UNIVERSITY OF EDUCATION, WINNEBA

COLLEGE OF TECHNOLOGY EDUCATION, KUMASI

INVESTIGATING DELAYS IN GHANA HEALTH SERVICE BUILDING PROJECTS SUPERVISED BY METROPOLITAN, MUNICIPAL AND DISTRICT ASSEMBLIES: A CASE STUDY OF ASHANTI REGION

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A Dissertation in the Department of CONSTRUCTION AND WOOD TECHNOLOGY, Faculty of TECHNICAL EDUCATION, submitted to the School of Graduate Studies, University of Education, Winneba in partial fulfilment of the requirements for the award of Master of Technology Education (Construction) degree

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SEPTEMBER, 2016

DECLARATION

CANDIDATE'S DECLARATION

I, Dzinadoh, Peter, hereby declare that this dissertation, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged is entirely my own original work and it has not been submitted either in part or whole, for another degree in this university or another university.

SIGNATURE……. DATE…….……

SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of this dissertation were supervised by me, in accordance with the guidelines for supervision of dissertations laid down by the School of Research and Graduate Studies, University of Education, Winneba.

NAME OF SUPERVISOR; DR. NONGIBA A. KHENI

SIGNATURE…… DATE…….

ACKNOWLEDGEMENTS

I am full of thanks to God for chosen me an able supervisor and giving him the health, wisdom and strength to take me through this project, I also appreciate all efforts from my family, friends, and to my colleague students and staff of department of the construction wood technology.

DEDICATION

The work is dedicated to Abigail Dzinadoh, Sandra Kafui Dzinadoh and Godsway Kudjo Dzinadoh and all friends

TABLE OF CONTENTS

CONTENTS

LIST OF TABLES

ABSTRACT

Ghana Health Service (GHS) is the main parastatal institution responsible for health service delivery in Ghana. The institution relies on a well-functioning physical infrastructure to effectively implement the Ghana Health Service and Teaching Hospitals Act 526. Many new projects undertaken by the GHS supervised by Metropolitan/Municipal/District assemblies continue to experience delays. The aim of this study was to examine delays in Ghana Health Service building projects supervised by Metropolitan, Municipal and District Assemblies (MMDAs). The study adopted a quantitative design involving the administration of survey questionnaires to a sample of 100 respondents made of 30 quantity surveyors, 15 Contractors, 13 Architect, 20 Structural engineers, 17 Estate officers and 5 District accountants. The collected data was analysed using statistical package for social science (SPSS) version 21. The results were presented using percentages and mean values in a Table. The findings of the study suggested that delays in approving design documents, ineffective communication among parties, shortage of materials, mistakes and discrepancies, unreliable sub-contractors, incompetent project team, complexity of the project, unclear details in drawings, equipment unavailability were the key factors causing delay in GHS construction projects in Ashanti Region. Also, the main effects of delays were found to be time overrun, cost overrun, reduced profit, substandard work as well as waste of resources were the most important effects the study found. Based on the findings, the study recommends that sub-contractors should be selected based on their past experience. Contractors should have competent – spot supervisors to ensure persuasive execution of the project in time.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The construction industry in Ghana contributes about 7% to its Gross Domestic Product (GDP) and 1.4% of employment of the youth (Osei, 2013). The contribution of the building construction industry to the economic growth of the nation requires improved efficiency in the industry by means of timelines and cost-effectiveness that would certainly contribute to cost savings for the country as a whole. A major critique facing the Ghanaian building construction industry is the increasing rate of delays in project delivery. Pourrostam and Ismail (2012) argue that delays are one of the biggest problems which construction firms face. The authors maintain that the problem of delay in the construction industry is a global phenomenon. Henry, Apolo and Tindiwinsi (2013) also posit that holding construction projects within estimated time schedule requires sound strategies, good practices, and careful judgment.

However, to the dislike of owners, contractors and consultants, many projects experience extensive delays and thereby exceed initial time and cost estimates. Mohammed and Isah (2012) revealed that 70% of the projects undertaken by government departments and agencies in the UK were delivered late. The authors further provided that time and cost overruns occur in most construction projects, although, the magnitude of these delays and cost overruns varies considerably from project to project. Pourrostam and Ismail (2012) also indicated that time overruns can be traced back to "root causes" that are often associated with the preliminary phases (project planning or design).According to Megha and Rajiv (2013), when projects are delayed, they are either quickened or have their duration extended beyond the scheduled completion date. These are however not without some cost consequences. Sepasgoza

et al. (2015) explain that the conventional approach to handling the extra cost is to include a percentage of the project cost as contingency in the pre-contract budget.

Motaleb and Kishk (2010) argue that construction projects are unique, as they may have a classable set of objectives, require the application of new technology or technical approaches to achieve the required result. This uniqueness makes the contingency allowance allocation based on assumption and intuition inadequate and unrealistic. An investigation by Owolabi et al. (2014) revealed that in Nigeria 5–10% of pre contract estimate is in most cases allowed as contingency. This allowance was found to be inadequate. Inadequate contingency implies extra financial commitments, which in some cases are beyond the capacity of the owner.

Haseeb et al. (2011) explain that the delay in the completion of building construction projects is a worldwide problem. In building construction industry, the authors explain that construction delay is the time overrun in specified completion date or time overrun in the delivery of the construction project on which all parties agreed. Assaf and Al-Hejji (2006) are of the opinion that construction delay can be defined as the time overrun either beyond the contract date or beyond the date that the parties agreed upon for delivery. For the client, construction delay refers to the loss of revenue, lack of productivity, dependency on existing facilities, lack of rentable facilities etc. For the contractor, construction delay refers to the higher costs, longer work duration, increased labour cost, higher material and equipment costs etc. Motaleb and Kishk (2010) posit that completion of construction projects on specified time or time agreed within parties indicates the work and construction efficiency. The delays in construction projects happen because of various factors or causes. Dayi (2010) contends that these causes lead to the delay in construction completion, and this delay leads to some negative effects on the construction project.

Construction projects can be delayed as a result of a large number of factors. Frimpong *et al.* (2003) explains that monthly payment difficulties from agencies, poor contractor management; material procurement, poor technical performances, and escalation of material prices have been identified as the main delay factors in Ghana. In Vietnam by Long *et al.*(2004) provided that lack of contractor competency, poor designers and estimation, unfixed management problems related to site and procedurals techniques have been identified as major causes of delay. In Kuwait, the financial difficulties, changing orders, insufficient experience of clients and contractors are the main delay factors (Koushki *et al.,* 2005). Assaf and Al-Hejji (2006) also identified change orders as the main delay cause in Saudi Arabia.in Jordan, inadequate planning, scheduling and financing by contractor, and change orders by clients have been reported to be the main factors causing delay (Sweis *et al.,* 2008).

It is clear from the above discussion that delays can have an adverse impact on project success in terms of time, cost, quality and safety. Motaleb and Kishk (2010) contend that construction stakeholders have to think about the nature of these problems by more analysis and studies. The effects of construction delays, however, are not confined to construction companies, but can influence the overall economy of a country like Ghana, where construction plays a major role in its development and contributes significantly to the GDP. It often appears as additional days of work or as a delayed start or finish of an activity. Even with today's advanced technology, and professional management systems, construction projects continue to suffer delays and project completion dates still get pushed back.

1.2 Statement of the Problem

Delay is pervasive phenomenon in construction project delivery (Akinsiku & Akinsulire, 2012). It is branded as the most common, costly and risky problem encountered in construction project with a draining effect on the parties to a contract. Mohammed and Isah (2012) ague that it creates bad relationships, distrust, litigation, cash flow problems, project abandonment and general feeling of apprehension towards each other. Improving construction efficiency by means of timeliness would certainly contribute to cost saving for the country as a whole. The Ghanaian construction industry has suffered many setbacks in term of completion of the project at stipulated period within the predetermine sum. According to Frimpong et al. (2003), majority of the construction project in Ghana experience time and cost overrun which in turn lead to the abandonment of project.

According to Ramanathan et al. (2012), the biggest customer of the construction industry in most countries is the government. To the dislike of owners, contractors and consultants, Odeh and Bataineh (2002), argue that many government projects experience extensive delays and thereby exceed the initial time and cost estimates. This problem is more evident in the traditional type of contracts in which the contract is awarded to the lowest bidder. This procurement strategy is adopted by majority of government projects in developing countries especially in Ghana. Owolabi et al. (2014) reported that ensuring timely delivery of projects is one of the important needs of clients of the construction industry.

In Ghana, Frimpong et al. (2003) argues that it is very uncommon case that building construction projects undertaken by MMDAs are completed on the time specified or agreed upon. There are many large construction projects in Ghana, which suffered delay or in some cases suffered suspension or abandonment. As the

construction industry is growing, construction projects are also expanding in size and complexity. In this term, delay has still remained as project managers' concern. Mohammed and Issah (2012) however argue that identifying the main causes of delays in large construction projects is very difficult and often initiates disputes about responsibility for delay.

The requirement of construction clients for the timely delivery of construction projects and the vulnerability of projects to delays and cost overruns has attracted the attention of researchers all over the world, most of who tried to identify the root causes of project delay. However, despite the various study and investigation into the causes of delays in other parts of the world, there exists little empirical evidence on the causes of delay of publics building in the Ghanaian construction industry especially in the Ghana Health Service. It is therefore crucial to conduct a study to ascertain the causes of delays of building projects of Ghana Health Service supervised by MMDAs. The objective of this study is therefore to investigate the major factors that causes delay in Ghana Health Service Building projects supervised by Metropolitan, Municipal and District Assemblies (MMDAs) and evaluate the effects of delays on construction project delivery and to devise a measures to curb the menace of building delays in the Ghana Health Service.

1.3 Aim and Objectives of the Study

The aim of this study is to examine delays in construction projects of Ghana Health Services (GHS) supervised by Metropolitan, Municipal and District assemblies (MMDAs) in the Ashanti region. The specific objectives of the study are as follows:

- to identify the factors that cause delays in building projects of Ghana Health Service (GHS) supervised by MMDAs in the Ashanti region;

- to identify and evaluate the effects of delays in building projects of Ghana Health Service; and,
- to identify ways of minimising the effects of delays of construction building projects of Ghana Health Service (GHS) supervised by MMDAs.

1.4 Research Questions

Based on the aim and objectives of the study the following research questions were put forward to guide the study:

- What are the causes of delays in building projects of Ghana Health Services (GHS) supervised by MMDAs in the Ashanti region?
- What are the effects of delays on building projects of Ghana Health Services?
- What are the strategies adopted to reduce delays in large engineering projects?

1.5 Significance of the Study

The study sought to highlight the important factors accounting for the delays in Ghana Health Service building projects in the Ashanti region. In this way, the study findings will add to knowledge regarding the initiation, planning, execution and termination of construction. This knowledge is significant especially to the construction industry which is incessantly looking for better means to complete on time, within costs and agreed-upon performance parameters.

An understanding of the key causes of delays will also play an important role in the ways building projects are conceptualized, planned and executed. The study will also be crucial to the government in formulation of construction industry policies and

the way these policies are implemented. An informed policy will provide practical guidelines to the industry which minimizes project failures and risks reduction in the construction industry. This work is also necessary because time is one of three pillars of construction project management: time, cost and quality. A study on project delays will lead to a better understanding of the causes of inefficiency in building construction projects. Once the most significant delay causing factors are identified, the parties to the projects shall then be able to channel their energies and resources to the specific factors thereby reducing delays to the projects.

This study is relevant because it will assist the government and related parties in dealing with problems related to the effects of delayed projects and effectively improve Ghanaian building construction industry. It is hoped that the government and relevant parties would adopt and implement the necessary plan of action in order to reduce disputes in construction project, so as to create a friendly and enjoyable working environment for all parties and to improve the payment flows in the Ghanaian building construction industry. The study also intends to engender practical and theoretical further research questions that can become useful study basis for future researchers. Study findings should be considered as a contribution in the debate about how to improve the efficiency and effectiveness in the construction industry particularly with regard to scheduling and cost management.

1.6 Limitations of the Study

There were some of limitations that the researcher encountered during the conduct of the study. First, there were lack of co-operation from some management, consultants and staff of the construction companies and MMDAs. Most of them were of the view that the research served no practical purpose other than academics. The respondents were however educated on the importance of this study.

The research was also limited in the sense that a section of the population was used for the study. This is common with most research projects because it is mostly not possible to engage the whole population for a study. Due to logistic problems stakeholders under the building engineering bodies were not available for interviews neither at local nor, national level mainly due to the fact that there was no central forum to bring them together for an interview. This is recognized as a weakness of the study since it is well known that in most districts, a majority of building projects are designed, supervised and managed by building engineers and architects. Despite these perceived limitations, the researcher made objective and honest attempt to do justice to the topic selected for the study.

1.7 Delimitation of the Study

Due to time limitations the study covered GHS building projects undertaken by the government of Ghana and supervised by MMDAs. The study coverage area was the Ashanti region and involving selected projects of GHS since these area had the suitable projects for the study. The data for this study has been gathered through detailed literature review and questionnaire survey.

