructions have become a common problem in public and private building projects in Jimma town. Unfinished building constructions are some of the main issues and obstacles that had been observed. Do to these scenarios lead to some people by raising questions about why there are unfinished for a year or more? And, no one can provide a direct answer to their problems. It is for this reason, why this research study was conducted to clarify the issues and to suggest remedies to lessen its impact on the construction industry.

### **1.3 Objectives**

#### **i. General Objective**

The general aim of the study is to assess the impact of unfinished private building construction projects in Jimma town.

#### **ii. Specific Objectives**

- To identify and discuss the significant factors affecting the implementation of projects which causes the unfinished building projects.
- To rank and analyze the significant factors causing the unfinished building projects and their impact on the construction industry in the study area.
- To identify recommendation strategies to minimize the impact of unfinished building construction projects based on the findings.

#### **1.4 Research Questions**

2. What are the major factors affecting the implementation of projects which causes the unfinished building projects?
3. What are the impacts of the significant factors of the unfinished building projects in the study area?
4. What are the strategies to minimize the impact of unfinished building construction projects?

#### **1.4 Significance of the study**

Unfinished buildings depreciate without utilization and interest accrues on money sunk. This results in frustration, embarrassment, and poverty as the money spent cannot be divested. It leads to loss of property, businesses, revenue, employment, and the market for suppliers, and cases of theft and vandalism, and quality degradation. Incomplete projects can also lead to low job satisfaction, low corporate market value, and little public opinion. The incomplete structures can be placed for crimes and can be very costly.

The significance of the study area:

Identification of Impacts (positive/negative, direct/indirect) and propose mitigation and enhancement measures to be incorporated into the design and construction activities of the building project.

- Preparation of the most appropriate management and monitoring framework for economic, environmental and social impacts, which will ensure that reinforcement measures for the positive effects and the mitigation of the adverse effects are adequately addressed.
- To identify factors influencing unfinished building construction project at pre-construction and construction phases of the projects.

- To make recommendations to overcome the critical factors in future Construction.
- The causes of unfinished building construction that enrolled in the Jimma town building.
- The extent and range of unfinished construction project that enrolled in Jimma city.
- The frequent occurrence of an unfinished building construction project that enrolled in the Jimma town project.
- Identify the best practices observed so far in the finished building construction project.

### **1.5Scope**

There were somany projects under construction in Ethiopia. However, to achieve the stated objectives of the study, the scope was limited within Jimma town where many public and private building construction projects under construction during the duration of the conduct of the research. Due to the numbers of building structures in the town, this study had focused only on the unfinished private building projects by considering personal interviews, and questionnaire surveys to gather information from the different group of respondents in the study area on how it would be affected the clients or the owners.



## 1.6 Structure of the Research

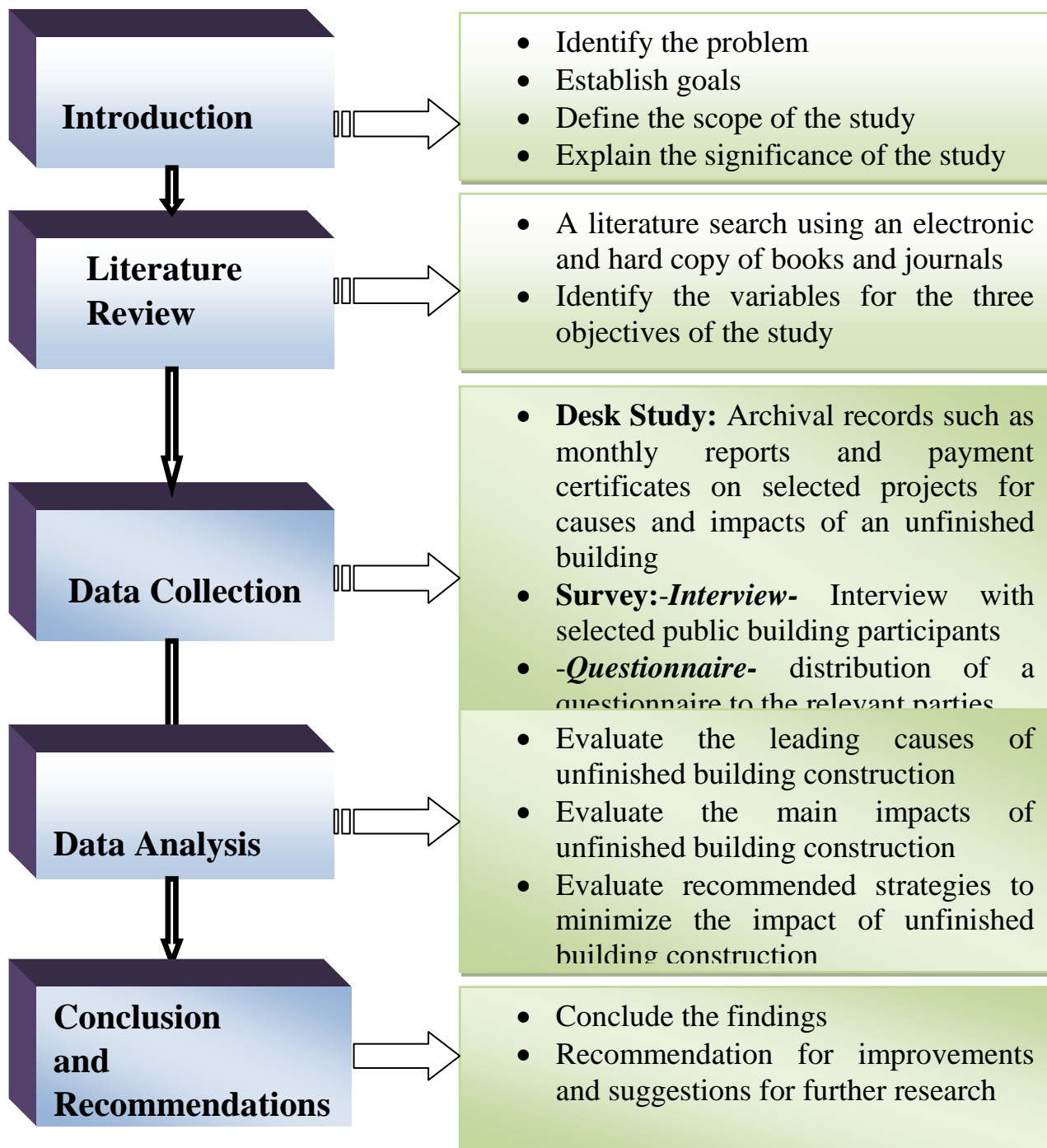


Figure 3.1 Structure of the research

## CHAPTER TWO LITERATURE REVIEW

### 2.1 Theoretical reviews/conceptual framework

The construction project is a mission, undertaken to create a unique facility, product or service within the specified scope, quality, time and cost. In practice, however, some construction projects encounter variation, delay on completion time or poor workmanship upon completion this results the construction projects were unfinished (HUSSIN, 2011).

This chapter reviews literature related to unfinished building construction; including: definition of unfinished building construction; nature of unfinished building construction; contractual provisions relative to unfinished building construction projects ; management of unfinished building construction, causes and impacts of unfinished building construction; and recommended strategies to minimize the effects of unfinished building construction on public and private building projects.

### 2.2 Definitions of unfinished building construction

An unfinished building is a building (or other architectural structure, as a bridge, a road or a tower) where construction work was abandoned or on-hold at some stage or only exists as a design. It may also refer to buildings that are currently being built, particularly those that have been delayed or at which construction work progresses exceptionally slowly.

Many constructions or engineering projects have remained unfinished at various stages of development. The work may be finished as a blueprint or white print and never be realized, or be abandoned during construction. A project may be discontinued at any stage of the life cycle and incur a significant amount of loss, and there has been no substantial activity on the site for six consecutive months (HOE, 2013)

### 2.3 Nature of unfinished construction

There are several stages before a project is declared abandoned. If it has passed its promised delivery date by 10%, it is considered late; if the delay stretches beyond 10%-30%, then it is considered 'sick'; and finally, if no work has been carried out, or no workers are on the project site for up to six months, then it is deemed abandoned (The Star, 2009).

Abandoned housing development means where a licensed housing developer had refused

to carry-out or delayed or suspended or stopped or ceased works continuously for a period of six months or more or beyond the stipulated period of completion as agreed under a sales and purchase agreement (Sabah, 2005).

A housing project is classified as "abandoned" by the Ministry of Housing and Local Government (MHLG) when there is no activity at the project site, continuously, for more than six months after the expected date of delivery of vacant possession (HUSSIN, 2011).

## **2.4 Contractual Provisions Relative to unfinished building construction**

No specific law governs unfinished building construction so that, it has to be included under the general provision, i.e. Ethiopian building proclamation No.624/2009 to overcome the abandonment of building construction that results from financial, social and political bankruptcies the country like Ethiopia.

## **2.5 Management of unfinished building construction projects**

Construction projects have been managed since time immemorial. Traditionally this was the responsibility of the "master of the works" – a concept retained in the modern French. It emerged as industrial societies started to build complex systems such as rail and power networks. Projects are classically defined by the need to complete a task on time, to budget, and with appropriate technical performance/quality. In recent decades, projects have tended to become more time-constrained, and the ability to deliver a project quickly is becoming an increasingly important element in winning a bid. There is an increasing emphasis on tight contracts, using a prime contractor ship to pass the time-risk onto the contractor (HUSSIN, 2011).

### **2.5.1 Startup**

This contains the proactive requirements that are essential for effective building construction problem management. These requirements enable the project team to respond readily to Cost overrun, time overrun, variation, Dispute and Arbitration, Rehabilitation Problem, Delay on completion Time and Delay in Payment to manage difference effectively, Late Site Hand Over or Change of Location of Construction site, acceleration Costs and to facilitate contingency plans for any anticipated problems.

### **2.5.2 Identify and evaluate the anticipated problem**

During a construction project, some issues can be anticipated while others may occur unexpectedly. The project team aims to seek to identify the potential problems at the earliest opportunity actively. This can be achieved by considering whether any of the possible problem causes are likely to be present in a project. Once a potential problem is identified, evaluation can be carried out to assist with the decision making the process. Evaluation steps may include implications assessment and an excellent selection of problem-solving methods.

### **2.5.3 Approval**

Once the evaluation step has been completed, it will need to be approved by an appropriate member of the team (usually the project manager) and maybe by the client depending on the nature of the problem. To solve a problem, it is necessary for the people involved to see the impact that the problem will have on the project.

### **2.5.4 Implement and Review**

Once a method is selected, it needs to be communicated to all team members whose work is affected by the problem. If necessary, schedule of work needs to be adjusted, and the new program needs to be agreed upon by the whole team. Finally, the project team should review and learn lessons from the process of solving the anticipated problem.

## **2.6 Causes of unfinished building construction**

There are several factors behind the abandonment of a housing project:

- i. Finance
- ii. Poor marketing and sales strategies
- iii. Technical problems faced during construction
- iv. Problems caused by compensation demanded by squatters for resettlement.

The MHLG's findings have shown that 118 or 70 percent of the 168 projects abandoned were due to the financial problems of development. Another 23 (14 percent) arose from poor marketing and sales strategies while 27 (16 percent) failed over issues arising from squatter resettlement, poor company management and disputes between developers and contractors or with landowners (News Tarikh, 2006). There are financial problems of a developer caused by incidences such as the 1997-98 economic crisis. A crisis within the development company, including disputes between shareholders or embezzlement of progress payment collections,

problems involving contractors and even disagreements with landowners are more reasons for abandoned housing projects. There are many reasons why delays occur. They may be due to:

- i. Strikes,
- ii. Rework,
- iii. Poor organization,
- iv. Material shortage,
- v. equipment failure,
- vi. Change orders,
- vii. Act of God and so on.

Also, delays are often interconnected, making the situation even more complicated (Alkass, 1996). The factors which may give rise to non-completion or late completion of projects cannot be exhaustively discussed due to space constraints, so only some are dealt with below. It is the responsibility of the parties to take account of any risk which might distort the completion of the plant, its operation, and revenue stream (Dow and Andrews-Speed, 1998). Lenders, as well as sponsors, need to be aware of the events which may endanger the completion of the project and the implication of leaving such factors unabated.

The insolvency of a contractor engaged in the construction of housing might mean distortion for the complete schedule. This is mainly an instance where a turn-key contract proves inadequate to mitigate completion risk unless the contractor's obligation had been guaranteed under a bond by a credit-worthy third party. Although it might not be possible to predict the contractor's state of affairs such as to determine impending insolvency, engaging an experienced, financially responsible and strongly capitalized contractor is a way to mitigate this risk (Abdul Aziz HUSSIN, 2011).

Many construction projects have however unfinished or have had plodding work progress. Some cited causes of project failure include changing financial climate, faulty design or unforeseen structural weaknesses, or a dramatic shift in the politics of the country. Tushabomwe (2006) affirms that many businesses in Uganda fail due to internal and external

factors. Shutt (1995) pointed out the same. Some of the cited factors responsible for unfinished buildings include:

### 1) Planning and Management

Harris and McCaffer, (2002) contend that project failures due to time and cost overruns result from; shoddy field investigation, underestimates, lack of experience, inadequate project analysis, and poor investment decisions. Poor planning for implementation entails inadequacies in time plan, resource plan, equipment planning, coordination, organization, cost planning, and improper pre/post contract actions. These results inefficient and ineffective working delays, low resource productivity, change in scope, and illegal construction (Chitkara, 2005). Unclear objectives, unworkable schedules, failure to identify critical items, lack of understanding of operating procedures, and ignorance of appropriate planning techniques are all a manifestation of poor planning and poor management. Poor communication can also turn a corporate strategy into a modern day Tower of Babel. Benjamin (2006) researched Indonesia, monitoring corruption in road construction, which provided a real-world example of how fraud constituted one of the causes of project failures in the form of missing quantities and stealing of construction materials.

### 2) The Role of the Project Parties

**The client:** Butler (1982) maintains the view that the client's first task should be to analyze and collect all the relevant information that is available to him to give the designer the most transparent and broadest picture of his requirements. Change of scope, rejection of work that they had not understood the drawings, dissatisfaction resulting from poor quality works, and delays to commission some stages of work, delayed approvals by the authorities and failure to procure materials and labor in time is some of the causes of project failure. Hardy Cross (cited in Lang and Mills, 1979) observed that if the owner can pre-qualify the contractors by screening out those whose performance cannot be trusted, the success rate of projects can improve significantly. Egan(1998) in Alinaitwe (2008) added that the potential for change in construction is well informed, demanding clients who know what they want and how much they are prepared to pay for it.

**Designers and consultants:** Incomplete or unclear design documents lead to mistakes in execution and inevitably cause delays while people try to figure out what the design

documents do or do not show. The teams should, therefore, gather enough data, use competent designers with knowledge and experience to ensure designs are complete.

**The contractor:** The contractor should decide whether or not, with the resources and general management and administrative set up at his command, he is in an original position to take up the project to success. Contractors execute most of the construction work, and the most aggravating delays are often those caused by their poor performances (Chitkara, 2005).

### 3) Economic Factors

Construction suffers from inflation, government policy, politics, and global factors just like any other business, according to the laws of demand and supply (Shutt, 1995).

### 4) Training and Experience

As explained by the Global Study (2001), Project Managers have little or no formal training to deal with the complexities of modern projects. Tushabomwe (2006) highlighted a lack of training and research as one of the internal problems affecting businesses in Uganda. Shrivastava (2008) suggested the causes of accidents are mainly due to lack of supervision, training, and experience.

### 5) Source of Finance for Building

A study by Hewitt (1987) in Alinaitwe (2008), cited lack of access to finance as arguably the most critical of the building constraints as lenders want to be assured that the project will offer a fair return on the investment. Tayebwa and Mugisha (1998) cited personal savings, loans, trade credits, trade bills, retained profits, selling bonds, and shares as the sources of finance.

The list of causes of unfinished building construction identified from the above-discussed sources are shown in Table 2.1 below.

