

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY,  
KUMASI, GHANA**

**Assessing the Implications of Cost Overruns in the Construction Industry in Ghana**

**BY**

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**MASTER OF SCIENCE**

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**DECLARATION**

I hereby declare that this submission is my own work towards the MSc Project Management 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.

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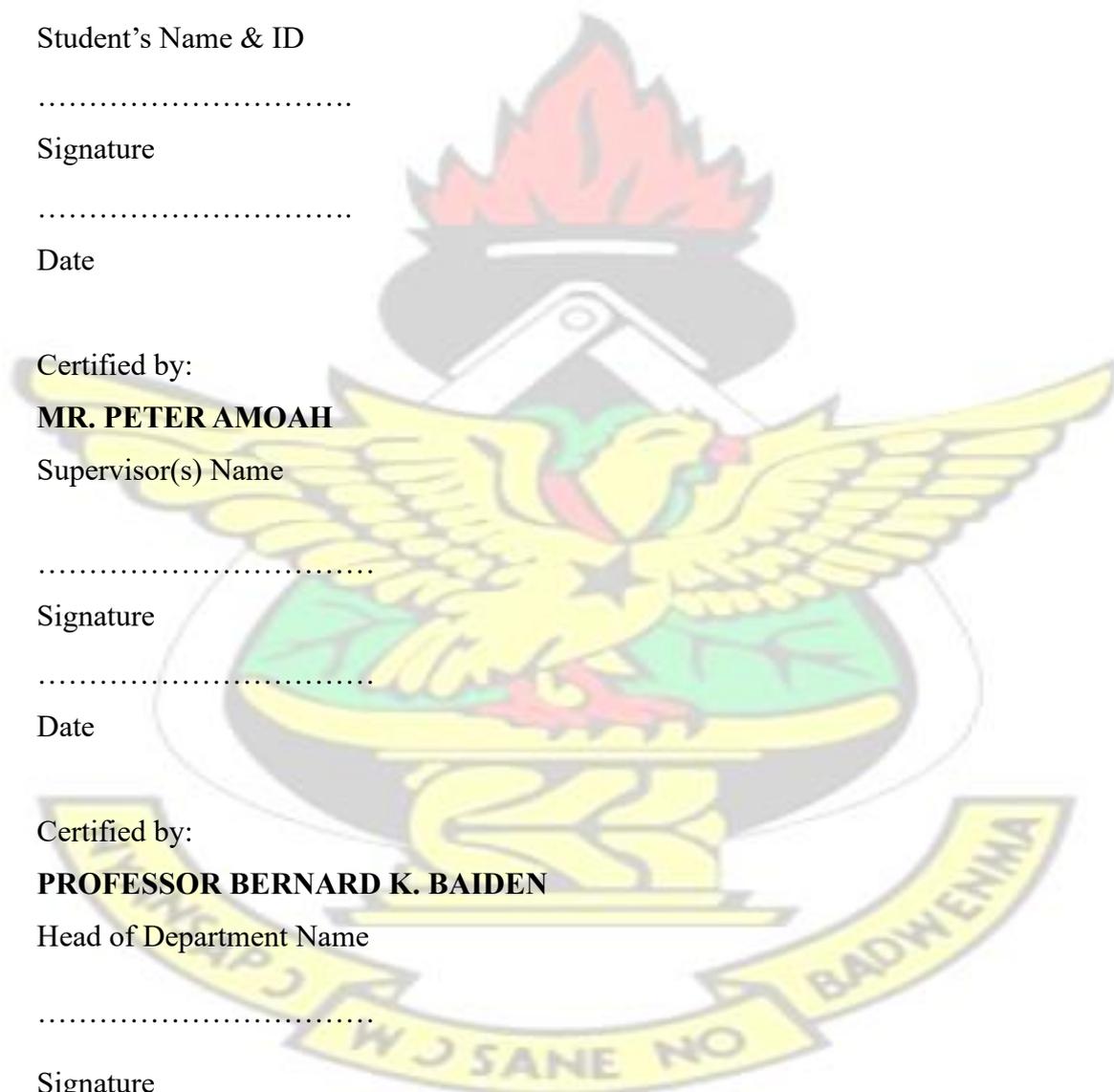
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## ABSTRACT

The issue of cost overruns in construction has indeed marred the quest for monetary worth in contracts executed as the country gears up to fill infrastructural gap as part of efforts towards national development. The existence of cost overruns has also affected the significant contributions aimed at the improvement to the overall Gross Domestic Product (GDP). Cost overruns inevitably yield overruns in construction of projects, the effects of which results in slippage of project schedules, a situation which does not augurs well for the construction industry. This, undoubtedly, creates implication of the variations in the budgets earmarked for the construction. In view of this, the study assessed the implications of cost overruns in the construction industry in Ghana. As a research design based on qualitative and quantitative approaches, the study relied on purposive sampling technique, a sample size of 117 respondents was selected for data collection. A 100% response rate was achieved in the questionnaire administration. There should also be explicit legal regime so as to legislate for the contractors and consultants to ensure that the best practices and standards tenets of construction cost estimates are carried out within the legal framework so as to manage cost overruns in construction. The key findings of study included inadequate skilled in estimating total project cost and disrespect for expert advice by contractors. It was also discovered that, problem of non-compliance with laid down rules concerning bidding for contracts, lack of appropriate bidding process and inadequate measures for evaluating the projects under construction are contributing factor. Among the key recommendations of the study was that there should be effective evaluation of project-cost relationship by the appropriate agencies tasked with the above stated responsibility. Regular time-cost trade-off analysis should be undertaken at all levels of the progress of the contract to be diligently carried out so as to shorten the project duration and to further get rid of any possible emergence of cost overruns in construction.

**Keywords:** Assessing Implications, Cost Overruns, Construction Industry

## TABLE OF CONTENT

<b>Table of content</b>	<b>Page</b>
Declaration.....	i
Abstract.....	ii
Acknowledgement.....	iii
Dedication.....	v
List of Tables .....	viii
List of Figures .....	ix
List of Acronyms.....	x
 <b>Chapter One: Introduction</b>	
1.1 Background to the Study .....	1
1.2 Statement of Problem.....	2
1.3 Aim.....	2
1.4 Research Questions.....	3
1.5 Significance of the Study.....	3
1.6 Scope of the Study.....	4
1.7 Brief Methodology.....	4
1.8 Organization of the Thesis.....	5
 <b>Chapter Two: Literature Review</b>	
2.1 Introduction .....	6
2.2 Operational Definitions of Key Concept.....	6
2.3 The Construction Industry.....	6

2.4 The Causes of Cost overruns Resulting in Projects Overruns .....	7
2.5 The Implications of Cost overruns on Projects in the Construction Industry....	9 2.6
Significance of cost overruns in construction .....	10

iii

2.7 The Impact of Cost overruns on Projects in the Construction Industry .....	13
2.8 Strategies Aimed at Addressing the Challenges Posed by Cost overruns on Projects in the Construction Industry .....	14
2.9 Theoretical Frameworks on Cost Overruns .....	16

### **Chapter Three: Methods Used**

3.1 Introduction.....	20
3.2 Research Design.....	20
3.2.1 Research Approach.....	20
3.2.2 Research Structure.....	21
3.2.3 Research Method.....	21
3.3 Population of Study.....	21
3.4 Sample Size Selection.....	22
3.5 Sampling Technique.....	23
3.6 Validity and Reliability.....	23
3.7 Data Sources.....	23
3.7.1 Primary Data.....	24
3.7.2 Secondary Data.....	24
3.8 Data Collection Instruments .....	24
3.8.1 Questionnaires.....	25
3.9 Analysis Procedure and Tools.....	25

3.10 Ethical Considerations.....	26
3.10.1 Privacy Rights.....	26
3.10.2 The Potential Psychological Harm.....	26
3.10.3 Deception.....	26
3.10.4 Confidentiality.....	27



**Chapter Four: Analysis, Discussions and Interpretation of data**

4.1 Introduction.....	28
4.2 Socio-Demographic Characteristics.....	28
4.3 Construction Industry and Economic Growth .....	30
4.4 Causes of Cost overruns in Construction.....	33
4.5 The Implications of Cost overruns in the Construction Industry.....	38
4.6 Appropriate Strategies Aimed at Addressing the Challenges Posed by Cost overruns in Ghana.....	42

**Chapter Five: Summary, Conclusion and Recommendations**

5.1 Introduction .....	47
5.2 Summary of findings .....	47
5.2.1 Socio-Demographic Characteristics .....	47
5.2.2 The Role of the Construction Industry in Economic Growth.....	47
5.2.3 The Causes of Cost overruns in construction.....	48
5.2.4 Challenges Affecting Cost overruns in the Construction Industry.....	48
5.3 Conclusion.....	48
5.4 Recommendations .....	49
References.....	51