1.8 Organisation of the Study

The report is logically organized into five (5) chapters and appendices: Chapter one is composed of background and general information, which give an overview of the various delays encountered in a building project. The chapter also includes the statement of the problem, objectives of the study, significance of the study, limitations and delimitations of the study. Chapter two comprises of literature review, and quotes the various related works done in this area of study. Chapter three describes in detail the methodology followed in this research study. This covered the study type, data collection methods, population, sampling size and sampling techniques, data collection procedure and data analysis methods. Chapter four contains the analysis of the information gathered through the questionnaire, identifies the critical causes of delay in the building construction industry of GHS in Ashanti region. Chapter five provides the summary of major findings, conclusions and recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter is dedicated to reviewing relevant literature on the topic. Various vies presented by various researchers, scholars and authors are also presented in this chapter. This chapter therefore summarizes and synthesises literature that has been reviewed for purposes of the study. The chapter is organised into nine (9) main sections comprising: an introduction, overview of the Ghanaian construction industry, physical development in the Ghana Health Sector (new construction projects and maintenance works), concept of delay in construction projects, types of delays in construction projects, Causes of delays in construction projects, (Delays in construction projects in developed nations, Delays in construction projects in developing countries, The phenomenon of delays in construction projects in Ghana), effects of delays in construction projects, Strategies for minimizing or preventing delays in construction projects, chapter summary and conceptual framework.

2.2 Overview of the Ghanaian Construction Industry

The development of the Ghanaian Construction Industry is vital in the improvement of the economic state of every country since it is responsible for the provision of infrastructural development in the country. Again, the Construction Industry provides many employment opportunities in both the private and public sector. Currently, Amartey (2014) argues that the construction industry contributes a significant economic force in all parts of the world. Anaman and Osei (2007) also assert that the Construction industry acts as a vital variable in any economy and its activities

are also important to the realization of the socio-economic development goals of providing shelter, infrastructure and employment.

Ahadzie and Amoa-Mensah (2012) defined the construction industry as a collection of firms with closely related activities involved in the construction of real estates, building, private and public infrastructure. The authors further argued that the construction industry can be broken down into two very broad categories: General Building Construction and Engineered Construction. Ofori (2012) indicates that many construction contractors' focuses on one of these categories, or even specialise within one of them. Bennet (2003) also provided a third category of contractor as the speciality trade contractor, who normally works as a sub-contractor for prime contractors responsible for the construction of the entire project.

According to Amartey (2014), the construction industry has traditionally consisted of three primary participants: The owner (or customer), the designer /engineer, and the contractor. The author posit that the basic construction process occurs in a series of activities where the owner hires an architect / engineering firm to design the project and places the project out for bid to contractors (competitive building process) and the contractors perform the actual construction work. Ofori (2012) also assert that the construction industry deals with all economic activities that are aimed at creation, renovation, repairs or extension of fixed assets in the form of buildings, land improvements of an engineering nature and other such engineering constructions such as roads, bridges, railways, ports, dams etc.

In Ghana, Amartey (2014) provides that civil engineering firms undertake some of the projects mentioned above which involves heavy engineering features like bridges, roads, railways and dams, whiles the building construction firms also handles projects such as the construction of schools, hospitals, health centres, hotels, offices etc.

the author further provided that the Ghanaian building construction companies comprises of a large quantity of firms of various sizes as registered and categorised by the Ministry of Water Resources, Works and Housing (MWRW&H) as D1K1, D2K2, D3K3 and D4K4. According to Adusa-Poku (2014), the D1K1 class of contractors are termed as larger firms, whereas D2K2 construction firms are medium and D3K3 and D4K4 are small firms. These categorizations are done based on factors such as annual turnover, equipment holding, and personnel. According to Danso (2010), the larger firms are registered as financial class 1, capable of undertaking projects of any value, class 2 (the medium firms) are capable of undertaking projects costing US$500,000 or GH¢750,000.00, while the small firms (financial class 3) are also capable of undertaking projects that values up to US$200,000 or GH¢ 300,000.00 or class 4 to undertake projects up to US$75,000 or GH¢112,500.00.

2.3 Physical development in the Ghana Health Sector (new construction projects and maintenance works)

A project is defined by Archibald et al. (2012) as a unique endeavour to produce a set of deliverables within clearly specified time, cost and quality constraints. The authors further maintained that all projects comprise of many different phases that form the life cycle (or life span) of each project. Ramanathan et al. (2012) also posit that the product life cycle commences at the moment the product begins to be used, sold or placed in operation, thus producing the benefits that justified the project in the first place. In the opinion of Ramanathan et al. (2012), there may be some overlap between the standard project close-out phase and the initiation of the product usage and thus its product life cycle. According to Akinsiku and Akinsulire (2012), for consumer products the product life cycle typically has five phases: introduction, growth, maturity, decline,

and termination. In some cases, there may be product improvements (new projects) to extend the product life.

Afshari et al. (2011) argues that there are five interrelated cycles/phases in project life cycle. Many authors maintain that a typical project goes through a number of phases described in the paragraphs that follow.

According to Afshari et al. (2011), some of the key activities in the preparation phase includes taking over of project land, preparation of the site, site mobilization; kick off meeting with the project client, geotechnical studies, etc. During this phase, joint team is formed and defines critical aspects of the project, which are presented in the form of a project plan. The joint team then formally introduced and defines critical aspects of the project, which are presented in the form of a project plan.

Afshari et al. (2011) argue that typically the engineering phase includes basic design and detail design. During this phase, activities occur to meet the objectives outlined in the project plan. The authors further argued that majority of the efforts in this phase happen at the initial months of the project. Production of mark-up drawings, producing as built drawings, handing over project manuals, etc. are some of engineering activities which will normally be done at the late months of the projects.

There are three main stages for materials procurement and equipment for the project. These are; bidding in accordance with the vendor list approved by the client and awarding contract to the winner; manufacturing or purchasing as stated in the contract conditions, and forwarding the goods and material to the project site.

During the construction phase, the project team works more autonomously toward meeting its business objectives. Construction includes civil activities such as foundation works, building and road making. Installation and pre-commissioning and commissioning are other construction activities undertaken during a project.

At the delivery and closing phase, progress and success are measured, project documents are archived, lessons learned are captured, and the engagement is formally closed. Akinsiku and Akinsulire (2012) argue that delivery and closing is the last phase in the project life cycle. It consists of handing over of commissioned equipment and system to the client, closing of the subcontractors' contracts, clearing defect, finalizing claim and delay, releasing project guarantees, releasing project resources, and closing of client contract as per the closing conditions.

2.4 Concepts of Delay in Construction Projects

On construction projects, as well as on other projects for which a schedule is being used to plan work, it is not uncommon for delays to occur. Many researchers have given a number of definitions for delay. First, Mahdavinejad and Molaee (2011) explained that delay is to make something happen later than expected; to cause something to be performed later than planned; or not to act in a timely manner. In another study, Trauner *et al.* (2009) describe delay as to make something happen later than expected or to not act timely. In the construction management context, the simplest definition of a delay is made by Mubarak (2005) as an event or a condition that results in finishing the project later than stipulated in the contract. Assaf and Al-Hejji (2006) also define delay in construction environment as the time during which some part of the construction project has been extended or not executed owing to an unexpected event. Mydin et al. (2014) also defined project delay as an incident that causes extended time to complete all or part of a particular projects. The authors gave the concept of delay as the extension of time beyond planned completion dates traceable to the contractors. According to Dayi (2010), delay can also be defined as the time overrun, either ahead of the date for project completion specified by the contract or further than

the extended contract period where an addition of time has been granted. According to Ren et al. (2008), what is being delayed determines whether a project or some other deadline, such as a milestone, will be completed late.

According to Motaleb and Kishk (2010), delay is generally acknowledged as the most common, costly, complex and risky problem encountered in construction projects. Because of the overriding significance of time for both the owner (in terms of performance) and the contractor (in terms of money), it is the source of frequent disputes and claims leading to lawsuits (Dayi, 2010). To control this situation, Henry et al. (2013) argues that a contract is formulated to identify potential delay situations in advance and to define and fix obligations to preclude such controversies. In the opinion of Mydin et al. (2014), the project delay in the construction industry is a universal or large-scale observable fact affecting not only the construction industry but the overall economy of a country as well. Project delay involves manifold multifaceted issues all of which are perpetually of decisive magnitude to the parties to the construction contract.

Abisuga et al. (2014) pointed out that the construction industry is an essential component in socioeconomic development of any nation. Ajayi et al. (2012) also argued that construction projects are characterized by poor performance in terms of projects pre- planned objectives. The complications and challenges that lead to delay occur during the project implementation phase (Ayudhya (2011). On the other hand, Ramanathan et al. (2012) made a case that delay in construction project can occur through many sources or means such as characteristics of the project, internal and external factors affecting the construction organization, social, economic and cultural issues and so on. These issues can be associated with the project stakeholders, namely:

clients, contractors, subcontractors, consultants and external factors (such as statutory agencies).

Pourrostam and Ismail (2012) assert that the construction industry has a very poor reputation for coping with delays. According to the authors, delay analysis is either ignored or performed subjectively by simply adding a contingency. As a result, many major projects fail to meet schedule deadlines. According to Duran (2006), in a construction project in which time truly equals money, the management of time is critical thus, predicting the likelihood of schedule delay may play a key role in project success. Majid (2006) contends that a construction project is commonly acknowledged as successful when it is completed on time, within budget, in accordance with the specifications and to stakeholders' satisfaction. Frimpong, et al. (2003) thus defined project success as meeting goals and objectives as prescribed in the project plan, while a successful project means that the project has achieved its technical performance, maintained its schedule and remained within budgetary constraints.

Ayudhya (2011) posit that one of the major characteristic of construction industry is uncertainties, unpredictability and susceptible to understandings leading to delays. Delay in project execution is a major problem in the construction industry in developing countries (Akinsiku & Akinsulire, 2012). According to Ren et al. (2008), delay occurs in both medium and large projects. Owolabi et al. (2014) assert that virtually all of the projects executed in recent years in Nigeria were faced with the problem of delay in delivery. The authors observed that seven out of every 10 projects in Nigeria suffer delays. This means that delays in construction can affect the overall project participants adversely. It is the common interest of all parties to avoid the delay as much as possible at the first place and to minimize then even if the delays arise.

Arikan and Dikmen (2004) defined planning as trying to forecast what will

happen and developing ways of achieving the set of objectives and targets. Dayi (2010) also describes planning as a process during which attempts and decisions are made to achieve the goals at the desired time in the desired way. The author further indicated that the main objectives of a construction project include: to complete the construction within the specified time (duration); to complete it within the budget, (with a profit) and to complete it in compliance with technical and administrative specifications. With specific reference to project planning, Ramanathan et al. (2012) defined it as the process of selecting the one method and order of work to be used on a project from among all the various methods and sequences in which it could be done. The author also notes that this process supplies elaborate information used for time estimation and schedule; besides a baseline for project control. Mubarak (2005) states that project planning works for several functions such as: cost estimating, scheduling, project control, safety management, etc. According to Arikan and Dikmen (2004) the main purpose of planning is to provide the primary duties of the manager, namely, direction and control. The authors further indicated that the second objective of planning is to organize all the relationships and information systems among the many parties involved in the construction project. The authors further describe the third function of planning as enabling project control and forecasting.

Smith (2002) also accentuated the importance of careful project planning in the success of a realization of a project; and also pointed out that the activities of designers, producers, suppliers, workers and contractors, and their resources must be coordinated and integrated with the objectives of contractor. Smith's claim was supported by Oberlender (2000) who indicated that project planning coordinates all works of the construction to reach a completed quality project. Oberlender (2000) found out there are a number of benefit obtained from project planning and scheduling as an effective

tool of preventing some of the problems like delays in work, cost overrun or decline in productivity and principally puts in order the desired results of project planning and scheduling. The author suggested that some of the benefits accrued from effective project planning include: finishing project on time; continuous (uninterrupted) flow of work (no delays); reduced amount of rework (least amount of changes); minimize confusion and misunderstandings; increased knowledge of status of project by everyone and meaningful and timely reports to management. On the other hand, Dayi (2010) provided that the other benefits obtained from proper project planning are: running the project instead of the project running you; knowledge of scheduled times of key parts of the project; knowledge of distribution of costs of the project; accountability of people, defined responsibility/ authority; clear understanding of who does what, when, and how much and integration of all work to ensure a quality project for the owner.

2.5 Types of Delays in construction projects

Akinsiku and Akinsulire (2012) argue that delay in projects is almost inevitable. Some delay will take place at a particular period in the completion of an activity and some other ones may be capable of leeway in when they have their effects. Pourrostam and Ismail (2012) are of the opinion that delay could be non-excusable; excusable (with or without compensation) and concurrent delays.

2.5.1 Non-Excusable Delays

The authors further explained that non-excusable delays are either caused by the contractor, subcontractor or other party but are within the control of the contractor. Mohammed and Isah (2012) also added that these non- excusable delays are as a result of equipment breakdown; inadequate scheduling or mismanagement; underestimation

of productivity; construction mistakes; improper project planning; poor site management and supervision; unreliable subcontractors or suppliers and general staffing problems.

Motaleb and Kishk (2010) contend that non-excusable delays are common in various construction projects and cause considerable losses to project parties. Again, Luu et al. (2009) opine that it is widely accepted that construction project scheduling plays a key role in project management due to its significant influence on project success. The common results of schedule delays include late completion of the project, increased cost, and disruption of work, loss of productivity, third party claims, disputes and abandonment or termination of contracts. Therefore, schedule delays in construction projects give rise to dissatisfaction in all the parties involved (Majid, 2006). Consequently, Assaf and Al-Hejji (2006) argue that this type of delay presents no entitlement to a time extension or delay damages for the contractor if the delay can be proved to have affected the whole project but thus entitled the client to claim for a liquidated damages.