Table 2.1 Causes of unfinished building construction

| S.N | Causes of unfinished building construction                    |
|-----|---|
| 1   | Discrepancies between contract documents                      |
| 2   | Suspension of work by owner or contractor                     |
| 3   | Change order  |
| 4   | Awarding the project for least or lowest bidder               |
| 5   | The incorrect organizational structure formed for the project |
| 6   | Delay to fix the Right of way problem                         |
| 7   | Poor communication and Coordination                           |

|    |   |
|----|---|
| 8  | Finance and payments of completed work  |
| 9  | Owner intervention  |
| 10 | Slow decision-making  |
| 11 | Unrealistic contract duration   |
| 12 | Wrong choice of Consultants and contractors   |
| 13 | Design alterations and change orders  |
| 14 | Financial problems  |
| 15 | Subcontractors  |
| 16 | Site management problems  |
| 17 | Improper Construction methods   |
| 18 | Improper planning   |
| 19 | Mistakes during construction  |
| 20 | Inadequate contractor experience  |
| 21 | Used of Inferior Quality of material.   |
| 22 | Shortage of material.   |
| 23 | Labor supply not adequate   |
| 24 | Awareness of Labor productivity   |
| 25 | Absence of consultant's site staff  |
| 26 | Lack of experience on the part of the consultant                                      |
| 27 | Knowledge of Contract management.   |
| 28 | Preparation and approval of drawings.   |
| 29 | Quality assurance and control practice  |
| 30 | Waiting time for approval of tests and inspections.                                   |
| 31 | Inappropriate design parameters   |
| 32 | Late identification and resolution of drawings and specification errors and Omissions |
| 33 | Regular inspection and monitoring   |
| 34 | Inappropriate coordination of information   |
| 35 | Equipment availability and readiness for repair on the breakdown.                     |
| 36 | Major disputes and negotiations   |
| 37 | Lack of communication between the parties.  |
| 38 | Weather condition   |
| 39 | Regulatory changes  |
| 40 | Unforeseen ground condition   |

## 2.7 Impact of unfinished building Projects

The impact is defined in the electronic Webster dictionary as "the force of impression of one thing on another." In construction, unfinished building construction can impact portions of the project directly or indirectly and result in reduced productivity. This is always a subjective issue as the contractor feel that the loss due to non-completion is the fault of the designers and owners. Conversely, owners typically claim that the loss in productivity is due to poor management on the part of the contractors.



The revival of an abandoned project involves:

High capital injection either by the developer or by other parties interested in reviving the project. This is due to vandalism at the project site, price increases of raw materials and changes in building requirements.

Developers also face non-performing loans and landowners risk their land being foreclosed.

There is also, the possibility that a project may no longer be viable for revival or that no company is interested in reviving it. All these mean a loss to the economy.

Non-completion projects have a positive implication on the affected parties. Managing and reviving a non-completion project is a complicated affair involving the developer, purchaser, financier, landowner and other parties? It will take time for all parties to reach a consensus since each party wants to protect their interest. When a single building is faced case of non-completion, there is usually a confrontation between these parties. What to do with the project and who has to pay are usually sensitive issues that end up in costly and slow lawsuits. Abandoned buildings also have a significant impact on socioeconomic nature and the environment. Some closed-ended implications are as follows:

**i. Developers/ clients**

A developer or client who is interested in reviving the project was burdened by the high capital injection. This is due to vandalism at the project site, price increases of raw materials and changes in building requirements. They also face non-performing loans and yet the land being foreclosed.

Consequently, there is the possibility that the project may be no longer viable for reviving or there is no company interested to invest in the project. All these mean a loss to the economy. Private sector failures are sometimes solved by the public administration so the transfer of cost happened between the private and public sector.

**ii. Illegal activities are conducted**

Studies showed that abandoned buildings are magnets for crime. First, they provide centers for the pursuit of a range of criminal activities, including prostitution, the consumption, and trafficking of drugs, and crimes against property. Evidence of this is found in Spelman's (1993) study of 59 abandoned residential buildings in a low-income Austin, Texas neighborhood. Of these buildings, 34% were being used for illegal activities. Of the 41% of unsecured buildings, some 83% were being used for unlawful activities (Spelman, 1993). Greenberg and other's (1990) study of TOADS in the 15 largest American cities find that

vacant buildings are frequently used as crack houses, and cites the use of TOADS as locales for drug dealing as one of the most prominent social ills associated with abandonment. According to Spelman (1993), abandoned buildings are ideal places to trade, conceal, and consume drugs.

### **iii. Cost overrun and time overrun**

Cost overrun and time overwhelmed (elongation of project duration) were the two most common effects of delay in the construction industry. Delay had a significant impact on actual project duration. The relating model delay and actual project duration provide a benchmark for non-completion of a project.

### **iv. Dispute and Arbitration**

Furthermore, associated delay problems can also result in conflict, arbitration, total abandonment and protracted litigation by the parties. To some extent, the contracting parties through claims usually agree upon the extra cost and time elongation associated with delay. Nevertheless, this has in many cases given rise to heated arguments between the owner and contractor. The question of whether a particular impediment to the progress of work warrants an extra cost and or extension of project duration is usually the cause of disagreement. Such situations, often involve questioning the facts, causal factors and contract interpretation, which have been addressed by (Alkasset al., 1995).

Another problem that has been identified is the disagreement prevailing among the purchasers, bankers, local authorities and the contractors concerned when it comes to reviving the abandoned housing projects. This problem is complicated as is evident in many cases. Consequently, the plans could or may not be rehabilitated as there is no universal consensus among them.

### **v. Rehabilitation Problem**

Further to aggravate and worsen the situation, in the event, there are plans for rehabilitation, the ideas and attempts to rehabilitate are not accessible. Many impending problems and difficulties, neither subtle nor obvious, would be awaiting the purchasers and the developers.

Among the traumatic problems is the impossibility to revive the projects as the projects have been too long overdue without any prospect of reviving and to rehabilitate them, needing additional and substantial costs and expenditure. Cases show that most of the purchasers are

reluctant to take extra money out from their own pockets on the ground, 'that it was not their fault,' as the 'fault was squarely due to the developers.' 'Thus, the developers concerned should advance their own money to revive the projects.' Matters would not be settled that easy since most of the developers involved do not have enough money, which may be due to poor management or they had calculatedly siphoned off the company's assets and monies through unreasonable directors' allowances and high overhead operating costs. Worst still and of all, most of them have been wound up, and the directors have fled, unable to be traced and contacted.

**vi. Delay on completion Time and Delay on Payment**

Delays defer income, while interest keeps accumulating. Long delays may result in projects ending up in the so-called 'interest trap' (Flyberg et al., 2004), where a combination of escalating construction costs, delays, and increasing interest payments result in cost overrun. According to Arditti et al., (1985), lengthy delays in inflationary environments increase cost overruns tremendously. The overall lack of finance to complete a project or delays in the payments for services by the project owners or clients can lead to significant problems. If the costs of a project have increased significantly beyond the original estimate, then work on the project may have to be stopped or be delayed until additional funds can be found. Delays on payment may sometimes provoke the contractor to claim for interest rates. If the amount by a project owner is slow, the contractor may begin to commit fewer resources to a project, and may even cease work if cash flow becomes a problem.

**vii. Late Site Hand Over or Change of Location of the Construction site**

Late handover of construction sites, sometimes may happen and substantially increase the cost of construction projects. In most international projects in Ethiopia, late site hand over is a common form of claim source for compensation for contractors (Girmay, 2003). For example, the Addis Ababa Bolle International Airport Project has suffered an additional cost of about USD 1,000,000.00 due to late site hand over (Girmay, 2003). Fortunately, domestic contractors do not ask for compensation due to new site hand over. Sometimes the owner may decide to change the location of the project after the award to the winning contractor. This is a rare phenomenon but; it does happen due to unforeseen and unavoidable circumstances. The change of location of a project might extensively change the entire character of the work that was initially

required under the (awarded)contract, or the new area of the construction site may have a different subsurface condition that may necessitate the structure to be redesigned. In such cases it is rightly alleged that the changes do alter the "general scope of work" and therefore, the final cost of the project might exceed the original contract amount.

#### **viii. Acceleration Costs**

Acceleration occurs, when a project has been delayed, yet the owner demands that the contractor completes the contracted work before the contract completion date, or agreed upon changed completion date, or when the contractor wants to finish early. When acceleration occurs, the contractor typically will incur additional direct and indirect costs. While direct costs are relatively easy to quantify, incidental damages are challenged to identify and quantify (William, 2002). If the contractor establishes a valid acceleration claim, it is entitled to recover the costs incurred. These costs may include increased mobilization and demobilization costs due to the need to commit additional resources in terms of labor, equipment, and supervision on the project than initially contemplated by the original schedule; specifically, direct labor costs include such items as increased wage costs for additional workers, overtime pay and rental expenses for other equipment.

Further, the contractor may incur additional costs for inefficiencies in labor. These inefficiencies may include congestion or fatigue from extensive overtime work. Labor inefficiencies are a hidden but prohibitive cost of acceleration. Nevertheless, while labor inefficiencies are a genuine part of an acceleration cost, they are tough to quantify.

#### **ix. Environmental impacts**

**Visual impact:** View quality is partially dependent on relatively unchanging landscape elements like mountains or valleys; views are also affected by more readily altered landscape features, mainly built structures such as buildings (Miller, 2001). In case of abandoned buildings, view quality can be severely deteriorated, especially if towering over flat coastal areas where the visual field is full and open. Puntillo Del Sol building (Tenerife) is composed of two enormous unfinished and badly preserved fifteen storey buildings. Its dilapidated appearance and its location at the top of a cliff generate a huge negative visual impact (CIEM, 2003).

## x. Pollution

Abandoned buildings usually trigger the creation of free and unsupervised garbage disposal. This is dirty, full of garbage, an attraction to rats and a focus for illnesses (Abdul Aziz HUSSIN, 2011).

A list of the impact of unfinished building construction identified from the above-discussed sources are shown in Table 2.2 below.

Table 2.2 impacts of unfinished building construction

| S.N | Impact of unfinished building construction project |
|-----|--|
| 1   | Increase in project cost                           |
| 2   | Progress is affected                               |
| 3   | Increase in overhead expenses                      |
| 4   | Delay in payment                                   |
| 5   | Quality degradation                                |
| 6   | Productivity degradation                           |
| 7   | Procurement delay                                  |
| 8   | Rework and demolition                              |
| 9   | Logistics delays                                   |
| 10  | Blemish firm's reputation                          |
| 11  | Poor safety conditions                             |
| 12  | Poor professional relations                        |
| 13  | Additional payments for contractor                 |
| 14  | Disputes among professionals                       |
| 15  | Completion schedule delay                          |
| 16  | Bad Public Relations                               |
| 17  | Litigation   |
| 18  | Arbitration  |
| 19  | Disputes and claims                                |
| 20  | Total abandonment                                  |

## 2.9 Recommended Strategies to minimize unfinished building construction

Some measures to prevent non-completion/abandoned projects are taken to avoid projects from becoming abandoned/unfinished/non-completion:

(Abdul Aziz and Abdelnaser, 2011)

- All involved parties require adequate planning before works start on site;
- The consultant should produce a concluding design and contract;
- Drawings should be complete at the tender stage;
- Tightening procedures for issuance of building construction, development licenses and focusing on a developer's financial capacity;
- Continuous project monitoring through Form 7f
- Regular visits to the project site and developer's premises to counter-check information provided in Form 7f;
- Exercising greater control over the building construction Development Account to ensure compliance with the building construction Development Regulations;
- Counter-checking all claims made on the building construction Development Account;
- Ensuring developers submit their annual audited financial reports;
- Taking legal action against developers for offenses; under the Act and its Regulations; and
- Adequate time should be spent on the pre-tender planning phase;
- Clients should provide a clear brief of the scope of works;
- All parties should forecast to overview unforeseen situations;
- Closer consultant co-ordination is required at the design stage;
- Enhance communication, and all parties should be proactive all times;
- Works should be supervised with an experienced and dedicated supervisor;
- The consultant should ensure that the design/specifications fall within the approved budget and the budget team should participate during the design phase;
- Get accurate information and research about procurement procedure, material, and plant;
- Carry out detailed site investigation, including detail soil investigations and consider it during tendering stage;

- Have the underground cable route, confirm with the local authorities;
- Have the land application or land purchase completed before awarding contracts;
- Once the tender is granted, there should be no changes to the specifications; and
- Place experienced and knowledgeable executives in the engineering and design department.

## 2.10 Variable Identification

This chapter reviewed kinds of literature on abandoned/unfinished/non-completion and their impacts on building projects. Based on the objectives of the study, the causes of abandoned/unfinished/non-completion and their impacts on building projects as well as recommended strategies to minimize them were identified from the kinds of literature to be used in the research instrument.

From the literature, the following causes of unfinished building construction were identified:

- Change of plans or scope
- Change of schedule
- Change in specifications
- Change in design
- Errors and omissions in design
- Inadequate working drawing details
- Non-compliant design with government regulations
- Impediment in the prompt decision-making process
- Unforeseen problems
- Replacement of materials or procedures
- Sparse shop drawing details
- Lack of judgment and experience
- Financial issues
- Inadequate scope of work for one or more parties to the contract
- Design complexity
- Lack of communication
- Defective artistry
- Design discrepancies

- Inappropriate project objectives
- Long lead procurement
- Lack of coordination
- Fast track construction
- Ambiguous design details
- Unavailability of skill
- Weather conditions
- Lack of strategic planning
- Lack of knowledge of available materials and equipment
- Lack of involvement in the design of one or more parties to the contract
- Non-compliant design with owner's requirement
- Health and safety considerations
- Lack of specialized construction management
- Obstinate nature of one or more of the parties to the agreement
- Differing site conditions
- Poor procurement process
- Conflicts between contract documents
- Value engineering
- Change in economic conditions
- Honest wrong beliefs of one or more parties to the contract
- Lack of required data
- Unavailability of equipment
- Unfamiliarity with or unawareness of local conditions
- Socio-cultural factors
- Change in government regulations
- Speculation on desired profitability
- Technological change

The frequent occurrence of impact building projects for example, by contributing to cost overruns. If not carefully managed, the impacts may give rise to abandoned/unfinished/non a completion of the projects. From the literature, a list of the effects of abandoned/unfinished/non-completion was identified. These are:



- Increase in project cost
- Progress is affected
- Increase in overhead expenses
- Delay in payment
- Quality degradation
- Productivity degradation
- Procurement delay
- Rework and demolition
- Logistic delays
- Blemish firm's reputation
- Poor safety conditions
- Poor professional relations
- Additional fees for a contractor
- Disputes among professionals
- Completion schedule delay

Due to the nature of construction projects, different problems may occur. But their occurrence can be minimized if clear strategies are set. Recommended strategies to reduce problems were developed from the literature are:

- Plan adequately before works start on site;
- Produce a concluding design and contract documents;
- Complete the drawings at the tender stage;
- Spend adequate time on the pre-tender planning phase;
- Provide a clear brief of the scope of works;
- Forecast to overview unforeseen situations;
- Coordinate closely at the design stage;
- Enhance communication between all parties;
- Supervise works with an experienced and dedicated supervisor;
- Ensure that the design/specifications fall within the approved budget
- Get information about procurement procedure, material and plant;
- Carry out detailed site investigation, including detail soil investigations;
- Have the underground cable route, confirm with the local authorities;

- Have the land application or land purchase completed before awarding contracts;
- Once the tender is awarded, make no changes to the specifications; and
- Place experienced and knowledgeable executives in the design department

## **2.11 Critique of the existing literature relevant to the study**

Scholars have carried out invaluable investigations regarding the problems affecting the construction industry, but, left out numerous unfinished buildings with very little attention. All critical information presented in the documentation will be extracted and combined with the data collected during the field investigations and from local offices to describe the baseline condition and identify potential issues/impacts.

## **2.12 Summary**

Before conducting field surveys for data collection and public and stakeholder consultations, relevant national as well as regional building construction policies, laws and regulations that govern building construction code requirements including EBCS of development projects will be gathered and reviewed.

## **2.13 Research Gaps**

A topic on "assessment on the Impact of unfinished building Construction and its mitigation measures" is one of the issues that have not been researched on that often. Published resources such as e-resources, journals, and even research papers in libraries have not been found the researcher got some from the internet which is done in Uganda, Kampala city.

## CHAPTER THREE

### RESEARCH METHODOLOGY

#### 3.1 Study area

Jimma Zone is located in the Oromia Regional State of Ethiopia. The climate of the project area is affected significantly by variation in attitude and latitudinal position. The average monthly minimum temperature is  $13^{\circ}$  c while the average maximum temperature is  $24.5^{\circ}$  c. The average annual rainfall is 2073mm. The research was conducted for all building Construction projects that are not completed and executed by different contractors in Jimma city.



Figure 3.2 Map of the project area (Google Map data 2018)

## 3.2 Population and Sampling

Due to the nature of data collected from the desk study and the expected participants for the survey study, non-probability sampling was used. A purposive sampling method adopted to select the population for the study.

Purposive sampling represents a group of different non-probability sampling techniques. Also known as judgmental, selective or subjective sampling, purposive sampling relies on the judgement of the researcher when it comes to selecting the units (e.g., people, cases/organizations, events, pieces of data) that are to be studied

In this study, first, a population of fourteen (14) (See Appendix C) private building projects, which were abandoned in Jimma from the commencement of work from September 2005 to the end of June 2014 G.C with more than 70% abandoned projects from different sectors were selected. Among the fourteen projects, nine building projects were used in the study from the nine building five of them are taken for desk study. The other populations were the stakeholders in the Jimmatown government, private building projects. These populations were selected on nine individual building project activities.

## 3.3 Study Variables

Independent variables: Training and experience factors, Contractual dispute planning and management, the role of the project parties, source of finance for building.

Dependent Variable: - impact of unfinished construction project

## 3.4 Data Collection

For a better understanding of the applicability of the various mechanisms used in assessing the impact of the unfinished building, data were collected using the desk study and survey.

### 4.4.1 Desk Study

To have information on the stated problem, the researcher physically visited the site; data were extracted from the project certificates of payment and monthly progress reports. This will help to clearly understand the relationship between the theories and actual practices in

building projects. The data collected through the desk research study were determined the worthiness of the topic for research.

