KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

COLLEGE OF ARCHITECTURE AND PLANNING

DEPARTMENT OF BUILDING TECHNOLOGY

FACTORS THAT LEAD TO POOR PROJECT PERFORMANCE: A CASE STUDY OF THE ASUTIFI NORTH DISTRICT ASSEMBLY

BY

ALFRED JERRY ASMAH

(BSc Hons.)

THIS DISSERTATION IS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF A MASTER OF SCIENCE DEGREE IN CONSTRUCTION MANAGEMENT

NOVEMBER, 2014.

DECLARATION

I hereby declare that this thesis submission is my own work towards the MSc and that, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

Alfred Jerry Asmah (PG9123813) ……..……..……

Student Names Signature Date

Certified by

Mr Peter Amoah …….…… ……..……..

Supervisor Signature Date

Prof Joshua Ayarkwa ……..…… ……..……..

Head of Department Signature Date

ABSTRACT

Globally, the construction industry contributes significantly to socio-economic development of a country. However, the prevailing conditions in the Municipal and District Assemblies dissuade contractors in execution of construction projects with accessible resources. The aim of this study was to investigate the critical factors that lead to poor project performance on construction projects. The objectives were: to identify the factors that led to poor construction project performance in the Asutifi North District Assembly; and to identify strategies that will ensure a successful project performance. A survey were utilised to administer questionnaires to all roads and building and civil contractors in the Asutifi North District Assembly. Using the one sample t test, the results revealed that: inadequate funds for the project; suspension of work by owner or contractor; cash problem during construction; inadequate planning of projects before commencement; client delay in payment certificates; and inadequate planning, were the highly ranked factors identified as factors that led to poor project performance. Also using the principal factor analysis, the factors that led to poor project performance were then classified as planning related factor, client related factors, technical related factor, resource related factor, cost related factor and site related factor. Effective time management practices, effective quality management practices, effective cost management, effective cost management, effective project scheduling were also identified as the effective strategies to mitigate the identified poor project performance factors. Recommendation made for further research was to ascertain the role of human resource in project performance in the Ghana Construction Industry.

KEYWORDS: Construction Industry, Cost, Performance, Parameters, Time, Quality.

ACKNOWLEDGEMENT

Once again the Lord has proved faithful and I am so grateful that he has been my strong tower of hope throughout my entire life especially in my academic pursuits. Father, this project has been a successful reality as a result of your Grace. Thanks so much Lord and may your name be forever praised.

I am highly indebted to my supervisor, Mr. Peter Amoah for his professional, academic and yet friendly approaches in helping me execute this work.

To all members of my family, especially my lovely wife Mrs. Gifty Asmah, my little son Allan Jeffery Ebo Asmah and my daughter Jerean Ewurabena Asmah my elder brother Ernest Kwame Asmah, my lovely and supportive siblings, my sisters Elizabeth Baaba Asmah and Florence Akua Asmah, my in-law Mr. Joseph Allotey and Mrs. Constance Allotey and the entire family.

I am also indebted in no small measure to my friends and loved ones especially Paa Kwesi Amoah, Mercy Gyamfua, Gloria Appiah, Auntie Diana, Jacklyn Agyekum, Gilbert K. Amenano, Yaw Adom-Frempah, Evans Dankyira, Maame Adwoa Amoah, Dr. Michael Amoah and others too many to mention for their emotional, mental, prayer and financial support. Pals, your contribution to my success this day will surely never go unrewarded.

Above all, to the Almighty God who provided me all these people.

May The Good Lord Bless Us All!!! Amen.

DEDICATION

I humbly dedicate this work to my beloved parents, the late Father Mr. John Kojo Appiah Asmah and Mad. Anna Yanful

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF STUDY

A completed project is defined to be a success provided the technical performance and the set objectives are met. According to Frimpong *et al.* (2003) a successful project is when it has met the targets and objectives as specified in the project scope and plan. Generally, the most important objective of every construction is that the projects is finished on time and within budget as well as the client's problem is solved, desired outcomes and results listed in the projects agreement are achieved and also sustain high-quality and working relationship. A project's performance, according to King (2013) of the Long International Incorporated is achieved fully when it is:

- *Constructed to meet exactly its intended purpose only*
- *Constructed to meet the level of quality desired*
- *Completed when it is intended to be completed*
- *Completed for its intended purpose and completed safely with environmental protection in mind.*

The parameters above are world-acclaimed as measures for a sound project success and noteworthy to highlight the project duration and budgetary performance clearly indicated above (The Standish Group, 2013).The development plan of the government of Ghana over the past years as part of meeting MiDA (Millennium Development Agenda) targets is to improve infrastructure in the country; which in effect would serve as a boost to the development of the country socio-economically.

According to the Royal Institute of Chartered Surveyors (RICS) (2013), the construction industry though labelled as such is poised with problems related to lack of proper standards, lack of effective project management practises, which normally result into project non-performance in various angles. These besetting problems are associated with majority of building and civil works in the Construction Industry. The Bank of Ghana (2009) declared that, the Ghanaian Construction Industry represent 10.30% of Ghanaian's Gross Domestic Product (GDP), suggesting that the Construction Industry influences the economy of Ghana. It also reveals that due to the contribution of the Construction Industry into the economic well-being of Ghana, the Ghana Government invest in construction as a form of maintaining and controlling the economy. Al-Moumani (2000) explains that the most important problems encountered in seeking after successful project performance cuts across a number of factors, particularly hinging on budgets and delays; supported by Arditi and Pattanakitchamroon (2006) and Association of Project Managers (2006) as well.

Furthermore, completing a projects within the specified duration is assign of efficiency and good performance (King, 2013); but construction activities are subjected to many variables and changeable factors, which result from different areas. These areas include the performance of stakeholder's involvement, availability of resources, environmental issues, involvement of other stakeholder's, and contractual relations between parties. However, it is a rare happening that a project is completed within the specified duration (Megha and Rajiv, 2013).The manufacturing sector has adopted the performance measurement system as a tool in monitoring the results, efficiency and effectiveness of their production. This tool effectively compared the outcomes of work with standards and determines the efficiency of that activity (Karim and Marosszeky, 1999). Later, Brown and Adams (2000) developed

a framework for measuring the efficiency of Building Project Management (BPM) by utilizing a conventional economic analysis tool that revolves around time, cost and quality. Lehtonen (2001) also pointed out that, due the challenges faced in the Construction Industry, it is crucial for the industry to use tools like the performance measurement systems. Samson and Lema (2002) declared that, performance measurement system should be employed by contractors to help in analysing the organizational management of firms in the Construction Industry with the mind-set of evaluating, controlling and improving performance.

Tangen (2004) contributed to the framework developed by Brown and Adams (2000) on performance measurement system, by asserting that even-though it is an ideal tool for measuring efficiency and effectiveness among practitioners and researchers, it is very complex in its implementation which operates within three distinct disciplines thus economics, management and accounting. Navon (2005) stated that performance measurement is can be used to update the historic data of projects but not only needed not only evaluation of to present projects. The updates enhance better planning of potential projects in relation to costs, schedules, labour allocation, etc. Pheng and Chaun (2006) declared management and products as new parameters in project performance measurement rather that sticking to the conventional method of performance measurement which are time, cost and quality. In a related study by Cheung *et* al (2004), the New South Wales Public Works Department developed a framework for Project Performance Evaluation using the following parameters communication, time, cost, dispute resolution, contract administration and environment related issues. Cheung *et* al (2004) added that, Key Performance Indicators (KPIs) are used instead of PPE in the UK Construction

Industry. The parameters identified for the KPIs are time, quality, cost, safety, client satisfaction, risk assessment, change in scope of work and the performance a project.

These two Performance Measurement model, PPE and KPIs may have a little differences conversely it can all be adapted to assess all projects which can produce close results which are not highly deviated from each other because most of the parameters in one technique correlates to the other. And can be employed at a particular point in time during the life of a project.

The using of the Performance Measurement model on construction projects have been reported to be complicated because of the inter-disciplinary nature of the Construction Industry (Iyer and Jha, 2005). The emerged trend in the Construction Industry seeks the services of designers, contractors, specialist, suppliers, manufacturers and project managers unlike the conventional method where a project due to the increased size and scope of modern projects. In addition Iyer and Jha (2005) affirmed that, although there are established parameters in judging the performance of a project such as schedule, cost and quality, participants are assessed based on the parameters decided by the researcher because all participants have their own established parameters to determine their efficiency and effectiveness on a project and work with different motives.

In a related study Lehtonen (2001) developed a model for assessing construction logistics using a two-dimension technique with the aim of improving productivity in the Construction Industry. The first dimension is sub divided into two further components, the first component under this dimension is the improvement measures which aid the Construction Industry to ascertain the challenges faced on techniques used on on-going projects. The other is the monitoring measures which serve the

purpose of further monitoring and evaluation of on-going projects. The second dimension of the model focuses on measures; it aids firms in the Construction Industry to clarify the measures for a particular level in an organization. Communication should flow freely within an institution as well as external institutions who are capable of such information.