Sepasgozar et al. (2015), also provided that non-excusable delays are delays, which the Contractor either causes or assumes the risk for. These delays might be the results of underestimates of productivity, inadequate scheduling or mismanagement, construction mistakes, weather, equipment breakdowns, staffing problems, or mere bad luck. Such delays are inherently the Contractor's responsibility and no relief is allowed. These delays are within the control of the Contractor or are foreseeable; however, it is not necessary that they be both. When a delay is caused by factors that are not foreseeable, beyond the Contractor's reasonable control and not attributable to the Contractor's fault or negligence, it may be "excusable". This term has the implied

meaning that neither party is at fault under the terms of the contract and has agreed to share the risk and consequences when excusable events occur.

Fugar and Agyakwah-Baah (2010) also assert that inexcusable delays (non-excusable delays) are caused solely by the contractor or its suppliers. The contractor is generally not entitled to relief and must either make up the lost time through acceleration or compensate the owner. This compensation may come from either liquidated damages or actual damages, provided there is no liquidated damages clause in the contract. Liquidated damages are generally expressed as a rate that is based on a forecast of costs the owner is likely to incur in the event of late completion by the contractor (Soon, 2010). Mohammed and Isah (2012) also made a case that these delays might be the results of underestimates of productivity, improper project planning and scheduling, poor site management and supervision, erroneous construction methods, equipment breakdowns, or unreliable subcontractors or suppliers.

2.5.2 Excusable Delays

Majid (2006) also assert that excusable delays on the other hand are caused by unforeseen factors beyond the contractor or any other party and are not attributed to their negligence or faults. It is however within the terms of contract that when excusable delays occur, both parties will have to share the risks involved. The contractor will not receive compensation for the cost of delays, but will be entitled to an additional time to complete his work and is relieved from any contractually imposed liquidated damages for the period of delays.

This type of delay according to Mohammed and Isah (2012) can also have an impact on noncritical activities which need a more detailed analysis to determine whether an extension of time is warranted, or if the reduction of float time can be justified. Excusable delays can therefore be further classified into excusable with compensation and excusable without compensation. Fugar and Agyakwah-Baah (2010) suggest that excusable delays can be further divided into two categories:

Non-compensable delays are caused by third parties or incidents beyond the control of either the owner or the contractor and are not attributable to any of the parties (Fugar & Agyakwah-Baah, 2010). Examples typically include acts of God, unusual weather, strikes, fires, acts of government in its sovereign capacity, etc. In this case, the contractor is normally entitled to a time extension but no compensation for delay damages (Soon, 2010).

Compensable delays are caused by the owner or the owner's agents (Fugar & Agyakwah-Baah, 2010). An example of this type of delay would be the late release of drawings from the owner's architect. An excusable, compensable delay usually leads to a schedule extension and exposes the owner to financial damages claimed by the contractor (Soon, 2010). In this case, the contractor incurs additional indirect costs for extended field office and home office overhead and unabsorbed home office overhead.

In addition to the compensable delays that result from contract changes by Change Notice, there are compensable delays that can arise in other ways. Such compensable delays are excusable delays, suspensions, or interruptions to all or part of the work caused by an act or failure to act by the Owner resulting from Owner’s breach of an obligation, stated or implied, in the contract. If the delay is compensable, then the Contractor is entitled not only to an extension of time but also to an adjustment for any

increase in costs caused by the delay. Owner-issued contracts specifically address some potential compensable delays and provide equitable adjustments.

2.6 Causes of Delay in Construction Projects

Delays on construction projects are a universal phenomenon. Kaliba et al. (2009) assert that the problem of delays in the construction industry is a global phenomenon. Again, Pourrostam and Ismail (2012) explain that delay often appears as additional days of work or as a delayed start or finish of an activity. Even with today's advanced technology, and professional management systems, Akinsiku and Akinsulire (2012) argue that construction projects continue to suffer delays and project completion dates still get pushed back. Several articles have examined the causes of construction delays in advanced countries in many ways; some studies determined the main causes of delay in different countries, while some of them investigated the delay analysis methods in different types of construction. Haseeb et al. (2011) also posit that delays caused by contractors can generally be attributed to poor managerial skills. Abisuga, Amusu and Salvador (2014) also argued that lack of planning and a poor understanding of accounting and financial principles have led to many a contractor's downfall. The following are the empirical studies carried out on the causes of delays in construction projects in the advanced countries.

2.6.1 Delays in construction projects in Developed Nations

In the construction industry of United Kingdom (UK), Olawale and Sun (2010) discovered 21 major factors causing time and cost overruns are changes in design, non-performance of subcontractors, complexity of works, conflict between project parties, unpredictable weather condition, dependency on imported materials, lack of

appropriate software, risk and uncertainty associated with projects, inaccurate evaluation of projects time and cost, disagreements in contract documentation, lack of proper training and experience of project manager, weak regulation and control, projects fraud low skilled manpower, contract and specification interpretation disagreement, inflation of prices, financing and payment, unstable interest rate, fluctuation of currency/exchange rate, and corruption and unstable government policies. Assaf and Al-Hejji (2006) undertook a similar study on the main causes of delay in large building projects in Saudi Arabia. In the study undertaken by Assaf and Al-Hejji (2006) the largest number of causes of delay (56 causes) was listed and the respondents were asked to point out their degree of importance. The authors found and grouped the delay factors into nine major groups: financing, project changes, government relations, materials, scheduling and control, contractual relationships, manpower, equipment, and environmental factors.

In another study, Afshari et al. (2011) conducted a study on the major causes of delays in construction projects in the Florida Construction Industry. According to the findings of the authors, there were two groups of causes for delays in construction projects: external and internal causes. The authors indicated that the internal causes of delays cover the causes, which come from four parties involved in that project. These parties are the owner, designers, contractors, and consultants. However, according to Sepasgozar et al. (2015), there are other delays, which do not come from these four parties, are based on external causes for example from the government, material suppliers, or weather. Some of the possible causes of delays are: possessive decision-making mechanism; financial difficulties; inadequate review; improper inspection approach; different attitude between the consultant and contractors; highly bureaucratic organization; insufficient data collection and survey before design; site's topography is

changed after design; lack of coordination at design phase and inexperienced personnel.

In a related study, Arditi et al. (2006) examined a number of public projects in Turkey in so as to determine and grade the level of importance of the causes of construction delays in such projects. The results of their research found the following as the most important reasons of these delays and their average weights were as follows: Shortage of some resources like qualified manpower, technical personnel, construction materials and equipment (31%), Financial difficulties of contractors and public agencies (21%), Organizational deficiencies of public agencies and contracting companies such as bureaucratic obstacles and slow decision-making mechanism in public organizations (19%), Delays in design work, large quantities of extra work, frequent change orders (14%).

Kassab et al. (2006) also assert that project managers experience significant delays in many countries around the world. Lowsley and Linnett (2006) reported that in 2000s, the number of claims submitted to the American Arbitration Association (AAA) reached almost 25% of the 1.7 million claims submitted over the past 74 years. A report by the National Audit Office, in the United Kingdom (U.K.) also revealed that 70% of the projects undertaken by government departments and agencies were delivered late. According to Iyer and Jha (2006), in India, a report of the infrastructure and project monitoring division of the ministry of statistics and program implementation in 2004 shows that about 646 central sector projects costing about $50 trillion were approximately 40% behind the project schedule.

2.6.2 Delays in Construction Projects in developing countries

Literature has provided that several factors can contribute to delays on building projects in Africa. A study was by Kaliba, et al. (2009) which sought to find out the causes schedule delays in construction projects in Zambia. The authors compiled the main causes of delays in construction projects to include the following: delayed payments, changes in drawings, materials procurement, staffing problems, financial processes and difficulties on the part of contractors and clients, contract modification, equipment unavailability, poor supervision, economic problems, construction mistakes, poor coordination on site, changes in specifications and labour disputes and strikes.

It has been researched, that delay is a major setback in the construction industry in Nigeria. According to Owolabi et al. (2014), the Nigerian construction industry is faced with a lot of problems, among which is delay in project execution. Mohammed and Isah (2012) reported that six out of ten projects in Nigeria suffered delays in their execution. Owolabi et al. (2014) researched into the causes of delays in building projects in Nigeria. The authors classified the causes of delay as project participants and extraneous factors. The authors assert that client-related delays included variation in orders, slow decision-making and cash flow problems. Contractor-related delays identified were: material management problems, financial difficulties, planning and scheduling problems, inadequate site inspection, equipment management problems and shortage of manpower. Extraneous causes of delay identified were: inclement weather, acts of nature, labour disputes and strikes.

Pourrostam and Ismail (2012) also conducted a research to identify causes and effect of delay in Iranian construction project. The authors ascertained that many construction projects in Iran suffered delays and the root causes include poor estimation of quantities, project schedule changes, design variations or errors, unexpected site

conditions, scope changes, rising costs of materials and labour (largely due to inflation), and/or unforeseen events. Again, according to Muhwezi et al. (2014), like in many developing nations, construction projects in Uganda are experiencing widespread delays. For instance, it took 56 months to complete Mapeera House on Kampala road instead of the original 13 months, representing a total delay period of 43 months (tripling the construction period). Again, a church house project was expected to be completed within 18 months from the date of commencement of works (April 2011), but by May 2013 the works had already taken 25 months and was yet to be completed.

In another instance, Mezher and Tawil (1998) conducted a study to ascertain the causes of delays in the construction industry in Lebanon from the perspective of owners, contractors and architectural and engineering firms. The study found that owners had more concerns regarding financial issues; contractors regarded contractual relationships as the most important; and consultants considered project management issues to be the most important causes of delays. In Vietnam, by Long *et al* (2004) identified lack of contractor competency, poor designers and estimation, unfixed management problems related to site and procedurals techniques as the major causes of delay in Vietnam. In Kuwait, Koushki *et al.* (2005) also found out that the financial difficulties, changing orders, insufficient experience of clients and contractors were the main delay factors.

Al – Momani (2000), carried out an analysis on construction delays in Jordan. The result of the study indicated that the main causes of delay in construction of public projects were related to designers, user changes, weather, site conditions, late deliveries, economic conditions and increase in quantity. Similarly Mohammed and Isah (2012) also conducted a survey aimed at identifying the most important causes of delays in construction projects with traditional type of contracts from the viewpoint of

construction contractors and consultants. Results of the survey indicated that contractors and consultants agreed that owner interference, inadequate contractor experience, financing and payments, labour productivity, slow decision making, improper planning, and subcontractors were among the top ten most important factors.

In the United Arab Emirates (UAE), Faridi and El-Sayegh (2006) report that clients and investors complain of non-receipt of their projects on time since delays take many years and gets on one of the most critical problem in the UAE. The authors' revealed that half of construction projects in the country encounter delays. Motaleb (2009) also reported that the number of construction projects encountering delay increased by about one fifth by 2009. Motaleb and Kishk (2010) investigation into the current and future state of the construction industry also revealed that in Dubai more than half of the construction projects in real estate, infrastructure, and leisure and entertainment in the UAE, worth $582 billion, are now on hold.

2.6.3 The phenomenon of delays in construction projects in Ghana

There is strong evidence of inconsistent performance of Ghanaian construction projects and the trend is growing rapidly. Buertey et al. (2014) have indicated that a major criticism facing the Ghanaian construction industry is the growing rate of delays in project delivery. In a research carried out by Frimpong et al. (2003) to determine the causes of delays and cost overruns in Ghana groundwater construction projects.

Owolabi et al. (2014) assert the terms of project planning and scheduling are often mistakenly thought of as synonymous. Mubarak (2005) however indicates that scheduling focuses on the timing and sequence of operations in the project planning effort. Therefore, it can be ascertained that while project planning covers the issues of what is going to be done? Where? How? and when? the term of project scheduling

concentrates on only the issue of when?. Trauner et al. (2009) supported Mubarak and defined project schedule as a written or graphical representation of the contractor's plan for completing a construction project that emphasizes the elements of time and sequence. According to the authors, the project schedule must show all the construction tasks from the inception of the project through completion, the time periods for each tasks, and the sequence of these tasks in a logical order.

Again, Akinsiku and Akinsulire (2012) defined project scheduling as the process of ascertaining the exact time periods during which the activities are planned to take place: that is, start and finish dates for each activity. The authors further maintained that in order to determine the construction activities and their time periods, project planning should be done before project scheduling. A claims was made by Oberlender (2000) that a successful project planning is more difficult to organize than scheduling. The author further argued that if the activities are identified in project planning, then scheduling the project will become relatively easy.

According to Dayi (2010), after a successful planning process, the schedule of the project is prepared. The author further posits that major objectives are expected from good project scheduling. Mubarak (2005) suggested that the following are the eight important objectives of scheduling: to calculate the project completion date; to calculate the start or end of a specific activity; to expose and adjust conflicts between trades or subcontractors; to predict and calculate the cash flow; to evaluate the effect of changes; to improve work efficiency; to resolve delay claims and to serve as an effective project control tool. Trauner et al. (2009) on the other hand view project schedule as a valuable project control tool for project managers to successfully conduct construction projects. The authors further explain that the main purposes of a project schedule is to effectively depict the construction plan to the project participants,

permitting management to control and measure the progression of the work, and finally accommodating the participants with information for timely decisions.

Ramanathan et al. (2012) also claim that the probabilities of timely, on-budget, and dispute free completion may be enhanced by means of a schedule and the purpose of the schedules is specified by the individual using the schedule. The authors further explained that the purpose of predicting project completion for contractors is that they can arrange workers sizes, shifts or equipment to speed or slow progress. For architects or engineers, the purpose is to determine how long design and construction will take for completion of the project (Akinsiku & Akinsulire, 2012). Akinsiku and Akinsulire (2012) further add that subcontractors use the information of specific activities start and finish times to predict when they are needed at the site. According to Pourrostam and Ismail (2012), another purpose of scheduling for contractors is to reveal and resolve conflicts between firms or subcontractors. Both for contractors and owners, schedules are used to plan cash flow .Dayi (2010) also indicate that schedules are used for measuring delay and time extensions. Dayi (2010) further argued that if the schedules are regularly updated including work sequences, unanticipated delays, actual activity completion dates and change orders, then the owner and contractor can measure the effect of additional works and unanticipated delays, thus avoiding disputes.