### **3.4.2 Survey**

#### **3.4.2.1 Interviews**

The interview was conducted face-to-face with the interviewee asking questions selected individuals. The interview is a useful technique for collecting data which would probably not be accessible using methods such as observations and questionnaires. A semi-structured interview was conducted with the senior project supervision and follow up team leader, a senior contract administrator, and a senior project manager to gather information on the causes and impacts of the unfinished building on public building projects as well as to look for recommendations if any to minimize the problem. Thus, out of 23 targeted responses, only 19 (82.6%) of them completed and returned the questionnaire. Nineteen questionnaires from 8 clients, four consultants, and seven contractors were received.

#### **3.4.2.2 Questionnaire**

The survey is the most straightforward and time-saving method to collect data effectively from a considerable number of respondents. Formulating questions from the identified variables, the questionnaire was designed to gather data from professionals that were involved in public and private building projects in Jimma city. Closed-ended questions were formulated by allowing them to add other variables from their experience at the end of each section (See Appendix A). The respondents were asked to rate the questions on the five-point scale of ordinal measures as shown below. The questionnaire was structured in four sections as follows

Section A: The category of organization in which the respondent serves, his/her role in the organization, and the respondent's working experience. There were four questions in this section

Section B: To obtain responses from respondents on the causes of unfinished building construction on private building projects. The ranking of the responses applied Likert's scale of five ordinal measures which arranged in ascending order from 1 to 5. This section included a total of 40 required responses.

Section C: To get responses from the respondents on the impact of the unfinished building on public and private building projects. The responses were ranked by using Likert's scale of five ordinal measures which arranged in ascending order from 1 to 5. A total of 20 required responses was included in this section.

Section D: To obtain responses from the respondents on the recommended strategies to minimize the impact of the unfinished building on public and private building projects. The responses were ranked by using Likert's scale of five ordinal measures which are arranged in ascending order from 1 to 5. A total of 15 required responses was included in this section.

The questionnaires were hand-delivered to the respondents at their head offices and on project sites. The responses were also received by the same means. However, face-to-face delivery was preferred to motivate the respondents participate and thereby to improve the response rate for the study.

### 3.5 Data Processing and Analysis

The responses to the questionnaire were based on Likert's scale of five ordinal measures which was from one 1 to five 5 arranged in ascending order according to the degree of contribution to each question.

The main approach used to analyze the data was by using the Relative Index (RI) technique. The responses are analyzed using the Microsoft Excel software package. The analysis included a ranking of the factors in terms of the degree of effect. In the computation of the relative index the following formula was used; (Ado, November 2014)

$$RI = \frac{(5n_5 + 4n_4 + 3n_3 + 2n_2 + n)}{5(n_5 + n_4 + n_3 + n_2 + n)} \dots \dots \dots \text{Equation 3.1}$$

Where:

RI: Relative Index

$n_5, n_4, n_3$  are number of responding indices.

The Spearman (rho) rank correlation coefficient utilized for measuring the differences in ranking between two groups of respondents scoring for various factors (i.e., Clients versus consultants, clients versus contractors, and consultants versus contractors).

The following formula gives the Spearman (rho) rank correlation coefficient for any two groups of ranking: Rho symbol is ( $\rho$ )

$$\mathbf{Rho}(\rho_{cal}) = 1 - \frac{6(\sum di^2)}{N(N^2 - 1)} \quad \dots \quad \text{Equation 3.2}$$

Where:

Rho ( $\rho_{cal}$ ): Spearman's rank correlation coefficient;

$d_i$ : the difference in ranking between each pair of factors; and

N: number of factors (variables).

The value of the Spearman ( $\rho$ ) rank correlation coefficient varies between -1 and +1. A correlation coefficient of +1 implies a perfect positive correlation; 0 means no correlation and -1 indicates a perfect negative correlation.

### **3.6 Ethical Consideration**

The researcher obtained consent before the study, questioners or the interview begins. The researcher learned enough about the culture of informants to ensure it is respected during the data collection process and ensure the confidentiality of the data obtained.

## CHAPTER FOUR

### DATA ANALYSIS, RESULTS AND DISCUSSION

#### 4.1 Project Data Information from the Desk Study

During the study period, a total of fourteen (14) private building projects which were under construction in Jimma, and nine (9) project samples considered for the study. From this number five (5) unfinished building projects were selected for desk study in order to fully understand the causes and impacts of unfinished building projects and to determine what recommendations or strategies could be taken to minimize problems of unfinished building projects on private building projects. These projects were uncompleted and selected as a representative to each of the private building projects. The list of selected projects are shown in Table 4.1

Table 4.1 List of selected building projects

| Promoter(s) Name               | Kebele (pl)    | Sectorial type/ Sub-sector | Investment Activity | Approved land area in (ha) | Date of an agreement signed | Proposed Capital (000) | Permanent /M/ | Permanent (F) | temporary (M) | Temporary (F) |
|--------------------------------|----------------|----------------------------|---------------------|----------------------------|-----------------------------|------------------------|---------------|---------------|---------------|---------------|
| Abdu Jemal(1)                  | HermataMentina | Trade                      | Mixed use           | 0.0800                     | 3/6/2002                    | 4,000,000.00           | 20            | 15            | 20            | 20            |
| Aziz Mohammed(2)               | Becho Bore     | Trade                      | Commercial          | 0.0810                     | 10/5/2002                   | 5,000,000.00           | 6             | 4             | 4             | 4             |
| Afro KandiaMult PLC(3)         | Awetu-Mender   | Education                  | College School      | 0.1600                     | 25/07/01                    | 7,000,000.00           | 21            | 16            | 3             | 2             |
| Addaamuol'qabaa(4)             | G/Guduruu      | Trade                      | Mixed use           | 0.0800                     |                             | 3,000,000              | 2             | 3             | 5             | 6             |
| AbdulwahaabMahaammad(A/Biyyaa) | G/Guduruu      | Trade                      | Rental office       | 0.0475                     | 1997                        | 2,000,000              | 0             | 1             | 0             | 6             |

(Source: Jimma city investment office )



### 4.1.1 Project 1

The tender sum for Project 1 was 4,000,000.00Birr, and the original planned work's duration was 540 days. There were numerous additional works associated with design changes due to the owner's requirement. As the contractor was not finished at the agreed time, no penalties were levied against the contractor. These results in abandoned of the Project.



Figure 4.1 Project 1

### 4.1.2 Project 2

Project 2 was awarded a tender sum of 5,000,000.00Birr, and the original planned work's duration was 720 days. The project was exposed to variation due to design changes for the error made by the consultant. It was observed that civil site works were redesigned which incurred an extra cost. Due to the lack of communication between the client and the consultant, a dispute occurred between the client and the consultant. These results in abandoned of the project



Figure 4.2 Project2

#### 4.1.3 Project 3

The tender sum for Project 3 was 7,000,000.00Birr, and the original planned work's duration was 800 days. Modification of the civil site works took about five months to make decisions and submit the modified documents to the contractor. Due to this lack of decision-making process by the client, the contractor was granted an extension time of 285 days, which was a time overrun over the schedule of works. Besides, the client faces some budget deficiency due to inflation. These results in abandoned of the project



Figure 4.3 Project3

#### 4.1.4 Project 4

Project 4 was awarded a tender sum of 3,000,000.00Birr, and the original planned work's duration was 260 days. The client ordered the contractor to execute the additional works, the missed items, and the works to be modified. Due to lack of decision-making process, the client did not submit the revised design at the right time to the contractor. The interim payment to the contractor is also delayed due to the additional works which affected payment for the other activities. Due to this reason, the project was delayed, which caused by the client, and the contractor was not finished over the schedule of works.



Figure 4.4 Project4

#### 4.1.5 Project 5

The tender sum for Project 5 was 2,000,000Birr, and the original planned work's duration was 540 days. A variation of was ordered due to the incomplete contract document. The client did not approve the difference at their earliest with the right decision because of an increase in project cost. These results the contractor was not finished over the schedule of the works. See fig below



Figure 4.5 Project5

Table 4.2 causes and impact of unfinished building project data from the desk study

| <b>Project</b> | <b>Causes of an unfinished building</b>  | <b>Impact of the unfinished building</b>   |
|----------------|--|--|
| Project 1      | -Design changes<br>-Incomplete contract document   | -Increase in project cost<br>-Completion schedule delay  |
| Project 2      | -Modification of design<br>-Noncompliant design with owner's requirement<br>-Lack of communication between parties           | -Increase in project cost<br>-Completion schedule delay<br>-Disputes between the parties<br>-Payment delay to the contractor |
| Project 3      | -Design changes<br>-Incomplete contract document<br>- Incomplete working drawings  | -Increase in project cost<br>-Completion schedule delay  |
| Project 4      | - Errors in design by consultant<br>- Incomplete working drawings<br>-Modification of design                                 | -Increase in project cost<br>-Completion schedule delay<br>-Payment delay to the contractor                                  |
| Project 5      | - Non-compliant design with owner's requirement<br>-Lack of decision making by the client<br>-Errors in design by consultant | -Increase in project cost<br>-Completion schedule delay  |

#### 4.1.6 Findings from the Desk Study

The desk study was applied to five selected documents of private building project's contract documents. The contract documents were massive with data, information, contract, bill of quantities and drawings. The studied documents were signed, stamped and legal documents for law.

##### 4.1.6.1 Causes of an unfinished building

The desk study findings showed that fourteen (14) causes of an unfinished building in answering the first objective. Due to the repetition, it was further syntheses to eight (8) from the most to the least repetitive causes of the unfinished private building to be used in the questionnaire for the verification and validation process to evaluate their degree of importance. But all the eight cases were already the domain of the variables identified from the literature review. Below is the document study finding of summary of causes of unfinished private building from the five projects contract documents as shown in Table 4.3.

Table 4.3 Causes of unfinished building from the desk study

| No    | Causes of an unfinished building              | Frequency | Rank |
|-------|---|-----------|------|
| 1     | Design changes                                | 2         | 1    |
| 2     | Incomplete contract documents                 | 2         | 1    |
| 3     | Incomplete working drawings                   | 2         | 1    |
| 4     | Errors in design by the consultant            | 2         | 1    |
| 5     | Design modification                           | 2         | 1    |
| 6     | Noncompliant design with owner's requirement  | 2         | 1    |
| 7     | Lack of communication between the parties     | 1         | 2    |
| 8     | Lack of decision-making process by the client | 1         | 2    |
| Total |   | N=14      |      |

#### 4.1.6.2 Impact of the unfinished building

From the document study findings, the following are a summary of the impacts of the unfinished building shown in Table 4.4. Thirteen (13) impacts were identified in answering the second objective. And these variables were further syntheses to four (4) in ascending order of their repetition which was being used in the questionnaire for the verification and validation process to evaluate their degree of importance. But all the variables were in the literature review.

Table 4 4 Impacts of unfinished building from the desk study

| No    | Impacts of an unfinished building   | Frequency | Rank |
|-------|-------------------------------------|-----------|------|
| 1     | Increase in project cost            | 5         | 1    |
| 2     | Completion schedule delay           | 5         | 1    |
| 3     | Payment delay to the contractor     | 2         | 2    |
| 4     | Disputes among the involved parties | 1         | 3    |
| Total |                                     | N=13      |      |

## 4.2 Interviews

### 4.2.1 Analysis of Data from the Interview

These interviews were done between selected construction industry practitioners who are currently involved in private building projects focusing on their perceptions on the impacts of unfinished buildings. In total three interviews were conducted, namely with project supervision and follow up team leader (A) from the clients' group, contract administrator (B) from the consultants', and project manager (C) from the contractors' group as shown in Table 4.5 below. The interview aimed at discovering the causes of the unfinished building and their impacts on private building projects and to seek recommendations to minimize their occurrence.

Table 4 5 Interview results

| Questions  | Interviewee A  | Interviewee B  | Interviewee C  |
|--|--|--|--|
| From your experience, what are the Causes of the unfinished building on private building projects? | <ul style="list-style-type: none"> <li>• Incomplete BoQ</li> <li>• Design changes and modification</li> <li>• Errors in design</li> <li>• Change in specifications</li> <li>• Lack of communication between parties</li> </ul> | <ul style="list-style-type: none"> <li>• Design Changes</li> <li>• Change in specification</li> <li>• Incomplete BoQ</li> <li>• Unforeseen conditions on site</li> <li>• Lack of coordination</li> </ul> | <ul style="list-style-type: none"> <li>• The discrepancy between drawing and BoQ</li> <li>• Non-compliant design with client's requirement</li> <li>• Lack of experience</li> <li>• Errors in design</li> <li>• Design complexity</li> <li>• Lack of judgment</li> </ul> |
| What are the various impacts of the unfinished building on private building projects?              | <ul style="list-style-type: none"> <li>• Increase in project cost</li> <li>• Completion schedule delay</li> <li>• Degrades quality</li> </ul>  | <ul style="list-style-type: none"> <li>• Disputes among the professionals</li> <li>• Increase in project cost</li> <li>• Completion schedule delay</li> <li>• Rework and demolition</li> </ul>           | <ul style="list-style-type: none"> <li>• Growth in the contract and overhead costs</li> <li>• Differences among parties</li> <li>• Completion schedule delay</li> </ul>  |



|   |  |   |  |
|---|--|---|--|
| What do you suggest to minimize the impacts of unfinished building construction on private building projects? | <ul style="list-style-type: none"> <li>• Produce a complete design and contract document</li> <li>• Prepare a completed detail drawing</li> <li>• There should be communication between parties</li> </ul> | <ul style="list-style-type: none"> <li>• Designs should be complete at tender stage</li> <li>• Carry out a detailed site investigation before tendering stage</li> <li>• Forecast unforeseen situations before tendering</li> </ul> | <ul style="list-style-type: none"> <li>• Prepare a complete drawing and contract document before tendering stage</li> <li>• Completed detail drawings should be submitted on time</li> <li>• Experienced supervisors should supervise works</li> </ul> |
|---|--|---|--|

#### 4.2.2 Results from the Interview

From the interview sixteen (16) causes of unfinished building construction in answering the first question, ten (10) impacts of unfinished building projects for the second question and nine (9) strategies to minimize impacts unfinished building projects in answering the third question were identified. These variables were merged and checked if they were out of the literature to include them in the questionnaire. But more of them with the same meaning were the domain of the variables identified from the literature.

The findings from the interview revealed that incomplete contract document, design changes, change in specifications, errors in design, unforeseen conditions, design complexity, lack of communication and coordination between the parties, lack of experience and judgment were the causes which contribute to the occurrence of unfinished building projects. As identified from the interview, the impacts of unfinished building projects which frequently occur on private building projects were increased in project cost, most of the time, which termed as a cost overrun, completion schedule delay termed as time overwhelmed, disputes among the parties, it degrades quality and it results in an unfinished building project.

The interviewee suggested that it is possible to minimize the occurrence impacts of unfinished building projects with the most common strategies which always pointed out by experienced construction practitioners. According to the interviewee, a complete design and contract documents should be produced, full detail drawings should be submitted on time, a detail site investigation should be carried out and unforeseen conditions should be forecasted



before the tendering stage and supervising the works with experienced supervisors can minimize impacts of the unfinished building on private building projects.

### 4.3 Analysis of Data from the questionnaire survey

#### 4.3.1 Rate of Response

The respondents were grouped into three major groups, namely Client, consultant, and Contractor. The returns from the three groups are tabulated in Figure 4.6 below which shows an average response rate. Out of 23 targeted responses, only 19 (82.6%) of them completed and returned the questionnaire. Nineteen questionnaires from 8 clients, four consultants, and seven contractors were received

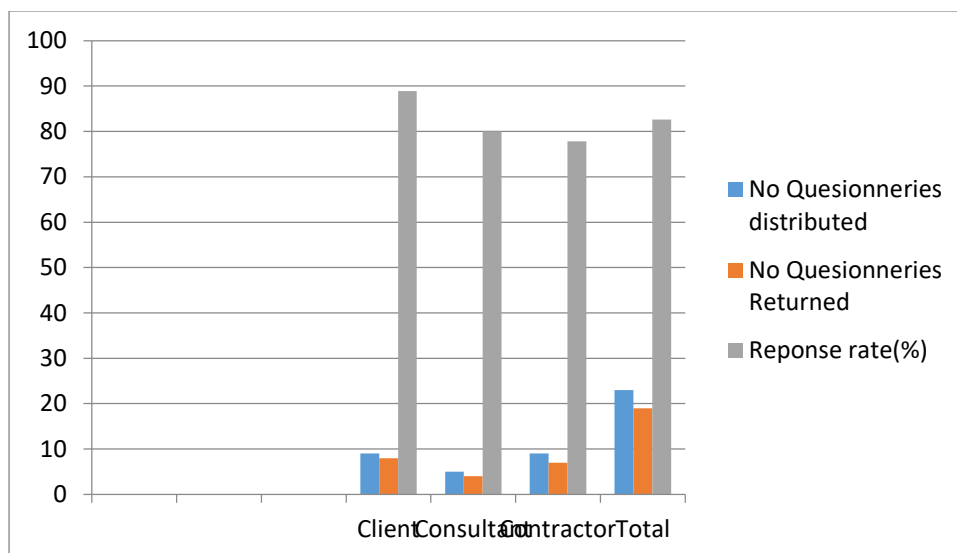


Figure 4.6 Questionnaire return rate

#### 4.3.2 Respondents' Background

Among the eight responses received from clients, six (75%) of them were construction supervisors and follow-up engineers, while two (25%) were Contract Administrators. Four responses received from consultants, three (75%) of them were resident engineers, and one (25%) was contracted administrator. And among the seven responses received from contractors, three (42.9%) of them were project managers, three (42.9%) of them were office engineers, and one (14.2%) was a quantity surveyor.