Samson and Lema (2002) formulated the Performance Measured System models which have the following parameters improvement and education, processes, projects, stakeholders, and financial viewpoint. These indicators developed from perspectives are further categorized into three key classifications which are drivers' indicators, process indicators and results indicators. Leadership loyalty; employees' participation and empowerment; information management and organisational management system are the determinant of the success or failure of the implementation of these measurement system.

All these studies have a common line of agreement that there are various factors which lead to poor performance in construction projects via various routes; contractors, consultants and clients, project-related, documentation/contract-related, materials/plant/human resources-related. Flyvbjerg *et al.* (2003) asserted that even-though construction consumes a great chunk of money annually, it also helps practitioners to acquire knowledge on the performance of such activities. Project performance has over the years been hindered mainly by project duration and budget underperformance (The Standish Group, 2013). There is a commensurate relationship between a project duration drag and the project budget; once a project's performance fails in the light of timely delivery, there is surely bound to lead to a budget excess. There would be extra working hours, payments for plant and equipment and supervisory charges (Megha and Rajiv, 2013; Othman, 2013).

1.2 PROBLEM STATEMENT

Generally, it is expedient that any investment made by a person or group yields the results desired and also lives up to the desired performance levels. From the research conducted by authors in various jurisdictions and even in Ghana by Frimpong et al (2003), project performance in the construction industry in Ghana leaves a lot to be desired.

Finances are going down the drain as a result of improperly managed projects, which end up not yielding the desired outcome. Challenges with respect to project performance on construction projects are agreeably a universal phenomenon. A project is said to unsuccessful when it not able to meet the targeted time, budgeted cost, changes or errors in design, user changes, climate weather, late deliveries and specified quality resulting in various negative effects on the projects are the reasons that projects do not live up to their expected performance ranging from unfavourable effect on parties (owner, contractor, consultant) to a contract in terms of a growth in adversarial relationships, cash-flow problems, distrust, litigation, arbitration, , and a common feeling of uneasiness towards each other. It is thus important to define the critical factors that lead to poor project performance of construction projects in Ghana in order to minimize their rate of recurrence.

Globally, according to the Standish Group (2013), it is reported that forty-three percent (43%) of projects were not able to meet full performance standards in the year 2012. This draws to the fore that the issue of poor project performance is a global bane aggravating the woes of many nations which Ghana cannot be left out, and must be addressed as such.

In Ghana, reports in the media provide that several projects, amongst which are the Accra-Kumasi highway project and stadia in some selected regions suffered in terms of duration and budgetary excesses (GNA, 2013), which are key indicators of poor project performance. In a nation such as Ghana, having a tight purse, such challenges ought to be addressed thoroughly, in order to sanitize the GCI, as well as promote efficiency on projects.

Normally, when a construction project fails to meet certain specific targets that indicate good performance; for example does not meet the stipulated delivery date, they are either accelerated or extended and therefore, incur additional budget/cost: the costs of procuring materials and to pay wages would absolutely increase. This situation should not be left unprocessed/untreated; it would lead to more severe problems in the future forthcoming construction projects in Ghana; particularly in the region of study. Furthermore, if this canker persists, Ghanaian Construction Industry (GCI) professionals would have to face several procedure and regulations before being awarded a construction project in the Asutifi North District Assembly of the Brong-Ahafo Region, and Ghana as a whole.

1.3 RESEARCH QUESTIONS

In the light of this research study, several questions were posed, through which this research would be fruitful in terms of achieving the aim and set objectives. The research asked the following:

1. What critical factors lead to poor construction project performance?
2. What are the strategies that can be adopted for successful project performance

1.4 AIM AND OBJECTIVES

The aim of this study was to investigate the critical factors that lead to poor project performance on construction projects.

The objectives are as follows:

1. To identify the factors that lead to poor construction project performance in the Asutifi North District Assembly; and
2. To identify strategies that will ensure a successful project performance.

1.5 SCOPE OF THE RESEARCH

This study was focused on infrastructural projects in the Asutifi North District Assembly in the Brong-Ahafo Region of Ghana being handled by any/all of the following outfits:

- Development Offices of the Asutifi North District Assembly; and
- Contractors of all classes operating in that region.

The study covered the building/civil contractors operating in the Asutifi North District Assembly, who are in good standing with the Association of Building and Civil Engineering Contractors Ghana (ABCECG) as at the year 2014. This is to enable the research contact qualified and functional firms in this area. All the classes of contractors were selected based on the fact that, these classes would cover a cross section of the various scales of projects executed in the Asutifi North District Assembly, thus provide relevant data needed for this study.

1.6 SIGNIFICANCE OF THE STUDY

The issue of poor project performance in construction projects has been a long standing issue in the GCI. This study seeks to:

1. Identify critical factors in the whole construction process which lead to major project blockades and poor performance. This would thus inform stakeholders in the ANDA to pay particular attention to those factors when venturing into a construction contract with any party.
2. The knowledge gathered from this study would go a long way to help curb the canker of poor construction project performance which seems to be settling as an undisputed 'norm' in the GCI, at the MMDAs level too.
3. The outcome of this study would provide essential recommendations to stakeholders in the GCI in the construction and local government sector, which would be driven at directives aimed at removing from the root-cause the causes of poor project performance on construction projects.
4. It would also enable key project stakeholder in the district assembly identify at early stages signs or indications that would suggest that the project is digressing from performance indicators.

1.7 RESEARCH METHODOLOGY

This study adopted all appropriate mechanisms essential in achieving the aim and the outlined objectives. Literature showed that similar studies undertaken by various researchers adopted a quantitative approach, using structured survey questionnaires with a combination of open and close ended questions. These studies also adopted the relative importance index to analyse the quantitative data collected (Megha and Rajiv, 2013; Afshari *et al*. 2011; Mohd, 2010; Motaleb and Kishk, 2010; Shaban,

2008; Alaghbari *et al*. 2007; Sambasivan and Soon, 2007). This provided the basic background for the adopted methodology to be employed in this study.

1.8 ORGANIZATION OF THE STUDY

The chapter 1 outlined introduction; background of the study, concepts, problem statement, Aims and Objectives, scope of research and Organization of study. Chapter 2 explored greater depth of factors and effective strategies for project performance. The Chapter dealt with the research methodology. Chapter 4 dealt with data analysis and interpretation. Chapter 5 was the conclusion and Recommendation and References.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

Frimpong *et al* (2003) posited that project success is confined to the goals and objectives set within a specific project scope. A project is governed by many characteristics however a completed project which ensures that it technical requirements, the required quality and its intended duration are met clearly defines the success of a project. Shaban (2008) indicated that projects basically revolves around three areas, these are completing a project in time within an estimated budget based on a defined quality with the aim of getting value for money.

The Bank of Ghana (2009) declared that, the Ghanaian Construction Industry represent 10.30% of Ghanaian's Gross Domestic Product (GDP), suggesting that the Construction Industry influences the economy of Ghana. It also reveals that due to the contribution of the Construction Industry into the economic well-being of Ghana, the Ghana Government invest in construction as s form of maintaining and controlling the economy. The Royal Institute of Chartered Surveyors (2013) posited that, the Construction Industry is very vast cutting across from the building sector to civil engineering works however, it is beset with non-standardization, lack of expertise in project management which continually affect the objectives of a project by causing failures in time and cost.

Earlier, Al-Moumani (2000) identified the challenge of poor project performance in the Construction Industry because construction projects were unable to meet it set objectives. Association of Project Managers (2006) and Arditi and Pattanakitchamroon (2006) revealed that, another challenge associate with the

Construction Industry is delay. Their study further on stated that delay is witness in all construction projects, notwithstanding that, the degree of delay varies from projects to projects because some delays are as a result of days behind schedules whilst others are years. Whether delay occurred within a couple of days or years it negatively affects the well-being of the project in cost, time, quality as well as safety.

2.2 CONCEPT OF PROJECT LIFE CYCLE

Every projects is a one off activity however, comprises of many activities. Afsahari (2010) identified the life cycle of a project in five linked phases, these are

1. **Preparation**: every project begins with the taking possession of the land in question provided that is a new project, site clearance and preparation, site mobilization, meetings among the contractor, consultants and the client and other technical studies on the land.
2. **Engineering:** the designers on the project start with the design as well as its details and produce other relevant documents to the project within this stage. Most of the planning of the project is done as this stage.
3. **Procurement:** procurement is a stage in the project cycle because it is time where the client and his technical team select the contractor to construct the design by the designers. It involves tendering by prospective contractors, evaluation and award of tender and the taking over of the project land by the winning contractor.
4. **Construction:** this is where, the physical infrastructure of the project is realised through activities such as excavation works, concreting, plastering, painting, tiling just to mention few, installation and commissioning of the project.

5. **Delivery and closing:** in other words this is where all contracts between client and other parties terminate by default. The project is now handed over to the client to occupy, during this time the defect liability would have been exhausted and all other claims have been settled.

Smith (2011) also attest to Association of Project Managers (2006) and Arditi and Pattanakitchamroon (2006) assertion that delay are often associated with Construction projects, notwithstanding that, Smith argued that delay can results as a result of the default of the contractor, client, consultants or other situations beyond the control of the parties involved. Moreover, as delay has a monetary repercussion on a project which at times in legal battle between the client and the other parties to the project. These delays cannot be controlled totally but can be minimise through effective planning.