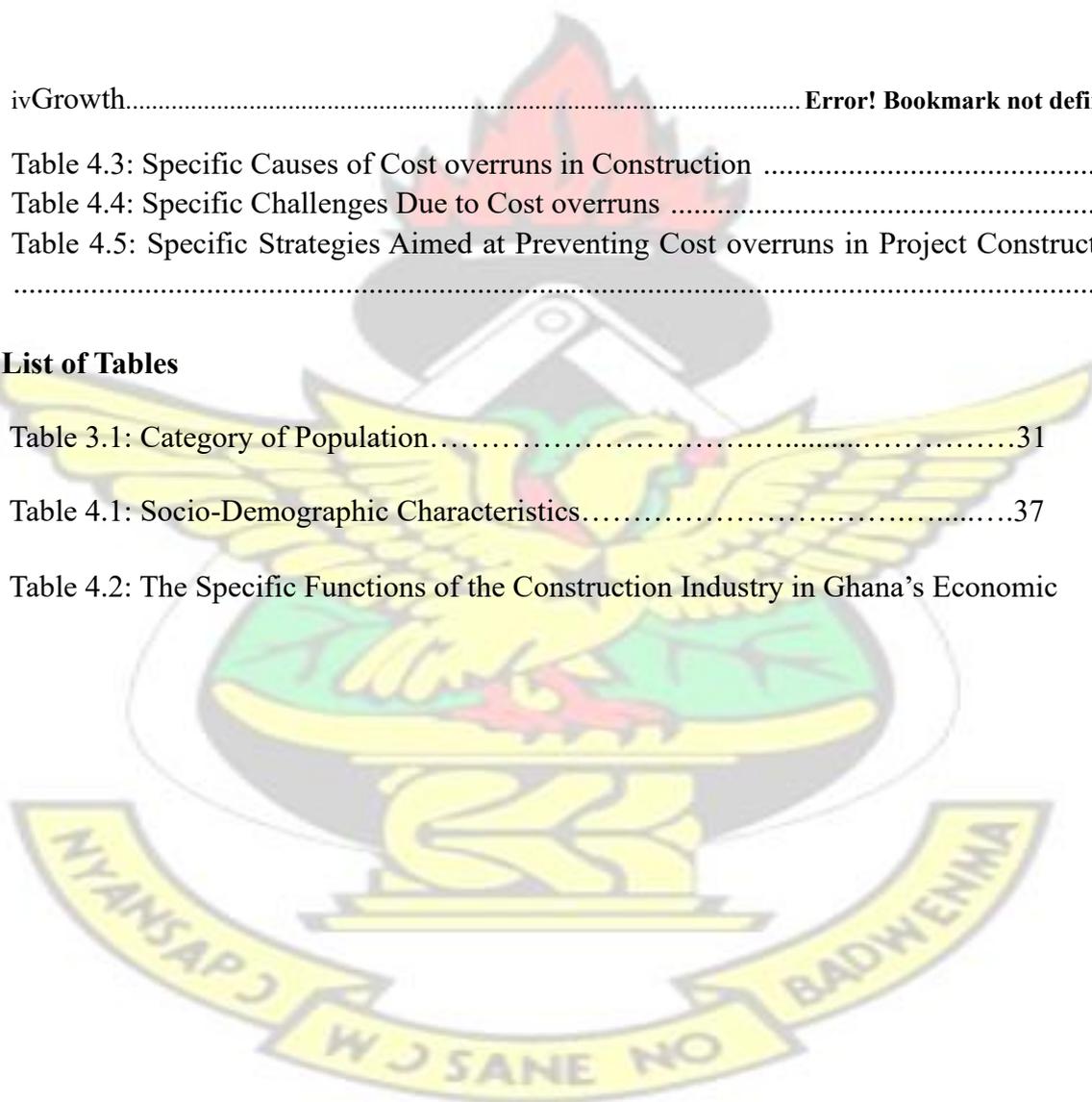
Appendices.....	56
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# KNUST

ivGrowth.....	<b>Error! Bookmark not defined.</b>
Table 4.3: Specific Causes of Cost overruns in Construction .....	32
Table 4.4: Specific Challenges Due to Cost overruns .....	37
Table 4.5: Specific Strategies Aimed at Preventing Cost overruns in Project Construction .....	41

## List of Tables

Table 3.1: Category of Population.....	31
Table 4.1: Socio-Demographic Characteristics.....	37
Table 4.2: The Specific Functions of the Construction Industry in Ghana’s Economic	



# KNUST

## List of Figures

ivi

Figure 3.1: Conceptual Framework on Causes of Cost overruns.....	27
Figure 4.1: Construction Industry and Economic Growth .....	39
Figure 4.2: Project Constructed Within Anticipated Cost. ....	41
Figure 4.3: The Essence of Cost overruns in the Construction Industry.....	42
Figure 4.4: Major Causes of Project Overruns in Construction .....	45
Figure 4.5: Repercussion for Contractors Due to Cost overruns.....	46
Figure 4.6 Cost overruns Results in Delay in Project Execution in the Construction Industry .....	47
Figure 4.7: Possibility of Suggesting Appropriate Strategies .....	50
Figure 4.8: Monitoring of Cost overruns for Actual Project Progress .....	51

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## List of Acronyms

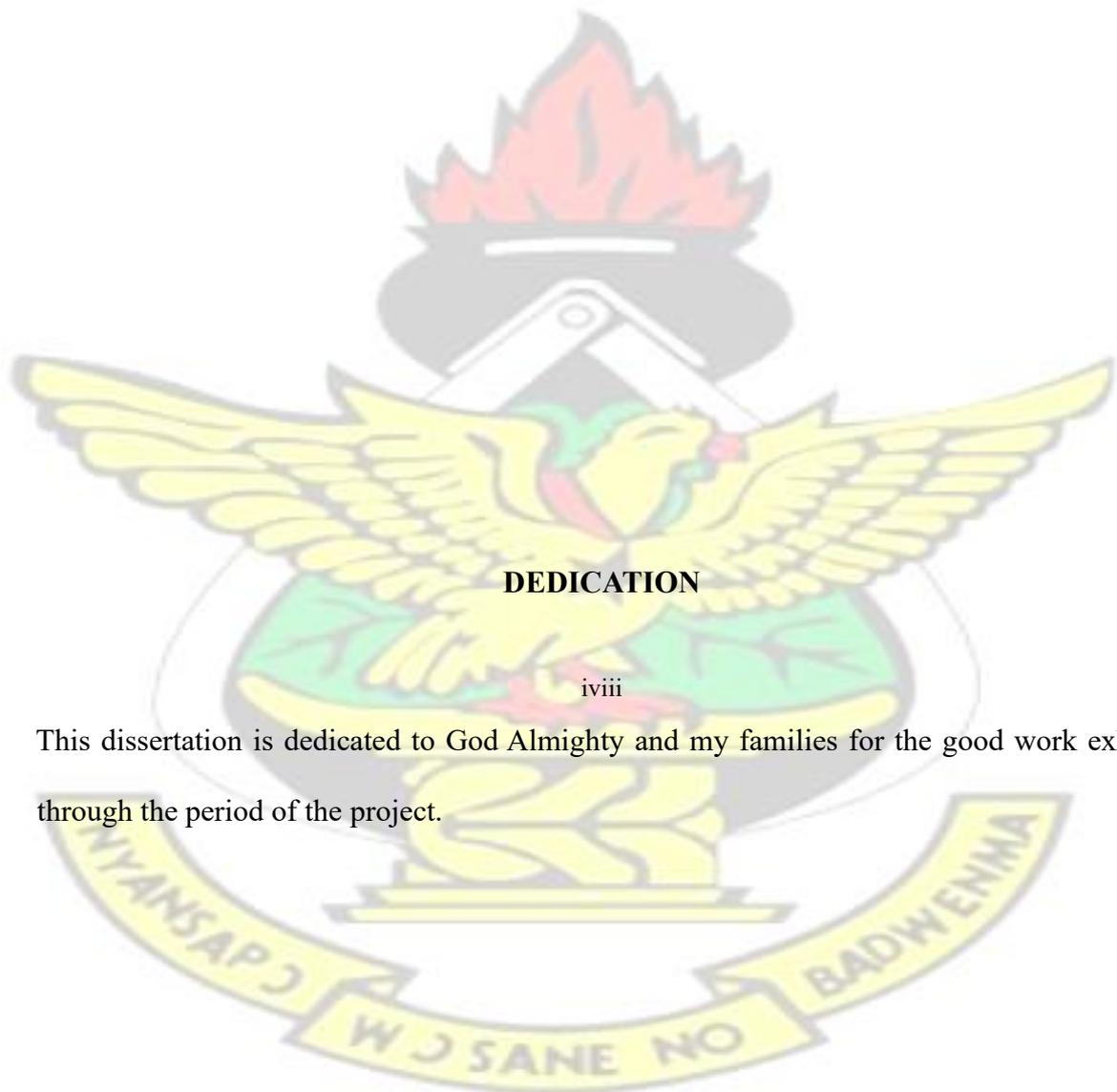
ivii

<b>Acronyms</b>	<b>Full Meaning</b>
CDD	Center for Democracy and Development
DA	District Assembly
DCE	District Chief Executive
FGD	Focus Group Discussion
GoG	Government of Ghana
MCE	Metropolitan Chief Executive
MMDAs	Metropolitan, Municipal and the District Assemblies
MPs	Members of Parliament
PNDCL	Provisional National Defense Council Law
RCC	Regional Coordinating Council
RMs	Regional Ministers
UCs	Unit Committees