### 4.3.3 Respondents' Experience

All the respondents have different levels of work experience in building projects. The proportions of the respondents in terms of the number of years of involvement in building projects are tabulated in Table 4.6. It was observed that the majority of the respondents from the clients have between five to ten years of experience. The majority of the respondents from the consultants have also between five to ten years of experience. And about one-half of the respondents from the contractors have less than five years of experience.

Table 4.6 Respondents' experience

| <b>Experience in Building Projects</b> | <b>Client</b> | <b>Consultant</b> | <b>Contractor</b> | <b>Total</b> |
|--|---------------|-------------------|-------------------|--------------|
| Less than five years                   | 3             | 1                 | 3                 | 7            |
| 5 to 10 years                          | 3             | 2                 | 2                 | 7            |
| Ten years and above                    | 2             | 1                 | 2                 | 5            |

### 4.3.4 Findings from the Questionnaires

In the structured part of the questionnaire, the respondents were asked to rate the degree of contribution. Furthermore, the respondents were also asked to add other variables or factors that contributed to the causes and impacts as well as recommendations that they perceived as being necessary. From the forty (40) causes of the unfinished building identified from the literature, all mutually exclusive causes of unfinished building construction, twenty (20) impacts of unfinished building projects and fifteen (15) strategies to minimize impacts of the unfinished building on private building projects were used in the questionnaire survey. All the impacts of unfinished building projects and the suggested approaches to minimize them were used as identified from the literature. The analyses were divided into three groups the clients' point of view, the consultants' point of view and the contractors' point of view and a correlation test was made between the groups. A ranking system using the Relative Index (RI) method was calculated to find the most significant factor for each section. The value of

RI ranges from 0.2 to 1. The value 0.2 represents the lowest strength and the value 1 representing the highest strength.

#### 4.3.4.1 Causes of unfinished building projects on Building Projects

The frequency of the causes of unfinished building projects was determined by using a 5 point Likert scale, namely Never = 1; Seldom = 2; Sometimes = 3, Often = 4; and Always = 5. The causes of unfinished building construction were ranked by comparing their relative index.

##### i. Clients Group

From Table 4.7 below, it was possible to rank the causes of unfinished building projects by comparing their RI. According to the clients, awarding the project for least bidder, delay to fix the Right of way problem, poor communication and Coordination, and Wrong choice of Consultants and contractors were the most ranking causes of unfinished building projects which dominate with ranges of value (RI=0.686-0.657) followed by late identification and resolution of drawings and specification errors and omissions, finance and payments of completed work, and shortage of material ranges (RI=0.633-0.625). And site management problems were the least ranked cause of unfinished building projects.

Table 4.7 Frequency of causes of unfinished building projects for the clients' group

| Causes of unfinished building construction  | RI    | Ranking |
|---|-------|---------|
| Awarding the project for least or lowest bidder                                       | 0.686 | 1       |
| Delay to fix the Right of way problem   | 0.686 | 1       |
| Poor communication and Coordination   | 0.657 | 3       |
| Wrong choice of Consultants and contractors   | 0.657 | 3       |
| Late identification and resolution of drawings and specification errors and Omissions | 0.633 | 5       |
| Finance and payments of completed work  | 0.629 | 6       |
| Shortage of material.   | 0.625 | 7       |
| Regulatory changes  | 0.622 | 8       |
| Weather condition   | 0.620 | 9       |
| Waiting time for approval of tests and inspections.                                   | 0.600 | 10      |
| Unforeseen ground condition   | 0.582 | 11      |

|   |       |    |
|---|-------|----|
| Inappropriate design parameters                                   | 0.580 | 12 |
| Absence of consultant's site staff                                | 0.578 | 13 |
| An incorrect organizational structure formed for the project      | 0.575 | 14 |
| Financial problems  | 0.575 | 14 |
| Preparation and approval of drawings.                             | 0.575 | 14 |
| Slow decision-making  | 0.571 | 17 |
| Suspension of work by owner or contractor                         | 0.567 | 18 |
| Used of Inferior Quality of material.                             | 0.567 | 18 |
| Inadequate contractor experience                                  | 0.560 | 20 |
| Improper Construction methods                                     | 0.556 | 21 |
| Equipment availability and readiness for repair on the breakdown. | 0.556 | 21 |
| Design alterations and change orders                              | 0.550 | 23 |
| Quality assurance and control practice                            | 0.550 | 24 |
| Owner intervention  | 0.543 | 25 |
| Mistakes during construction                                      | 0.533 | 26 |
| Major disputes and negotiations                                   | 0.527 | 27 |
| Improper planning   | 0.525 | 28 |
| Discrepancies between contract documents                          | 0.520 | 29 |
| Lack of communication between the parties.                        | 0.520 | 29 |
| Awareness of Labor productivity                                   | 0.511 | 31 |
| Inappropriate coordination of information                         | 0.511 | 31 |
| Regular inspection and monitoring                                 | 0.509 | 33 |
| Knowledge of Contract management.                                 | 0.486 | 34 |
| Change order  | 0.475 | 35 |
| Unrealistic contract duration                                     | 0.467 | 36 |
| Lack of experience on the part of the consultant                  | 0.457 | 37 |
| Subcontractors  | 0.429 | 38 |
| Labor supply not adequate   | 0.400 | 39 |
| Site management problems  | 0.371 | 40 |

## ii. Consultants Group

As shown in Table 4.8 respondents of this group equally believed that discrepancies between contract documents delay to fix the Right of way problem and Late identification and resolution of drawings and specification errors and omissions were the most ranking causes of unfinished building projects (RI=0.800). Regulatory changes, awarding the project for least or lowest bidder formed for the project dominate with ranges of value (RI=0.760-0.750) and the Suspension of work by owner or contractor, poor communication and Coordination, wrong choice of Consultants and contractors, (RI=0.733). According to the respondents of this category, the least ranked cause of unfinished building projects was knowledge of Contract management.

Table 4.8 Frequency of causes of unfinished building projects for the consultants' group

| Causes of unfinished building projects  | RI of consultant | Ranking |
|---|------------------|---------|
| Discrepancies between contract documents  | 0.800            | 1       |
| Delay to fix the Right of way problem   | 0.800            | 1       |
| Late identification and resolution of drawings and specification errors and Omissions | 0.800            | 1       |
| Regulatory changes  | 0.760            | 4       |
| Awarding the project for least or lowest bidders                                      | 0.750            | 5       |
| Suspension of work by owner or contractor   | 0.733            | 6       |
| Poor communication and Coordination   | 0.733            | 6       |
| Wrong choice of Consultants and contractors   | 0.733            | 6       |
| Weather condition   | 0.733            | 6       |
| An incorrect organizational structure formed for the project                          | 0.700            | 10      |
| Equipment availability and readiness for repair on a breakdown.                       | 0.700            | 10      |
| Unforeseen ground condition   | 0.680            | 12      |
| Finance and payments of completed work  | 0.650            | 13      |
| Preparation and approval of drawings.   | 0.650            | 13      |
| Inappropriate design parameters   | 0.633            | 15      |

|  |       |    |
|--|-------|----|
| Slow decision-making                                       | 0.600 | 16 |
| Financial problems   | 0.600 | 16 |
| Inadequate contractor experience                           | 0.600 | 16 |
| Shortage of material.                                      | 0.600 | 16 |
| Absence of consultant's site staff                         | 0.600 | 16 |
| Quality assurance and control practice                     | 0.600 | 16 |
| Waiting time for approval of test results and inspections. | 0.600 | 16 |
| Regular inspection and monitoring                          | 0.600 | 16 |
| Inappropriate coordination of information                  | 0.600 | 16 |
| Major disputes and negotiations                            | 0.600 | 16 |
| Lack of communication between the parties.                 | 0.600 | 16 |
| Used of Inferior Quality of material.                      | 0.550 | 27 |
| Mistakes during construction                               | 0.533 | 28 |
| Improper Construction methods                              | 0.520 | 29 |
| Owner intervention   | 0.500 | 30 |
| Unrealistic contract duration                              | 0.500 | 30 |
| Design alterations and change orders                       | 0.500 | 30 |
| Improper planning  | 0.500 | 30 |
| Awareness of Labor productivity                            | 0.500 | 30 |
| Change order   | 0.467 | 35 |
| Subcontractors   | 0.400 | 36 |
| Site management problems                                   | 0.400 | 36 |
| Labor supply not adequate                                  | 0.400 | 36 |
| Lack of experience on the part of the consultant           | 0.400 | 36 |
| Knowledge of Contract management.                          | 0.399 | 40 |

### iii. Contractors Group

From Table: 4.9 below, the most cause of unfinished building projects according to these respondents delays to fix the Right of way problem, awarding the project for least or lowest bidder, poor communication and Coordination, wrong choice of Consultants

and contractors and late identification and resolution of drawings and specification errors and omissions formed for the project dominate with ranges of value (RI=0.700-0.633). Site management problems were the least ranked cause of unfinished building projects.

Table 4.9 Frequency of causes of unfinished building from the contractors' group

| Factor Description  | RI    | Rank |
|---|-------|------|
| Delay to fix the Right of way problem   | 0.700 | 1    |
| Awarding the project for least or lowest bidder                                       | 0.667 | 2    |
| Poor communication and Coordination   | 0.640 | 3    |
| Wrong choice of Consultants and contractors   | 0.640 | 3    |
| Late identification and resolution of drawings and specification errors and Omissions | 0.633 | 5    |
| Suspension of work by owner or contractor   | 0.600 | 6    |
| Finance and payments of completed work  | 0.600 | 6    |
| Slow decision-making  | 0.600 | 6    |
| Financial problems  | 0.600 | 6    |
| Shortage of material.   | 0.600 | 6    |
| Absence of consultant's site staff  | 0.600 | 6    |
| Waiting time for approval of test results and inspections.                            | 0.600 | 6    |
| Unforeseen ground condition   | 0.600 | 6    |
| Inappropriate design parameters   | 0.580 | 14   |
| Preparation and approval of drawings.   | 0.575 | 15   |
| Weather condition   | 0.575 | 15   |
| Quality assurance and control practice  | 0.571 | 17   |
| Equipment availability and readiness for repair on a breakdown.                       | 0.571 | 17   |
| Regulatory changes  | 0.571 | 17   |
| Used of Inferior Quality of material.   | 0.560 | 20   |
| Inadequate contractor experience  | 0.556 | 21   |
| Improper Construction methods   | 0.550 | 22   |
| Incorrect organizational structure formed for the project                             | 0.543 | 23   |

|  |       |    |
|--|-------|----|
| Owner intervention                               | 0.543 | 24 |
| Design alterations and change orders             | 0.543 | 24 |
| Improper planning                                | 0.543 | 24 |
| Major disputes and negotiations                  | 0.533 | 27 |
| Inappropriate coordination of information        | 0.525 | 28 |
| Mistakes during construction                     | 0.520 | 29 |
| Regular inspection and monitoring                | 0.520 | 29 |
| Lack of communication between the parties.       | 0.511 | 31 |
| Discrepancies between contract documents         | 0.500 | 32 |
| Awareness of Labor productivity                  | 0.500 | 32 |
| Knowledge of Contract management.                | 0.500 | 32 |
| Change order                                     | 0.475 | 35 |
| Unrealistic contract duration                    | 0.457 | 35 |
| Lack of experience on the part of the consultant | 0.457 | 35 |
| Subcontractors                                   | 0.433 | 38 |
| Labor supply not adequate                        | 0.400 | 39 |
| Site management problems                         | 0.371 | 40 |

The Spearman correlation coefficient is calculated using Equation 3.2 and tabulated as shown below in Table 4.10.

Table 4.10 Summary of correlation test on the ranking of causes of unfinished building construction

| Respondents               | $\text{Rho}(\rho_{cal}) = 1 - \frac{6(\sum di^2)}{N(N^2 - 1)}$ | Relation of the respondents |
|---------------------------|--|-----------------------------|
| Client Vs. Consultant     | 0.975  | Strong                      |
| Consultant Vs. Contractor | 1.006  | Strong                      |
| Client Vs. Contractor     | 0.981  | Strong                      |

From the correlation table above, it can be concluded that there is a strong correlation between the attitudes of the respondents in all three groups. This means that most of the respondents have the same perception of the causes of unfinished building projects.



#### iv. Overall Responses

As shown in Table: 4.11 below, it was possible to rank the causes of the unfinished building combining the responses of all respondents. The most ranked causes of unfinished building projects by all respondents were discrepancies between contract documents, delay to fix the Right of way problem, and Late identification and resolution of drawings and specification errors and omissions dominate with the same value (RI=0.800). Regulatory changes and awarding the project for the least bidder dominate with ranges of value (RI=0.760-0.750). Suspension of work by owner or contractor, poor communication and Coordination, Wrong choice of Consultants and contractors and Weather condition followed with the same value (RI=0.733) and then Incorrect organizational structure formed for the project, equipment availability and readiness to repair on breakdown and Delay to fix the Right of way problem (RI=0.700). Labor supply not adequate, site management problems (RI=0. 0.400) were the least ranked causes of unfinished building projects

Table 4.11 Overall frequency of causes of unfinished building construction

| Causes of unfinished building projects  | RI    | Rank |
|---|-------|------|
| Discrepancies between contract documents  | 0.800 | 1    |
| Delay to fix the Right of way problem   | 0.800 | 1    |
| Late identification and resolution of drawings and specification errors and Omissions | 0.800 | 1    |
| Regulatory changes  | 0.760 | 4    |
| Awarding the project for least bidder   | 0.750 | 5    |
| Suspension of work by owner or contractor   | 0.733 | 6    |
| Poor communication and Coordination   | 0.733 | 6    |
| Wrong choice of Consultants and contractors   | 0.733 | 8    |
| Weather condition   | 0.733 | 8    |
| Incorrect organizational structure formed for the project                             | 0.700 | 10   |
| Equipment availability and readiness for repair on a breakdown.                       | 0.700 | 10   |

|   |       |    |
|---|-------|----|
| Unforeseen ground condition                         | 0.680 | 12 |
| Finance and payments of completed work              | 0.650 | 13 |
| Preparation and approval of drawings.               | 0.650 | 13 |
| Inappropriate design parameters                     | 0.633 | 15 |
| Shortage of material.                               | 0.625 | 16 |
| Waiting time for approval of tests and inspections. | 0.600 | 17 |
| Slow decision-making                                | 0.600 | 17 |
| Financial problems                                  | 0.600 | 17 |
| Inadequate contractor experience                    | 0.600 | 17 |
| Absence of consultant's site staff                  | 0.600 | 17 |
| Quality assurance and control practice              | 0.600 | 17 |
| Regular inspection and monitoring                   | 0.600 | 17 |
| Inappropriate coordination of information           | 0.600 | 17 |
| Major disputes and negotiations                     | 0.600 | 17 |
| Lack of communication between the parties.          | 0.600 | 17 |
| Use of Inferior Quality of material.                | 0.567 | 27 |
| Improper Construction methods                       | 0.556 | 28 |
| Design alterations and change orders                | 0.550 | 29 |
| Owner intervention                                  | 0.543 | 30 |
| Improper planning                                   | 0.543 | 31 |
| Mistakes during construction                        | 0.533 | 32 |
| Awareness of Labor productivity                     | 0.511 | 33 |
| Unrealistic contract duration                       | 0.500 | 34 |

|  |       |    |
|--|-------|----|
| Knowledge of Contract management.                | 0.500 | 34 |
| Change order                                     | 0.475 | 36 |
| Lack of experience on the part of the consultant | 0.457 | 36 |
| Subcontractors                                   | 0.433 | 38 |
| Labor supply not adequate                        | 0.400 | 39 |
| Site management problems                         | 0.399 | 40 |

#### 4.4.4.2 Impact of unfinished building projects on private Building Projects

The impact of unfinished building construction on private projects was determined utilizing a 5 - point Likert scale, namely: No impact = 1; Low impact = 2; Medium impact = 3; High impact = 4; and Very high impact = 5. The impacts of unfinished building construction were ranked by comparing their relative index.

##### i. Clients Group

From Table: 4.12 below, the respondents of this group responded that the most impact of unfinished building construction increased in project cost (RI=0.822) followed by progress is affected (RI=0.778). Increase in overhead expenses was the third-ranked impact (RI=0.733). The fourth and Fifth progress is modified according to the clients followed by a delay in payment and bad Public Relations with equal value (RI = 0.667). Litigation was the least impact of unfinished building construction on private building projects with (RI = 0.400).