2.3 PROJECT PERFORMANCE

The manufacturing sector has adopted the performance measurement system as a tool in monitoring the results, efficiency and effectiveness of their production. This tool effectively compared the outcomes of work with standards and determines the efficiency of that activity (Karim and Marosszeky, 1999). Later, Brown and Adams (2000) developed a framework for measuring the efficiency of Building Project Management (BPM) by utilizing a conventional economic analysis tool that revolves around time, cost and quality. Lehtonen (2001) also pointed out that, due the challenges faced in the Construction Industry, it is crucial for the industry to use tools like the performance measurement systems. Samson and Lema (2002) declared

that, performance measurement system should be employed by contractors to help in analysing the organizational management of firms in the Construction Industry with the mind-set of evaluating, controlling and improving performance.

Tangen (2004) contributed to the framework developed by Brown and Adams (2000) on performance measurement system, by asserting that even-though it is an ideal tool for measuring efficiency and effectiveness among practitioners and researchers, it is very complex in its implementation which operates within three distinct disciplines thus economics, management and accounting. Tangen (2004) further on, defined the criteria upon which a specific technique in performance measurement should be adapted which includes the rationale for such measurement; the details required; the time factor; availability of a standard and the cost contribution involved in the measurement.

Navon (2005) also added unto performance measurement by defining it as the establishment of an actual performance for an activity and comparing it with a desired performance. Instances include deviating from a set and due to the standard established earlier, the manager in charge of such activity is able to analyse and detect the reasons for such deviation. Navon (2005) describe such deviations to exist on two prospective groupings:

I. Unrealistic or unplanned target setting.

II. Challenges emanating from actual construction.

In as much as performance measurement is required to evaluate, maintain and control an ongoing project, it is also a tool for updating the database for similar projects in the distant future by aiding project managers to plan effective in relations to the assigning of resources whether financial, human, material, plant or equipment (Navon, 2005).

Pheng and Chaun (2006) declared management and products as new parameters in project performance measurement rather that sticking to the conventional method of performance measurement which are time, cost and quality. In a related study by Cheung *et* al (2004), the New South Wales Public Works Department developed a framework for Project Performance Evaluation using the following parameters communication, time, cost, dispute resolution, contract administration and environment related issues. Cheung *et* al (2004) added that, Key Performance Indicators (KPIs) are used instead of PPE in the UK Construction Industry. The parameters identified for the KPIs are time, quality, cost, safety, client satisfaction, risk assessment, change in scope of work and the performance a project. KPIs are implemented in three interrelated phases:

I. The activity to measure (decision).
II. Data collection.
III. Calculation of KPIs.

These two Performance Measurement model, PPE and KPIs may have a little differences conversely it can all be adapted to assess all projects which can produce close results which are not highly deviated from each other because most of the parameters in one technique correlates to the other. And can be employed at a particular point in time during the life of a project.

The using of the Performance Measurement model on construction projects have been reported to be complicated because of the inter-disciplinary nature of the Construction Industry (Iyer and Jha, 2005). The emerged trend in the Construction Industry seeks the services of designers, contractors, specialist, suppliers, manufacturers and project managers unlike the conventional method where a project

due to the increased size and scope of modern projects. In addition Iyer and Jha (2005) affirmed that, although there are established parameters in judging the performance of a project such as schedule, cost and quality, participants are assessed based on the parameters decided by the researcher because all participants have their own established parameters to determine their efficiency and effectiveness on a project and work with different motives.

In a related study Lehtonen (2001) developed a model for assessing construction logistics using a two-dimension technique with the aim of improving productivity in the Construction Industry. The first dimension is sub divided into two further components, the first component under this dimension is the improvement measures which aid the Construction Industry to ascertain the challenges faced on techniques used on on-going projects. The other is the monitoring measures which serve the purpose of further monitoring and evaluation of on-going projects. The second dimension of the model focuses on measures; it aids firms in the Construction Industry to clarify the measures of a particular level in an organization. Communication should flow freely within an institution as well as external institutions that are capable of such information.

Samson and Lema (2002) formulated the Performance Measured System models which have the following parameters improvement and education, processes, projects, stakeholders, and financial viewpoint. These indicators developed from perspectives are further categorized into three key classifications which are drivers' indicators, process indicators and results indicators. Leadership loyalty; employees' participation and empowerment; information management and organisational management system are the determinant of the success or failure of the implementation of these measurement system.

All these studies have a common line of agreement that there are various factors which lead to poor performance in construction projects via various routes; contractors, consultants and clients, project-related, documentation/contract-related, materials/plant/human resources-related. Flyvbjerg *et al.* (2003) asserted that even-though construction consumes a great chunk of money annually, it also helps practitioners to acquire knowledge on the performance of such activities.

Shen et al (2005) proposed a measurement system on environmental performance of construction projects under the auspices of contractors through the contractor's environmental performance score (EPS). This system helps contractors to realise their role in the enhancing of safety on projects vicinities. In addition Kuprenas (2003) also identified the cost performance using the Cost Performance Index (CPI)

$$CPI=BCWP/ACWP$$

Where:

- BCWP = Budgeted cost of the work performed
- ACWP = actual cost of the work performed.
- From previous equation:
- If CPI value of one means, the cost was as planned (at the cost Value)
- If CPI value above one means, the project was below its cost
- If CPI of less than one means, the project exceeded its cost.
- Based on previous equation, time performance is measured through a schedule performance index (SPI) computed as:

$$SPI=BCWP/BCWS$$

Where:

- BCWP = Budgeted cost of the work performed
- BCWS = Budgeted cost of the work scheduled.
- From previous equation:
- If SPI value of one means, the time was as planned (at the time Value)
- If SPI value above one means, the project was ahead of schedule
- If SPI of less than one means, the project was behind schedule

2.4 INFLUENCES ON PROJECT PERFORMANCE

Chan and Kumaraswamy (2002) asserted that many researchers on related studies have contributed to knowledge on time the measurement of time performance in the Construction Industry over three decades ago. Iyer and Jha (2005) added that cost performance has also been studied by researchers beginning from the 60's. There is an evident that all performance studies starts with a theoretical work based on experience of researchers to structured work. Phengand Chuan (2006) also affirmed that performance studies in the context of time and cost have been dealt with by many researchers in performance studies. Notwithstanding that, studies on performance are not a one off activity because every now and then new construction techniques are emerging making construction of projects faster but complicated.

Chan and Kumaraswamy (1996) posited that, most of time and cost related performance challenges are attributed to improper planning, changes in the scope of work and un-workable designs. It is also realised from research that poor site management practices, unforeseen ground conditions and delay in decision making among project participant are the three most important factors leading to delays and

problems of time performance in construction works. Okuwoga (1998) declared that time and cost have been the challenges faced in the Construction Industry from time immemorial. Dissanayaka and Kumaraswamy (1999) revealed that complexity of a project, nature of client, experience of project team and communication are measured using time performance model; whilst the complexity of a project, nature of the client and contractor are measured on the cost performance model. Reichelt and Lyneis (1999) suggested that the simplest way to subdue the challenges faced in relation to project schedule and cost performance is employing an effective feedback process. These identified processes include "the rework cycle, feedback loops creating changes in productivity and quality, and effects between work phases". Chan (2001) posited that the most excellent forecaster of time performance of public sector projects in Malaysian Construction Industry is T = 269 C 0.32 . This measurement can serve as a suitable tool for both project managers and clients to forecast the average time necessary for construction projects. Kuprenas (2003) also suggested that, frequent design team meeting and effective report writing of the design phase progress are great antidote to high design phase costs. And further on argued that project manager training and organizational structure do not significantly reduce the high design phase costs. Iyer and Jha (2005) also listed out the factors affecting cost performance: project manager's capability; top management support; project manager's relationship and leadership skill; evaluating and feedback by the project participants; decision making; relationship among project participants; owners' competence; social condition, economical condition and climatic condition. relationship among project participants was as the most important of all the factors having greatest influence on cost performance of projects.

Love et al (2005) examined the relationship between project time-cost performance by using project related factors for 161 construction projects that were completed in different geographical area in the Australian States. It was revealed that gross floor area and the number of floors in a building are determinants of time performance in projects. Furthermore, the results indicate that cost is a poor forecaster of time performance. Chan and Kumaraswamy (2002) suggested technological and managerial practices that facilitate the pace of construction and act as a tool in construction time performance. Their study further on suggested that, effective communication, easy information transfer between project participants, the best selection procedure and process for project managers and a completed and comprehensive construction program with recognised software can aid to accelerate the performance of a project. Competition in firms basically operates on the speed of construction, procurement and the actual construction process. It is established that customers are more specific and recognise the impact of time on a project because time is a resource (Jouini et al, 2004).

2.5FACTORS THAT LEAD TO POOR PROJECT PERFORMANCE

Chan et al. (2004) remarked that construction is a developing industry which is continuously faced with uncertainties in terms of costs, processes and technology. These uncertainties include the complex nature of projects and the stakeholder's leads to the management of project costs a challenge in a construction project. This evidence is witnessed in project with time and cost overruns challenges (Doloi, 2011). Arcila (2012) also argued that, efforts have been made to improve construction projects in terms of management, time and cost is still an open issue inhibiting the growth of the Construction Industry.