SSRN Social Service Research Network

MDAs Ministry, Department and Agencies

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## DEDICATION

iviii

This dissertation is dedicated to God Almighty and my families for the good work exhibited through the period of the project.

# KNUST



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iix

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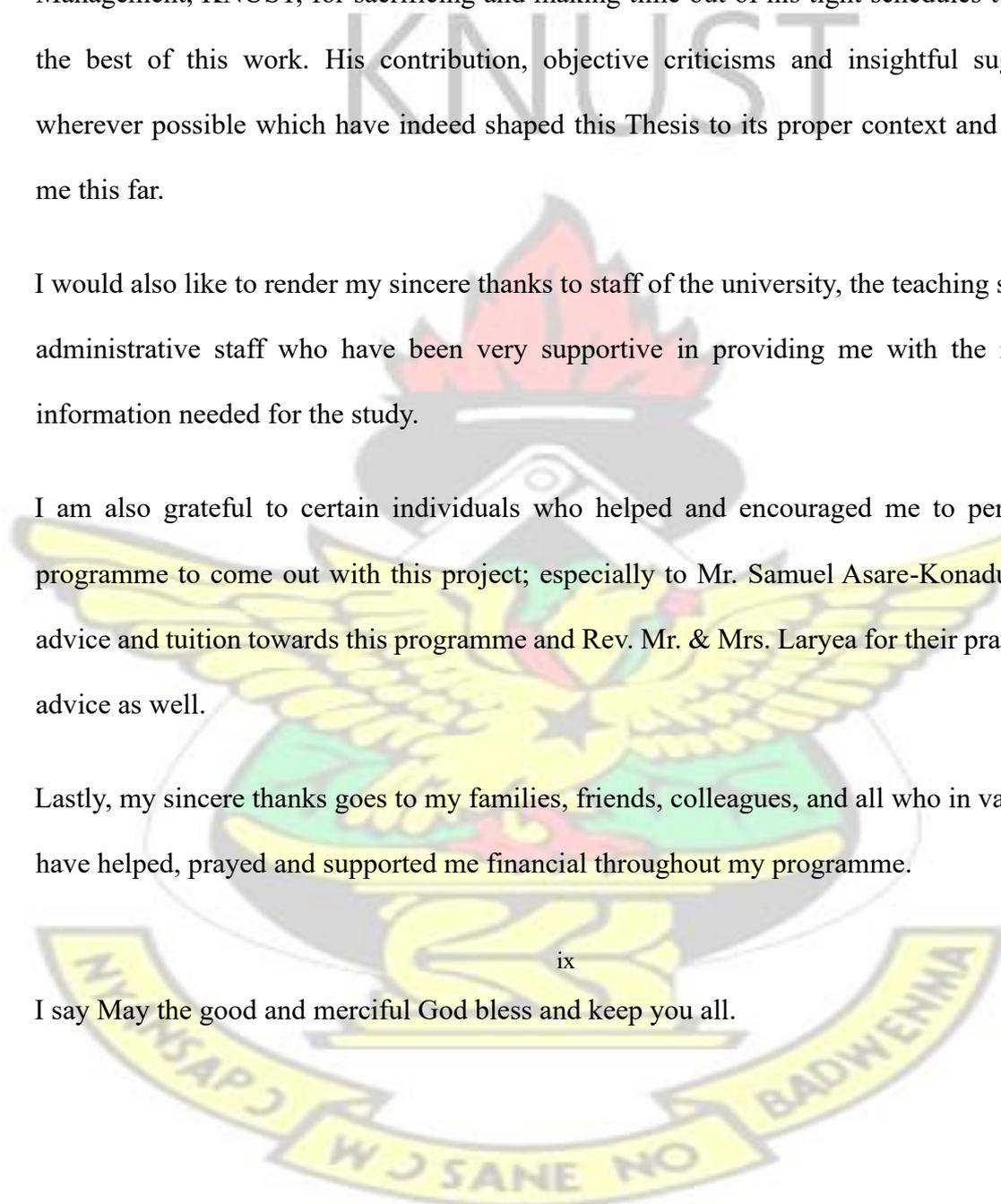
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I say May the good and merciful God bless and keep you all.



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## CHAPTER ONE

### INTRODUCTION

#### 1.1 BACKGROUND TO THE STUDY

The construction industry plays a significant and crucial role in the socio-economic growth of a country. Economically, it contributes meaningfully to the improvement to the overall GDP of Ghana. It also increases the quality of life by providing the necessary infrastructure such as roads, hospitals, schools and other basic and improved facilities for the performance of various social services in the economy. Hence, it is fundamentally essential in ensuring that construction projects are executed successfully within the budget limits and timelines. However, as it is a complex, fragmented and ambitious industry, it faces chronic difficulties such as cost volatility and other challenges such as low quality and productivity, construction waste and more.

Cost overruns result in severe problem that are likely to affect the quality of the infrastructure thereby affecting the overall development of any country (Olawale and Sun, 2010). Designs that results in cost overruns are considered a global phenomenon in the construction industry, where projects are rarely completed within the budgeted cost. In a global study (Flyvbjerg et al., 2013) on the performance of construction projects, cost overruns have been identified as the main problem, with 9 out of 10 projects exceeding 50 to 100% of the estimated budget (source of info). The construction industry in developed countries such as the UK is also affected by this problem, with nearly a third of clients complaining that their projects generally exceed their allocated budget, which affects the timetable (Olawale and Sun, 2010).

Like other countries, Ghana faces serious cost problems in the construction sector, as only 46.8% of public and 37.2% of private sector projects were completed within the given budget (Ibrahim et al., 2013). The problems of cost volatility have become a serious investment

challenges that require intensive care and in-depth research to find solutions to the problems that lie ahead. Therefore, this study focused on assessing the implications of cost overruns in the construction industry.

## **1.2 STATEMENT OF THE PROBLEM**

Cost overruns inevitably yield overruns in construction of projects. Most often, regarded by consultants as slippage of project schedules, a situation which does not augurs well for the construction industry. The implication of the variations is that the budget and time earmarked for the construction of projects increase, thereby going beyond the timelines to complete the construction projects after planned date. Surroundings of construction of projects is sometimes influenced by both the internal and external causes. Cost fluctuations typically arise in the form of cost increases, which at the conclusion of the project represent the difference between the preliminary estimated and final costs, which results in the projects going beyond the planned date.

It is in view of the above problem that; this study is being conducted to attempt addressing the challengers pose by the phenomenon under study.

## **1.3 AIM AND OBJECTIVES OF THE STUDY**

The aim of the study is to assess cost implications of variations in large construction projects, specifically commercial projects.

The aim of this study seeks to achieve the following objectives:

1. To identify causes of cost overruns in the construction industry that results in projects overruns;
2. To identify the implications of cost overruns in the construction industry; and
3. To prepare appropriate strategies aimed at addressing the implications posed by cost overruns in construction.

## **1.4 RESEARCH QUESTIONS**

In a study of this nature, it is important to find answers to the under listed questions:

1. What are the causes of cost overruns in the construction industry that results in projects overruns?
2. Are there implications of cost overruns on the construction industry?
3. What appropriate strategies could be recommended to address the challenges posed by cost overruns in construction?