The research showed that monthly payment difficulties from agencies, poor contractor management, material procurement, poor technical performances, and escalation of material prices were the main causes in the study. In specific terms, Amoatey et al (2015) addressed the causes of delays in Ghanaian building projects. Important causes of delay identified by Amoatey et al (2015) were: financing of and payment for completed works, poor contract management, changes in site condition and shortages in materials. Ansah (2011) also classified the causes of delay via project participants

and extraneous factors. Client-related delays identified include variation orders, slow decision-making and cash flow problems while contractor-related delays include financial difficulties, material management problems, planning and scheduling problems, inadequate site inspection, equipment management problems and shortage of manpower. Extraneous causes of delay identified were inclement weather, Acts of God, labour disputes and strikes.

Frimpong et al. (2003) also conduct a survey to identify the significant factors contributing to delay and cost overruns in Ghana groundwater construction projects. The authors identified the factors as monthly payment difficulties from agencies, poor contractor management, material procurement, poor technical performances, and escalation of material prices. Amoatey et al (2014) also analysed the delay causes and effects in Ghanaian state housing construction projects. The authors identified 10 most important causes of delay in construction projects. The causes included: contractor's improper planning, contractor's poor site management, inadequate client's finance and payments for completed work, lack of communication between parties, inadequate contractor experience, labour supply, equipment availability and failure, problems with subcontractors, shortage in material, and mistakes during the construction stage.

In a similar objective, Fugar and Agyakwah-Baah (2010) investigate the causes of delay of building construction projects in Ghana to determine the most important factors in relation to the key project participants. All major stakeholders asserted that the top ten most important factors that caused delay in construction projects in Ghana are: delay in honouring payment certificates, difficulty in accessing bank credit, shortage of materials, underestimation of the cost of project, poor supervision, fluctuation of prices/rising cost of materials, underestimation of complexity of project,

underestimation of time for completion of projects by contractors, poor professional management, and poor site management.

Fobi (2014) also identified major factors that cause construction delays in Ghana. The author found that the causes of delay in Ghanaian construction projects were attributed to finance and payment arrangements, poor contract management, and shortages in materials, inaccurate estimations and overall price fluctuations.

2.7 Effects of Delay in Construction Projects

Construction delays occur either as a liability on part of the client and his team, liability on part of the contractor and his team, nature and social political issues through the changes bye-laws, statues etc. (Ramanathan et al., 2012). The authors assert that the effects of these delays is always draining on construction project performance. Previous studies conducted on the effect of delay on building project have revealed that delays are associated with time and cost overruns as well as litigation and project abandonment. Haseeb et al. (2011) discovered that dispute, lawsuit, total desertion, litigation and project abandonment are the effects of delays. The authors further identified that dispute, cost overrun, time overrun, arbitration, total abandonment and litigation are the resulting effects of delays.

Toor and Ogunlana (2008) studied factors influencing projects in Thailand and found out that while injecting additional resources can significantly increase project costs, prolonged overtime work may cause declines in productivity and performance, which may also generate rework. Henry, Apolo and Tindiwinsi (2013) were also of the opinion that delays can lead to some negative effects such as lawsuits between project parties, increased costs, loss of productivity and revenue, and in some cases contract termination. Braimah and Ndekugri (2008) also indicated delay and disruption to

contractors' progress are some of major sources of claims and disputes in the construction industry.

In another study, Arditi et al. (2006) found out that delays have an adverse impact on project success in terms of time, quality, cost and safety. Motaleb and Kishk (2010) also reported that the effects of construction delays, however, are not limited to construction companies, but can influence the overall economy of a country like the United Arab Emirates (UAE), where construction plays vital role in its development and contributes 14% to the GDP. Furthermore, Mohammed & Isah (2012) found out that associated delay problems can also result in dispute, total abandonment, arbitration and protracted litigation by the parties. To some extent the authors posit that the contract participants through claims usually agree upon the extra cost and time extension associated with delay. However, in many cases the authors contend that this has given rise to heated arguments between the owner and contractor.

Similarly, Abisuga et al. (2014) argue that delays in construction have so many effects. The authors showed that additional costs, loss of productivity, late completion of the project, decline in quality and rework, increased time related costs, third party claims, and termination of contract are some of the negative effects of construction delay. Thus, according to Aibinu (2009), delay could generate distrust and create tension between the contractor, owner, and the owner's project management team.

2.8 Strategies for minimizing or preventing delays in construction projects

Abisuga et al. (2014) contend that for a project to be successful; delays must be minimized or reduced. Aibinu and Jagboro (2002) conducted a study aimed at minimizing construction delays and two methods were identified: acceleration of site activities and contingency allowances. Dayang (2009) identified to reduce delay in

construction, proper project planning and scheduling, developing appropriate communication system linked to all functional groups, ensuring availability of resources, hiring a competent project manager and utilization of appropriate construction methods, incentive offer for early project completion and emphasizing on the availability of resources are needed. Odeh and Battaineh (2002) also recommended reinforcement of liquidated damages clauses and offering incentives for early completion, developing human resources, adopting a new contract award approach such as design-build and construction management contract type can minimize construction delays as some of the ways to reduce construction delays.

In Kuwait, Koushki et al. (2005) identified methods of reducing delays which include: ensuring an adequate source of finance, hiring of independent supervising engineer to monitor progress of work, performance of pre-construction planning, allocation of sufficient time and money during the design phase, ensuring timely delivery of materials and selection of competent and reliable consultants to carry out the work. In a similar study, Abudul-Rahman et al. (2006) also identified the procedures taken by the contractor as to the recovery of delays by recommending a process to increase productivity by working overtime hours or working by shifts, and followed by asking for an extension of time.

According to Abisuga et al. (2014), with time being the essence in most of the construction contracts and with the project duration clearly defined, it is also important to follow the next outline procedures when delays occur. The authors argued that whenever the contractor anticipates any delays in the delivery of the work, and in any event immediately upon the occurrence of any delay which the contractor considers unavoidable, the contractor ought to notify the owner's representative in writing of the probability of occurrence of such delay and its cause. When this is done, the owner's

representative may take prompt steps to prevent, the occurrence or continuance of the delay or, if this cannot be done, may determine whether the delay is to be considered avoidable or unavoidable, how long it continues, and to what extent the prosecution and completion of the work are to be delayed.

Several studies have also been conducted to identify methods of minimising non-excusable delay in construction project. In Vietnam Nguyen, Ogunlana and Lan (2004) conducted a study into project success factors in large construction projects. The authors found out that the following are factors that can be applied as a method of reducing non-excusable delay: effective strategic planning; competent project manager; commitment to projects; availability of resources; competent project team; frequent progress meetings; accurate initial time estimates; systematic control mechanisms; comprehensive contract documents; awarding bids to the right/experience consultant and contractor; proper emphasis on past experience; community involvement; clear information and communication channels; use of up-to-date technology.

2.9 Chapter Summary

There has been a substantial and sustained interest on the causes of construction delays. The information available as reviewed above is diverse and widespread. Despite the necessity for such research, little work has been described in the literature concerning public projects especially in the Ghana Health Service. The previously proposed factors contributing to construction delay are frequently observed in many studies. The actual frequency and magnitude of these factors is not known, which has proven to be a serious and very expensive problem for the construction industry.

As has been observed, it is knowable that various studies and researches had been conducted on this subject matter beforehand. Most of them focused on explaining

the causes, which would be accommodating to guide practitioners to identify possible measures for mitigating against delays in construction project. Delays in construction projects risen the displeasure to all the parties involved and the main role of the project manager is to make sure that the projects are completed within the budgeted time and cost. Despite many recommendations being introduced after researches and studies being done, the projects delays is still the major problem in constructions industry up to day. This study intends to fill the gap by researching to identify the factors of delays and their effect on project completion in the public sector, particularly Ghana Health Service projects. This study takes an integrated approach and attempts to analyse the effect of specific causes on specific effects.

2.9.1 Conceptual Framework

Kothari (2008) argues that conceptual frameworks are structured from a set of broad ideas and theories that assist a researcher to properly identify the problem they are looking at, frame their questions and find suitable literature. Most academic research uses a conceptual framework at the outset because it helps the researcher to clarify the research questions and aims. Researchers use conceptual framework to guide their data collection and analysis. Sociologists, Haralambos and Holborn (2008) also contend that a conceptual framework allows the researcher to find the link between the existing literature and his own research goals. The review of the literature has led to the development of a conceptual model which is presented in Figure 1.

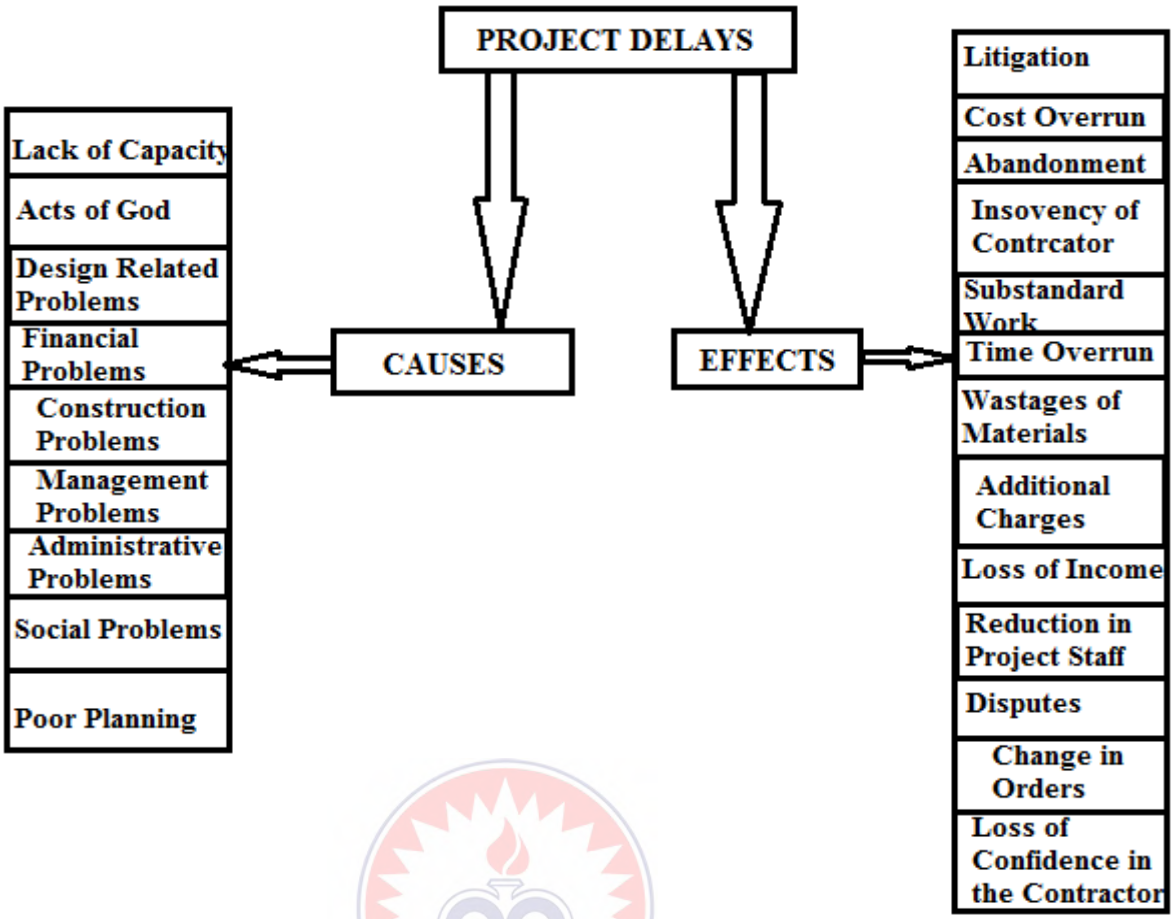

Figure 2.1: Causes and Effects of Construction Projects

Source: Researcher's Construct (2016)

The model in Figure 1 tries to analyze the causes and effects of construction projects. The causes includes poor planning, acts of God, lack of capacity, Financial and economic problems, design related problems. Etc. on the other hand, the effects of construction projects includes litigations, cost overruns, time overruns, total abandonment of projects, provision of substandard works, additional charges, changes in order description etc.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter explains the methodology used to gather data for the research in order to achieve the research objectives presented in chapter one. The chapter explains the nature of investigation, the study area and the population of the study. This chapter also explains the techniques used to choose the sample size, data collection instruments used, data analysis method and the ethical consideration of the research.

3.1 Study Design

A descriptive research was also adopted for the study. Descriptive research is a research that involves describing, recording, analysing and interpreting conditions that exist. Yin (2003) explains that a descriptive approach of design is used to provide solutions to the main research questions. The research aims to provide information concerning an existing situation and thus descriptive approach of research was considered to be more desirable.

The design involved the identification of the problem, investigating the problem by collecting data through questionnaires and interviews, analysis of the data, drawing conclusions and then making recommendations. This study was therefore structured within the framework of descriptive research approach. Descriptive research studies are designed to obtain information, which concerns the current status of phenomenon (Saunders, Lewis & Thornhill, 2007). The descriptive research approach was chosen because the researcher would not manipulate the variable but the researcher rather described the phenomenon that existed at the time of the research. It is however argued

that the descriptive research may however fall short of discovering new insights into a phenomenon, because it does not manipulate the variables concern and it only focuses on explaining what already exist.