In simple term, cost overrun results when there is disparity between the initial contract sum and the final cost of a project (Arcila, 2012). Notwithstanding, it is expedient to understand the importance of project cost in order to the cost overruns of the project. The initial project cost is realised during the preparation phase of a project (Flyvbjerg, et al., 2002; Odeck, 2004). Ideally, many researchers have suggested that the best approach in determining the cost overrun of projects is comparing the initial contract sum and the final cost during the completion and closing phase. According to Love et al. (2012), the distinction between project cost overruns differs in the extent of such excesses that would be reported over the years or the completion of the project. Le-Hoai et al. (2008) also posited that, even-though whether a project lags a day or a year it adversely affects the cost of the projects, and the degree of such overrun is rooted in the varying size of projects, the geographical locations of projects and the nature of the projects. Eden et al. (2005) recorded that, most of cost overruns are reported on public projects although the private sector also experience these challenges and even worse than the public sector. Koushki, et al. (2005) stated that cost and time overruns are not associated with only complex construction projects but small projects also suffer from these challenges. Frimpong, et al (2003) agreed with Koushki, et al. (2005) assertion but revealed that complex and large projects are crucial victim cost and time overruns rather than small projects. Although Gkritza and Labi (2008) argued from the perspective that, cost and time overrun are associated to the longevity of a project. Conversely, Odeck (2004) objected to Gkritza and Labi (2008) revelation complex and large projects results in cost overruns but not a higher degree because managers spend most time on the administration of such projects through frequent meetings and deliberations as compared to small projects.

2.6 INFORMATION FROM CURRENT STUDIES

Arditi and Pattanakitchamroon (2006) conducted a study on delay in Turkey; the study concluded that the factor in cost overrun is as a result of high material cost because of the high inflation digit recorded in Turkey. In a related development, such high inflation also affects contractors because it directly contributes to the final cost of the. Shortages in resources, changes in design specifications and financial constrains were some of the factors which caused delays in projects. These delays were considered the fourth reason for cost overruns in public projects in Turkey. In-addition, the study concluded that underestimation of work items also contribute to the cost overrun of projects.

Okpala and Aniekwu (1988) conducted a similar study as cited by Ancila (2012) meant to identify the prevailing influential factors in cost overrun of construction projects. It was identified in the study that materials shortage, financial and payment of certificate problems, price fluctuations, poor contract management and fraudulent practices, materials prices hikes, poor planning and high cost of machinery adversely affects cost in the Nigerian Construction Industry. Mansfield et al (1994) as cited by Arcila (2012) also conducted a study in Nigeria, proposed these factors as the significant once that lead to cost overruns in Nigeria:

1. Shortage of materials
2. Finance and payment for completed works
3. Poor contract management
4. Price Fluctuations
5. Fraudulent practices
6. Cost of materials
7. High cost of machineries

8. Inaccurate estimates leading to delays
9. Lack of geotechnical studies before starting the construction
10. Delays caused by the involvement of complicated rules

Factors that affect cost performance can be generalised to all developing countries because the problems faced in their construction industries are similar because they all operate from the first principle approach (Flyvbjerg et al., 2003). The imminent factors identified from the study of Flyvbjerg et al. (2003) includes: lack of materials due to the inaccurate planning and estimating; increase of materials' cost; complexity of project; poor contractor management and unpredictable weather. This finding of Flyvbjerg et al. (2003) was confirmed by that of Frimpong et al. (2003) in Ghana.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This study adopted all appropriate tool in achieving the aim and the stated objectives. Literature showed that similar studies undertaken by various researchers adopted a quantitative approach, using structured survey questionnaires with a combination of open and close ended questions. These studies employed the relative importance index (RII) as a tool in the data for the data collected (Megha and Rajiv (2013); Alaghbari *et al.* 2007; Sambasivan and Soon (2007); Mohd (2010); Motaleb and Kishk (2010); Afshari *et al.* (2011)).

3.2 POPULATION AND SAMPLING

The study had as a sampling frame all contractor firms in the Asutifi North District Assembly who are registered with the MWRWH and in good standing with their national association, being the Association of Building and Civil Engineering Contractors (ABCECG) as at the time of the study. The purposive sampling technique was adopted in this study, with respect to the target region in Ghana.

The sample size for the study comprised all the contractors operating in and registered by the district assembly.

3.2 SOURCES OF DATA

Primary data was collected from construction professionals of the target population through a structured survey questionnaire. Secondary data was sourced from the

internet (world-wide-web), books, journals, conference papers amongst other prominent publications relevant to the focus of the study was consulted. This approach provided a good base of information for the study, similar to what Megha and Rajiv (2013), Al-Momani (2000), Assaf and Al-Hejji (2006), Assaf *et al*. (1995), Mohd (2010), Motaleb and Kishk (2010), Odeh and Battaineh (2002) and Sambasivan and Soon (2007) did in their studies on construction delays in their various jurisdictions.

3.3 COLLECTION OF DATA

Comprehensive and all-encompassing data relevant to the study was collected from the 85 targeted respondents through the use of survey questionnaires with a mixed composition of open and close ended questions. This approach provided a good base for collection of valid data for the study, similar to what Megha and Rajiv (2013) Motaleb and Kishk (2010), Baloyi and Bekker (2011), Aiyetan *et al.* (2011), Haseeh *et al.* (2011), Singh (2009) and Sambasivan and Soon (2007) adopted in their studies on construction delays.

The collection of data was done over a period of two (2) weeks, collecting data from management level personnel of all contractor firms registered with the Asutifi North District Assembly. The questionnaires were distributed and collected personally to fifteen (15) and seventy (70) all class of Civil and Building contractors respectively. Out of the eighty-five (85) questionnaires distributed, seventy-eight (78) were retrieved; ten (10) road contractors; sixty-eight (68) Building and Civil Contractors, making up 91.76% response rate.

3.4 DATA ANALYSIS

The data was analysed for using the Statistical Product for Social Scientists (SPSS) data analysis tool, in conjunction with MS Excel where required. A descriptive form of analysis was adopted, employing other approaches such as the one sample t test, factor analysis and Relative Importance Index for a comprehensive and rigorous discussion. This is similar to the analysis methods adopted by Baloyi and Bekker (2011), Aiyetan *et al.* (2011) and Haseeh *et al.* (2011).

3.5 ETHICS

All information and communication engaged in with other parties in relation to this study was held in utmost confidentiality. All interactions were held without bias, favouritism or nepotism. All activities involving other parties were executed with objectivity. All other essential ethics were duly observed to make the study a success.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION OF RESULTS

4.1 INTRODUCTION

The study in the preceding chapters has gone through and assessed relevant literature in the light of its aim and pursuant objectives and detailed out its positivist quantitative methodology. All these were in the direction of ensuring that the data collected would be relevant to this study.

Through the data collected, the analysis is being discussed into detail, linking it to relevant literature and authors in the relevant areas of this study in order to bring out the uniqueness of this particular work. The study focused on identifying the main influencing factors on poor project performance at the district assembly level, with the focus being on the Asutifi North District Assembly (D/A) in the Brong-Ahafo Region. The uniqueness of this study lies in its grass-roots approach of addressing the factors at the local government level, which majority of studies in various jurisdictions have ignored; including studies by Megha and Rajiv (2013), Arditi and Pattanakitchamroon (2006), Love et al (2005), Sambasivan and Soon (2007), Assaf and Al-Hejji (2006), Motaleb and Kihk (2010), Singh (2009), Mohd (2010) and Baloyi and Bekker (2011) amongst others. In all these studies, the research was constricted to projects at the national scale or level, ignoring the grass root projects which are the engines of infrastructural development in developing countries particularly in Ghana. Thus, this research gap is filled by this study from earlier studies within Ghana and other jurisdictions (Megha and Rajiv (2013); Alaghbari *et al.* 2007; Baloyi and Bekker (2011); Aiyetan*et al.* (2011);Haseeh *et al.* (2011); Sambasivan and Soon (2007); Mohd (2010); Motaleb and Kishk (2010) and Afshari *et al.* (2011).

This method of analysis, being descriptive, according to Baloyi and Bekker (2011), Aiyetan *et al.* (2011) and Haseeh *et al.* (2011) easily lends itself to the quick understanding and appreciation of all relevant persons interested in the study of the phenomenon at hand. It does not lead to cumbersome explanations (Dawson, 2002).

Descriptive analysis using frequencies and percentages were drawn from the data collected from road, civil engineering and building contractors registered with the district assembly as valid contractors in the Asutifi North D/A. The tables, figures and discussion following herewith present the empirical data gathered into coherent understanding on the subject at hand, uniquely focusing on district assemblies of the local government of Ghana.

4.1.1 Structure of Analysis and Discussion

The structure of the analysis would be discussed in a coherent string from the side of the civil/building and road contractors comparatively, whilst drawing similarities. There would be the use of tables and bar charts for illustrating the data being spoken of. The analysis and discussion are thus broken into major segments as follows:

1. Background Information on respondent contractors
2. Factors leading to poor project performance
3. Strategy factors to mitigate the identified factors

The studies considered in literature were all conducted with respect to the desired respondents having to be adequately qualified to provide data relevant for the study at hand (Megha and Rajiv, 2013; Baloyi and Bekker, 2011; Singh, 2009). In the same vein, this study sought to contact registered grades of contractors with the Asutifi North D/A in the Brong-Ahafo Region.