## **1.5 SIGNIFICANCE OF THE STUDY**

The study aims to provide practical and workable solutions to challenging problems caused by different costs in the construction industry. The authorities in charge of awarding contracts in the construction industry may find the outcomes of the study worthy of implementation since it will provide comprehensive project management practices aimed at reducing cost overruns in construction. The study will also draw the attention of the authorities in the construction industry on the underlying challenges which adversely affect contractors as a result of cost overruns. The study shall also be a useful to research students and research organizations since the findings will provide an important source of literature which would be relevant for further studies relative to cost overruns in construction. It may also be useful to policy makers, marketing professionals and other stakeholders interested in how quality service delivery is delivered in the construction industry devoid of cost overruns.

## **1.6 SCOPE OF THE STUDY**

This study was carried out specifically in the construction sector and in Accra Metropolis.

The sample was restricted to the stakeholders (consultants and contractors) in the industry. Although there are numerous construction variations and their implications, this study could not cover the exhaustive list of construction challenges due to constraints such as time.

Nevertheless, cost overruns are considered in this study.

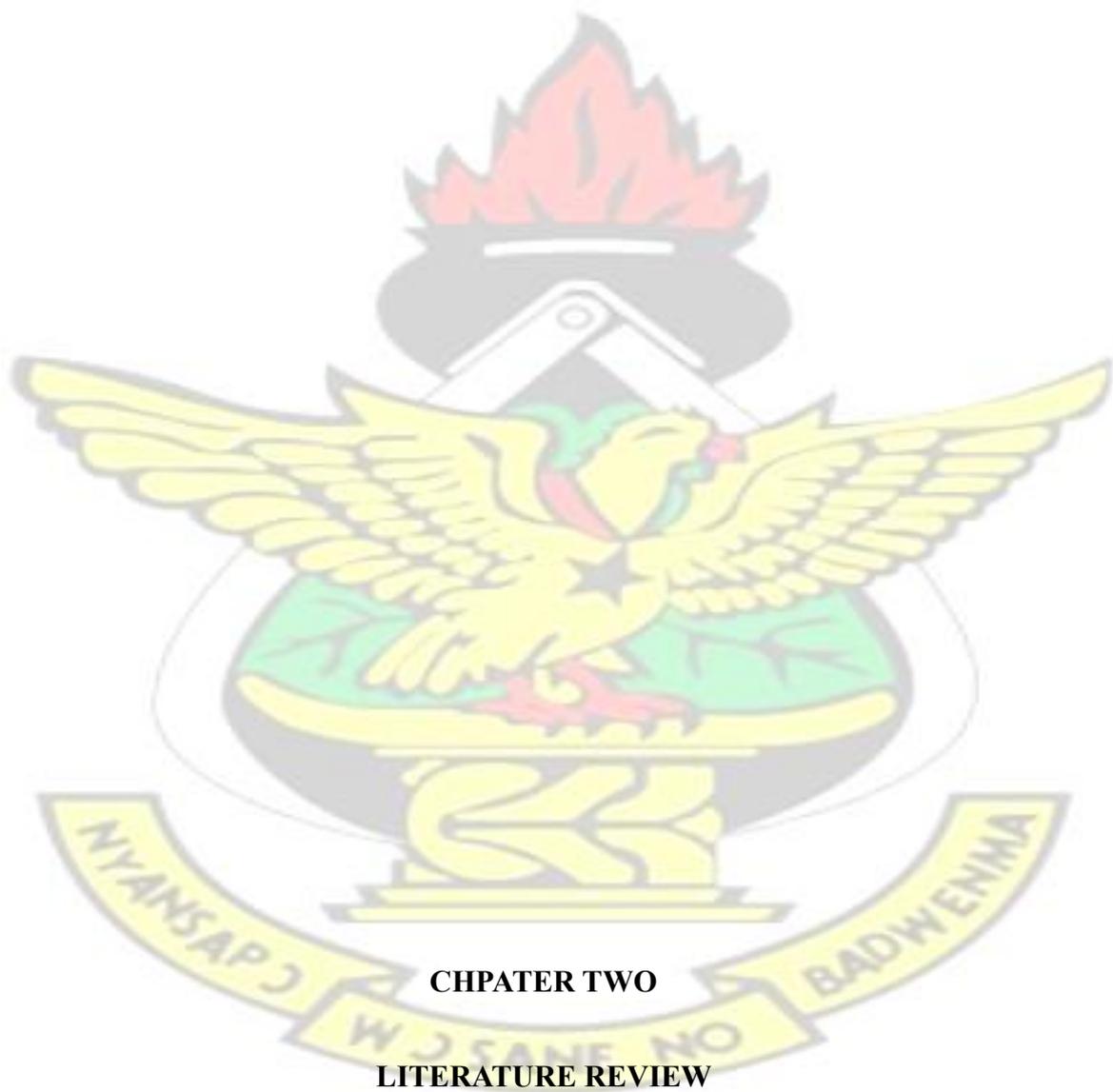
## **1.7 BRIEF METHODOLOGY**

The study adopted quantitative method in gathering data. Hence, the researcher contacted respondents using survey questionnaires to collect the required data. The data for this project work were obtained from two main sources namely primary and secondary. The primary sources provide firsthand information from instruments such as the questionnaires. The secondary sources which basically processed information are used particularly during the literature review. The researcher ensured that no respondents was sampled twice. Through purposive sampling technique, a sample size of 117 respondents was selected from both consultants and staff of construction firms. Descriptive analysis using frequencies, percentages, and tables was utilized in presenting and analyzing the data. In order to ensure the legitimacy and dependability of the data that was obtained, the researcher ensured that, the respondents were sufficiently furnished with the required information and cross checking with instruments over and over before data analysis. The researcher also ensured that the respondents were not psychologically harmed by making sure that, questions asked were not offensive. Confidentiality of the information was also assured by making sure that names and addresses of respondents were not attached to the responses provided.

## **1.8 ORGANISATION OF THE THESIS**

This study was organized in five chapters. Chapter one dealt with the introduction of the research which comprises the background to the study, problem statement, study objectives, research questions, significance and scope of the study as well as limitations and the

organisation of the study. Chapter two dealt with the literature review on cost overruns in construction. Chapter three covered the methods and processes employed for data collection of the study. Chapter four presented and analyzed the results of the study. The final chapter, thus, chapter five presented the summary of the findings, the conclusions drawn from the study and finally the appropriate recommendations to address the challenges associated with cost overruns in construction.



## **CHPATER TWO**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

This chapter sets out the core areas of literature to be reviewed and their respective authors and other relevant references. These areas are known as follows: the causes of cost overruns resulting in projects overrun, the implications of cost overruns on projects in the construction industry, significance of cost in construction, the impact of cost overruns on projects in the construction industry in Ghana and the strategies aimed at addressing the challenges posed by cost overruns on projects in the construction industry.

## **2.2 OPERATIONAL DEFINITIONS OF KEY CONCEPTS**

**Large construction projects:** The study considered a large construction projects to be large commercial projects meant or used for commercial purposes.

## **2.3 THE CONSTRUCTION INDUSTRY**

In every country, construction plays a crucial role in the economic development and it also promotes improvement of other productions (Rum and Akasah, 2011). There is significant funding worldwide in the construction industry, providing significant jobs and vital infrastructures. The construction industry requires a better effectiveness of the industry to contribute to the development of the economy by implementing effective project. Achieving construction projects within expected costs and at excellent levels is a way of projects being executed successfully. Notwithstanding the importance of every building costs, most construction projects in developing and emerging countries regularly have significant cost overruns. Many studies, including this specific study, are being carried out in many countries, including Ghana, on construction cost overruns. The construction industry is a single branch of the developing industries that contribute to the socio-economic development of the country, but donate minimal services, production and agriculture sectors.

Construction in Ghana have suffered significant cost losses since the beginning of the fourth Republic (Olawale & Sun, 2010).

Shehu et al. (2014) indicated that more than 50% of the projects had difficulty in overspending. While Rahman et al. (2012) confirms that cost overruns in the global construction industry are a major challenge that requires to be reduced or controlled. The effective control in cost overruns, the consideration of relevant factors in these matters is very important. This chapter explains the different causes of building cost overruns. In Ghana, the construction industry is a developing industry that contributes to the socioeconomic development of the country, but it adds less than the service sector of agriculture and manufacturing. Construction in Ghana are suffering from cost issues that are the main theme of this study.