Table 4.12 Frequency of impact of unfinished building construction from the clients' group

| Impacts of unfinished building construction project | RI    | Rank |
|---|-------|------|
| Increase in project cost                            | 0.822 | 1    |
| Progress is affected                                | 0.778 | 2    |
| Increase in overhead expenses                       | 0.733 | 3    |
| Delay in payment                                    | 0.667 | 4    |
| Bad Public Relations                                | 0.667 | 4    |
| Quality degradation                                 | 0.644 | 6    |

|                                   |       |    |
|-----------------------------------|-------|----|
| Arbitration                       | 0.629 | 7  |
| Productivity degradation          | 0.622 | 8  |
| Procurement delay                 | 0.622 | 8  |
| Rework and demolition             | 0.600 | 10 |
| Logistic delays                   | 0.571 | 11 |
| Total abandonment                 | 0.571 | 11 |
| Blemish firm's reputation         | 0.556 | 13 |
| Poor safety conditions            | 0.511 | 14 |
| Poor professional relations       | 0.489 | 15 |
| Additional payments to contractor | 0.450 | 16 |
| Disputes and claims               | 0.433 | 17 |
| Completion schedule delay         | 0.429 | 18 |
| Disputes among professionals      | 0.422 | 19 |
| Litigation                        | 0.400 | 20 |

## ii. Consultants Group

As can be seen Table: 4.13 below, it was possible to rank the impacts of unfinished building construction. The most ranked impacts of unfinished building construction by the consultants was quality degradation (RI=0.800). Increase in project cost came next (RI=0.733) and then progress is affected, logistics delays, bad Public Relations and Disputes and claims with equal value (RI=0.700). Disputes among professionals (RI=0.686) was the least impacts of unfinished building construction on private building projects.

Table 4 .13 Frequency of impact of unfinished building construction from the consultants' group

| <b>Impacts of unfinished building construction project</b> | <b>RI</b> | <b>Rank</b> |
|--|-----------|-------------|
| Quality degradation  | 0.800     | 1           |
| Increase in project cost                                   | 0.733     | 2           |
| Progress is affected                                       | 0.700     | 3           |

|                                   |       |    |
|-----------------------------------|-------|----|
| Logistic delays                   | 0.700 | 3  |
| Bad Public Relations              | 0.700 | 3  |
| Disputes and claims               | 0.700 | 3  |
| Delay in payment                  | 0.686 | 7  |
| Productivity degradation          | 0.686 | 7  |
| Rework and demolition             | 0.680 | 9  |
| Increase in overhead expenses     | 0.650 | 10 |
| Arbitration                       | 0.644 | 11 |
| Poor safety conditions            | 0.640 | 12 |
| Blemish firm's reputation         | 0.633 | 13 |
| Procurement delay                 | 0.600 | 14 |
| Additional payments to contractor | 0.600 | 15 |
| Litigation                        | 0.600 | 15 |
| Poor professional relations       | 0.500 | 17 |
| Total abandonment                 | 0.500 | 17 |
| Completion schedule delay         | 0.467 | 19 |
| Disputes among professionals      | 0.400 | 20 |

### iii. Contractors Group

From the following Table 4.14, it was possible to rank the impacts of unfinished building construction by comparing their RI. According to the contractors, the increase in project cost (RI=0.822) was the most ranked impact followed by progress is affection (0.778). Increase in overhead expenses (RI=0.733) and bad Public Relations (RI=0.680) were the next most ranked impact was a delay in payment (RI=0.667) and then Productivity degradation (RI=0.650). According to the contractors, Litigation was the least ranked impacts of unfinished building construction with a value (RI=0.400).

Table 4.14 Frequency of impact of unfinished building construction from the contractors' group

| Impacts of unfinished building construction project | RI    | Rank |
|---|-------|------|
| Increase in project cost                            | 0.822 | 1    |
| Progress is affected                                | 0.778 | 2    |
| Increase in overhead expenses                       | 0.733 | 3    |
| Bad Public Relations                                | 0.680 | 4    |
| Delay in payment                                    | 0.667 | 5    |
| Productivity degradation                            | 0.650 | 6    |
| Procurement delay                                   | 0.650 | 6    |
| Quality degradation                                 | 0.644 | 8    |
| Arbitration   | 0.633 | 9    |
| Rework and demolition                               | 0.625 | 10   |
| Logistic delays                                     | 0.600 | 11   |
| Blemish firm's reputation                           | 0.600 | 11   |
| Total abandonment                                   | 0.571 | 13   |
| Poor safety conditions                              | 0.525 | 14   |
| Poor professional relations                         | 0.500 | 15   |

|                                   |       |    |
|-----------------------------------|-------|----|
| Disputes and claims               | 0.500 | 15 |
| Disputes among professionals      | 0.467 | 17 |
| Additional payments to contractor | 0.440 | 18 |
| Completion schedule delay         | 0.440 | 18 |
| Litigation                        | 0.400 | 20 |

The Spearman's correlation coefficient is calculated using Equation 3.2 and tabulated as shown below in Table 4.15.

The summarized Spearman correlation coefficient indicated that there was a strong correlation between all the three groups. It means that most of the respondents have the common perception about the impact of unfinished building construction.

Table 4.15 Summary of correlation test on the ranking of the impact of unfinished building construction

| Respondents               | $Rho(\rho_{cal}) = 1 - \frac{6(\sum di^2)}{N(N^2 - 1)}$ | Relation of the Respondents |
|---------------------------|---|-----------------------------|
| Client Vs. Consultant     | 0.996   | Strong                      |
| Consultant Vs. Contractor | 1.00  | Strong                      |
| Client Vs. Contractor     | 1.00  | Strong                      |

#### iv. Overall Responses

As can be seen in Table: 4.16 below, the most ranked impacts of unfinished building construction from the combined responses of all respondents were increased in project cost (RI=0.822) followed by quality degradation (RI=0.800). Progress is affected (RI=0.778) and Increase in overhead expenses (RI=0.733) was the next and then logistics delays, bad Public relations, disputes and claims (RI=0.700). Disputes among professionals (RI=0.467) were the least ranked impact of unfinished building construction as responding by all participants.

Table 4 .16 Overall frequency of impact of unfinished building construction

| <b>Impacts of unfinished building construction project</b> | <b>RI</b> | <b>Rank</b> |
|--|-----------|-------------|
| Increase in project cost                                   | 0.822     | 1           |
| Quality degradation  | 0.800     | 2           |
| Progress is affected                                       | 0.778     | 3           |
| Increase in overhead expenses                              | 0.733     | 4           |
| Logistic delays  | 0.700     | 5           |
| Bad Public Relations                                       | 0.700     | 5           |
| Disputes and claims  | 0.700     | 5           |
| Delay in payment   | 0.686     | 8           |
| Productivity degradation                                   | 0.686     | 8           |
| Rework and demolition                                      | 0.680     | 10          |
| Procurement delay  | 0.650     | 11          |
| Arbitration  | 0.644     | 12          |
| Poor safety conditions                                     | 0.640     | 13          |
| Blemish firm's reputation                                  | 0.633     | 14          |
| Additional payments to contractor                          | 0.600     | 15          |
| Litigation   | 0.600     | 15          |
| Total abandonment  | 0.571     | 17          |
| Poor professional relations                                | 0.500     | 18          |
| Completion schedule delay                                  | 0.467     | 19          |
| Disputes among professionals                               | 0.466     | 20          |



#### 4.3.4.3 Recommended Strategies to minimize the impact of the unfinished building

The frequency of recommended strategies to mitigate the impact of unfinished building construction on building projects was identified using a 5 point Likert scale, namely Unimportant = 1; Less important = 2; Important = 3; Very important = 4; and Very high important = 5. The impact of unfinished building construction was ranked by comparing their relative index.

##### i. Clients Group

From Table 4.17, it was possible to rank the recommended strategies to minimize the impact of unfinished building construction by comparing their RI. According to the client, the most ranked recommended approach was all involved parties should plan adequately before works start on site (RI=0.933) followed by the consultant should produce a concluding design and contract document (RI=0.867). Spend adequate time on the pre-tender planning phase come next (RI=0.850). The recommended strategy Once the tender is awarded, make no changes to the specifications (RI=0.657) was the least ranked recommendation to minimize the impact of unfinished building construction.

Table 4.17 Frequency of recommended strategies from the client group

| <b>Recommendations to minimize the impact of the unfinished building construction project</b> | <b>RI</b> | <b>Rank</b> |
|---|-----------|-------------|
| All involved parties should plan adequately before works start on site                        | 0.933     | 1           |
| The consultant could produce a concluding design and contract Document                        | 0.867     | 2           |
| Spend adequate time on the pre-tender planning phase  | 0.850     | 3           |
| Complete the drawing sat tender stage   | 0.844     | 4           |
| The consultant should coordinate closely at the design stage                                  | 0.829     | 5           |
| Enhance communication between all parties   | 0.829     | 5           |
| Clients could provide a clear brief of the scope of works                                     | 0.822     | 7           |
| All parties should forecast unforeseen situations   | 0.822     | 7           |

|   |       |    |
|---|-------|----|
| Supervise the works with an experienced and dedicated supervisor  | 0.800 | 9  |
| Employ experienced and knowledgeable executives in the engineering and design department                            | 0.767 | 10 |
| Consultants could ensure that the design/specifications fall within the approved budget                             | 0.756 | 11 |
| Carry out detail site investigation including detail soil investigations and consider it during the tendering stage | 0.750 | 12 |
| Get accurate information and research with regard to procurement procedure, material, and plant                     | 0.743 | 13 |
| Have the land application or land purchase completed before awarding contracts                                      | 0.733 | 14 |
| Once the tender is awarded, make no changes to the specifications   | 0.657 | 15 |

## ii. Consultants Group

From Table: 4.18 below, the most ranked recommended strategy to minimize the impact of unfinished building construction, according to respondents of this category is All involved parties should plan adequately before works start on site (RI=0.933). The next recommendations were to Complete the drawing set the tender stage (RI=0.900). Once the tender is awarded, the consultant should coordinate closely at the design stage was the least ranked recommendation to minimize the impact of unfinished building construction according to the consultants (0.867).

Table 4.18 Frequency of recommendations from the consultants' group

| <b>Recommendations to minimize the impact of the unfinished building construction project</b>   | <b>RI</b> | <b>Rank</b> |
|---|-----------|-------------|
| All involved parties should plan adequately before works start on site                          | 0.950     | 1           |
| Complete the drawing set the tender stage   | 0.900     | 2           |
| The consultant should coordinate closely at the design stage                                    | 0.867     | 3           |
| Get accurate information and research with regard to procurement procedure, material, and plant | 0.867     | 3           |

|  |       |    |
|--|-------|----|
| The consultant could produce a concluding design and contract Document   | 0.850 | 5  |
| Spend adequate time on the pre-tender planning phase   | 0.850 | 5  |
| Employ experienced and knowledgeable executives in the engineering and design department                               | 0.850 | 5  |
| Carry out detailed site investigation, including detail soil investigations and consider it during the tendering stage | 0.840 | 8  |
| Enhance communication between all parties  | 0.833 | 9  |
| Clients could provide a clear brief of the scope of works  | 0.800 | 10 |
| All parties should forecast unforeseen situations  | 0.800 | 10 |
| Consultants could ensure that the design/specifications fall within the approved budget                                | 0.760 | 12 |
| Supervise the works with an experienced and dedicated supervisor   | 0.750 | 13 |
| Once the tender is awarded, make no changes to the specifications  | 0.650 | 14 |
| Have the land application or land purchase completed before awarding contracts   | 0.600 | 15 |

### iii. Contractors Group

As shown in Table: 4.19 below, the most ranked recommendation to minimize impact of unfinished building construction according to the contractors was all involved parties should plan adequately before works start onsite (RI=0.950) followed by the consultant should produce a concluding design and contract documents (RI=0.875) and then complete the drawing set tender stage (RI=0.850). According to these respondents, Place experienced, and knowledgeable executives in the engineering and design department (RI=0.675) was the least ranked recommendation to minimize the impact of unfinished building construction.

Table 4.19 Frequency of recommendations from the contractors' group

| <b>Recommendations to minimize the impact of the unfinished building construction project</b> | <b>RI</b> | <b>Rank</b> |
|---|-----------|-------------|
| All involved parties should plan adequately before works start on site                        | 0.950     | 1           |
| The consultant could produce a concluding design and contract Document                        | 0.875     | 2           |
| Complete the drawing set tender stage   | 0.850     | 3           |

|  |       |    |
|--|-------|----|
| Spend adequate time on the pre-tender planning phase   | 0.822 | 4  |
| Clients could provide a clear brief of the scope of works  | 0.822 | 4  |
| All parties should forecast unforeseen situations  | 0.825 | 6  |
| The consultant should coordinate closely at the design stage   | 0.825 | 6  |
| Enhance communication between all parties  | 0.825 | 6  |
| Supervise the works with an experienced and dedicated supervisor   | 0.800 | 9  |
| Consultants could ensure that the design/specifications fall within the approved budget                                | 0.775 | 10 |
| Get accurate information and research with regard to procurement procedure, material, and plant                        | 0.771 | 11 |
| Carry out detailed site investigation, including detail soil investigations and consider it during the tendering stage | 0.771 | 11 |
| Have the land application or land purchase completed before awarding contracts   | 0.771 | 11 |
| Once the tender is awarded, make no changes to the specifications  | 0.675 | 14 |
| Employ experienced and knowledgeable executives in the engineering and design department                               | 0.675 | 15 |

The Spearman's correlation coefficient is calculated using Equation 3.2 and tabulated as shown below in Table 4.20. The summarized Spearman correlation coefficient indicates that there is a strong correlation between all the three groups. This means that most of the respondents have the same perception on the recommended strategies to minimize the impact of unfinished building construction.

Table 4.20 Summary of correlation test on the ranking of recommendations

| Respondents               | $Rho(\rho_{cal}) = 1 - \frac{6(\sum di^2)}{N(N^2 - 1)}$ | Relation of the respondents |
|---------------------------|---|-----------------------------|
| Client Vs. Consultant     | 0.998   | Strong                      |
| Consultant Vs. Contractor | 1.000   | Strong                      |
| Client Vs. Contractor     | 0.998   | Strong                      |

#### iv. Overall Responses

From Table: 4.21, it was possible to rank the recommended strategy to minimize the impact of the unfinished building. The most ranked strategy by all respondents was all involved parties should plan adequately before works start on site (RI=0.950) followed by the Drawings should be complete at tender stage (RI=0.900). The consultant should produce a concluding design and contract documents (RI=0.875) was the next. According to all the respondents, the least ranked strategy was once the tender is awarded, there should be no changes to the specifications (RI=0.675).

Table 4.21 Overall frequency of recommendations to minimize impacts of the unfinished building

| <b>Recommendations to minimize the impact of the unfinished building construction project</b>                          | <b>RI</b> | <b>Rank</b> |
|--|-----------|-------------|
| All involved parties should plan adequately before works start on site   | 0.950     | 1           |
| Complete the drawings at tender stage  | 0.900     | 2           |
| The consultant should produce a concluding design and contract Document  | 0.875     | 3           |
| The consultant should coordinate closely at the design stage   | 0.867     | 4           |
| Get accurate information and research with regard to procurement procedure, material, and plant                        | 0.867     | 4           |
| Spend adequate time on the pre-tender planning phase   | 0.850     | 6           |
| Place experienced and knowledgeable executives in the engineering and design department                                | 0.850     | 7           |
| Carry out detailed site investigation, including detail soil investigations and consider it during the tendering stage | 0.840     | 8           |
| Enhance communication between all parties  | 0.833     | 9           |
| All parties should forecast unforeseen situations  | 0.825     | 10          |
| Clients could provide a clear brief of the scope of works  | 0.822     | 11          |

|  |       |    |
|--|-------|----|
| Supervise the works with an experienced and dedicated supervisor                         | 0.800 | 12 |
| Consultants should ensure that the design/specifications fall within the approved budget | 0.775 | 13 |
| Have the land application or land purchase completed before awarding contracts           | 0.771 | 14 |
| Once the tender is awarded, make no changes to the specifications                        | 0.675 | 15 |

#### 4.4 Discussion of Findings

This section presents the discussion of the study findings from the questionnaires, the desk study, and the interview. The cause of the unfinished building, impact of unfinished building and recommendations to minimize impacts of unfinished building construction are discussed.

##### 4.4.1 Causes of the unfinished building on private building projects

From the questionnaires, the desk study and interview, the common causes of the unfinished building on private building projects were design changes and incomplete contract documents, which resulted from numerous additional works. The causes of the unfinished building were ranked in ascending order, and the most frequent were identified.

As ranked on the questionnaire response previously in Table 4.1 it is clear that the first most causes of the unfinished building were discrepancies between contract documents, delay to fix the right of way problem, inadequate working drawing details, change in specifications, and poor procurement process.