4.2 BACKGROUND INFORMATION

Information collected from the development office of the D/A provided that there were ten (10) road and sixty-eight (68) building/civil engineering contractors actively in good standing with them. This section thus set out to do two major things: the first is to verify the information on the contractors received by the D/A; second is to check the eligibility of each of the respondents for this study. The tables 4.1 and 4.2 respectively indicate the various classes of contractors in the D/A who qualified in their respective capacities to be involved in this study in the Brong-Ahafo Region. This further provides that the study is dealing with relevant contractors who are not defunct thus can give insightful contributions to the study.

Table 4.1 Class of contractors (Building and civil)

		Frequency	Percent
Valid	D1K1	2	2.94
	D2K2	15	22.06
	D3K3	47	69.12
	D4K4	4	5.88
	Total	68	100

(Field Survey, 2014)

Table 4.2 Class of contractors (road)

		Frequency	Percent
Valid	A2B2	1	10
	A3B3	7	70
	A4B4	2	20
	Total	10	100

(Field Survey, 2014)

4.2.1 Professional Background of Respondents

Figure 4.1 illustrates the professional background of the respondents from the building and civil contractors as well as the road contractors. Most of the respondents were site engineers representing 32%, followed by quantity surveyors (21%), project managers (16%), architects (14%), office engineers (13%) and others 4% comprising of geotechnical, geomatic and civil engineers. From inference, project management is a growing profession in the construction industry.

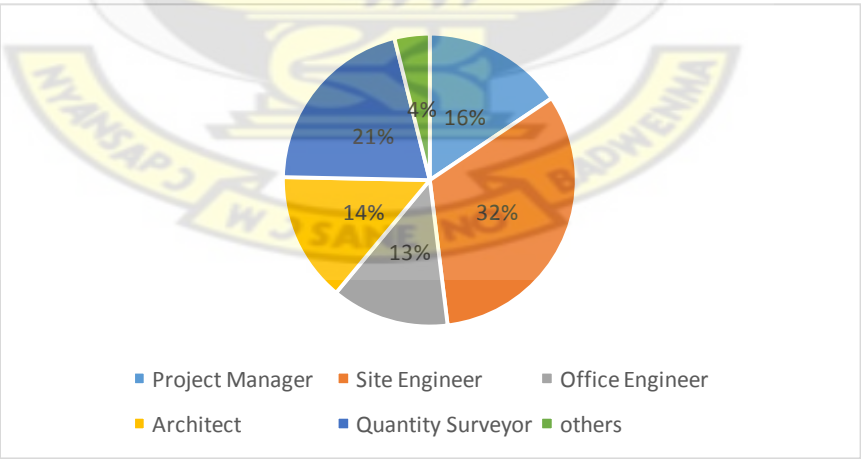

Figure 4.0-1 Profession of respondents (Field Survey, 2014)

4.2.2 Experience of Respondents

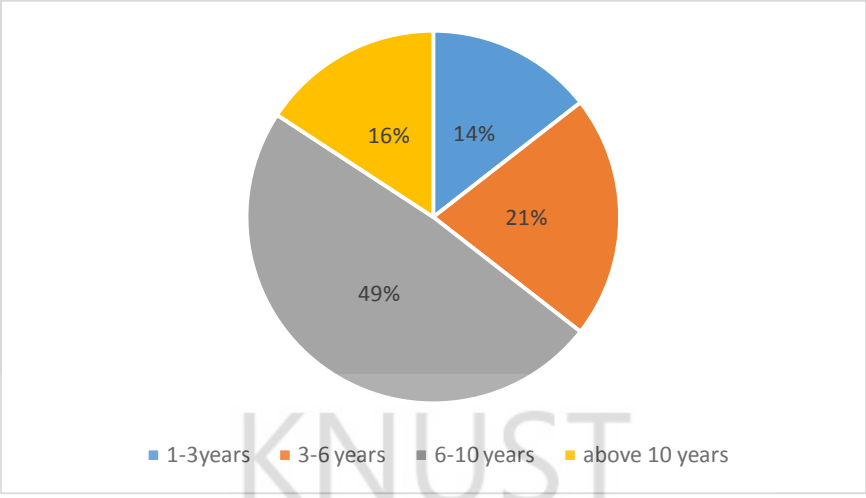

Figure 4.0-2 Work experience of respondents (Field Survey, 2014)

Figure 4.2 indicates the experience of the respondents. 14% of the respondents have been working within the past three (3) and 21% have been in existence within the last three (3) to six (6) years. 65% of the respondents have worked with the various professional backgrounds in Figure 4.1 over the past 6years showing that, respondents are in the right position to make objective and analytical decisions on the study.

4.3 FACTORS OF POOR PROJECT PERFORMANCE

Inadequate funds for the project, suspension of work by owner or contractor, cash problem during construction, inadequate planning of projects before commencement, client delay in payment certificates, inadequate planning, uncompromising attitude between parties are the highly ranked factors using one sample t test with a test value of 1 *(p>0.05)*.

Funds are the basically the moving resource for every project

Table 4.3 Factors of poor project performance using mean score

	Number Of Respondent	Mean	Std. Deviation	Rank
Unpredictable weather conditions	78	3.0897	1.15304	35
Inaccuracy of materials estimate	78	3.7436	0.97282	11
Inaccurate prediction of craftmen production rate	78	3.2179	0.98887	34
Inaccurate prediction of equipment production rate	78	3.2949	1.16339	29
Materials shortage	78	3.9103	1.19725	9
Equipment shortage	78	3.3506	1.07319	27
Skilled labour shortage	78	3.6104	1.07796	16
Locational restriction of the project	78	3.2632	1.06293	31
Inadequate planning	78	4.026	1.14678	6
Poor labour productivity	78	3.7792	1.02114	10
High quality of finishes needed	78	3.0789	1.25181	36
Slow information flow between project team members	78	3.3077	1.04828	28
Discrepancies in contract documents	78	3.6795	1.09892	15
Suspension of work by owner or contractor	78	4.2308	0.80458	2
Insufficient number of staffs	78	3.3718	1.05817	25
Poor site management	78	3.9103	0.95599	8
Uncompromising attitude between parties	78	4.0256	4.70969	7
Equipment allocation problems	78	2.9605	1.23764	39
Cash problem during construction	78	4.1923	1.18495	3
Inadequate funds for the project	78	4.5065	0.70006	1

Inadequate planning of project before commencement	78	4.1039	0.852	4
Delay in delivery of materials	78	3.6842	0.94107	14
Subcontractor incompetence	78	3.3684	0.81391	26
Delay in response to decision making	78	3.4744	0.90775	18
Incompleteness of technical documentation	78	3.3718	1.02068	24
Labour dispute in the form of strikes or lock-out	78	3.7105	1.23089	13
Unexpected subsoil/ground condition	78	3.2597	1.19651	32
Inadequate instructions to operators	76	2.974	1.02565	38
Delay in inspection and testing of completed work	78	3.0256	1.18403	37
Political instability or change in government policies	78	3.3816	1.4139	23
Accidents	78	2.961	1.21873	40
Obtaining building permits and approvals	78	3.2208	1.08365	33
Clients delay in payment certificates	78	4.0921	1.02212	5
Unrealistic clients requirements	78	3.4675	1.13072	19
Contract modifications	78	3.6053	1.02084	17
Major disputes/negotiations on site	78	3.4487	1.05249	21
Delays in preparation of interim certificates	78	3.7105	1.0042	12
Poor subcontractor selection processes	78	3.4231	1.02589	22
Little periodical sessions to address work problems	78	3.2692	0.92122	30
Centralization of decision making process of client	78	3.4487	0.90665	20

(Field survey, 2014)

A mean ranking analysis was conducted to determine the significance of the 40 variables using a test value of 3 (Table 4.3). Three factors namely; equipment allocation problem, inadequate instructions to operators and accidents were not

included in the factors analysis each has a mean score less than 3. All the 37 factors had communalities of 1.00, indicating their suitability for the study for factor analysis. The 37 significant factors were further reduced to common factor patterns. This was done to segregate the factors into simplified factors explaining the factors leading to poor project performance in Asutifi North District. The principal component analysis with Varimax rotation and Kaiser Normalization was used to determine which factors are empirically significance. Factor retention was by the eigenvalue ≥ 1.0 criteria, indicating that factors with variance greater than one was included in the factor extraction.

The principal component analysis (Table 4.3), where linear combinations of observed variables formed was the method used to extract the factors. The first principal component is the combination that accounts for the largest amount of variance and the second principal components account for the next largest amount of variance and is uncorrelated with the first.