#### **2.4 THE CAUSES OF COST OVERRUNS RESULTING IN PROJECTS OVERRUNS**

One of the causes of cost variation in the construction is the assessment of the order of change in the project design. Contract renewal with issuing of variations or contract amendments to the contract or cost management of a lump sum contract. They are triggered by either the owner for a change the owner wishes to make, due to unforeseen conditions such as subterranean obstacles or an area result of the contractor providing the response to an RFI, a change in the contract drawings or specifications (Ahuja et al., 2013). Dlakwa and Culpin (2010) emphasized the fact that the negotiator must rely, at least in part, on an independently prepared government estimate in order to arrive at an agreed price / cost. Detailed analysis of changes in demand and current working conditions must be the bases of an estimate. Instead of better data, the Government's estimate for bid evaluation can be used as support. It is imperative to fully understand the range of change (for example, by meeting with the designer and the owner) and then prepare a precise volume start for each direct change.

Project success which is defined as meeting goals and objectives as prescribed in the project plan could prevent cost overruns. A positive project means that the project has achieved its

technical performance, maintained its schedule and remained within budgetary costs (Frimpong, 2010). Project management tools and techniques play an important role in the effective management of a project. Therefore, good project management depends on the management tools and techniques used to manage the project. Project management involves the management of resources - workers, machines, money, materials and methods. Some projects are managed efficiently, while others are handled wrongly, resulting in significant delays and cost overruns (Ministry of Finance Government Budget Statement 1999 Ghana: Accra). A construction project such as groundwater consists of two phases: the preconstruction phase (the period between the preliminary design of the project and the signing of the contract; and the construction phase, which is the period after the award of the contract as and when the actual construction phase goes on). Delays and cost overruns nevertheless occur in both phases; the main causes of project overruns usually take place during the construction phase. Previous studies show extensive information on project delays and cost overruns (Frimpong, 2010).

According to his work, he identifies and investigates the causes of delays and cost overruns in the construction of groundwater projects. The study is based on data on groundwater projects in Ghana. There are many factors that can lead to delays and cost overruns in groundwater drilling projects. These range from factors inherent in technology and its management to those arising from the physical, social and financial environment. A preliminary study carried out on water-drilling projects in Ghana found that 33 out of a total of 47 projects completed between 1970 and 1999 were delayed, while 38 projects were exceeded. The data showed that 75% of projects exceeded the original project plan and cost, while only 25% were completed within budget and on time. The study found that there are generally delays and cost overruns in the construction of groundwater projects in Ghana and developing countries, especially in

long-term projects. It is therefore important that a thorough analysis be conducted to enable efficient project management, reduce delays and avoid cost overruns (Frimpong 2010).

## **2.5 THE IMPLICATIONS OF COST OVERRUNS ON PROJECTS IN THE CONSTRUCTION INDUSTRY**

In particular, the design environment is constantly changing, leading to uncertain variables in the project data. As a result, the Project Manager faced performance issues in determining the exact project performance. To achieve better profits, the Project Manager must make a timely and informed decision. Nevertheless, current inefficiencies in monitoring and controlling project operations mean that the Project Manager cannot manage the project effectively and leads to a major reason for the failure of the project (Al-Tababai, 2012). The Project Manager should not only monitor the cost and timing of actual project progress by controlling the project performance, he/she should also determine the correct project status based on objective forecasts of final project enactment. When completed, project performance can be predicted by comparing the estimated total budget and the final duration with the most likely projected values (Ahuja et al., 2013). However, this is necessary so that the Project Manager can determine if corrective action is needed to minimize expected deviations from planned performance. Therefore, forecasts are required to predict project performance on completion based on current performance.

## **2.6 SIGNIFICANCE OF COST OVERRUNS IN CONSTRUCTION**

Barazza et al. (2014) argued that cost fluctuations lead to forecasts in the construction industry. In fact, the original estimates may be considered as the first project forecast, and at the time the project is completed, the last updated estimate (last forecast) and the actual amount of expenditure should be the same. When managing a construction project, the Project Manager should understand the importance of using project baselines that serve as a benchmark. This

should ensure that the project runs smoothly and that early indications of project deficiencies can be found. Therefore, necessary corrective action can be taken in time. Crandall and Woolery (2012) emphasized that in current practice, project baselines or planned S-Curves are used to determine cost or schedule variances and measure the value achieved. In this context, it explains why this method is widely used in the construction industry to measure the performance of projects. One of the advantages of this method is that it can detect cost and schedule deviations at the end of the project. However, this method will not be able to create corrective action plans if negative discrepancies are detected. Therefore, the Project Manager relies on the need to predict deviations in completion performance to determine the appropriate corrective action plans and impact on project performance (Crandall & Woolery, 2012).

A project cost relationship is also possible if cost overruns are effectively managed. In Davison (2013), the total cost of the project includes both direct costs and indirect costs for carrying out the project activities. Direct costs for the project include the cost of materials, labor, equipment and subcontractors. Indirect costs, on the other hand, are the costs necessary to carry out work that cannot be linked to a particular activity and, in some cases, cannot be linked to a particular project (Davison 2013). If any activity was scheduled for the duration that resulted in the minimum direct costs, the cost of completing the entire project might be too high and the high cost of the project would ultimately be penalized (Dlakwa, 2012). Since direct cost of project corresponds to the activities of direct cost of sum, there is therefore a possibility that the direct costs of the project will be increased by reducing its duration. On the other hand, the indirect costs will decrease by shortening the duration of the project, as the indirect costs are almost linear with the duration of the project (Khalil & AlGhafly, 2012).

Shortening project costs as Diekmann and Al-Tabtabai (2012) as a result of the minimum cost of completing a project, is measured against estimates for the project. This minimum

completion time for the project can then be used to determine the cost of the project crash. Since some activities are not on the critical path to which a longer duration can be assigned without delaying the project, it is beneficial to change the overall crash plan and thereby reduce costs (Diekmann and Al-Tababai, 2012). Approaches to solving the cost transaction problem, the cost-lope method, have proven to be efficient. In particular, a simple approach is to first apply critical path scheduling with all the activity periods that are believed to be at minimal cost. Next, the planner can examine activities on the critical path and reduce the planned duration of activities with the least resulting cost increases.

As Fleming and Koppelman (2013) put it, cost-loading is a model that requires each of the construction activities to include a cost or budget amount that reflects the cost of the activity's scope of activity. The cost of each construction activity should be "rolled up" to the entire value plan of the contract by using the work breakdown structure. This feature is typically found in government or public sector contracts, requires additional maintenance and allows an owner to make payments to a contractor based on the progress achieved for each activity. Note that using the schedule as a payment tool, unlike a construction forecasting tool, can skew forecasts of the project's completion date if the completed percentage of the activity is tied to both the cost amount and the remaining duration.

Inaccurate forecasts occur when the residual duration of an activity is not adjusted to the actual circumstances (Fleming & Koppelman, 2013).

Many works contracts, especially government contracts, for large construction projects now include sections with the planning specifications that specify a specific methodology that the contractor must follow in order to prove his request for an extension of the schedule and related monetary damages. The analysis that implements this contractual methodology is commonly referred to as the time impact analysis of the time impact assessment. The basic concept of

time-impact analysis is to evaluate delays chronologically and cumulatively (Okpala and Aniekwu, 2012). The chronological and cumulative approach allows the scheduler as well as any fact finder to consider a number of key concepts:

- The schedule is dynamic and the critical path can change from month to month
- Time is a resource for the schedule operator as well as for those involved in the schedule.
- A logical consequence of this concept is the delay of a request for time extension, which effectively serves as a refusal.

The main advantage of the chronological and cumulative approach is that the status of the project is considered at the time of the delay. In this way, all parties of the project live with the events of the delay. Therefore, the parties accept the "victim" or "project" as they find it at the time of a delay (Okpala and Aniekwu, 2012).

## **2.7 THE IMPACT OF COST OVERRUNS ON PROJECTS IN THE CONSTRUCTION INDUSTRY**

When a change is made, billing this change involves the cost and time impact on ongoing work. A sphere of influence on the modification of unchanged work is difficult to define. The extent of the impact is broad, vulnerable and intangible to a variety of situations (Ogunlana & Olomolaiye, 2012). Impact costs are typically first presented by the contractor as "claimed" impact costs under the proposal. Support for such "claimed" costs should also be obtained and includes narratives, calculations and planned rescheduling. To determine the extent of the impact, the existing network provided by the contractor must be developed to reflect the actual design as accurately as possible. The change work must be superimposed on the original network plan so that the delay is minimized. The network must be reviewed for existing establishment plan (Davison 2013).