The first major cause of unfinished building was discrepancies between contract documents. This could also be caused due to the client change of mind, i.e. design change is indeed one of the most causes of unfinished buildings and this fact is supported by the interviewees and the observations in the desk study. This similarly confirms with the literature review that a discrepancy between contract documents was one of the major causes of the unfinished building. As Shutt (1995) identified discrepancies between contract documents was the major cause of the unfinished building.

The second major cause of unfinished building construction was a delay to fix the Right of way problem. This occurs due to the Government or the municipality, not works before

tendering and awarding of the land. The Right of way problem done by the Government or the municipality, it could be difficult to complete a payment because they are busy with work.

The third major cause of unfinished building was late identification and resolution of drawings and specification errors and omissions, which is due to lack of judgment by the client or the consultant. There is no doubt that late identification and resolution of drawings and specification errors and omissions delay the project and causes the contractors to re-design the requirements, reschedule, their works and material procurement which would have an adverse impact on the project.

Regulatory changes and awarding the project for least bidders the fourth major cause of unfinished building which is the outcome of the building policy and owner. A well-detailed working drawing is believed to decrease abandonment of building projects. Most professionals argue that a detailed working drawing should be prepared before the tender stage and awarding the project for the appropriate bidder.

The fifth major cause of unfinished building was a suspension of work by the owner or contractor which confirms with the literature review and the interview. In a construction stage, it could be a failure to suspend works due to change of mind of the owner or contractor which results in abandonment of building projects. Consequently, suspension of work can be the major cause. As reviewed in the literature part of this research Shutt (1995) listed that suspension of work among the major causes. Contrarily, this was not the major causes in the desk study.

#### **4.4.2 Impact of the unfinished building on private building projects**

According to the findings from the desk studies, completion schedule delay and increase in project cost are the most common impacts of the unfinished building. It was unexpected for the project cost to increase due to frequent impacts in the project. These impacts are also repeated on the questionnaire responses as shown and ranked previously in Table 4.16

As it was found from the interview, completion schedule delay, increase in project cost, and disputes among parties were the most predominant impacts of an unfinished building.

From the responses of the questionnaire, increase in project cost, quality degradation, progress is affected; logistics delays and increases in overhead expense were the most impacts of an unfinished building.

Increase in project cost was the first major impact of an unfinished building in private building projects. According to the findings from the desk studies and the interview, an increase in project cost is the common impact on private building projects that increases the consistency of the response to conclude. Previously (William, 2002) pointed out that when the delay occurs, the contractor typically will incur additional direct and indirect costs. While the direct costs of a project are relatively easy to quantify, indirect costs are difficult to identify and quantify. This confirmed that the increase in project cost impacts the project adversely, leading to delays in the project completion. This may result abandoned in the building project.

The second major impact of unfinished building was quality degradation on private building projects which similarly confirms with the findings from the desk study and interviews.

Increase in project cost and quality degradation are also the major impacts as reviewed in the literature part. For example (Miller, 2001) found that in the case of abandoned buildings view quality can be seriously deteriorated. These impacts were due to an increase in project cost and quality degradation since they negatively affect the building project. Any major additions or changes in the design may eventually increase the project cost. It was not expected for the project cost to increase due to frequent variations in the project. This was because the variation orders may impact the project's overall direct and indirect costs. Hence, any major addition or changes in the design may eventually increase the project cost. The findings from the respondents were also consistent with the observations from the desk study and interviews.

As the responses found from the questionnaire, Progress is affected due to for the contractor was the third major impact of the unfinished building. An additional payment to the contractor is the common impact unfinished building. As Arditti et al., (1985), described, lengthy delays in inflationary environments increase cost overruns tremendously. The overall lack of finance to complete a project or delays in the payments for services by the project owners or clients can lead to significant problems. If the costs of a project have increased significantly beyond the original estimate, then work on the project may have to be stopped or be delayed until additional funds can be found.



The fourth major impact was increased in overhead expenses. Cost overrun and time overrun are the two most-frequent effects of delay in the construction industry. Delay had significant effects on actual project duration. The relating model delay and actual project duration provide a benchmark for non-completion of a project. This may result from an increase in overhead expenses

The fifth major impact of the unfinished building on private building projects was logistics delays. This cost can be incurred during the process and implementation of the project. Because the overhead expenses for all involved parties will increase as lots of professional and paper works, need to be done. Arguably, the more the abandonment, the more likely they increase the overhead expenses especially to the contractor that impact private building projects. This will result in non-completion of the building projects.

#### **4.4.3 Recommended Strategies to minimize the impact of unfinished buildings**

According to the findings from the interview, the suggested recommendations by the interviewee were to carry out a detailed site investigation before tendering, to produce a complete design and contract documents, there should be communication between the parties, and works should be supervised by a dedicated supervisor. These recommendations were also mostly ranked on the questionnaire response. As the interviewee pointed out, preparing complete detail drawings can reduce the risk of the unfinished building. Open communication among all involved parties involved in the project is the key to reduce the problem of unfinished building construction projects.

Experienced and dedicated supervisors can also reduce the impact of the unfinished building since they are not careless on the works they are assigned.

According to the findings from the questionnaires ranked previously in Table 4.21 and the interview conducted, the first most recommended strategy was all involved parties should plan adequately before works start on site. The controls for the frequent change in design by the consultant and inadequate working drawing details would be through systematic detailing of the design. This would provide an opportunity for the consultant to review and finalize the design during the design phase.

Completing drawings at the tender stage was the second most recommended strategy to minimize the impact of the unfinished building. Any change or modification made later will result in additional work which leads to non-completion of building projects. The design team

should submit a complete design for tendering. This would assist in reducing the occurrence of the impacts of the unfinished building during the construction phase where the impact of the unfinished building can be severe on the project.

The third most recommended strategy worked should be the consultant should produce a concluding design and contract Document. This was because an experienced consultant can forecast what will happen on the site through their past experience. They are also decision makers comparing the design and the actual site condition at the right time. An experienced consultant is also responsible for their job, and this surely helps to minimize the impact of the unfinished building.

The consultant should coordinate closely at the design stage was the fourth most recommended strategy to minimize impacts of the unfinished building. Different parties involved in a project work differently, so a clear coordination between the parties is necessary. This was because co-ordination can increase project performance during the execution of a project.

The fifth most recommended strategy was getting accurate information and research with regard to procurement procedure, material, and plant. This was because the design and construction methodology varies from one site to the other. Even the same type of projects cannot be executed with the same cost and schedule due to the difference in site conditions.

## CHAPTER FIVE

### CONCLUSION AND RECOMMENDATIONS

#### 5.1 Conclusion

##### 5.1.1 Causes of the unfinished building on private building projects in Jimma city

The first purpose of the study was to analyze the causes of the unfinished building on private building projects in Jimma city. The desk study of the five projects confirmed that the most frequent causes of unfinished building on private building projects were discrepancies between contract documents, delay to fix the right of way problem, and late identification and resolution of drawings and specification errors and omissions, regulatory changes and awarding the project for least or lowest bidder, design changes. According to the interview made between three selected construction practitioners involved in private building projects, they pointed out that the leading cause of unfinished building was planned and designed changes.

Among the 40 causes of unfinished buildings, the responses received from the clients' showed that awarding the project for least bidder, delay to fix the Right of way problem, poor communication and coordination wrong choice of consultants and contractors were the most ranking causes of unfinished building projects which dominate with ranges of value (RI=0.686-0.657) followed by late identification and resolution of drawings and specification errors and omissions, finance and payments of completed work, and shortage of material ranges value (RI=0.633-0.625). These were the top five most frequent causes of unfinished on private building projects.

According to the consultants', the top five most frequent causes of unfinished building on private building projects were discrepancies between contract documents, delay to fix the Right of way problem, late identification and resolution of drawings and specification errors and omissions, regulatory changes, awarding the project for least or lowest bidder, suspension of work by owner or contractor (RI=0.800). These were the most ranking causes of unfinished building projects from the consultant points of view.

Regarding the contractors', the top five most frequent causes of unfinished building on private building projects were delayed to fix the Right of way problem, awarding the project for least bidder, poor communication and Coordination, wrong choice of Consultants

and contractors and late identification and resolution of drawings and specification errors and omissions formed for the project dominate with ranges of value (RI=0.700-0.633).

From the overall responses, it was concluded that discrepancies between contract documents, delay to fix the Right of way problem, late identification and resolution of drawings and specification errors and omissions dominate with the same value (RI=0.800), regulatory changes, and awarding the project for least or lowest bidder dominate with ranges of value (RI=0.760-0.750) were the most important causes of unfinished building on private building projects. Hence, the results indicated a strong correlation between ranking by client and consultant, client and contractor as well as a consultant and contractor. This confirmed that most of the respondents have the same perception of the unfinished building on private building projects.

From the findings of the desk study, interview and questionnaire, discrepancies between contract documents, delay to fix the right of way problem, late identification and resolution of drawings and specification errors and omissions, regulatory changes, and awarding the project for the last bidder were the major common causes of the unfinished building.

### **5.1.2 Impact of the unfinished building on private building projects in Jimma city**

The second objective was to identify the various impacts of the unfinished building on private building projects in Jimma. The study found that unfinished building had an impact on private building projects. From the desk study of five projects, project 1, project 2, project 3, project 4 and project 5 were passed promised delivery date. According to the data from the desk study, an increase in project cost was the major impact on private building projects.

As it was analyzed for the desk study, the interviewee also pointed out that time overruns also impacts the completion schedule of private building projects.

From the 20 impacts of the unfinished building, increase in project cost (RI=0.822), progress is affected (RI=0.778), increase in overhead expenses (RI=0.733); delay in payment, and bad Public Relations with equal value (RI = 0.667) were the top five most frequent impacts of unfinished building according to the responses of the clients'.

As consultants' responded, the top five most frequent impacts of the unfinished building were quality degradation (RI=0.800), increase in project cost (RI=0.733), progress is affected, logistics delays, bad Public relations with equal value (RI=0.700).

According to the responses of the contractors', increase in project cost (RI=0.822), effect on progress (0.778), increase in overhead expenses (RI=0.733), bad Public Relations (RI=0.680), and productivity degradation (RI=0.667) were the top five most frequent impacts of the unfinished building on private building projects.

From the overall responses received, it was concluded that the topmost impact of the unfinished building on private building projects was increased in project cost (RI=0.822), quality degradation (RI=0.800), effect on progress (0.778), increase in overhead expenses (RI=0.733), and logistics delays (RI=0.700). The correlation between ranking by client and consultant, client and contractor as well as a consultant and contractor was strong. This indicated that most of the respondents have the same perception about the impact of the unfinished building on private building projects.

From the findings of the desk study, interview and the questionnaires we observe that the significant impacts of the unfinished building on private building projects were increased in project cost, quality degradation, the effect on progress, increase in overhead expenses and logistics delays.

The third objective was to suggest recommendations to mitigate the effects of the unfinished building on private building projects in Jimma city. From the literature, fifteen (15) strategies to reduce the impact of the unfinished building on building projects were identified. No recommended strategies were found from the document study and conclusion was based on the questionnaire survey and the interview to be able to suggest recommendations to minimize impacts of the unfinished building.

From the interview, it was repetitively suggested that designs and contract documents should be complete at the tender stage to minimize the occurrence of the unfinished building on private building projects.

The clients' responded that all involved parties should plan adequately before works start on site (RI=0.933) to minimize impacts of the unfinished building on building projects. Eventually, this may aid in eliminating the occurrence of the impacts of the unfinished structure, arising from errors and design discrepancies, during the construction stage where the impact of the unfinished building can be severe.

The consultants' and the contractors' response argued on the strategy that states adequate planning in advance are required by all involved parties before works start on site to

minimize the impact of an unfinished building. This was because a well-planned project can eliminate impacts of the unfinished building that may arise due to lack of pre-project planning.

From the interview and overall responses received, it was therefore concluded that the following best five strategies were recommended to minimize impacts of the unfinished building on private building projects:

- The consultant should produce a concluding design and contract documents
- Drawings should be complete at tender stage
- Works should be supervised with an experienced and dedicated supervisor
- Enhance communication between all parties
- Carry out detailed site investigation, including detail soil investigations and consider it during the tendering stage

## 5.2 Recommendations

The research study focused on the assessment of the unfinished building in a few contracts of private building projects undertaken by the city administration of Jimma. Based on the focused sector and how the impacts of the unfinished building are minimized, the recommendations are as follows:

- All the 3 parties should communicate during planning and design phase of a project to eliminate the impact of unfinished building
- Complete design shall be prepared by the consultant before the tendering stage
- There should be an improvement in project management, and improved decision-making process on the part of the client during the project execution stage to minimize the occurrence of Impacts of the unfinished building
- The results of the research study would help augment construction practitioners, policymakers and researchers in the field of construction management.

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Further areas of research recommended are as follows;

- Since this study focused on private building projects, it would be interesting to study the impact of an unfinished building in other towns or cities, and compare this result.
- A more elaborate investigation into the contract conditions is needed by the view to minimizing the impact of unfinished buildings private building projects.

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## APPENDIX

Annex-A:

**JIMMA UNIVERSITY**  
**JIMMA INSTITUTE OF TECHNOLOGY**  
**SCHOOL OF CIVIL AND ENVIRONMENTAL ENGINEERING**  
**POST GRADUATE STUDIES (CONSTRUCTION ENGINEERING and**  
**MANAGEMENT CHAIR)**

**SURVEY: ASSESSMENT ON THE IMPACT OF UNFINISHED BUILDING**  
**CONSTRUCTION and ITS MITIGATION MEASURES ON PRIVATE**  
**BUILDING PROJECTS CASE OF JIMMA TOWN.**

### Introduction

This questionnaire is prepared to obtain information from key informants with semi-structured questions. The information is required for the academic research entitled **“Assessment on the Impact of Unfinished Building Construction and Its Mitigation Measures on private building projects in Case of Jimma Town”**, which will be conducted as partial fulfillment of MSc in Construction Engineering and Management. The main objective of the research is to assess the main impact of unfinished building construction, and make recommendations based on the findings. The questionnaire consists of three sections. **Section A:** General organization information. **Section B:** Causes of unfinished building construction projects. **Section C:** Impacts of unfinished building construction. **Section D:** Recommendations to minimize impact of unfinished building construction project

At the end, there is a space that left for general comments regarding the research topic. Your response, in this regard, is highly valuable and contributory to the outcome of the research. All feedback will be kept strictly confidential, and utilized for this academic research only

Thank you,

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**SECTION A: GENERAL ORGANIZATION INFORMATION**

1. Name of organization: -----

2. State respondent organization/company type.

Client  Contractor  Consultant 

3. Respondents designation:

Owner of organization  Project manager  Site Engineer  Office Engineer Resident Engineer  Site Supervisor  Other \_\_\_\_\_

4. Relevant working experience (Years):

1-4Yrs  4-8Yrs  8-12Yrs  >12Yrs **SECTION B: CAUSES OF UNFINISHED BUILDING CONSTRUCTION PROJECTS**

**ASSESSMENT ON THE IMPACTS OF UNFINISHED BUILDING CONSTRUCTION PROJECTS IN JIMMA TOWN.** Please indicate the significance of each factor by ticking the appropriate boxes. Add any remarks relating to each impacts on the last column e.g. as to the reasons, the critical factors or the solutions. E.S. = extremely significant (5); V.S. = very significant (4); M.S. = moderately significant (3); S.S. = slightly significant (2); N.S. = not significant (1)

| No | Causes                                    | E.S<br>(5) | V.S<br>(4) | M.<br>S<br>(3) | S.S<br>(2) | N.S<br>(1) | Additional<br>comment<br>(If any) |
|----|---|------------|------------|----------------|------------|------------|-----------------------------------|
| 1  | Discrepancies between contract documents  |            |            |                |            |            |                                   |
| 2  | Suspension of work by owner or contractor |            |            |                |            |            |                                   |
| 3  | Change order                              |            |            |                |            |            |                                   |
| 4  | Awarding the project for least bidder     |            |            |                |            |            |                                   |
| 5  | Incorrect organizational structure        |            |            |                |            |            |                                   |

|    |  |  |  |  |  |  |  |
|----|--|--|--|--|--|--|--|
|    | formed for the project                           |  |  |  |  |  |  |
| 6  | Delay to fix the Right of way problem            |  |  |  |  |  |  |
| 7  | Poor communication and Coordination              |  |  |  |  |  |  |
| 8  | Finance and payments of completed work           |  |  |  |  |  |  |
| 9  | Owner intervention                               |  |  |  |  |  |  |
| 10 | Slow decision-making                             |  |  |  |  |  |  |
| 11 | Unrealistic contract duration                    |  |  |  |  |  |  |
| 12 | Wrong choice of Consultants and contractors      |  |  |  |  |  |  |
| 13 | Design alterations and change orders             |  |  |  |  |  |  |
| 14 | Financial problems                               |  |  |  |  |  |  |
| 15 | Subcontractors                                   |  |  |  |  |  |  |
| 16 | Site management problems                         |  |  |  |  |  |  |
| 17 | Improper Construction methods                    |  |  |  |  |  |  |
| 18 | Improper planning                                |  |  |  |  |  |  |
| 19 | Mistakes during construction                     |  |  |  |  |  |  |
| 20 | Inadequate contractor experience                 |  |  |  |  |  |  |
| 21 | Used of Inferior Quality of material.            |  |  |  |  |  |  |
| 22 | Shortage of material.                            |  |  |  |  |  |  |
| 23 | Labor supply not adequate                        |  |  |  |  |  |  |
| 24 | Awareness of Labor productivity                  |  |  |  |  |  |  |
| 25 | Absence of consultant's site staff               |  |  |  |  |  |  |
| 26 | Lack of experience on the part of the consultant |  |  |  |  |  |  |
| 27 | Knowledge of Contract management.                |  |  |  |  |  |  |
| 28 | Preparation and approval of                      |  |  |  |  |  |  |

|    |   |  |  |  |  |  |  |
|----|---|--|--|--|--|--|--|
|    | drawings.   |  |  |  |  |  |  |
| 29 | Quality assurance and control practice  |  |  |  |  |  |  |
| 30 | Waiting time for approval of tests and inspections.                                   |  |  |  |  |  |  |
| 31 | Inappropriate design parameters   |  |  |  |  |  |  |
| 32 | Late identification and resolution of drawings and specification errors and omissions |  |  |  |  |  |  |
| 33 | Regular inspection and monitoring   |  |  |  |  |  |  |
| 34 | Inappropriate coordination of information   |  |  |  |  |  |  |
| 35 | Equipment availability and readiness for repair on breakdown.                         |  |  |  |  |  |  |
| 36 | Major disputes and negotiations   |  |  |  |  |  |  |
| 37 | Lack of communication between the parties.  |  |  |  |  |  |  |
| 38 | Weather condition   |  |  |  |  |  |  |
| 39 | Regulatory changes  |  |  |  |  |  |  |
| 40 | Unforeseen ground condition   |  |  |  |  |  |  |

If you have comments regarding time causes of unfinished building construction project kindly request to write here.