3.2 Population of the Study

The target population of the study comprised consultants and construction firms involved in the execution of health sector projects in the study region in 2015 and 2016 physical year. The consultants comprised assembly engineers, planners, architects and quantity surveyors involved in health sector projects in the study region. The size of the population is given Table 3.1 below.

Table 3.Population size for 30 assemblies in the Ashanti Region

Assembly	Consultants					
	Engineers	Quantity Surveyors	Architects	Planners	Total	Contractors on health projects (2015 & 2016)
Metropolitan						
Kumasi Metropolitan	5	2	5	2	14	2
Municipals						
Asante Akim Central	1	1	3	2	7	1
AsokoreMampong	1	1	2	1	5	0
Bekwai Municipal	1	1	1	1	4	0
EjisuJuaben	1	1	1	1	4	0
Mampong	1	1	1	1	4	1
Offinso	1	0	1	1	3	1
Obuasi	1	0	1	2	4	0
Districts						
Adansi North	1	0	1	1	3	1

Adansi south	1	1	1	1	4	0
Afigya - Kwabre	1	0	1	1	3	0
AhafoAno North	1	0	1	1	3	0
AhafoAno south	1	0	1	1	3	0
Amansie central	1	0	1	1	3	1
Amansie West	1	0	1	1	3	1
Asante Akim North	1	0	1	1	3	0
Asante Akim South	1	0	1	1	3	0
AtwimaKwanwoma	1	0	1	1	3	0
AtwimaMponua	1	1	1	1	4	0
AtwimaNwabiagya	1	0	1	1	3	0
BosomeFreho	1	1	1	1	4	1
Bosomtwe	1	0	1	1	3	0
EjuraSekyedumase	1	0	1	1	3	2
Kwabre East	1	0	1	1	3	1
Offinso North	1	1	1	1	4	1
SekyereAframPlains	1	0	1	1	3	1
Sekyere Central	1	0	1	1	3	0
Sekyere East	1	0	1	1	3	0
Sekyere South	1	0	1	1	3	0
Kumawu	1	0	1	1	3	1
Total	**34**	**11**	**37**	**31**	**113**	**15**

Source: Ashanti Regional association of consultant's 2013/2014 annual report.

3.3 Sampling Size and Sampling Technique

Purposive sampling Technique was adopted to select the respondents that represent the broad spectrum of the stakeholders to provide information that could provide insights into the different perspectives of the research problem and to provide answers to the research questions posed in chapter one. The sample size comprised all 113 of the population of consultants and two employees each of the 15 contractors involved in the Ghana Health Service projects. The two employees selected were those having in-depth knowledge on delays relating the projects being executed namely; quantity surveyors and site managers. The total sample size was therefore (113+30) 143.

3.4 Data Collection Instruments and Procedures

The research methodology for present study has adopted questionnaire survey to identify significant factors influencing time overruns in building projects of GHS supervised by MMDAs in the Ashanti region of Ghana. To identify time overruns and cost overruns factors, literature reviews, books, conference proceedings and discussion with practitioners of all parties involved in construction industry were carried out.

The questionnaire is divided into four main parts. Part I is related to general information for both the company and respondent. Both contractors and consultants were further requested to answer questions pertaining to their experience in the construction industry. Part II includes the list of the identified causes of delay in construction project. These causes are classified into four (4) groups according to the sources of delay: factors related to owner, contractor, consultant, and external factors. Part III also required the respondents to choose from possible suggestions, the effects of delays of building construction to the various parties. Finally, part IV sought to

generate from the respondents possible ways of minimizing project delays. For each factor the respondents were requested to rate using five point scale of 1 to 5. It is categorized as follows 5=very high; 4=high; 3=medium; 2=low; and 1=very low.

According to Bryman (2004), the Likert scale normally has five categories to show strengths of agreement or disagreement (Bryman, 2004). The likert scale is a multiple item scale that would enable the study to capture a broad concept and help to illustrate finer distinction items. Prior to formulating questionnaire, a field study was carried out to get feedback from experts in construction industry on the factors identified from literature reviews. One hundred (100) questionnaires were distributed to staff of MMDAs and GHS, consultants and contractors in the selected MMDAs. The respondents involved in the survey had several years of experience in handling various types of projects.

3.5 Data Validity and Reliability

The study did not take into accounts the names and identities of respondents. This motivated the respondents to give honest, valid and reliable answers to questions that were asked and thus made the data collection valid and reliable. Comparisons of various conclusions made by various studies were carefully examined. Questionnaires designed for collecting data was critically designed in line with the literature review. In order to enhance the degree of validity, various sources of evidence were necessary. To minimize the possibility of the respondents not understanding the terminology and layout of the questions, the questionnaire was piloted on two contractor respondents and two consultant respondents. Based on their feedback some alterations were carried out.

In conducting the research, the researcher observed the highest level of ethical consideration. All information's were collected from the respondents out of their own freewill. The confidentiality of the information received and the anonymity of the respondents were protected. The information obtained from the respondents was used only for this research.

3.6 Data Analysis Methods

Data analysis consists of grouping, tabulating, testing, or recombining both qualitative and quantitative evidence collected to address the questions of the study. Tables, frequencies, mean, relative important index (RII) and percentages were the main tools used to analyse the data collected from the respondents with the help of Microsoft Excel and Statistical Package for Social Sciences (SPSS).

The data analysis was carried out in two folds using SPSS (version 21). SPSS was used to generate the frequency (*f*) of the response category index for the cause and effect factors. The relative importance index (RII) for each factor was calculated using the frequency data for each response categories generated from SPSS. The RII is the calculation of the mean frequency of each responses category index for the probability and impact.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND DISCUSSION OF RESULTS

4.1 Introduction

This chapter presents the results and discussions of the data collected from respondents. The results were obtained from the questionnaires distributed to contractors, consultants and clients. Tables and figures were used to present the results after the data have been analyzed using Statistical Package for Social Science (SPSS version 21).

4.2 Response Rate

An aggregate of one hundred and ten (110) questionnaires were administered to the survey respondents. One hundred and four (four) were completed and returned. Four (4) of the reverted questionnaires were not accurately completed and were therefore not included in the analysis of the results. The remaining one hundred (100) questionnaires representing a response rate of 70% form the basis of the analysis and discussion of results. The response rate is considerably high and reasons that contributed to this included; persistent reminders by the researcher through phone calls, discussions held with Hospital administrators and Metropolitan Mayor and Presiding member on aim the research and its potential benefits to the MMDAs.

4.3 Demographic characteristics of respondents

In assessing the causes and effects of delays of Ghana Health service construction projects supervised by the Metropolitan, Municipal and District Assemblies (MMDAs), the demographic features of the respondents were studied as shown in Table 4.1

Table4. 1 Demographic of features of respondents

Variable	Frequency	Percentage (%)	Mean
Gender			
Male	78	78.0	1.32
Female	22	22.0	
Age			
20 – 30 years	15	15.0	2.25
31 – 40 years	55	55.0	
41 – 50 years	20	20.0	
	10	10.0	
Experts			
Quantity surveyor	30	30.0	2.15
Contractor	15	15.0	
Architect	13	13.0	
Structural engineer	20	20.0	
Estate officer	17	17.0	
District accountants	5	5.0	
Educational level			
Diploma	40	40.0	1.90
First degree	35	35.0	
Masters	20	20.0	
PhD	5	5.0	
Years worked			
Less than 5 years	19	19.0	2.63
5 – 10 years	35	35.0	
11 – 15 years	20	20.0	
16 – 20 years	16	16.0	
21 – years and above	10	10.0	

N= 100

Presented in Table 4.1 is the demographic features of the respondents selected this study. The results show that, majority (78%) of the respondents were males whiles 22% were females. This was because the construction industry is dominated by males.

Additionally, the results from Table 4.1 has exposed that, for the age distribution of respondents, more than half (70%) were aged 40 years or younger. However, about one – fifth (20%) were respondents between the ages of 41 and 50. Respondents who have attained more than 50 years amounted to 10%. Moreover, the results show that of the hundred participants who opted for the study, 30% were quantity surveyors whiles 15% were contractors. Structural engineers and architects amounted to 20% and 13% respectively.

However, estate officers constitute 7% whiles district accountants represented 5%. These experts were selected for the study because they were the major face of the construction industry and for that matter can provide the necessary information needed for this study. The estate officers and the accountants were representatives from the Metropolitan, Municipal and District Assemblies (MMDAs) who were the sole financier of projects under studied.

With respect to the education level of respondents, exactly three – fourth (75%) reported that they either holds a Diploma or were First degree holders. The remaining 25% were either master's holders or PhD holders. This implies that, the respondents were highly educated and will therefore provide information that is relevant to this study.

An inspection into their work experience proved that, more than half (54%) have worked for 10 years or below whiles 20% reported to have worked for between 11 and 15 years. The remaining 26% were respondents with 16 years or more working experience. This denotes that respondents were experienced and could give the vital information pertaining to this study.

4.4 Causes of Delays of Building construction Projects

The primary data collected from the second part of the questionnaire was analyzed from the perspective of clients, consultants and contractors and external. The result presented in (Table 4.2)

Table 4.2 Client related causes of delays of building projects.

	Percentage respondents scoring (%)							
Client related causes of delays	5	4	3	2	1	Mean	SD	Rank
Delays in approving design documents	87.0	13.0	0.0	0.0	0.0	4.20	.338	1st
Ineffective communication among parties	80.0	20.0	0.0	0.0	0.0	4.05	.402	2nd
Mistake and discrepancies in contract	49.0	21.0	0.0	27.0	3.0	3.90	.409	3rd
Delay in payments	35.0	25.0	10.0	25.0	5.0	3.55	.416	4th
Lack of fund	40.0	10.0	15.0	15.0	20.0	3.12	.833	5th
Change specifications and materials	20.0	30.0	12.0	22.0	16.0	3.00	1.202	6th
Slow in decision	34.0	10.0	0.0	26.0	30.0	2.84	1.249	7th
Change orders	41.0	39.0	4.0	6.0	10.0	2.70	1.323	8th
Inappropriate organization structure.	26.0	15.0	13.0	17.0	29.0	2.40	1.266	9th
Labour strikes	48.0	0.0	10.0	30.0	12.0	2.00	1.291	10th

N=100 scale 5= strongly agree, 4 = agree, 3= uncertain, 2 = disagree, 1= strongly disagree

Presented in Table 4.2 is the causes of delays of building construction projects from the perspective of the clients. The respondents reported positively to about four understudied causes of delay of building construction projects as indeed causes of the delay. However, clients were neutral to four of the understudied causes and totally disagree to two of understudied causes of delay of construction projects. This was evident from the mean scores.

However, the respondents attested that some of the causes were more important than others. For instance, from the perspective of the clients, delays in approving design documents (M=4.20), ineffective communication among parties involved (4.05) as well as mistakes and discrepancies in contract (M = 3.90) were the most concerned cause of construction project delays. There was ineffective communication due to the bureaucracies in approving the document by the perspective officers. Moreover, some designs might have some loop holes and therefore time was needed to address them before approval hence the delay. This confirms Olawale and Sun (2010) notion that, contract specification and interpretation disagreement as well as financing and payment were major contributors of delay of construction projects.

Again, most at times there were ineffective communication among the parties which were involved in putting up the project. This could be the contractor, the consultant and the administrators or clients of the said project. These parties find it difficult to pass out the right information among themselves. As one party thinks of an idea, as a perfect one, the other thinks otherwise which contributes to the delays of the project. This was because until these parties agree on an issue nothing meaningful could be done.

Moreover, there might be mistakes or lack of agreement in most construction contracts. Most contracts fails to outline the exact specifications of the project and therefore as the contractor might have a different understanding about the modules in the contract, the client or the consultant will also have a different view. This discrepancies delays the start of the project and subsequently the completion of the project.

Reasonably, majority of the respondents (60%) either strongly agree or agree that delays in payment was also a major cause of the delays of the construction projects. They explain that, contractors use their monies for pre - financing parts of the entire project before they were paid. However, parts of the projects delays as a result of delays in payment of the completed part of the project. These contractors wait until they were paid. This eventually delays the project. Clients attested that sometimes they delay in paying contractors for monies used at the pre – financing stage which was a cause of their project delays.

Again, about half (50%) reported that lack of funds (M = 4.5) was also another cause of delays in construction projects. Some clients would devote insufficient amount of money towards a large project. As a result the project is delayed when the funds were used up and the project is not completed. Moreover, change in specifications and materials is also a cause of construction project delays. Even though the specification would be spelt out in the contract, the clients sometimes ask for change in the materials to be used or the specification stipulated in the contract. This results in the delays of the project as new materials have to be purchased and new drawings or designs would have to be made. This confirms Fobi (2014) notion that changes in specification of drawings as well as insufficient contract sum were a major cause of delays of building projects.

Additionally the research assessed the external factors that causes the delays of projects. In assessing the external factors, twelve factors were understudied and the result presented in (Table 4.3)

Table 4.3 External related causes of delays of building projects.