From the Table 4.3, component 1 has total variance of 4.406 accounting for 11.909% of the total variance of the 40 factors. Component 2 has total variance of 3.871 accounting for 10.462% of the total 40 factors, component 3 has a total variance of 3.839 representing 10.376% of the total factors, component 4 has a total variance of 2.845 of the total variance representing 7.689%, component 5 has a total variance of 2.259, component 6 has a variance of 2.253 whilst component 7 has a least variance value of 2.253 representing 5.531% of the total variance. Factor analysis enabled 21 of the factors identified as factors leading to poor project performance and placed them under seven components which are as follows:

Table 4.4 Rotated Component Matrix

Rotated Component Matrix[a]							
	Component						
	1	2	3	4	5	6	7
Unpredictable weather conditions							
Inaccuracy of materials estimate			.775				
Inaccurate prediction of craftmen production rate			.590				
Inaccurate prediction of equipment production rate	.702						
Materials shortage				.681			
Equipment shortage							
Skilled labour shortage	.676						
Locational restriction of the project							
Inadequate planning							
Poor labour productivity				.585			
High quality of finishes needed				.689			
Slow information flow between project team members	.699						
Discrepancies in contract documents							
Suspension of work by owner or contractor							

Insufficient number of staffs	.500						
Poor site management							.621
Uncompromising attitude between parties							
Cash problem during construction						.707	
Inadequate funds for the project						.869	
Inadequate planning of project before commencement			.517				
Delay in delivery of materials			.776				
Subcontractor incompetence							
Delay in response to decision making	.557						
Incompleteness of technical documentation							
Labour dispute in the form of strikes or lock-out							
Unexpected subsoil/ground condition							
Delay in inspection and testing of completed work							
Political instability or change in government policies				.591			
Obtaining building permits and approvals	.646						
Clients delay in payment certificates							

Unrealistic clients requirements		.670					
Contract modifications		.670					
Major disputes/negotiations on site							
Delays in preparation of interim certificates		.692					
Poor subcontractor selection processes							
Little periodical sessions to address work problems							
Centralization of decision making process of client		.716					
Eigen values	**4.406**	**3.871**	**3.839**	**2.845**	**2.259**	**2.253**	**2.047**
Percentage of variance explained	**11.909**	**10.462**	**10.376**	**7.689**	**6.105**	**6.088**	**5.531**
Cumulative percentage of variance explained	**11.909**	**22.371**	**32.747**	**40.436**	**46.540**	**52.629**	**58.160**

(Field Survey, 2014)

Note

Valid N (Listwise) = 78

Bartlett's Test of Sphericity Significance level = 0.000

Extraction Method: Principal Component Analysis

Rotation Method: Varimax with Kaiser Normalization

Insignificant factor loadings (i.e< 0.5) are blanked

KMO value: 0.531

Component 1: inaccurate prediction of equipment production rate, skilled labour shortage, slow information flow between project team members, insufficient number of staff, delay in response to decision making, obtaining building permits and approval.

Component 2: unrealistic clients requirement, contract modification, delays in preparation of interim certificates, centralization of the decision making process of clients**.**

Component 3: inaccuracy of materials estimate, inaccurate prediction of craftmen production rate, inadequate planning before commencement. Delay in delivery of materials**.**

Component 4: materials shortage, poor labour productivity, high quality of finishes, political instability or change in government.

Component 5: No factors under component 5

Component 6: cash problem during construction, inadequate funds for the project**.**

Component 7: poor site management**.**

The components are described as planning related factor (component 1), client related factor (component 2), technical related factor (component 3), resource related factor (component 4), cost related factor (component 6), site related factor

(component 7). Component 5 is not considered because no variable was registered under it.

4.3.1 Component 1: Planning related factors

Afsahari (2010) asserted earlier that planning of a project ensures that all components within a project are accurately considered to prevent performance related issue on a project. this component revealed these factors; inaccurate prediction of equipment production rate, skilled labour shortage, slow information flow between project team members, insufficient number of staff, delay in response to decision making, obtaining building permits and approval are as a result of non due diligence to planning. Smith (2011), Association of Project Managers (2006) and Arditi and Pattanakitchamroon declared that, construction projects are known to encounter poor performance. This study affirms Chan and Kumaraswamy (1996) and Dissanayaka and Kumaraswamy (1999) views and suggest that, team building is a major challenge among construction firms in the Asutifi North District and the effect of in-competent personnel results in poor performance of projects.

4.3.2 Component 2: Client related

The client is the vision bearer of every projects, it is his idea which is translated into a design for execution. . Cheung *et* al (2004) suggested that, client satisfaction, unrealistic clients' requirement and contract modification also contributes to poor project performance**.** This component identified the following factors unrealistic clients requirement, contract modification, delays in preparation of interim certificates, centralization of the decision making process of clients**.** The study agrees with this challenges and attributes these challenges to the fact that, client are not interested in the feasibility and realistic nature of project. The study also reveals

that, most client forgo the preparation phase of a project as suggested by Afsahari (2010).

4.3.3 Component 3: Technical related factors

Inaccuracy of materials estimate, inaccurate prediction of craftmen production rate, inadequate planning before commencement, and delay in delivery of materials are the identified factors in Technical factors. Iyer and Jha (2005) indicated the complexity of modern construction projects involves many expertises. Mansfield et al (1994) as cited by Arcila (2012) identified component factors. These components reveal the roles of personnel on a project and assert that, complacency on the part of these experts.

4.3.4 Component 4: Resource related factors

Materials shortage, poor labour productivity, high quality of finishes, political instability or change in government are resource related factors. Samson and Lema (2002) asserted that materials/plant/human resources-related contributes to the poor performance of projects provided things are not executed right. In as much as resources affect the performance of projects, political instability also contributes to poor project performance as identified in the study. Political instability demoralise the human resource because change of government delays the payment of contractors interim certificate which in turn affects the well-being of the project.

4.3.5 Component 5: Financial Related Factors

Cash problem during construction and inadequate funds for the project were identified under this component. Fugar and Agyakwah-Baah (2010) earlier reiterated that, the running of any infrastructural projects depends on the cash flow of the contractor because the inability of the client to fund the project will impede the

success of the project which might lead to the abandonment or other related factors such as litigation.

4.4 STRATEGIES FOR SUCCESSFUL PROJECT PERFORMANCE

Table 4.5 Relative Importance Index of strategic factors

	Scale					Total		A	RII=	
	1	**2**	**3**	**4**	**5**	(N)	∑W	×N	(∑W/A×N)	Rank
Effective time management practices	0	1	7	31	39	78	342	390	5.3352	1
Effective quality management practices	1	2	3	28	43	77	341	385	5.2514	2
Effective cost management	0	1	11	31	35	78	334	390	5.2104	3
Effective project scheduling	1	6	8	31	32	78	321	390	5.0076	4
Effective communication between client, contractor and consultant	0	6	14	33	25	78	311	390	4.8516	5
Effective resource management technique	1	7	13	30	27	78	309	390	4.8204	6
Client satisfaction management practices	1	11	15	26	24	77	292	385	4.4968	7
Effective safety	1	8	17	34	17	77	289	385	4.4506	8

management practices										
Effective risk management	4	9	16	32	16	77	278	385	4.2812	9

(Field Survey, 2014)

Four out of the nine strategies identified from literature were significant to our studies, these are; effective time management practices, effective quality management practices, effective cost management, effective project scheduling. The results in Table 4.4 basically defines the characteristics of projects as asserted Frimpong *et al.* (2003) that, projects thrive on three basic theory; time, cost and quality. King (2013) also posited that a project is successful when the project is complete within the stipulated completing date, at the quality and achieve its intended purpose. The Standish Group (2013) also highlighted that the global antidote for poor project performance is through effective time management and cost management practices. Pheng and Chaun (2006) concluded that, the classification of the strategies of effective and efficient performance of project is effective time management, cost management and quality.

Shaban (2008) also argued that, effective project scheduling underpins the globally recognized characteristics of projects which are time, cost and quality. In as much as the results support these views of researchers, it can be concluded that effectiveness and efficiency of a project is attributed by time, cost and quality acknowledging the immense contribution of effective project scheduling, in-addition; the absence of these four strategies will always put the success of a project into jeopardy.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1 INTRODUCTION

The aim of this study was to investigate the critical factors that lead to poor project performance on construction projects with two objectives; to identify the factors that lead to poor construction project performance in the Asutifi North District Assembly; and to identify strategies that will ensure a successful project performance. The study employed a field survey through the administering of questionnaires to construction contractors in the Asutifi North District Assembly. The data were analysed using descriptive analysis, mean score, factor analysis and Relative Importance Index (RII).

5.2 FINDINGS

5.2.1 To identify the factors that lead to poor construction project performance

Using the one sample t test, the results revealed that inadequate funds for the project, suspension of work by owner or contractor, cash problem during construction, inadequate planning of projects before commencement, client delay in payment certificates, inadequate planning, uncompromising attitude between parties were the highly ranked factors identified. Moreover, when the significant factors were subjected to factor analysis, seven components were identified notwithstanding that, component five (5) did not get any variable. The other five components were labelled under the following headings planning related factor (component 1), client related factor (component 2), technical related factor (component 3), resource related

factor (component 4), cost related factor (component 6), site related factor (component 7).

5.2.2 To identify strategies that will ensure a successful project performance

Four out of the nine strategies identified from literature were significant to our studies when subjected to the Relative Importance Index (RII) analysis, these are; effective time management practices, effective quality management practices, effective cost management, and effective project scheduling.