## **2.8 STRATEGIES AIMED AT ADDRESSING THE CHALLENGES POSED BY COST OVERRUNS ON PROJECTS IN THE CONSTRUCTION INDUSTRY**

Sambasivan and Soon (2011) came out with recommendations on challenges affecting cost overruns in the construction industry as follows:

Provisions for clients in the selection of contractors, clients must ensure that contractors are selected not only on the basis of the lowest bid. The selected contractor must have sufficient skill and other capabilities to carry out the work. Interfere by clients can lead to excessive delays in the project. Clients should have the finances on time to pay the contractors after completing a job. During the contract between the client and the contractor, the consultant must include points such as duration of contract, dispute resolution mechanism, mechanisms for assessing causes of delay and risk assessment plans. Consultants should closely monitor the work by providing specifications at appropriate times and make drawings available on time. The contractors must employ experienced professionals before accepting jobs for which they have no expertise.

Al-Momani (2010) Research on delays in the construction industry in Libya has made the following recommendation for reducing the causes of delays: The contractor's management team should act to control the causes within the planned element of planning and construction. Good planning practices, Planning, coordination and continuous control processes must be recognized. The project developer should introduce a risk management mechanism that will make an important contribution to reducing construction delays in projects. Early correct predictions should be considered to reduce the significant time loss. Always improve on estimated duration of activity to actual skill level and effectiveness of working time and to avoid mistakes and misunderstandings. Bentil (2014) said, to achieve a flawless design, includes: the right communication with the entire design professional, the coordination of the violin design process is paramount, so that proper planning, reasonable time for

troubleshooting, extensive Investigations and evaluations during the design are all essential requirements to reduce building delays. Agyakwah-Baah (2010) also pointed to the following solutions to delays in the Ghanaian construction industry: The Recommendation includes; Reduction of the delay in large construction projects, as details are very important. It is also suggested that the seller in due course the payment to the contractor, as it is the responsibility of the contractor to manage the economic records and therefore the growth of the work is effective.

With decreasing delay, the project change during the construction must be kept as low as possible. It is also important for contractors to increase their workforce as productivity increases. To reduce the delay, managers and technical staff should be hired to manage and monitor the website. It is always important to involve experienced and experienced people to improve performance. During the construction phase, focusing on planning / resource management, schedules and work monitoring of subcontractors, as well as the immediate payment of intermediate certificates, helps to avoid delays. Holt et al. (2011) In order to eliminate delay in major projects, the following information is very important: the seller must provide the contractor with a service in due course, as it is the contractor's responsibility to manage the economic records; To reduce project delays, changes in the drawings should be reduced during construction; In order to reduce the delay in project implementation, the contractor must be aware of the resource strength and current machinery and / or seek to procure new equipment for the design.

## **2.9 THEORETICAL FRAMEWORKS ON COST OVERRUNS**

A study by Ali and Kamaruzzaman (2010) identified 13 major causes that influenced cost overruns on construction projects. As shown in Figure 1, the causes of budget overruns are an incorrect / poor initial cost estimate and underestimation of the duration of the construction

projects, poor planning, poor contractor project management, poor contract management, lack of contractor experience, increased project costs, heavy equipment cost fluctuations, Material price fluctuations, unexpected construction site situations, insufficient project financing, obsolete construction equipment / unsuitable construction methods, construction errors.

In addition, Memon et al. (2014) identified 15 key factors that affect the economics of large construction projects. Memon et al. (2014) mentioned the main cost overrun factors, including contractor financial problems, inadequate site management, lack of supervision of the contractor's construction, unfit contractors, unavailability of site work, unclear planning and order by the contractor, instability of building material costs, lowest contracting to bidders, lack of communication and coordination between key stakeholders, underestimation of project duration and late material procurement. In an additional, Memon et al. (2010) reiterated that the main factors of cost overruns on construction projects are planning errors, slowing down of planning preparation, impractical contract duration, incompetent contractors, delivery delays of material and equipment on site, bad relations with executives and delays in creating drawings, slow approval reworking resulting from drawing documents, inadequate planning and planning and errors during the construction process.

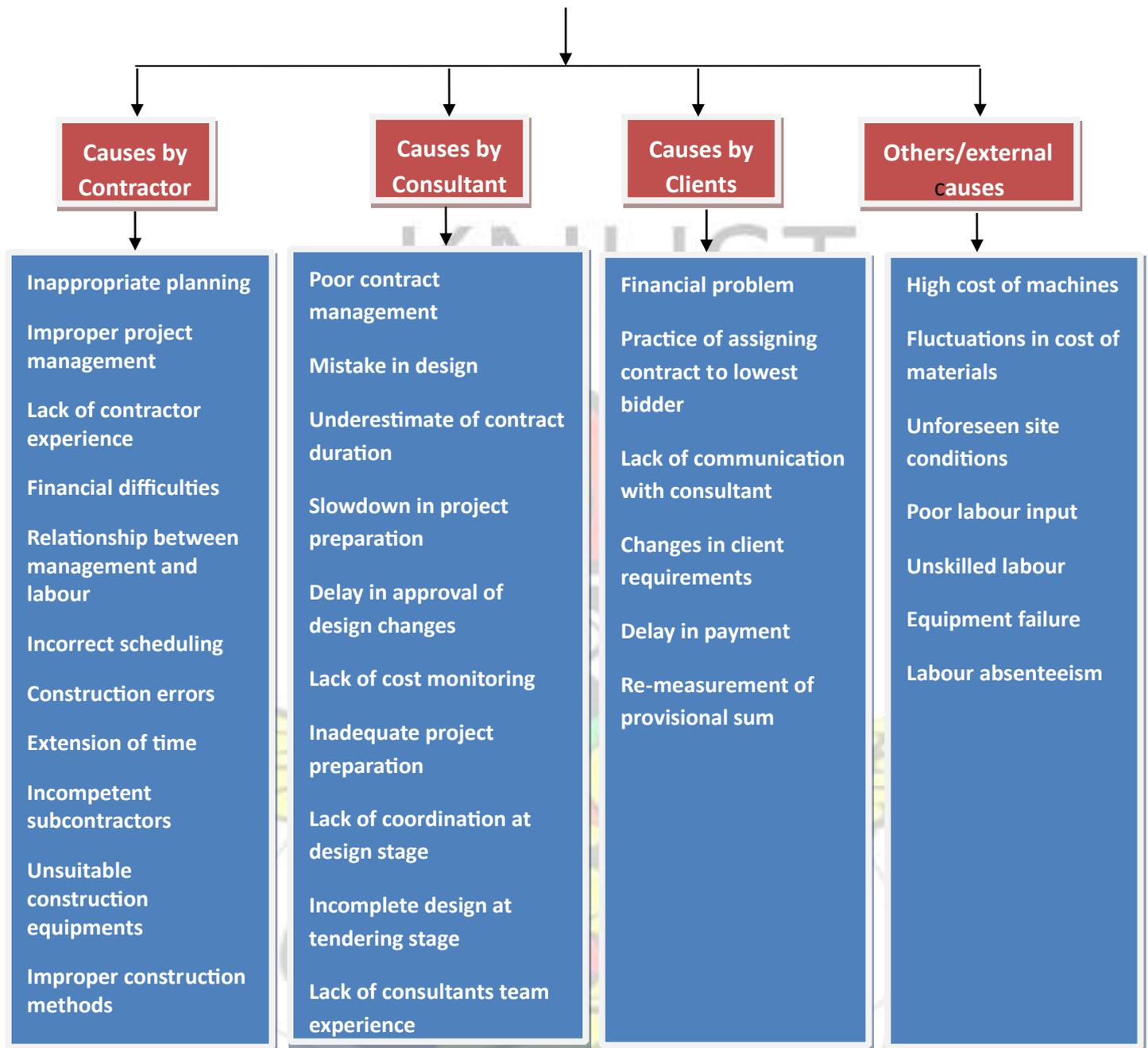
Ramanathan et al. (2010) argued that due to cost increases in construction, time extensions, raw material cost fluctuations, design changes, unpredictable weather conditions, inadequate project preparation and planning, delays in the delivery of raw materials and equipment to the site, lack of cost plan / inappropriate phase monitoring before and after contract conclusion, monopoly some suppliers of project materials, coordination difficulties in the design phase and reassessment of the provisional sum. This discussion examines the factors that contribute to increasing the budget for major construction projects in most countries, of which Ghana is no exception. Rahman et al. (2013) identified common causes of cost overruns that targeted three groups: large-scale construction clients, consulting firms and contractors working on

major construction projects. Key factors in cost overruns or budget overruns for major construction projects include, as Rahman argues, cost differences in raw materials, inefficient construction site and contractor management, contractor experience in managing large construction projects, design flaws, scheduling delays, improper planning and planning, unqualified subcontractors, design flaws, regular design deviations, financial difficulties of the owner, poor financial control on site, lack of availability of building materials, inaccurate cost estimation and underestimation of the duration of the project.