External related causes of delays	Percentage respondents scoring					Mean	SD	Rank
	5	4	3	2	1			
Shortage of materials	47.0	15.0	20.0	15.0	3.0	4.70	.204	1st
Environmental and social factors.	70.0	0.0	0.0	20.0	10.0	4.65	.354	2nd
Accidents	43.0	34.0	4.0	5.0	14.0	4.57	1.038	3rd
Unexpected surface condition	71.0	12.0	0.0	12.0	5.0	4.40	1.057	4th
Bad weather conditions	74.0	5.0	6.0	9.0	6.0	4.32	1.246	5th
Natural disaster	55.0	14.0	14.0	7.0	10.0	3.97	.088	6th
Escalation of material prices	36.0	20.0	22.0	12.0	10.0	3.94	.078	7th
Delays in utilities services provision	31.0	24.0	11.0	21.0	13.0	3.79	.066	8th
Fluctuation in prices of materials	52.0	9.0	15.0	11.0	13.0	3.75	.402	9th
Conflicts and public enemy	47.0	16.0	13.0	9.0	15.0	3.71	1.254	10th
Legal disputes	39.0	27.0	7.0	11.0	16.0	3.62	.123	11th
Unreliable suppliers	44.0	16.0	12.0	13.0	15.0	3.55	1.517	12th

N=100 scale 5= strongly agree, 4 = agree, 3= uncertain, 2 = disagree, 1= strongly disagree

Table 4.3 presents the external related causes of delay of building projects supervised by Metropolitan, Municipal and District Assemblies (MMDAs). The outcome show that, the respondents reported to be strongly agree to all the understudied factors. This was evident from the fact that, the respondents perceived the factors above 3.

In-spite of the level of agreement of the factors, some factors were considered most important than others. For instance, most of the respondents (62%) were most concerned about shortage of materials (M=4.70) as a major cause of delay. Contractors due to lack of adequate planning purchase limited materials which get used up somewhere along the line. The project will therefore be halted until materials were supplied. Accidents at site (M= 4.65) was also reported among the external factors that leads to building project delays. When accidents such as cuts and fall from scaffolds

which could even result to death happens, the project in question was halted until the mess was dealt with. The time used for dealing the mess consequently delays the project delivery.

Bad weather condition (M=4.32) was also an external cause of project delays. For instance during heavy rainy season projects cannot continue with ease. Also in the sunny weather, workers find it difficult to work and therefore work is slow down. Furthermore, majority of the respondents (56%) reported that Escalation of material price (M = 3.97) as a major cause of Metropolitan, Municipal and District Assemblies (MMDAs) supervised projects. However, more than half (55%) reported delays in utilities services provision as a cause of delays of projects. Unreliable suppliers (M=3.35) as well as legal disputes (M=3.62) were also reported as external causes of delay in building projects. The absence of delay in provision of utilities such as water and electricity at the construction site delays project. Suppliers on the other hand contributes to a project delay when they don't supply the right materials at the right time.

Finally, when there was a legal dispute on the land or even the project, it automatically delays the project because until the legal dispute was settled, the project cannot continue. This therefore confirms Owolabi et al. (2014) findings that externals factors such as legal disputes, unreliable suppliers and utilities, which were major causes of project delays cannot be over emphasized.

Comparatively, the researcher assessed the consultant related causes of delays of construction projects (Table 4.4).

Table 4.4 Consultant related causes of delays of building projects.

Consultant related causes of delays	Percentage of respondents scoring					Mean	SD	Rank
	5	4	3	2	1			
Complexity of the project	76.0	0.0	6.0	12.0	6.0	4.40	.833	1st
Inadequate definition of substantial completion	42.0	21.0	13.0	18.0	6.0	4.10	.745	2nd
Unclear details in drawings	46.0	10.0	15.0	16.0	13.0	4.00	.665	3rd
Misunderstanding of owners requirement	35.0	17.0	20.0	18.0	10.0	3.75	.305	4th
Delays in performing inspection and testing	38.0	20.0	15.0	12.0	15.0	3.55	1.114	5th
Delays in interim payment certificates	55.0	20.0	10.0	10.0	5.0	3.50	1.090	6th
Insufficient estimation of original contract duration	57.0	10.0	20.0	8.0	5.0	3.30	1.002	7th
Delays in major changes	40.0	10.0	15.0	25.0	10.0	3.00	.716	8th
Poor communication	64.0	25.0	2.0	3.0	6.0	2.75	.507	9th
Design errors made by designers	50.0	20.0	0.0	20.0	10.0	2.45	1.209	10th

N=100 scale 5= strongly agree, 4 = agree, 3= uncertain, 2 = disagree, 1= strongly disagree

Table 4.4 presents causes of delays of building project in the perspective of the consultant. The information in Table 4.3 reveals that, complexity of the project (M = 4.40) was the topmost cause of project delays. Most project were very complex and therefore, consultant would have to have sufficient time to approve the necessary documents for the commencement of the project which was an eventual cause for the project delay.

Again, inadequate definition of substantial completion of the project (M = 4.10) was also yet another cause of project delays. Even though the completion of the project should be stipulated in the contract, it was sometimes inadequately defined. As a result, the exact completion date or day is unknown which delays the project because the project was not time bound.

Moreover, another cause of project delay reported was unclear detail in drawing (M = 4.00). Most at times the drawing for the project were unclear to either the consultant or the contractor. A lot of time is spent on explanation and communication to clear all doubts for commencement and completion of the project.

Furthermore, misunderstanding of clients requirement (M= 3.75) and delays in performing inspection and testing (M = 3.55) were also reported among the cause of delays of building projects. Consultants usually misunderstood the requirements of the client. As the client may be requesting a desired requirement, the consultant or the contractor would also be thinking otherwise. For instance the consultants and the contractor for the sake of a good work might prefer some specific specifications; however the client may insist on his/her requirements. As a result, a lot of issues or dialogue would be deliberated before a consensus is met. All these deliberations delays the project. Consultants were neutral to delays in major changes (M = 3.00), and Poor communication (M= 2.75) as causes of delay of construction projects. This was because they themselves were involve in the designs and therefore could not attested to the fact that it is a cause of project delays. Design errors made by designers (M = 2.45) was however disagreed by consultants as among the major causes of delay of construction projects. Sometimes there were the need to effect some major changes in specification or even the designs. When these changes are delayed, it automatically delays the project completion. Again when there is poor communication between the parties involved such as the client, contractor the consultant and even the worker it results in delay of the project because the exact requirement would not be understood. This findings therefore confirms Sepasgozaret et al. (2015) who conceives that poor communication between stakeholders constitutes delay in construction projects.

Finally, when the designer make errors in the design, it brings the project progress to a halt. The error would have to be rectified and the necessary changes effected before the project could continue if it has started already. Halting the project result in delaying the project. This finding however opposes Kaliba et al. (2009) who were of the view design errors could not be a factor of construction projects because all errors were rectified by the experts in charge before commencement of a project.Reasonably, the contractor related causes of delays of Ghana health Service projects supervised by Metropolitan Municipal and District Assemblies (MMDAs) were assessed as presented in Table 4.5

Table 4.5Contractor related causes of delays of building projects.

	Percentage respondents scoring							
contractor related causes of delays	5	4	3	2	1	Mean	SD	Rank
Inappropriate construction methods	38.0	20.0	30.0	10.0	2.0	4.00	.498	1st
Equipment unavailability and failure	46.0	5.0	25.0	13.0	11.0	3.85	.646	2nd
Inadequate contractor experience	59.0	10.0	14.0	16.0	1.0	3.70	.882	3rd
Unreliable subcontractors	52.0	20.0	8.0	0.0	20.0	3.65	.747	4th
Frequent equipment breakdowns	33.0	17.0	5.0	16.0	29.0	3.50	.911	5th
Incompetent project team	81.0	8.0	2.0	4.0	5.0	3.40	.957	6th
Poor procurement of construction materials	33.0	22.0	22.0	12.0	11.0	3.00	.892	7th
Poor quality of construction materials	50.0	18.0	4.0	22.0	6.0	2.95	.968	8th
Rework due to errors	37.0	15.0	22.0	10.0	160.0	2.60	1.067	9th
Financial indiscipline/dishonesty	36.0	10.0	20.0	23.0	11.0	2.55	1.085	10th
Poor site management and supervision	28.0	22.0	25.0	15.0	10.0	2.15	1.132	11th

N=100 scale 5= strongly agree, 4 = agree, 3= uncertain, 2 = disagree, 1= strongly disagree

Presented in Table 4.5 is the causes of delays of building projects from the perspective of the contractor. The contractors were very keen to about five causes of delay building projects supervised by Metropolitan, Municipal and District Assemblies (MMDAs). Among the most concerned causes include the use of inappropriate construction methods (M=4.00). Most of the construction firms used their old methods of doing things without learning the new technological ways in construction. As a result their projects were delayed in completion.

Moreover, they reported of equipment unavailability (M= 4.87) as among the major cause of the delay. Most construction firms especially the local construction firms, lack most of the necessary equipment needed for building construction. They most at time hire from other firms. This is a cause of delay because if at the time a contractor needs an equipment and that equipment has already been booked by other person, it means the work would have to wait till such an equipment is ready. Again, they reported of unreliable subcontractor (M = 4.63). Many subcontractors to major contracts were themselves causes of the project delays. This was because they bid and win many projects at a time. However with their limited equipment and lack of adequate technical knowhow, they tend to delay their portion or part of the project which eventually delays the major project.

Furthermore, among the contractor related causes of delays of building construction was frequent equipment breakdown (M=4.6) as well as poor procurement of construction materials (M = 4.56). The construction firms has limited equipment and the available once are old and faulty. As a result there were frequent breakdown of these equipment such as tipper trucks, bull-dozers, excavators are which turn to delay the project because the project would have to be halted for servicing and maintenance of these breakdown equipment. This findings refutes Frimpong et al. (2003) that

construction equipment were serviced and properly maintained before commencing a project hence, it has little influence in delaying a project.

Again, the procurement department of some construction firms sometimes procure poor construction materials with reason such as cheap materials to save money. This could bring about chaos between the client and the contractor if the client do not approve of the materials and it is tantamount to delay of the project. Finally even though poor site management was considered least among the contractor related factors, more than 4 out 5 (84%) reported to be of much concern about it. Most of the construction sites were poorly managed and little or inadequate supervision is been carried out there, some space to store materials were sometimes a problem. Again access roads to the construction site or within the site for free movement of goods and services all hinder the progress of the project hence the project delays confirming Al – Momani, H (2000) notion that bad road networks to construction site constitutes project dela

4.4 Effects of delays of construction building projects

The cause of delays of building projects has effects on the construction industry. The researcher assessed the effects or delay of Ghana Health Services building projects. The sequel is presented in Table 4.6.

Table 4.6 Effects of delay of Ghana Health Service building projects

Effects	Percentage of respondents scoring			Mean	Rank
	Strongly disagree and disagree (%)	Uncertain (%)	Strongly agree and agree (%)		
Time overrun	25.0	0.0	75.0	4.15	1st
Wastage of resources	4.0	2.0	94.0	4.00	2nd
Litigation	4.0	2.0	94.0	3.85	3rd
Contractor insolvency	11.0	7.0	82.0	3.80	4th
Dispute between parties involved	7.0	4.0	89.0	3.55	5th
Substandard work	18.0	3.0	79.0	3.00	6th
Reduced profit	12.0	0.0	88.0	2.90	7th
Increase in final cost of project	11.0	2.0	87.0	2.85	8th
Arbitration	11.0	4.0	85.0	2.70	9th
Under- utilization of man - power	10.0	5.0	85.0	2.62	10th
Abandonment of building project	10.0	3.0	87.0	2.60	11th
Loss of confidence in contractor	13.0	2.0	85.0	2.50	12th
Changes in project specification	6.0	4.0	90.0	2.40	13th
Tying down of client capital	17.0	4.0	79.0	2.15	14th
Additional bank charges	25.0	17.0	58.0	2.00	15th

N=100 scale 5= strongly agree, 4 = agree, 3= uncertain, 2 = disagree, 1= strongly disagree

Presented in Table 4.6 is the effects of delay of building project. Table 4.6 revealed numerous effects of delayed projects. These effects were assessed on the perspective of contractor, clients and consultants. Among the numerous effects of delayed building projects were Time overrun (M=4.15). The respondents reported that when projects are delayed, they become affected by time. This means that the scheduled time of completion of the said project will delay.

Furthermore, increase in cost of the project (M=4.00) was among the major effects of delayed building projects. This was because when project were delayed the progress of the project to slowed down. However, the cost of the project increases because new materials and even extra materials would be needed to continue the delayed project. This confirms Toor and Ogunlana (2008) building project delays. They

were of the view that when projects were delayed, the materials and other resources became wasted when the project was left at the mercy of the sun and rainfall. As a result the materials become worn out and rusty in case of metals.

Therefore new materials and equipment will be needed to complete the project making the ones used earlier a waste. Again, project delays results to substandard of work. This was so because, additional finances would be needed to continue the delayed project, however, if the same amount of money is to be used without any additional cost, then the project would have to be completed with the little money at hand which could result to substandard wok.

Furthermore, there was loss of confidence in contractor when a project is delayed. More than 2 out of 3 (88%) attested that whenever a building project was delayed, the contractor of the construction firm involved was blamed and for that matter winning subsequent bids becomes difficult. Clients might think of that firm as incompetent and therefore lose confidence in them.

Again, delays in construction projects results in the change of the project specification (M=2.40). Respondents reported that project delays is affected by changes in the specification. This was because the delays results in waste of materials and other necessary resources which requires extra finances, materials and equipment to continue the project. However, if these new and extra incursion cannot be met, then, the original project specification are changed to meet the limited resources. This affects the original project as well as the cost and time of delivery.

4.5 Strategies to minimize delays of building project.

The earlier discussion has revealed that delays of building projects has numerous effects on the construction industry. The researcher therefore assessed important strategies to be instigated to minimize the delays of building projects (Table 4.7).