5.3 CONCLUSIONS

As far as construction projects regulates economies by creating employment, contribute to the Gross Domestic Products (GDP) of both developed and developing projects, it will also be executed whether by governments who are the larger clients to construction or private institutions. Performance of construction projects has many dimensions which have been researched into by many researchers in the construction field. The study identified poor projects performance factors which include cost, resource, technical, time, planning and client related factors using the factor analysis. These factors would be efficiently and effectively mitigated by the effective time, cost, quality and project scheduling management practices.

5.4 RECOMMENDATIONS

Based on the findings identified from the study, the following recommendations are made;

5.4.1 Recommendations to contractors

Contractors should incorporate risk management into the management of contract as well as effective planning. Workshops should be organized frequently for workers because such activities enlighten personnel to adjust into the modern trend of construction. Notwithstanding, that, contractors should employed the competent human resource and effective lean construction techniques to mitigate the forms of delays.

5.4.2 Recommendations to consultants

Poor site management, delay in the issue of interim certificate which are the consultant's responsibility. It is recommended that, consultants should regularly follow up the work executed by contractors by ensuring that, the contractors follow their plans. And also facilitate the orders delivered by contractors in order to work within the stipulated duration of the projects and work within cost.

5.4.3 Recommendations to clients

Unavailability of funds, modifications to project scope, unrealistic clients' requirement is attributed to the responsibilities of the client. It is recommended that, clients should not underestimate the role of consultants to a project, begin a project after undertaking extensive risk assessment and fulfil their part of the contract by providing the resources needed to the contractor

5.4.4 Recommendations for future research

It is recommended for future study into the factors for poor projects performance in the perspective of the clients as well as consultants. It is also recommended that, further studies should be done to ascertain the role of human resource in project performance in the Ghana Construction Industry.

REFERENCES

Afshari H., Khosravi S., Ghorbanali A., Borzabadi M., Valipour M., (2011), "Identification of Causes of Non-excusable Delays of Construction Projects", *International Conference on E-business,Management and Economics IPEDR*, vol.3, pp. 42-46 IACSIT Press, Hong Kong.

Aiyetan, A., Smallwood, J. and Shakantu, W., (2011), "A systems thinking approach to eliminate delays on building construction projects in South Africa",*ActaStructilia*2011: 18(2).

Alaghbari, W., Kadir, M.R.A., Salim, A., and Ernawati, A., (2007), "The significant factors causing delay of building construction projects in Malaysia", *Engineering, Construction and Architectural Management*, vol. 14 (2), pp. 192-206.

Amoako K.B, (2011), "The Effect of Delayed Payment on Cash Flow Forecasting of GhanaianRoad Contractors", *Unpublished CEMBA Thesis Report*, Institute of Distance Learning, KwameNkrumah University of Science and technology, Kumasi, Ghana.

Arcila S.G., (2012), "Avoiding cost overruns in construction projects in the United

Kingdom", *Unpublished MSc Thesis*, The University of Warwick, Warwick Manufacturing Group, UK.

Arditi, D. and Pattanakitchamroon, T., (2006), "Selecting a delay analysis method in resolving construction claims", *International Journal of Project Management*, vol. 24, pp. 145-55.

Assaf, S.A. and Al-Hejji, S., (2006), "Causes of delay in large construction projects", *International Journal of Project Management*, vol. 24, pp. 349–357

Assaf, S.A., Al-Khalil, M. and A-Hazmi, M., (1995), "Causes of Delay in Large Building Construction Projects", *Journal of Management in Engineering, ASCE,* pp. 45-50

Association of Project Managers (APM), (2006), *APM Body of Knowledge*, 5th ed., APM, London

Ayman, H. Al-Moumani, (2000), "Construction delay: a quantitative analysis", *international Journal of Project Management*, vol. 18 (1), pp. 51-59

Baloi, D. and Price, A.D.F., (2003), "Modelling global risk factors affecting construction cost performance", *International Journal of Project Management*, vol. 21, No.4, pp. 261-269

Baloyi, L. and Bekker, M., (2011), "Causes of construction cost and time overruns: The 2010 FIFA World Cup stadia in South Africa", *ActaStructilia* 18(1)

Bank of Ghana, (2009), *Ghana Shared Growth and Development Agenda* (GSGDA), Accra, Ghana

Brown, A., and Adams J., (2000), "Measuring the effect of project management on construction outputs: a new approach", *International Journal of Project Management,* vol. 18,pp. 327-335

Chan, A.P.C., (2001), "Time-cost relationship of public sector projects in Malaysia", *International Journal of Project Management*, vol.19, pp. 223-229

Chan, D. and Kumaraswamy, M. M., (2002), "Compressing construction durations: lessons learned from Hong Kong building projects", International *Journal of Project Management*,vol.20, pp. 23-35

Cheung, S.O, Suen, H.C.H. and Cheung, K.K.W., (2004), "PPMS: a Web-based construction Project Performance Monitoring System", *Automation in Construction*, vol.13, pp. 361-376.

Dell'Apa, F., (2008), "US could be used as late substitute", *Boston Globe*, Boston Massachusetts, U.S.A.

Dissanayaka, S.M. and Kumaraswamy, M.M., (1999), "Comparing contributors to time and cost performance in building projects", *Building and Environment*, vol. 34, pp. 31- 42.

Doloi, H.K., (2011), "Understanding stakeholders' perspective of cost estimation in project management", *International Journal of Project Management*, vol. 29, No.5, pp. 622-636.

Eden, C., Williams, T. and Ackermann, F., (2005), "Analysing project cost overruns comparing the "measured mile" analysis and system dynamics modelling", *International Journal of Project Management*, vol. 23, No. 2, pp. 135-13

Flyvbjerg, B., Holm, M.K.S and Buhl, S.L., (2003), "How common and how large are cost overruns in transport infrastructure projects?", *Transport Reviews*, vol. 23, no. 1, Department of Development and Planning, Aalborg University, Taylor and Francis Group, Aalborg, Denmark.

Frimpong, Y., Oluwoye, J., and Crawford, L., (2003), "Causes of delay and cost overruns in construction of groundwater projects in developing countries: Ghana as a case study", *International journal of project management* vol. 21(5), pp. 321-326.

Fugar, F.D.K and Agyarkwah-Baah, A.B, (2010), "Delays in building construction projects in Ghana", *Australian Journal of Construction Economics and Building*, vol. 10 (1/2), pp. 103-116.

Ghana News Agency, (2013), "*National Projects in 'limbo'"*, Published News Article, www.ghananews.com, accessed on May 08, 2014.

Gkritza, K. and Labi, S., (2008), "Estimating Cost Discrepancies in Highway Contracts: Multistep Econometric Approach", *Journal of Construction Engineering and Management*,vol. 134, No. 12, pp. 953-96.

Iyer, K.C. and Jha, K.N., (2005), "Factors affecting cost performance: evidence from Indian construction projects", *International Journal of Project Management* vol. 23 nr.4, pp. 283-295.

Jackson, S., (2002), "*Project cost overruns and risk management*", The University of Reading, Reading, UK.

Jouini, E., Meddeb, M. and Touzi, N.(2004), Vector-valued coherent risk measures. Finance andStochastics8, 531–552.

Karim K. and Marosszeky M., (1999), "Process monitoring for process re- engineering-using key performance indicators", *International Conference on Construction Process Re-engineering*, CPR 99, Sydney UNSW 12-13 July, Building Research Centre.

King, R., (2012), "*'White elephant' London 2012 Olympics runs£2bn over budget as security costs double due to 'poor planning' since 7/7"*, The Daily Mail, Main Section ed. dailymail.co.uk.

King, T.D., (2013), "*Assessment of problems associated with poor project management performance"*, Long International Inc., Littleton, C.O., USA

Koushki, P A, Al-Rashid, K and Kartam, N., (2005), "Delays and cost increase in the construction of private residential projects in Kuwait", *Construction Management and Economics*, vol. 23, pp. 285-294

Kuprenas, J.A., (2003), "Project management actions to improve design phase cost performance", *Journal of Management in Engineering*, vol. 19, no.1, pp. 25-32

Le-Hoai, L., Lee, Y.D. and Lee, J.Y., (2008), "Delay and cost overrun in Vietnam large construction projects: A comparison with other selected countries", *KSCE Journal of Civil Engineering*, vol. 12 nr.6, pp.367–377

Lehtonen, T.W., (2001), "Performance measurement in construction logistics", *International Journal of Production Economics*, vol. 69, pp.107-116

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

Love, P.E.D., Tse, R.Y.C. and Edwards, D.J., (2005), "Time-Cost Relationships in Australian Building Construction Projects", *Journal of Construction Engineering and Management*, vol. 131, no. 2, pp. 187-194

Love, P.E.D., Wang, X., Sing, C.-P. AndTiong, R.L.K., (2012), "Determining the Probability of Project Cost Overruns", *Journal of Construction Engineering and Management* vol. 1 nr.1, pp. 438-438

Mansfield, N.R., Ugwu, O.O. and Doran, T., (1994), "Causes of delay and cost overruns in Nigerian construction projects", *International Journal of Project Management*, vol. 12 nr.4, pp. 254-260

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*, Volume 3, Issue 3, March 2013, pp. 396-404

Mohd, M.M., (2010), "The Factors and Effect of Delay in Government Construction Project (Case Study InKuantan)", *Unpublished BSc Thesis Report, Faculty of Civil Engineering & Earth Resources*, Universiti Malaysia Pahang

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

Navon, R., (2005), "Automated project performance control of construction projects", *Automation in Construction*, vol. 14, pp. 467-476

Odeck, J., (2004), "Cost overruns in road construction—what are their sizes and determinants?",*Transport Policy*, vol.11 nr.1, pp. 43-53

Odeh, A.M., and Battaineh, H.T., (2002), "Causes of construction delay: traditional contracts",*International Journal of Project Management*, vol. 20, pp. 67–73.