On the part of Jamaludin et al. (2014) are the factors that affect the cost variance during the construction of the building, incomplete design drawings and specifications in the tender phase, changes in client requirements, cash flow and financial problems of contractors, fluctuation of material prices, poor planning, planning and monitoring, increase of Labor salaries, fluctuation in equipment and heavy machinery costs, lack of coordination and communication between stakeholders, scratching and rework, lack of experience of the project team. Ismail et al. (2014) investigated the risk of several factors that led to cost overruns throughout the lifecycle of a construction project. The study found that 6 carries a high risk of cost overruns, which means ineffective management and supervision of the plant, inexperienced subcontractors, design flaws, incomplete design documentation during the tender phase and late payments. The theoretical framework for the causes of construction cost overruns results from seven scientific papers, as shown in Figure 1.



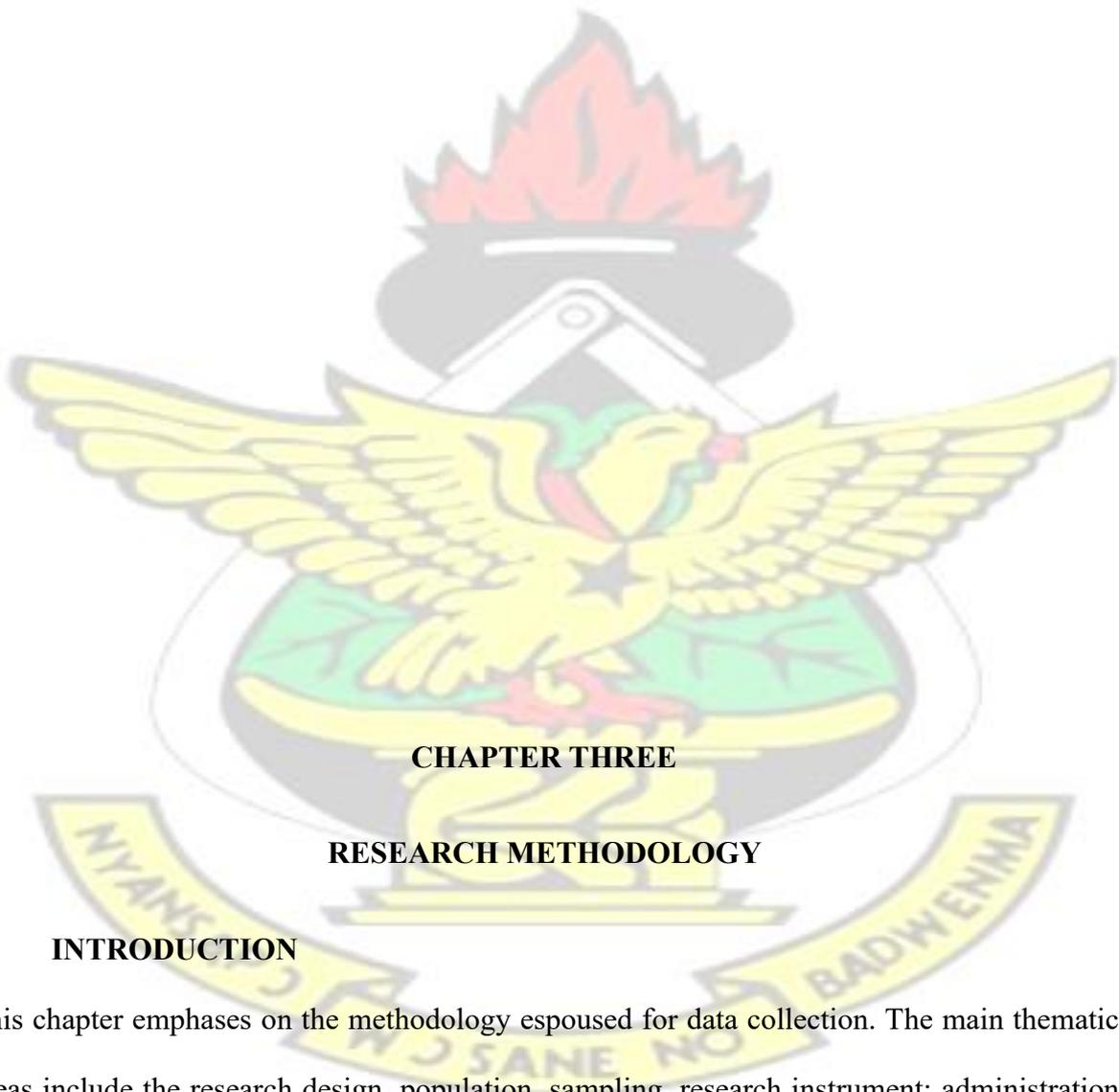
Causes of Cost Overruns



**Figure 1: conceptual Framework on Causes of Cost Overruns**

The question of construction cost overruns has been remarkable for many years in the construction of projects. The framework has identified various causes of overrun of construction costs, which have been determined by various researchers and theoreticians. The cost overrun frameworks developed showed 38 cost overruns on real construction projects, all of which are applicable in Ghana. It analyzes and discusses the problems of cost overruns in the construction industry, identifies possible solutions and measures possible solutions for the successful completion of the construction project.

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## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 INTRODUCTION**

This chapter emphasizes on the methodology espoused for data collection. The main thematic areas include the research design, population, sampling, research instrument; administration of questionnaire and interview.

#### **3.2 RESEARCH DESIGN**

In view of the nature of cost overruns in construction, both qualitative and quantitative approaches are considered appropriate for the study. Nevertheless, elements of qualitative approach are also used to complete the analytical process. The researcher used a case study design in as a blueprint outline for the study. This in Kusi's (2012) opinion is appropriate since it will help to do an in-depth analysis cost variation in construction. Through the use of qualitative research instruments such as questionnaire and interview guide, the interviews have assisted in investigating various factors that determine effective and efficient cost overruns.

### **3.2.2 Research Structure**

The literature review provided firm basis for the researcher in this study in the constructions of the questionnaires. Both contractors and consultants were identified to answer some questions on answers to multiple answers and others on a five-point likert scale. Defendants were being asked to ticking a column which represented as follows (1 = agree, 2 = fully agree, 3 = neutral, 4 = disagree and 5 = strongly disagree).

### **3.2.3 Research Methods**

The questions were a mixed of open and closed, the researcher examines the findings of various participants in the construction industry on the relative causes and cost effects of fluctuations in the industry in Ghana. In fact, this study was conducted on the basis of quantitative method in the performance and analysis of data from the field, to answer all of the above-mentioned research questions.

## **3.3 POPULATION OF THE STUDY**

According to Mason et al. (2010), the population of a study is the collection of all possible individuals, objects or measurements of interest. The target population of the study includes quantity surveyors, architects, engineers, contractors and consultants who are well competent in cost variation capable of establishing in-depth analysis of the application of cost overruns in actual life situation.

The Table below shows the total numbers of subjects during the data collection stage

**Table 3.1 Category of Population**

<b>Category of Respondents</b>	<b>Number of Respondents</b>	<b>Percentage</b>
Quantity Surveyors	12	10%
Architects	25	21%
Civil and structure Engineers	10	9%
Contractors	50	42%
Consultants	20	18%
<b>Total</b>	<b>117</b>	<b>100%</b>

Source: Researcher's Construct 2018.

### **3.4 SAMPLE SIZE SELECTION**

In view of the limited nature of each of the target respondents for the study, all the identified respondents constituting the target population were included in the sample size used for data collocation. The above-identified respondents were from the various devolved departments in the Assembly, who were found to be knowledgeable and have satisfactory experience in cost overruns in construction works. Their presence in the sample size offered them equal opportunity to respond to the form of questions be it in the questionnaires and in the interview guide. The objectives of the study form the foundation for the questions used for the survey.

The purpose was to obtain different views from respondents on the challenges of cost overruns in the construction industry and the need to promote its activities within the study area.

### **3.5 SAMPLING TECHNIQUE**

In order to define the sampling allocation among the various categories of respondents identified in Table 3.1 above, purposive sampling techniques were applied to include all the respondents comprising the target population. This means that, they were purposively chosen following their in-depth knowledge in cost overruns in construction. This gives clear cut and clear role clarity of each of the experts identified above, and each set of respondents noted for a particular activity in the construction industry.