Table 4.7 Strategies to minimize delays of building projects

Strategies to minimize construction delays	Mean	SD	Rank
Consultants perspective			
There should be timely, accurate and adequate communication between all stakeholders	4.40	.284	1st
Consultants should ensure that all design changes during the execution of the works are handled explicitly.	4.24	.327	2nd
Adequate due diligence must be made prior to recommending a contractor for award of project	4.00	.709	3rd
The consultants should ensure that adequate site investigations are carried out both during feasibility study and conceptual design	3.80	.701	4th
All working drawings must be clearly drawn indicating all the dimensions and labels to scale	3.55	.905	5th
The consultant should have competent representative on the site to make quick decisions that are binding	3.40	.817	6th
Any design errors made by consultants must be immediately rectified	3.15	1.049	7th
Contractor perspective			
There must be proper planning and scheduling of the works	4.25	.327	1st
Avoid diverting particular project funds to non-project activities	4.00	.512	2nd
Particular attention must be paid to the requirements of a project during the pre-contract and bidding period	3.85	1.075	3rd
Enough cash must be made available	3.05	1.348	4th

Client perspective			
All change order demands must be evaluated to assess their impact on quality of work envisaged	3.90	.642	1st
Clients should ensure that proper planning and costing of the works are made during the pre-contract period	3.80	1.051	2nd
Design changes during the construction period should have no adverse effects on the critical activities	3.05	1.152	3rd
Interim payment certificates must be paid in time within the stipulated time-frame s	3.00	1.210	4th
There should be effective communication between the client and other parties	4.18	1.336	5th

Table 4.7 presents the strategies to minimize delays of building projects. The strategies where assessed from the perspective of the consultants, contractors and clients.

From the consultant it was revealed that, the delays of building projects would be minimized when there was timely, accurate and adequate communication between all stakeholders involved in the building project (M= 4.40). This will help in completion and delivery of the project as stipulated in the contract. Furthermore, design changes results in project delays. Therefore if consultants ensure that all design changes are handled explicitly, then the delays of building projects would be minimized. This confirms Dayang (2009) findings that handling design changes appropriately will result to early completion of building projects.

Moreover, having competent consultant representation on site (M=4.24) as well as immediately rectifying any design errors made by consultants (M=4.00) were also reported to be ingredients to minimize delays of building projects. This was because when there is a representative of the consultant at the site, quick decisions that are binding can be taken in no time to avoid any errors. Again the representative's presence would help contractors to rectify any design errors made to help the progress of the project.

Comparatively from the contractors perspective, it was revealed that, proper planning and scheduling of the work (M=4.25) was a strategy to minimize delays of building projects. When a project is planned and scheduled very well, time overrun, substandard work as well as shortage of materials would be dealt with hence the progress of the project will be in line with completion time as spelt out in the contract. Moreover, Avoidance of diverting project funds to non-project activities (M=4.00) and paying attention to project requirements at the pre-contract and binding period (M=3.85) were also strategies to minimize construction project delays. Diverting a particular project funds to a different project will result to lack of adequate funds to finance the project. Therefore if contractors stick to using the right amount of money towards a particular projects, materials and other resources would be supplied adequately. Again paying attention at the pre-contract binding period will help to avoid design errors and also order or purchase the right and adequate materials for the project.

This however, disputes Dayang (2009) assertion that diverting project finances to other projects could be strategies to minimize building projects however, it has no impact in delaying a building project because provision might be made for the other project.

Similarly, from clients, they reported that to minimize the delays of building projects, all change order demands must be evaluated (M=3.90). They further explained that, proper evaluation of the change orders will help assess the impact of quality of work done.

Again, the clients reported that, interim payment certificates must be paid in time (M=3.80) when this is done the effects of overrun, cost overrun among others will be minimized which intern will enhance the progress of the project. This buttress the views of Anaman (2007) who postulate cost overrun, and delays in payment of interim

certificates as major causes of delays of building project and posits timely payment of the interim certificate as an ideal measure to minimize the building project delays.

Finally, the client attested that to minimize the delays of building projects, there should be effective communication between client and other parties. This effective communication will help solve all errors and bring proper understanding as to how the project should be.

In conclusion, the response rate for the study was high. Most of the respondents contributed fairly with respect to the various items on the questionnaire. The respondents positively attested to the various factors that causes delays of Ghana Health Service's building projects supervised by Metropolitan, Municipal and District Assemblies (MMDAs). Furthermore, issues about the various effects as a result of the delays were also analysed and discuss thoroughly. Moreover, the study also discussed some strategies which could minimize delays of building projects supervised by Metropolitan, Municipal and District Assemblies (MMDAs) under the perspective of Consultants, Contractors and Clients. This chapter therefore concludes that, the numerous delays of the Ghana Health Service's building projects supervised by Metropolitan, Municipal and District Assemblies (MMDAs) will be minimize if attention is paid to the strategies to minimize the delays of building projects.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION

5.1 Introduction

The rate at which building projects supervised by the Metropolitan, Municipal and District Assemblies (MMDAs) delayed is very alarming. This chapter presents the summary of the major findings, conclusion and recommendation.

5.2 Summary of the Findings

The earlier discussion has revealed numerous causes and effects of delay of Ghana health service building projects supervised by Metropolitan, Municipal and District Assemblies (MMDAs). The major findings from the study include:

- Delays of the building projects supervised by Metropolitan, Municipal and District Assemblies (MMDAs) was as a result of numerous political assurances. Most politicians assured many projects during their campaign trail. As a result, they start many projects at the same time without completing it just to fulfil a campaign assurance and to win votes subsequently.
- Furthermore, as a responsibility of the Metropolitan, Municipal and District Assemblies (MMDAs) to put up developmental projects, they tend to start projects with limited funds at hand just to fulfil their obligation. The said projects are delayed because there were no funds to be approved for continuation of the project.
- Again, building projects were delayed as a result of change in project specifications and materials. Most at times the materials procure for the projects were not standard. As a result new materials were needed for the project.

This also affects the project specification. Changing the specifications and purchasing new materials tantamount to delay in project delivery.

- Moreover, the study revealed that since the project is to be used by a sector different from the supervised sector, there were bureaucracies in decision making. Until all the levels in decision taken were met no meaningful decision could be taken. This therefore delays the project.
- The study again exposed that delays in payment also contributed to delays in project completion. Contractors use their monies to start the project to a point where they were supposed to be paid for continuation of the project. However, payment certificates were delayed. This delays the said project because contractors would wait till their monies were paid before they could work on the project again.
- More so, the study has shown that shortage of project materials really delays the delivery of the project. This was because much of the progress of a project depends on the availability of the materials. Therefore if human resource for the project was adequate and there were no materials the project was halted which affects the completion and delivery of the project.
- Additionally, accidents and natural disasters such as storm, rainfall, bad weather condition and climate change were also found to be major cause of building project delays
- Finally, time overrun, cost overrun, reduced profit, substandard work as well as waste of resources were the most important effects the study found.

5.3 Conclusion

Based on the swift of the foremost findings, the succeeding conclusion remarks were underscored. The findings have showed that Ghana Health Service (G.H.S) projects supervised by Metropolitan, Municipal and District Assemblies (MMDAs) were delayed. The study also brought to light that most G.H.S building projects were not completed in the duration of the project time.

There were a lot of delays in completion of the projects. Personnel in the Metropolitan, Municipal and District Assemblies showed unconcerned attitude towards public assets They did not see the need to exert vigilance and diligence in supervising such public properties The appalling attitude of the Metropolitan, Municipal and District Assemblies (MMDAs) towards Ghana Health Service building projects was as a result of interferences from some politicians, unreliable suppliers, opacity in project bidding and bad procurement processes, inappropriate construction methods, equipment unavailability and failure, inadequate contractor experience as well as unreliable subcontractors. Moreover, complexity of the project, unclear details in drawing, shortage of construction materials as well as bad weather condition were the causes of the delays of projects supervised by Metropolitan, Municipal and District Assemblies (MMDAs)

5.4 Recommendation

Based on the supposition, the following recommendations were made,

- Contractors should not be selected based on the lowest bid. The selected contractor must have appropriate experience, technical and financial competency with ample manpower to accomplish the project.

- Sub-contractors must be selected based on their past experience to ensure that they can execute the project as stipulated in the contract.
- Contractors should not take projects in which they do not have ample capability.
- Contractors should have competent – spot supervisors to ensure persuasive execution of the project in time.
- Clients should not impede recurrently during the accomplishment to keep making major changes to the requirements.
- Clients should have enough funds in time to pay the contractors after completion.
- Consultants should inspect the work closely by making checkups at appropriate times.
- Consultants should prepare and approve drawings on time.
- Contractors should have a sound financial background which should be supported by documents as a proof.
- Drawings and specifications in the contract documents should be strictly adhere to before and during the project execution.

5.5 Suggestion for further studies

It is the hope of the researcher that this research will be conducted on other Government agencies with large sample size with an extended period of time to enable Metropolitan, Municipal and District Assemblies (MMDAs) to accrue the benefits of putting up effective measures to check project delays.

REFERENCES

Abisuga A.O, Amusu O.R.O. and Salvador K.A (2014). Construction Delay in Nigeria: A Perception of Indigenous and Multinational Construction Firms. Journal of Emerging Trends in Economics and Management Sciences (JETEMS) 5(3):371-378.

Abdul-Rahman H., Berawi, M.A, Berawi, A.R, Mohamed, O., Othman, M. and Yahya, I.A (2006). Delay mitigation in the Malaysian construction industry. *Journal of Construction Engineering and Management*, 132 (2) 125-133.

Afshari, H. Khosravi, S. Ghorbanali, A.. Borzabadi, M and Valipour M. (2011) Identification of Causes of Non-excusable Delays of Construction Projects". International Conference on E-business, Management and Economics

Ahadzie, D. K. & Amoah-Mensah, K. (2010) Management Practices in the Construction Ghanaian House Building Industry, Journal of Science and Technology pp. 62-75

Aibinu, A.A. (2009). Avoiding and mitigating delay and disruption claim conflict: Role of precontract negotiation, *Journal of Legal Affairs and Dispute Resolution in Engineering and Construction*, 1(1), 47-58

Ajayi, O.,Ogunsanmi, O.,Salako, O., Mafimidiwo, B. (2012). Impact of risk on performance of design and build projects in Lagos State, Nigeria. Proceeding of 4th WABER conference, 203-215, Abuja, Nigeria.

Akinsiku, O. E. and Akinsulire, A. (2012) Stakeholders' perception of the causes and effects of construction delays on project, KICEM Journal of Construction Engineering And Project Management; Http://Dx.Doi.Org/10.6106/JCEPM.2012.2.4.025.

Al-Momani, H. (2000). Construction delay quantitative analysis, International Journal of Project Management,, 51-59.

Amartey, A. C. (2014). Improving safety performance of Ghanaian building contractors. a thesis submitted to the Department of Building Technology in partial fulfilment of the requirements for the degree of Master of Science in Construction Management at the Kwame Nkrumah University of Science and technology.

Amoatey, C. T., Ameyaw, A. Y. Adaku, E. and Famiyeh, S. (2015). Analysing delay causes and effects in Ghanaian state housing construction projects", International Journal of Managing Projects in Business, Vol. 8 Iss 1 pp. 198 - 214

Anaman, K. A. & Osei-Amponsah C.,(2007), Analysis Of Causality Links Between The Growth Of The Construction Industry And Growth Of The Macro-Economy In Ghana,Construction Management & Economics, Vol 25, pp. 951-961.

Ansah, S. K. (2011). Causes and effects of delayed payments by clients on construction projects in Ghana. Journal of Construction Project Management and Innovation, vol. 1(1), pp 27 - 45

Archibald, R. D., Filippo, I. D. and and Filippo, D. D. (2012). The Six-Phase Comprehensive Project Life Cycle Model Including the Project Incubation/Feasibility Phase and the Post-Project Evaluation Phase. Systems Thinking: Managing Chaos and Complexity, Burlington, MA: Butterworth-Heinemann.

Arditi, D., Akan, G. T. and Gurdamar, S. (1985). „Reasons for delays in public projects in Assaf, S.A, and Al-Hejji, S. (2006). „Causes of delay in large construction projects", International Journal of project management vol.24-4, pp.25-33

Arikan, M. and G. Dikme n (2004) *"Construction Engineering and Management, Lecture Notes"*, Middle East Technical University, Department of Civil Engineering.

Assaf, S. A. and Al-Hejji, S. (2006). Cause of delay in large Construction projects, *International journal of project Management,* 24, 349-357.

Ayudhya, B. I. N. (2011). Evaluation of Common Delay Causes of Construction Projects in Singapore. Journal of Civil Engineering and Architecture, vol 5, pp. 1027-1034

Bennet, F. L. (2003). The Management of Construction: A Project Life Cycle Approach, Amsterdan: Butterworth Heineman.

Braimah, N. and Ndekugri, I. (2008). Factors influencing the selection of delay analysis methodologies. *International Journal of Project Management, 26*(8), 789-799

Bryman, A. (2004), Social Research Methods, Oxford University Press, Oxford.

Buertey, J. I. T, Mierzah, A. K. and Kumi, T. A. (2014). Delays to Large Construction Projects in Ghana: A Risk Overview. Journal of Civil Engineering and Architecture, vol 8, pp. 367-377

Danso, F. O. (2010). A Thesis Presented To The Department Of Building Technology Faculty Of Architecture And Building Technology College Of Architecture And Planning Kwame Nkrumah University Of Science And Technology In Partial Fulfilment Of The Requirements for the degree of Master Of Science In Construction Management Programme

Dayang Sabriah B. (2009). A comparative study of construction project delays in Johor and Sabah region, Faculty of Civil Engineering: Universiti Teknologi. Malaysia: Master Thesis.