**SECTION C: IMPACTS OF UNFINISHED BUILDING CONSTRUCTION**

Please indicate your level of agreement with the following questions on a scale 1 to 5.

Indicator:

1= No impact

2= Low impact

3= Medium impact

4= High impact

5= Very high impact

3. The Following are list of impacts of unfinished building construction projects. From your experience, what are the impacts of unfinished building construction on building projects?

| S.N | Impact of unfinished building construction project | NoimpactVeryhighimpact |   |   |   |   |
|-----|--|------------------------|---|---|---|---|
|     |  | 1                      | 2 | 3 | 4 | 5 |
| 1   | Increase in project cost                           |                        |   |   |   |   |
| 2   | Progress is affected                               |                        |   |   |   |   |
| 3   | Increase in overhead expenses                      |                        |   |   |   |   |
| 4   | Delay in payment                                   |                        |   |   |   |   |
| 5   | Quality degradation                                |                        |   |   |   |   |
| 6   | Productivity degradation                           |                        |   |   |   |   |
| 7   | Procurement delay                                  |                        |   |   |   |   |
| 8   | Rework and demolition                              |                        |   |   |   |   |
| 9   | Logistics delays                                   |                        |   |   |   |   |
| 10  | Blemish firm's reputation                          |                        |   |   |   |   |
| 11  | Poor safety conditions                             |                        |   |   |   |   |
| 12  | Poor professional relations                        |                        |   |   |   |   |
| 13  | Additional payments for contractor                 |                        |   |   |   |   |
| 14  | Disputes among professionals                       |                        |   |   |   |   |
| 15  | Completion schedule delay                          |                        |   |   |   |   |
| 16  | Bad Public Relations                               |                        |   |   |   |   |
| 17  | Litigation   |                        |   |   |   |   |

|    |   |  |  |  |  |  |
|----|---|--|--|--|--|--|
| 18 | Arbitration   |  |  |  |  |  |
| 19 | Disputes and claims   |  |  |  |  |  |
| 20 | Total abandonment   |  |  |  |  |  |
|    | If any other impact of unfinished building construction project, please specify |  |  |  |  |  |
| 21 |   |  |  |  |  |  |
| 22 |   |  |  |  |  |  |
| 23 |   |  |  |  |  |  |
| 24 |   |  |  |  |  |  |
| 25 |   |  |  |  |  |  |



## SECTION D: RECOMMENDATIONS TO MINIMIZE IMPACT OF UNFINISHED BUILDING CONSTRUCTION PROJECT

Please indicate your level of agreement with the following questions on a scale 1 to 5.

Indicator:

1= Unimportant

2= Less important

3= Important

4= Very important

5 = Very high important

| S.N | Recommendations to minimize impact of unfinished building construction project                                  | Unimportant      very important |   |   |   |   |
|-----|---|---------------------------------|---|---|---|---|
|     |   | 1                               | 2 | 3 | 4 | 5 |
| 1   | All involved parties should plan adequately before works start on site  |                                 |   |   |   |   |
| 2   | The consultant should produce a concluding design and contract Documents  |                                 |   |   |   |   |
| 3   | Complete the drawings attender stage  |                                 |   |   |   |   |
| 4   | Spend adequate time on pre-tender planning phase  |                                 |   |   |   |   |
| 5   | Clients should provide a clear brief of the scope of works  |                                 |   |   |   |   |
| 6   | All parties should forecast unforeseen situations   |                                 |   |   |   |   |
| 7   | The consultant should coordinate closely at design stage  |                                 |   |   |   |   |
| 8   | Enhance communication between all parties   |                                 |   |   |   |   |
| 9   | Supervise the works with an experienced and dedicated supervisor  |                                 |   |   |   |   |
| 10  | Consultants should ensure that the design/specifications fall with in the approved budget                       |                                 |   |   |   |   |
| 11  | Get accurate information and research with regard to procurement procedure, material and plant                  |                                 |   |   |   |   |
| 12  | Carry out detail site investigation including detail soil investigations and consider it during tendering stage |                                 |   |   |   |   |

---

|    |  |  |  |  |  |  |
|----|--|--|--|--|--|--|
| 13 | Havethelandapplicationorlandpurchasecompletedbeforeawardingc<br>ontracts                   |  |  |  |  |  |
| 14 | Once the tender is awarded,make no changes to the specifications                           |  |  |  |  |  |
| 15 | Place experienced and knowledgeable executives in the<br>engineering and design department |  |  |  |  |  |

If any other Recommendations to minimize Impact of unfinished building construction project,pleasespecify

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**Thank You!**

## Annex-B

**JIMMA UNIVERSITY**  
**JIMMA INSTITUTE OF TECHNOLOGY**  
**SCHOOL OF CIVIL AND ENVIROMENTAL ENGINEERING**  
**POST GRADUATE STUDIES (CONSTRUCTION ENGINEERING and**  
**MANAGEMENT CHAIR)**  
**SURVEY: ASSESSMENT ON THE IMPACT OF UNFINISHED**  
**BUILDING CONSTRUCTION and ITS MITIGATION MEASURES IN**  
**CASE OF JIMMA TOWN.**

Format will be prepared for filling when oral question will be conducted.

**QUESTIONARIES FOR INTERVIEW****INTRODUCTION**

You are kindly requested to give detailed information.

You are not obliged to answer questions, which you do not want to.

**1 .COMPANY PROFILE**

Name of the company \_\_\_\_\_

Years of establishment \_\_\_\_\_

Average number of worker for the recent 5 years:

Total \_\_\_\_\_

Female \_\_\_\_\_

Male \_\_\_\_\_

**2. General question**

- From your experience, what are the Causes of unfinished building on private building projects?

\_\_\_\_\_

- What are the various impacts of unfinished building on private building projects? \_\_\_\_\_

\_\_\_\_\_

- What do you suggest to minimize the impacts of unfinished building construction on private building projects?

\_\_\_\_\_

**Thank You!**

**APPENDIX C: List of Private Building Projects for the Study**

| S.No         | Promoter(s) Name                | Kebele (pl)     | Sectorial type    | Sub-sector        | Investment Activity    | Approved land area in (ha) | Date of agreement signed | Budget year | Proposed Capital (000) | Permanent /M/ | Permanent (F) | temporary (M) | Temporary (F) |
|--------------|---------------------------------|-----------------|-------------------|-------------------|------------------------|----------------------------|--------------------------|-------------|------------------------|---------------|---------------|---------------|---------------|
| 1            | Abdu Jamal                      | Hermata Mentina | Trade             | Trade             | Mixed use              | 0.0800                     | 3/6/2002                 | 2002        | 4,000,000.00           | 0             | 0             | 1             | 0             |
| 2            | Ahmed Abbas                     | Hermata Mentina | Trade             | Trade             | Multi purpose building | 0.0500                     | 24/8/2004                | 2004        | 5,000,000.00           | 0             | 0             | 1             | 0             |
| 3            | Mahammad Bore and KaledBor      | G\G             | Hotel and Tourism | Hotel and Tourism | Hotel                  | 0.1554                     | 2001                     | 2001        | 15,000,000.00          | 0             | 0             | 1             | 0             |
| 4            | Na'ifYaya                       | Becho-Bore      | Educatio n        | Educatio n        | PrimerySch ol          | 0.5000                     | 4/3/2005                 | 2005        | 10,000,000.00          | 1             | 0             | 0             | 0             |
| 5            | Aziz Mohammed                   | Becho Bore      | Trade             | Trade             | Commercia l            | 0.0810                     | 10/5/2002                | 2002        | 5,000,000.00           | 1             | 0             | 0             | 0             |
| 6            | Najib Aba-Biyya                 | Becho Bore      | Health            | Health            | Higher clinic          | 0.4000                     | 27/10/99                 | 1999        | 10,000,000.00          | 1             | 0             | 0             | 0             |
| 7            | Afro KandiaMult PLC             | Awetu-Mender    | Educatio n        | Educatio n        | Collage School         | 0.1600                     | 25/07/01                 | 2001        | 7,000,000.00           | 1             | 0             | 0             | 0             |
| 8            | Abdulwahaab Mahaammad(A/Biyyaa) | G/Guduru u      | Trade             | Trade             | Rental office          | 0.0475                     | 1997                     | 1997        | 2,000,000              | 0             | 1             | 0             |               |
| 9            | Addaamuol'q abaa                | G/Guduru u      | Trade             | Trade             | Mixed use              | 0.0800                     |                          |             | 3,000,000              |               |               |               |               |
| 10           | Sultan Adem                     | G/Guduru u      | service           | Trade             | Mixed use              | 0.08                       | 7/71998                  | 1998        | 8,272,250              | 10            | 8             | 6             | 4             |
| 11           | Webe Driver                     | Becho-Bore      | service           | Educatio n        | Car training center    | 0.1888                     | 27/11/2005               | 2001        | 5,000,000              | 12            | 8             | 12            | 5             |
| 12           | GizachewDiba ba                 | Ginjo           | service           | Trade             | Commercia l Building   | 0.02                       | 5/11/1997                | 1998        | 480,000                | 9             | 10            | 8             | 9             |
| 13           | Galib A/jabal                   | G/Guduru u      | Trade             | Trade             | Trade center           | 0.6                        | 17/10/1996               | 1996        | 1,500,000              | 13            | 8             | 8             | 9             |
| 14           | AhmedinDannuur                  | Becho Bore      | Hotel and Tourism | Hotel and Tourism | Café and Hotel         |                            |                          |             | 3,700,000              | 9             | 7             | 6             | 5             |
| <b>Total</b> |                                 |                 |                   |                   |                        | <b>1.5539</b>              |                          |             | <b>61,000,000</b>      |               |               |               |               |

(Taken from Jimmacity investment office Bureau (2018))

**APPENDIX D: Questionnaire return rate**

| <b>Group</b> | <b>Number of Questionnaires Distributed</b> | <b>Number of Questionnaires Returned</b> | <b>Response Rate (%)</b> |
|--------------|---|--|--------------------------|
| Client       | 9   | 8  | 88.9                     |
| Consultant   | 5   | 4  | 80                       |
| Contractor   | 9   | 7  | 77.8                     |
| <b>Total</b> | 23  | 19                                       | 82.6                     |

**APPENDIX E: Clients' responses for Causes of unfinished building construction**

| <b>Causes of unfinished building construction</b>         | <b>N.S</b> | <b>S.S</b> | <b>M.S</b> | <b>V.S</b> | <b>E.s</b> |
|---|------------|------------|------------|------------|------------|
| Discrepancies between contract documents                  | 1          | 1          | 1          | 1          | 0          |
| Suspension of work by owner or contractor                 | 1          | 2          | 1          | 2          | 1          |
| Change order  | 2          | 3          | 1          | 2          | 0          |
| Awarding the project for least bidder                     | 0          | 2          | 1          | 3          | 1          |
| Incorrect organizational structure formed for the project | 1          | 2          | 2          | 3          | 0          |
| Delay to fix the Right of way problem                     | 0          | 1          | 3          | 2          | 1          |
| Poor communication and Coordination                       | 0          | 1          | 3          | 3          | 0          |
| Finance and payments of completed work                    | 0          | 2          | 2          | 3          | 0          |
| Owner intervention  | 1          | 2          | 2          | 2          | 0          |
| Slow decision-making                                      | 0          | 3          | 2          | 2          | 0          |
| Unrealistic contract duration                             | 2          | 3          | 3          | 1          | 0          |
| Wrong choice of Consultants and contractors               | 0          | 1          | 3          | 3          | 0          |
| Design alterations and change orders                      | 1          | 2          | 3          | 2          | 0          |
| Financial problems  | 0          | 3          | 3          | 2          | 0          |
| Subcontractors  | 1          | 4          | 2          | 0          | 0          |
| Site management problems                                  | 4          | 1          | 1          | 1          | 0          |
| Improper Construction methods                             | 1          | 2          | 4          | 2          | 0          |
| Improper planning   | 1          | 3          | 2          | 2          | 0          |
| Mistakes during construction                              | 1          | 1          | 3          | 1          | 0          |
| Inadequate contractor experience                          | 2          | 2          | 3          | 2          | 1          |
| Used of Inferior Quality of material.                     | 1          | 0          | 4          | 1          | 0          |
| Shortage of material.                                     | 0          | 2          | 3          | 3          | 0          |
| Labor supply not adequate                                 | 2          | 2          | 2          | 0          | 0          |
| Awareness of Labor productivity                           | 2          | 2          | 3          | 2          | 0          |
| Absence of consultant's site staff                        | 1          | 3          | 2          | 2          | 1          |
| Lack of experience on the part of the consultant          | 2          | 2          | 2          | 1          | 0          |
| Knowledge of Contract management.                         | 1          | 3          | 2          | 1          | 0          |
| Preparation and approval of drawings.                     | 2          | 1          | 2          | 2          | 1          |

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| Quality assurance and control practice  | 1 | 3 | 2 | 1 | 1 |
| Waiting time for approval of tests and inspections.                                   | 1 | 2 | 2 | 2 | 1 |
| Inappropriate design parameters   | 2 | 2 | 2 | 3 | 1 |
| Late identification and resolution of drawings and specification errors and omissions | 1 | 1 | 1 | 2 | 1 |
| Regular inspection and monitoring   | 1 | 6 | 2 | 1 | 1 |
| Inappropriate coordination of information   | 2 | 3 | 2 | 1 | 1 |
| Equipment availability and readiness for repair on breakdown.                         | 1 | 3 | 3 | 1 | 1 |
| Major disputes and negotiations   | 1 | 5 | 3 | 1 | 1 |
| Lack of communication between the parties.  | 2 | 3 | 3 | 1 | 1 |
| Weather condition   | 1 | 2 | 4 | 1 | 2 |
| Regulatory changes  | 1 | 2 | 3 | 1 | 2 |
| Unforeseen ground condition   | 1 | 3 | 4 | 2 | 1 |