Odeyinka, H.A., andYusif, A., (1997), "The causes and effects of construction delays on completion cost of housing project in Nigeria", *Journal of Financial Management and Property Construction*, vol. 2(3), pp.31–44

Ogunlana, S.O., Promkuntong, K. &Jearkjirm, V., (1996), "Construction delays in a fast-growing economy: Comparing Thailand with other countries", *International Journal of Project Management*, vol. 14 nr.1, pp. 37-45

Okuwoga, A.A., (1998), "Cost-time performance of public sector housing projects in Nigeria", *Habitat International*, vol. 22, no. 4, pp. 389 ñ 395

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*, vol.28 no.5, pp. 509-526

Othman, A.A.E., (2013), "Challenges of Mega Construction Projects in Developing Countries", *Organization, Technology and Management in Construction*, vol. 5 (1), pp. 730 – 746

Pheng, S.L. and Chuan, Q.T., (2006), "Environmental factors and work performance of project managers in the construction industry", *International Journal of Project Management*, vol. 24, pp. 24-37

Reichelt KS and Lyneis JM. (1999). *The dynamics of project performance: benchmarking thedrivers of cost and schedule overrun*. European Management Journal17(2)

RICS, (2013), *RICS workshop on Project Management Perspectives on Planning, Cost Management and Performance*, India

Sambasivan, M. and Soon, Y.W., (2007), "Causes and effects of delays in Malaysian construction industry", *International Journal of Project Management*, vol. 25(5), pp. 517-526

Samson, M. and Lema, N.M., (2002), "*Development of construction contractors performance measurement framework*", 1st International Conference of Creating a Sustainable Built Environment, U.K

Shaban, S.S.A., (2008), "Factors Affecting the Performance of Construction Projects in the Gaza Strip", *Unpublished Thesis Submitted in Partial Fulfillment of the*

Requirements for Degree of Master of Science in Construction Management, The Islamic University of Gaza, Palestine

Singh, R., (2009), "Delays and Cost Overruns in Infrastructure Projects: An Enquiry into Extents, Causes and Remedies", *Working Paper No. 181, Centre for Development Economics CDE* August 2009, http://www.econdse.org/faculty/ram/ram.htm

Smith, H., (2011), "Remedies for Delay in Construction Contracts", *Construction Dispute Avoidance Newsletter* number 33, November 2011

Sweis, G., Sweis, R., Abu Hammad, A. and Shboul, A., (2008), "Delays in construction projects: The case of Jordan", *International Journal of Project Management* vol. 26 (6), pp. 665-667

Syal, R. and Gibson, O., (2012), "*Olympic Games risk going over budget as cost hits £11bn, say MPs*", The Guardian, guardian.co.uk

Shen L.-Y., Lu W.-S., Yao H., Wu D.-H. (2005). "A computer-based scoring method for measuring the environmental performance of construction activities".

Automation in Construction 14:297-309.

Tangen, S., (2004), "Professional practice performance measurement: from philosophy to practice", *International Journal of Productivity and Performance Management*, vol. 53, no. 8, pp. 726-737

The Standish Group (2013), "*CHAOS Manifesto: Think Big, Act Small.* The Standish Group

APPENDIX 1

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF BUILDING TECHNOLOGY

SURVEY QUESTIONNAIRE (MSc RESEARCH PROJECT)

Dear Sir,

REQUEST FOR ASSISTANCE

As part of research into the topic **'factors that lead to poor project performance'**, this questionnaire has been designed to aid in collecting relevant information necessary for the research.

Valuable information would be obtained by you providing the requisite information, which would be useful in furnishing the Ghanaian Construction Industry with knowledge which would help grow the industry.

All information provided herein shall be treated and held in utmost confidentiality, respecting your reservations as well. It is imperative that you complete the questionnaire in totality. This would enable the researcher to make meaningful analysis based on the information provided.

Your firm was selected through a convenience sampling process to be a valued respondent to this important questionnaire.

Your co-operation is appreciated.

.....

Yours Sincerely

Researcher: **Alfred Jerry Asmah**

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF BUILDING TECHNOLOGY

SURVEY QUESTIONNAIRE (MSc RESEARCH PROJECT)

TOPIC: 'FACTORS THAT LEAD TO POOR PROJECT PERFORMANCE.'

Guidelines to answering the questionnaires:

1. All answers selected should be done candidly; without any external influences.
2. Kindly answer all questions as you actually feel about it
3. Kindly select by ticking in the appropriate boxes where applicable.
4. Multiple selections are allowed only in sections where indicated; otherwise, all answers should be selected once by the appropriate means.
5. Where it is required to write, kindly do so briefly and concisely with all the relevant information provided.

Completing this questionnaire should take a maximum of 8minutes.

Your invaluable contributions are highly appreciated.

RESEARCH STUDENT: **Alfred Jerry Asmah**

SUPERVISOR: **Mr. Peter Amoah**

QUESTIONNAIRE FOR RESPONDENTS

SECTION A. GENERAL ORGANIZATION INFORMATION

1. Class of firm?

D1/K1	[ ]	D3/K3	[ ]
D2/K2	[ ]	D4/K4	[ ]
A1/B1	[ ]	A3/B3	[ ]
A2/B2	[ ]	A4/B4	[ ]

2. Major type of work involved in

   Building Construction projects [ ]

   Civil Engineering projects [ ]

   Both of the above [ ]

3. Respondent's designation (PLEASE TICK APPROPRIATELY)

   Project Manager [ ]

   Site Engineer [ ]

   Office Engineer [ ]

   Architect [ ]

   Quantity Surveyor [ ]

   Others, please

   specify…….

4. Work experience

   1-3years [ ] 3-6 years [ ] 6-10 years [ ] above 10 years [ ]

SECTION B- FACTORS THAT LEAD TO POOR PROJECT PERFORMANCE

5. The following factors have been identified as some of the contributory factors which lead to poor project performance. Rank on a Likert scale of 1-5 the level of contribution of these factors to poor project performance during construction activities.

1	2	3	4	5
Not a contributory factor	Low level of contribution	Neutral	Contributory factor	High level of contribution

Factors that lead to Poor Project Performance	1	2	3	4	5
1. Unpredictable weather conditions					
2. Inaccuracy of materials estimate					
3. Inaccurate prediction of craftmen production rate					
4. Inaccurate prediction of equipment production rate					
5. Materials shortage					
6. Equipment shortage					
7. Skilled labour shortage					
8. Locational restriction of the project					
9. Inadequate planning					
10. Poor labour productivity					
11. High quality of finishes needed					
12. Slow information flow between project team members					

13. Discrepancies in contract documents					
14. Suspension of work by owner or contractor					
15. Insufficient number of staffs					
16. Poor site management					
17. Uncompromising attitude between parties					
18. Equipment allocation problems					
19. Cash problem during construction					
20. Inadequate funds for the project					
21. Inadequate planning of project before commencement					
22. Delay in delivery of materials					
23. Subcontractor incompetence					
24. Delay in response to decision making					
25. Incompleteness of technical documentation					
26. Labour dispute in the form of strikes or lock-out					
27. Unexpected subsoil/ground condition					
28. Inadequate instructions to operators					
29. Delay in inspection and testing of completed work					
30. Political instability or change in government policies					
31. Accidents					
32. Obtaining building permits and approvals					
33. Clients delay in payment certificates					
34. Unrealistic clients requirements					
35. Contract modifications					
36. Major disputes/negotiations on site					

37. Delays in preparation of interim certificates					
38. Poor subcontractor selection processes					
39. Little periodical sessions to address work problems					
40. Centralization of decision making process of client					
41. Others					

If others, please specify ……

SECTION B- FACTORS THAT LEAD GOOD PROJECT PERFORMANCE

6. The following factors have been identified as some of the contributory factors that lead to good project performance. Rank on a Likert scale of 1-5 the level of contribution of these factors to budget excess during construction activities.

1	2	3	4	5
Not a contributory factor	Less level of contribution	Neutral	Contributory factor	High level of contribution

ITEM	FACTORS	1	2	3	4	5
1	Effective risk management					
2	Effective cost management principles					
3	Effective time management practices					
4	Effective safety management practices					
5	Effective resource management technique					
6	Client satisfaction management practices					
7	Effective communication between client, contractor and consultant					
8	Effective project scheduling					
9	Effective quality management practices					
10	Others					

If others, please specify ……