Dayi, S. (2010) Schedule delay analysis in construction projects: "A case study using time impact analysis method" Middle East Technic\al University

Faridi, A.S. and El-Sayegh, S.M. (2006). Significant factors causing delay in the UAE Construction Industry. Construction Mangement and Economics 24,. Dubai,UAE.: pp: 167-176.

Fobi, D. Y. (2014). Key causes of delay in construction projects – views of Ghanaian D3K3 and A3B3 contractors. Dissertation presented to the Department of Building Technology in partial fulfilment of the requirements of the Master of Science Degree in Construction Management at the Kwame Nkrumah University of Science and Technology, Kumasi

Frimpong, Y. Oluwoye J. and Crawford, L. (2003). Causes of delay and cost overruns in construction of ground water projects in developing countries: Ghana as a case study. International Journal of Project Management, 21, 321-326.

Fugar, F. D.K and Agyakwah-Baah, A.B (2010). Delay in building construction projects in Ghana, Australasian Journal of Construction Economics and Building, 10 (½), 103-116.

Haseeb, M., Bibi, A and Rabbani, W. (2011). Problems of projects and effects of delays in the construction industry of Pakistan,. Australian Journal of Business and Management Research,, 41-50.

Henry, A. Apolot, R. and Tindiwinsi, D. (2013). An Investigation into the Causes of Delay and Cost Overrun in Uganda's Public Sector Construction Projects. Second International Conference on Advances in Engineering and Technology.

Iyer, K., & Jha, K. (2006). Critical factors affecting schedule performance: Evidence from Indian construction projects. *Journal of construction engineering and management, 132*(8), 871-881

Kaliba, C., Muya, M. and Mumba, K. (2009) Cost escalation and schedule delays in road construction projects in Zabia, International Journal of Project Management, 27, 522-

Kassab, M., Hipel, K., & Hegazy, T. (2006). Conflict resolution in construction disputes using the graph model. *Journal of construction engineering and management, 132*(10), 1043-1052.

Koushki, P. Al-Rashid, K. and Kartam, N. (2005). Delayed and cost increase in the construction of private residential projects in Kuwait, *Journal of Construction management and Economics*, 23 (3), 285-294

Long, N.D., Ogunlana, S., Quang, T. and Lam, K.C. (2004) Large construction projects in developing countries: a case study from Vietnam, *International Journal of Project Management,* 22, 553-561

Lowsley, S. and Linnett, C. (2006). *About time-: delay analysis in construction*: RICS.

Luu, T.V., Kim, S., Tuan, N.V. and Ogunlana, S.O. (2009) 'Quantify schedule risk in construction projects using Bayesian belief networks', *International Journal of Project Management,* 27, 3950

Mahdavinejad, M. and Molaee, M. (2011). The result of delayed projects on publics' satisfaction in Tehran. Paper presented at *2nd International Conference on Construction and Project Management IPEDR*. Singapore, 16–18 September

Majid, I .A (2006). Causes and effects of delays in Aceh construction industry. Master of Science in Construction Management. University Teknologi Malaysia.

Megha, D. and Rajiv, B. (2013). A Methodology for Ranking of Causes of Delay for Residential Construction Projects in Indian Context. International Journal of Emerging Technology and Advanced Engineering, vol 3, pp 396-404

Mez her, T. and Tawil, W. (1998) „Causes of delays in the construction industry in Lebanon", Journal of project management. Vol. 28, issue 6, August 2010, pp. 569-579

Mohammed A.K. and Isah A.D. (2012) Causes of delay in Nigeria construction industry. *Interdisciplinary Journal of Contemporary research in business.* 4(2), 785-794.

Motaleb, O and Kishk, M (2010). An investigation into causes and effects of construction delays in UAE. In: Egbu, C. (Ed) Proceedings of 26th Annual ARCOM Conference, 6-8 September 2010, Leeds, UK, Association of Researchers in Construction Management, 1149-1157.

Mubarak, S. (2005). Construction Project Scheduling and Control, Pearson Prentice Hall, USA.

Muhwezi, L., Acai, J. and Otim, G. (2014). An Assessment of the Factors Causing Delays on Building Construction Projects in Uganda. International Journal of Construction Engineering and Management, vol 3(1): 13-23

Mydin, M. A. O., Sani, N. M., Salim, N. A. A. and Alias, N. M. (2014). Assessment of Influential Causes of Construction Project Delay in Malaysian Private Housing from Developer's Viewpoint. Web of Conferences, EDP Sciences.

Oberlender, G. D. (2000) *Project Management for Engineering and Construction*, McGraw-Hill, Singapore.

Odeh, A. M. and Battaineh, H. (2002). Causes of construction delay: Traditional contracts, *International Journal of Project Management*, 20 (1), 67-73.

Ofori, G. (2012), Developing the Construction Industry in Ghana: The Case for a Central Agency, National University of Singapore, Singapore, available at: www.ghanatrade.gov.gh/file/Developing%20the%20Construction%20I

Ogunlana, S. O., Lan, D. T. X. and Nguyen, L. D. (2004). A study on project success factors in large construction projects in Vietnam, Journal of Engineering, Construction and Management 11 (6) (2004) 404-413.

Olawale, Y. A., and Sun, M., 2010, Cost and time control of construction projects: inhibiting factors and mitigating measures in practice, Construction Management and Economics, 28(5), pp. 509– 526.

Owolabi, J. D., Amusan, L. M., Oloke, C. O., Olusanya O., Tunji-Olayeni P., Owolabi, D., Peter, J. and Omuh, I.(2014), Causes and effect of delay on project construction delivery time". International Journal of Education and Research, Vol. 2 No. 4, Covenant University Ota, Ogun State, Nigeria.

Pourrostam, T. and Ismail, A. (2011). Significant factors causing and effects of delay in Iranian construction projects. Australian Journal of Basic and Applied Sciences, 5 (7), 450-456

Ramanathan, C. Narayanan, S. P. and Idrus, A. B. (2012). Construction delays causing risks on time and cost: A critical review", Australasian Journal of Construction Economics and Building, Universiti Teknologi Petronas, Malaysia

Ren, Z, Atout, M and Jones, J (2008) Root causes of construction project delays in Dubai. *In*: Dainty, A (Ed) *Procs 24th Annual ARCOM Conference*, 1-3 September 2008, Cardiff, UK, Association of Researchers in Construction Management, 749-757.

Saunders, M., Lewis, P. and Thornhill, A. (2007). Research Methods for Business Students. *7th ed. England: Pearson Education Limited.*

Sepasgozar, S. M. E, Razkenari, A. M. and Barati, K. (2015). The Importance of New Technology for Delay Mitigation in Construction Projects. *American Journal of Civil Engineering and Architecture, vol. 3, pp 15-20*

Smith, N. J. (2002). *Engineering Project Management*, Blackwell Science Publishing, USA.

Sweis, G., Sweis, R., Abu Hammad, A.and Shboul, A. (2008). Delays in construction projects: the case of Jordan, International Journal of Project Management 26(6): 665-674. http://dx.doi.org/10.1016/j.ijproman.2007.09.009

Toor, S. and Ogunlana, S.O. (2008). Problems causing delays in major construction projects in Thailand. Construction Management and Economics, 26, 395–408.

Trauner, J.T., Manginelli, W.A., Lowe, J.S., Nagata, M.F. and Furniss, B.J. (2009). Construction Delays: understanding them clearly and Delay Analysis in Construction analyzing them correctly. London: Elsevier Inc

Yin, R. K. (2003). Case Study Research: Design and Methods. *Thousand Oaks: Sage Publications.*

APPENDIX A

QUESTIONNAIRE

UNIVERSITY OF EDUCATION, WINNEBA

COLLEGE OF TECHNOLOGY EDUCATION - KUMASI

QUESTIONNAIRE ON DELAYS OF GHANA HEALTH SERVICE BUILDING PROJECTS SUPERVISED BY MMDAS

This questionnaire is part of a study aimed at investigating the causes and effects of delays of Ghana Health Service building projects supervised by MMDAS. Please your time and energy used in responding to this questionnaire are highly appreciated.

Please you are assured that any information given shall be treated with confidentiality and anonymity.

You are please entreated to provide objective and dispassionate answers to the questionnaire items. The information provided will be treated confidentially. Please tick (√) the appropriate response to each item.

SECTION A: Background information of Respondents

1. Gender: Male [ ] Female [ ]

2. Age in years: 20-30 [ ] 31 – 40 [ ] 41 – 50 [ ] 51 and above [ ]

3. Profession of respondents:

Quantity Surveyor [ ] Architect [ ] Engineer [ ] Builder [ ] Other [ ]

4.Educational qualification of respondents:

Diploma/H.N.D [ ] First Degree[ ] Masters [ ] P.H.D [ ]

5. Years of working experience of the respondents: Less than 5 years [ ] 5-10 years [ ] 11-15 years [ ] 16-20 years [ ] 20yrs and above [ ]

6. Types of clients respondents have been dealing with:

Private individuals [ ] companies [ ] government and MMDAs [ ]

7. Types of projects respondents have been involved in:

Residential [ ] Office [ ] Industrial [ ] Civil [ ] Institutional [ ]

8. Highest causes of delay: Clients [ ] Consultants [ ] Contractors [ ]

SECTION B: Causes of delays of building Projects of Ghana Health Service (GHS)

Kindly indicated the level of agreement to the following causes of building projects of GHS by the various participants: Note: 5 = Strongly Agreed; 4 = Strongly Agreed; 3 = Undecided; 2 = Disagreed; 1 = Strongly Disagreed

Causes of Delay	**5**	**4**	**3**	**2**	**1**	**Rank**
Client related factors						
Lack of fund to finance the project to completion						
Corruption tendencies						
Change orders						
Delay in payments						
Labour strike						
Changes in material types and specifications during construction						
Slow decision making						
Delay in approving design documents						
Mistake and discrepancies in contract document.						
Ineffective communication among the parties involved						
Inappropriate overall organizational structure linking to the project						

External related factors						
Legal disputes						
Unexpected surface & subsurface conditions (such as soil, high water table)						
Escalation of local material prices						
Shortage of construction materials						
Accidents during construction						
Unreliable suppliers						
Conflict, war, and public enemy						
Delay in providing services from utilities (such as water, electricity)						
Fluctuation in prices of building materials						
Natural disasters (flood, hurricane, earthquake)						
Bad weather conditions						
Environmental and social factors						
Consultant related factors						
Changes in drawings						
Delay in assessing/evaluating major changes in the scope of work						
Design errors made by designers						
Delay in preparing interim payment certificates						
Inadequate site investigation						
Unclear and inadequate details in drawings						

Inadequate definition of substantial completion						
Complexity of the project						
Inadequate project management assistance						
Delay in performing inspection and testing						
Misunderstanding of owner's requirements						
Conflicts between consultants						
Poor communication and coordination with other parties						
Lack of experience of consultant in construction projects						
Insufficient estimation of original contract duration						
Contractor related factors						
Project management problem						
Equipment unavailability and failure						
Financial indiscipline/dishonesty						
Inappropriate construction methods						
Inadequate contractor experience						
Absenteeism						
Poor site management and supervision						
Contractor's insolvency						
Incompetent project team						
Mistake during construction stage						

Unqualified / inadequate experienced labour						
Poor site management and supervision						
Poor communication and coordination with other parties						
Rework due to errors						
Obsolete technology						
Ineffective project planning and scheduling						
Absenteeism						
Poor procurement of construction materials						
Frequent equipment breakdowns						
Unreliable subcontractors						
Poor quality of construction materials						
Shortage of labour						
Strike						
Personal conflicts among labour						

SECTION C: Effects of Delay of building projects of GHS

Please indicate the extent of your agreement to the following as the effects of delays of building projects. Note: 5 = Strongly Agreed; 4 = Strongly Agreed; 3 = Undecided; 2 = Disagreed;

1 = Strongly Disagreed

Effects of Delay	**5**	**4**	**3**	**2**	**1**	**Rank**
Time overrun						
Increase in final cost of project						
Tying down of client capital due to non-completion of the project						
Reduced profit						
Abandonment of building project						
Wastage of resources						
Arbitration						
Under-utilization of man-power						
Dispute between parties involved						
Litigation						
Additional charges (bank charges)						
Contractor insolvency						
Changes in project specification						
Substandard work						
Loss of confidence in contractor						

SECTION D: Strategies to minimize delays of building projects

The following are suggested strategies to minimise delays in building projects of GHS. Please indicate the level of your agreement with the suggested strategies. Note: 5 = Strongly Agreed; 4 = Strongly Agreed; 3 = Undecided; 2 = Disagreed; 1 = Strongly Disagreed

Strategies to Minimize delays of building projects	**5**	**4**	**3**	**2**	**1**	**Rank**
Consultant Measures						
Consultants should ensure that all design changes during the execution of the works are handled explicitly						
Any design errors made by consultants must be immediately rectified						
The consultants should ensure that adequate site investigations are carried out both during feasibility study and conceptual design						
The consultant should have competent representative on the site to make quick decisions that are binding						
All working drawings must be clearly drawn indicating all the dimensions and labels to scale						
There should be timely, accurate and adequate communication between all stakeholders						
Adequate due diligence must be made prior to recommending a contractor for award of project						

Contractor measures						
particular attention must be paid to the requirements of a project during the pre-contract and bidding period						
Enough cash must be made available						
Avoid diverting particular project funds to non-project activities						
There must be proper planning and scheduling of the works						
Client Measures						
design changes during the construction period should have no adverse effects on the critical activities						
interim payment certificates must be paid in time within the stipulated time-frame s						
All change order demands must be evaluated to assess their impact on quality of work envisaged						
There should be effective communication between the client and other parties						
Clients should ensure that proper planning and costing of the works are made during the pre-contract period						