**APPENDIX F: Consultants' responses for Causes of unfinished building projects**

| <b>Causes of unfinished building projects</b>   | <b>N.S</b> | <b>S.S</b> | <b>M.S</b> | <b>V.S</b> | <b>E.s</b> |
|---|------------|------------|------------|------------|------------|
| Discrepancies between contract documents  | 0          | 0          | 0          | 1          | 0          |
| Suspension of work by owner or contractor   | 0          | 1          | 0          | 1          | 1          |
| Change order  | 1          | 1          | 0          | 1          | 0          |
| Awarding the project for least bidder   | 0          | 1          | 0          | 2          | 1          |
| Incorrect organizational structure formed for the project                             | 0          | 1          | 1          | 1          | 1          |
| Delay to fix the Right of way problem   | 0          | 0          | 1          | 1          | 1          |
| Poor communication and Coordination   | 0          | 0          | 1          | 2          | 0          |
| Finance and payments of completed work  | 0          | 1          | 1          | 2          | 0          |
| Owner intervention  | 1          | 1          | 1          | 1          | 0          |
| Slow decision-making  | 0          | 1          | 1          | 1          | 0          |
| Unrealistic contract duration   | 1          | 1          | 1          | 1          | 0          |
| Wrong choice of Consultants and contractors   | 0          | 0          | 1          | 2          | 0          |
| Design alterations and change orders  | 1          | 1          | 1          | 1          | 0          |
| Financial problems  | 0          | 1          | 1          | 1          | 0          |
| Subcontractors  | 1          | 2          | 1          | 0          | 0          |
| Site management problems  | 2          | 0          | 0          | 1          | 0          |
| Improper Construction methods   | 1          | 1          | 2          | 1          | 0          |
| Improper planning   | 1          | 1          | 1          | 1          | 0          |
| Mistakes during construction  | 1          | 0          | 1          | 1          | 0          |
| Inadequate contractor experience  | 1          | 1          | 1          | 1          | 1          |
| Used of Inferior Quality of material.   | 1          | 0          | 2          | 1          | 0          |
| Shortage of material.   | 0          | 1          | 1          | 1          | 0          |
| Labor supply not adequate   | 1          | 1          | 1          | 0          | 0          |
| Awareness of Labor productivity   | 1          | 1          | 1          | 1          | 0          |
| Absence of consultant's site staff  | 1          | 1          | 1          | 1          | 1          |
| Lack of experience on the part of the consultant                                      | 1          | 1          | 1          | 0          | 0          |
| Knowledge of Contract management.   | 1          | 1          | 1          | 0          | 0          |
| Preparation and approval of drawings.   | 1          | 0          | 1          | 1          | 1          |
| Quality assurance and control practice  | 1          | 1          | 1          | 1          | 1          |
| Waiting time for approval of tests and inspections.                                   | 1          | 1          | 1          | 1          | 1          |
| Inappropriate design parameters   | 1          | 1          | 1          | 2          | 1          |
| Late identification and resolution of drawings and specification errors and omissions | 0          | 0          | 1          | 1          | 1          |
| Regular inspection and monitoring   | 0          | 3          | 1          | 1          | 1          |
| Inappropriate coordination of information   | 1          | 1          | 1          | 1          | 1          |
| Equipment availability and readiness for repair on breakdown.                         | 0          | 1          | 1          | 1          | 1          |
| Major disputes and negotiations   | 0          | 3          | 1          | 1          | 1          |
| Lack of communication between the parties.  | 1          | 1          | 1          | 1          | 1          |



|                             |   |   |   |   |   |
|-----------------------------|---|---|---|---|---|
| Weather condition           | 0 | 1 | 2 | 1 | 2 |
| Regulatory changes          | 0 | 1 | 1 | 1 | 2 |
| Unforeseen ground condition | 0 | 1 | 2 | 1 | 1 |

### APPENDIX G: Contractors' responses for causes of unfinished building

| Causes of unfinished building   |     |     |     |     |     |
|---|-----|-----|-----|-----|-----|
|   | N.S | S.S | M.S | V.S | E.s |
| Discrepancies between contract documents  | 1   | 1   | 1   | 1   | 0   |
| Suspension of work by owner or contractor   | 1   | 2   | 1   | 2   | 1   |
| Change order  | 2   | 3   | 1   | 2   | 0   |
| Awarding the project for least bidder   | 0   | 2   | 1   | 2   | 1   |
| Incorrect organizational structure formed for the project                             | 1   | 2   | 2   | 2   | 0   |
| Delay to fix the Right of way problem   | 0   | 1   | 2   | 2   | 1   |
| Poor communication and Coordination   | 0   | 1   | 2   | 2   | 0   |
| Finance and payments of completed work  | 0   | 2   | 2   | 2   | 0   |
| Owner intervention  | 1   | 2   | 2   | 2   | 0   |
| Slow decision-making  | 0   | 2   | 2   | 2   | 0   |
| Unrealistic contract duration   | 2   | 2   | 2   | 1   | 0   |
| Wrong choice of Consultants and contractors   | 0   | 1   | 2   | 2   | 0   |
| Design alterations and change orders  | 1   | 2   | 2   | 2   | 0   |
| Financial problems  | 0   | 2   | 2   | 2   | 0   |
| Subcontractors  | 1   | 3   | 2   | 0   | 0   |
| Site management problems  | 4   | 1   | 1   | 1   | 0   |
| Improper Construction methods   | 1   | 2   | 3   | 2   | 0   |
| Improper planning   | 1   | 2   | 2   | 2   | 0   |
| Mistakes during construction  | 1   | 1   | 2   | 1   | 0   |
| Inadequate contractor experience  | 2   | 2   | 2   | 2   | 1   |
| Used of Inferior Quality of material.   | 1   | 0   | 3   | 1   | 0   |
| Shortage of material.   | 0   | 2   | 2   | 2   | 0   |
| Labor supply not adequate   | 2   | 2   | 2   | 0   | 0   |
| Awareness of Labor productivity   | 2   | 2   | 2   | 2   | 0   |
| Absence of consultant's site staff  | 1   | 2   | 2   | 2   | 1   |
| Lack of experience on the part of the consultant                                      | 2   | 2   | 2   | 1   | 0   |
| Knowledge of Contract management.   | 1   | 2   | 2   | 1   | 0   |
| Preparation and approval of drawings.   | 2   | 1   | 2   | 2   | 1   |
| Quality assurance and control practice  | 1   | 2   | 2   | 1   | 1   |
| Waiting time for approval of tests and inspections.                                   | 1   | 2   | 2   | 2   | 1   |
| Inappropriate design parameters   | 2   | 2   | 2   | 3   | 1   |
| Late identification and resolution of drawings and specification errors and omissions | 1   | 1   | 1   | 2   | 1   |
| Regular inspection and monitoring   | 1   | 5   | 2   | 1   | 1   |

---

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| Inappropriate coordination of information                     | 2 | 2 | 2 | 1 | 1 |
| Equipment availability and readiness for repair on breakdown. | 1 | 2 | 2 | 1 | 1 |
| Major disputes and negotiations                               | 1 | 4 | 2 | 1 | 1 |
| Lack of communication between the parties.                    | 2 | 3 | 2 | 1 | 1 |
| Weather condition   | 1 | 2 | 3 | 1 | 1 |
| Regulatory changes  | 1 | 2 | 2 | 1 | 1 |
| Unforeseen ground condition                                   | 1 | 2 | 2 | 2 | 1 |

**APPENDIX H: Clients' responses for Impact of unfinished building construction project**

| Impact of unfinished building construction project | No | Low | Medium | High | veryhigh |
|--|----|-----|--------|------|----------|
|  | 1  | 2   | 3      | 4    | 5        |
| Increase in project cost                           | 0  | 1   | 0      | 5    | 3        |
| Progress is affected                               | 0  | 1   | 2      | 3    | 3        |
| Increase in overhead expenses                      | 1  | 0   | 2      | 4    | 2        |
| Delay in payment                                   | 1  | 1   | 3      | 2    | 2        |
| Quality degradation                                | 0  | 2   | 5      | 0    | 2        |
| Productivity degradation                           | 1  | 3   | 1      | 2    | 2        |
| Procurement delay                                  | 0  | 2   | 4      | 3    | 0        |
| Rework and demolition                              | 0  | 2   | 5      | 2    | 0        |
| Logistics delays                                   | 0  | 2   | 4      | 1    | 0        |
| Blemish firm's reputation                          | 2  | 2   | 2      | 2    | 1        |
| Poor safety conditions                             | 1  | 3   | 4      | 1    | 0        |
| Poor professional relations                        | 1  | 4   | 3      | 1    | 0        |
| Additional payments for contractor                 | 1  | 4   | 3      | 0    | 0        |
| Disputes among professionals                       | 2  | 4   | 3      | 0    | 0        |
| Completion schedule delay                          | 1  | 4   | 2      | 0    | 0        |
| Bad Public Relations                               | 0  | 1   | 3      | 1    | 1        |
| Litigation   | 1  | 2   | 1      | 0    | 0        |
| Arbitration  | 1  | 1   | 2      | 2    | 1        |
| Disputes and claims                                | 2  | 2   | 1      | 1    | 0        |
| Total abandonment                                  | 1  | 1   | 3      | 2    | 0        |

**APPENDIX I: Consultants' responses for Impact of unfinished building construction project**

| Impact of unfinished building construction project | No | Low | Medium | High | veryhigh |
|--|----|-----|--------|------|----------|
|  | 1  | 2   | 3      | 4    | 5        |
| Increase in project cost                           | 0  | 1   | 0      | 1    | 1        |
| Progress is affected                               | 0  | 1   | 1      | 1    | 1        |
| Increase in overhead expenses                      | 1  | 0   | 1      | 1    | 1        |
| Delay in payment                                   | 1  | 1   | 1      | 2    | 2        |
| Quality degradation                                | 0  | 0   | 1      | 0    | 1        |
| Productivity degradation                           | 1  | 1   | 1      | 2    | 2        |
| Procurement delay                                  | 0  | 1   | 1      | 1    | 0        |
| Rework and demolition                              | 0  | 1   | 1      | 3    | 0        |
| Logistics delays                                   | 0  | 0   | 1      | 1    | 0        |
| Blemish firm's reputation                          | 1  | 1   | 1      | 2    | 1        |
| Poor safety conditions                             | 0  | 0   | 4      | 1    | 0        |
| Poor professional relations                        | 1  | 1   | 1      | 1    | 0        |
| Additional payments for contractor                 | 0  | 0   | 2      | 0    | 0        |
| Disputes among professionals                       | 1  | 1   | 1      | 0    | 0        |
| Completion schedule delay                          | 1  | 0   | 2      | 0    | 0        |
| Bad Public Relations                               | 0  | 1   | 1      | 1    | 1        |
| Litigation   | 0  | 0   | 1      | 0    | 0        |
| Arbitration  | 1  | 1   | 3      | 3    | 1        |
| Disputes and claims                                | 0  | 0   | 1      | 1    | 0        |
| Total abandonment                                  | 1  | 1   | 1      | 1    | 0        |

**APPENDIX J: Contractors' responses for Impact of unfinished building construction project**

| Impact of unfinished building construction project | No | Low | Medium | High | veryhigh |
|--|----|-----|--------|------|----------|
|  | 1  | 2   | 3      | 4    | 5        |
| Increase in project cost                           | 0  | 1   | 0      | 5    | 3        |
| Progress is affected                               | 0  | 1   | 2      | 3    | 3        |
| Increase in overhead expenses                      | 1  | 0   | 2      | 4    | 2        |
| Delay in payment                                   | 1  | 1   | 3      | 2    | 2        |
| Quality degradation                                | 0  | 2   | 5      | 0    | 2        |
| Productivity degradation                           | 1  | 2   | 1      | 2    | 2        |
| Procurement delay                                  | 0  | 1   | 4      | 3    | 0        |
| Rework and demolition                              | 0  | 1   | 5      | 2    | 0        |
| Logistics delays                                   | 0  | 1   | 5      | 1    | 0        |
| Blemish firm's reputation                          | 1  | 2   | 2      | 2    | 1        |
| Poor safety conditions                             | 1  | 2   | 4      | 1    | 0        |
| Poor professional relations                        | 1  | 2   | 2      | 1    | 0        |
| Additional payments for contractor                 | 1  | 2   | 2      | 0    | 0        |
| Disputes among professionals                       | 1  | 2   | 3      | 0    | 0        |
| Completion schedule delay                          | 1  | 2   | 2      | 0    | 0        |
| Bad Public Relations                               | 0  | 1   | 2      | 1    | 1        |
| Litigation   | 1  | 2   | 1      | 0    | 0        |
| Arbitration  | 1  | 1   | 1      | 2    | 1        |
| Disputes and claims                                | 1  | 1   | 1      | 1    | 0        |
| Total abandonment                                  | 1  | 1   | 3      | 2    | 0        |

**APPENDIX K: Clients' responses for strategies to minimize impact of unfinished building construction project**

| Recommendations to minimize impact of unfinished building construction project                                  | unimportant very important |   |   |   |   |
|---|----------------------------|---|---|---|---|
|   | 1                          | 2 | 3 | 4 | 5 |
| All involved parties should plan adequately before works start onsite   | 0                          | 0 | 0 | 3 | 6 |
| The consultant should produce a concluding design and contract Document   | 0                          | 0 | 1 | 4 | 4 |
| Complete the drawing sat tender stage   | 0                          | 0 | 1 | 5 | 3 |
| Spend adequate time on pre-tender planning phase  | 0                          | 0 | 2 | 2 | 4 |
| Clients should provide a clear brief of the scope of works  | 0                          | 1 | 1 | 3 | 4 |
| All parties should forecast unforeseen situations   | 0                          | 0 | 2 | 4 | 3 |
| The consultant should co-ordinate closely at design stage   | 0                          | 0 | 1 | 4 | 2 |
| Enhance communication between all parties   | 0                          | 0 | 1 | 4 | 2 |
| Supervise the works with an experienced and dedicated supervisor  | 0                          | 1 | 0 | 4 | 2 |
| Consultants should ensure that the design/specifications fall with in the approved budget                       | 0                          | 1 | 3 | 2 | 3 |
| Get accurate information and research with regard to procurement procedure, material and plant                  | 0                          | 0 | 3 | 3 | 1 |
| Carry out detail site investigation including detail soil investigations and consider it during tendering stage | 0                          | 0 | 4 | 2 | 2 |
| Have the land application or land purchase completed before awarding contracts                                  | 0                          | 0 | 6 | 0 | 3 |
| Once the tender is awarded, make no changes to the specifications   | 0                          | 1 | 3 | 3 | 0 |
| Place experienced and knowledgeable executives in the engineering and design department                         | 0                          | 1 | 2 | 0 | 3 |

**APPENDIX L: Consultants' responses for strategies to minimize impact of unfinished building construction project**

| Recommendations to minimize impact of unfinished building construction project                                  | unimportant |   | very important |   |   |
|---|-------------|---|----------------|---|---|
|   | 1           | 2 | 3              | 4 | 5 |
| All involved parties should plan adequately before works start onsite   | 0           | 0 | 0              | 1 | 3 |
| The consultant should produce a concluding design and contract Document   | 0           | 0 | 1              | 1 | 2 |
| Complete the drawing sat tender stage   | 0           | 0 | 0              | 2 | 2 |
| Spend adequate time on pre-tender planning phase  | 0           | 0 | 1              | 1 | 2 |
| Clients should provide a clear brief of the scope of works  | 0           | 1 | 0              | 1 | 2 |
| All parties should forecast unforeseen situations   | 0           | 0 | 1              | 2 | 1 |
| The consultant should co-ordinate closely at design stage   | 0           | 0 | 0              | 2 | 1 |
| Enhance communication between all parties   | 0           | 0 | 1              | 3 | 2 |
| Supervise the works with an experienced and dedicated supervisor  | 0           | 1 | 0              | 2 | 1 |
| Consultants should ensure that the design/specifications fall with in the approved budget                       | 0           | 1 | 1              | 1 | 2 |
| Get accurate information and research with regard to procurement procedure, material and plant                  | 0           | 0 | 0              | 2 | 1 |
| Carry out detail site investigation including detail soil investigations and consider it during tendering stage | 0           | 0 | 1              | 2 | 2 |
| Have the land application or land purchase completed before awarding contracts                                  | 1           | 0 | 0              | 0 | 1 |
| Once the tender is awarded, make no changes to the specifications   | 0           | 1 | 1              | 2 | 0 |
| Place experienced and knowledgeable executives in the engineering and design department                         | 0           | 1 | 0              | 0 | 3 |

### APPENDIX M: Contractors' responses for strategies to minimize impact of unfinished building construction project

| Recommendations to minimize impact of unfinished building construction project                                     | unimportant very important |   |   |   |   |
|--|----------------------------|---|---|---|---|
|  | 1                          | 2 | 3 | 4 | 5 |
| All involved parties should plan adequately before works start onsite  | 0                          | 0 | 0 | 2 | 6 |
| The consultant should produce a concluding design and contract Document  | 0                          | 0 | 1 | 3 | 4 |
| Complete the drawing sat tender stage  | 0                          | 0 | 1 | 4 | 3 |
| Spend adequate time on pre-tender planning phase   | 0                          | 0 | 3 | 2 | 4 |
| Clients should provide a clear brief of the scope of works   | 0                          | 1 | 1 | 3 | 4 |
| All parties should forecast unforeseen situations  | 0                          | 0 | 2 | 3 | 3 |
| The consultant should co-ordinate closely at design stage  | 0                          | 0 | 1 | 5 | 2 |
| Enhance communication between all parties  | 0                          | 0 | 1 | 5 | 2 |
| Supervise the works with an experienced and dedicated supervisor   | 0                          | 1 | 0 | 5 | 2 |
| Consultants should ensure that the design/specifications fall within the approved budget                           | 0                          | 1 | 2 | 2 | 3 |
| Get accurate information and research with regard to procurement procedure, material and plant                     | 0                          | 0 | 2 | 4 | 1 |
| Carry out detailed site investigation, including detail soil investigations and consider it during tendering stage | 0                          | 0 | 3 | 3 | 2 |
| Have the land application or land purchase completed before awarding contracts                                     | 0                          | 0 | 4 | 0 | 3 |
| Once the tender is awarded, make no changes to the specifications  | 0                          | 1 | 3 | 4 | 0 |
| Place experienced and knowledgeable executives in the engineering and design department                            | 0                          | 3 | 2 | 0 | 3 |