### **3.6 VALIDITY AND RELIABILITY**

After cautiously designing the set of questions, they were substantiated and pretested. Errors detected were duly corrected. In situations where the respondents were illiterates, the researcher managed the questionnaire as an interview so as to be able to solicit the requisite information needed for the study. The researcher made direct remarks on the field where construction projects under the jurisdiction of the Assembly. The five categories of respondents were consulted as they go about their work duties. Their activities as well as mode of operations were closely monitored and observed and duly recorded. The data collected from the identified respondents were analyzed using simple frequency distribution tables and the results discussed. This is to ensure in-depth understanding and analysis of the problems at hand and the possible ways of addressing these problems to improve on cost analysis and variations.

### **3.7 DATA SOURCES**

The study used both primary and secondary sources of information from the various sampling units for purposes of collecting variable data.

### **3.7.1 Primary Data**

The primary sources of data included information that was obtained from the questionnaires and interviews administered to the respondents at the respective institutions/organisations of the respondents in the district. Creswel (2008) indicated that, the main advantage of using primary data is that, they are more reliable since they were obtained from the original sources especially from first hand sources such as the research respondents providing answers directly to the researcher without intermediaries.

### **3.7.2 Secondary Data**

The secondary sources of data included the annual reports, brochures and manuals of stakeholders in the construction industry. A number of both published and unpublished materials on the effects of cost overruns are being studied and reviewed as instituting the themes of the literature review in the second chapter. Substantial data collected from the secondary sources complemented the primary data and were expressively utilized since it has improved the clarification of the results of the study. Furthermore, data for literature review was sourced from libraries of educational institutions such as Universities, Polytechnics and colleges in Accra Metropolis, and websites such as Academia, Questia, Ebscohost, and Social Science Research Network (SSRN).

## **3.8 DATA COLLECTION INSTRUMENTS**

The main instruments that was used for data collection for the study included questionnaire and structured interview guide. Questionnaires would be directed to Quantity Surveyors, Architects, Civil and Structural Engineers, Consultants while, interview will be conducted to Contractors.

### **3.8.1 Questionnaires**

Questionnaires are usually used to collect first-hand information from research respondents at the various units identified at the devolved departments of the assembly. Different types of questionnaires exist for different purposes and their usage depends on the type of data to be collected. Questionnaires are practical in nature and are directed based on the sample sized chosen for data collections. Questionnaires have been proven to be more precisely accurate and reliable when it comes to data collection. The Likert-scale which takes the form of asking questions to rate a scale 1 to 5 were applied since the main focus of this study is established a relationship between cost overruns and the attainment of value for money in the construction industry.

### **3.9 ANALYSIS PROCESS AND TOOLS**

The data analysis comprises arranging the raw data from the varied respondents into a controllable size, developing summaries and applying statistical interpretations to give meanings to the data obtained. As a result, the following steps were applied for analysing the data for the study. Primarily, the data was edited to detect and correct likely errors and to add oversights that were likely to occur during the actual data analysis, so as to ensure uniformity in the findings which are achieved in the end. The data was then coded to enable the respondents to be grouped into limited number of groupings. The data after this stage was then presented in a tabular form, graphical and narrative forms so as to ensure effective analysis of the data.

### **3.10 ETHICAL CONSIDERATIONS**

The main areas of ethical considerations that the researcher considered very important are the privacy rights, the impact of psychological harm, deception and confidentiality.

### **3.10.1 Privacy Rights**

Respondent's right to privacy is considered as one of the greatest vital ethical issues in this research. Taking into consideration the elusive nature of cost overruns in the construction industry, and as such, satisfying an important aspect of the respondents' privacy right was considered since the researcher furnished the respondents at various phases of the cost overruns with enough data concerning aimed at explaining the logic of the study, so that respondents may choose to participate or otherwise in the data collection process at their own discretion.

### **3.10.2 The Potential for Psychological Harm**

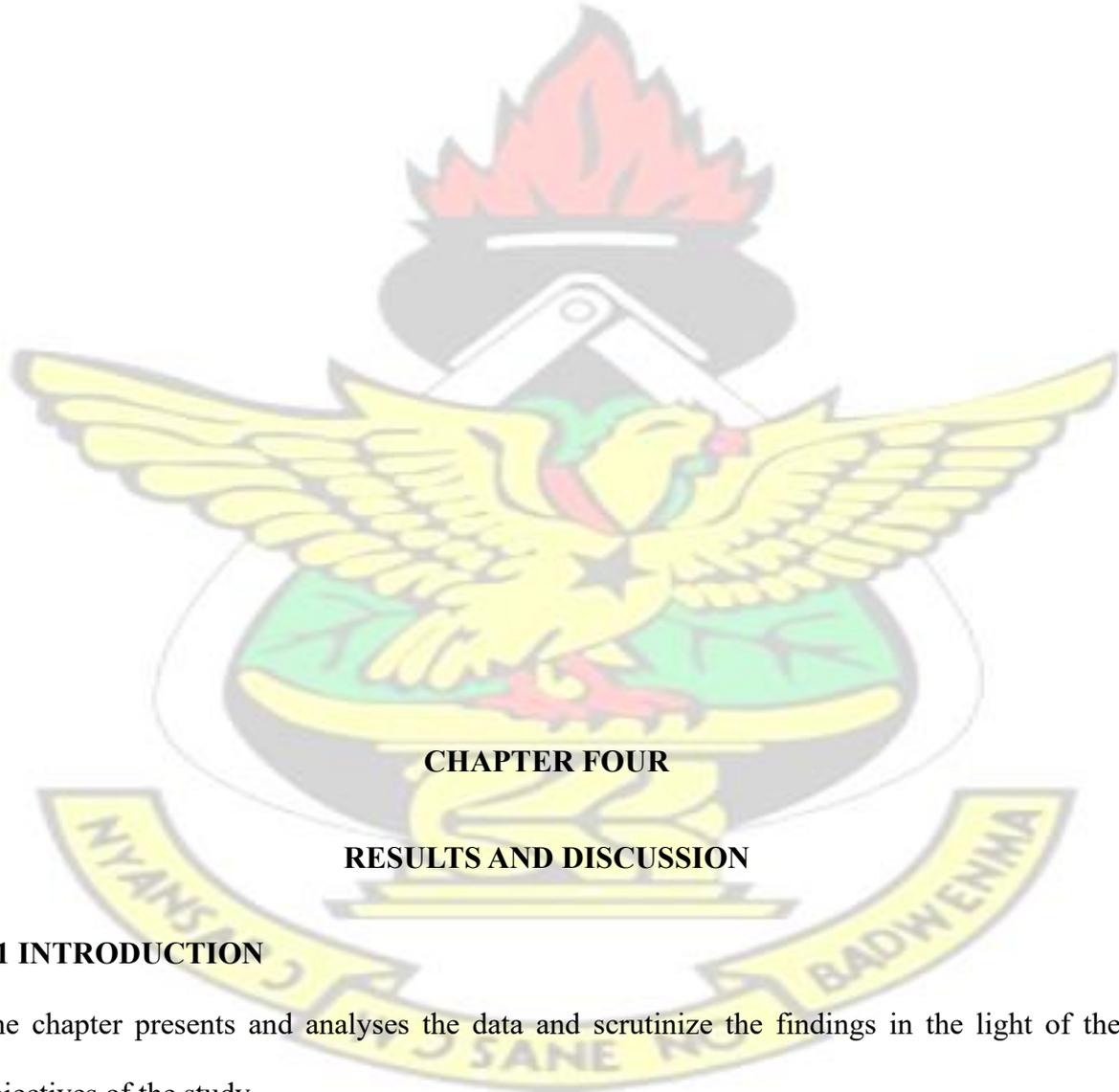
The researcher was considerate to the likelihood of harming the research respondents having in mind that, these were expecting in their respective profession. In view of this, the researcher was strategic since a reminder of serious challenges in the various methods of cost overruns; could cause sensitive discomfort and psychological pain for the professionals. As a policy to do away with this particular challenge, the researcher managed effectively on the types of questions that are not offensive, thus obtaining the data on challenges so as not to cause any potential psychological harm to the identified respondents in this study.

### **3.10.3 Deception**

Since the delicate and the realities that describe issue relating cost in the construction, particularly at projects that required heavy capital demanding, the researcher in his own preference did everything possible to ensure that, respondents were not deceived, and the logic of the study was disclosed and clearly explained to all the respondents in the data collection exercise so as not to correct any/all delusions and discernments that are hypothetical so as to keep them up-to-date with the logic of the study.

### **3.10.4 Confidentiality**

Data collection on research respondents raises the issue of confidentiality. In order to address this precise encounter, the researcher assured all the respondents the obligatory confidentiality of the data obtained under strict concealment. As a very useful project, the researcher ensured that names, addresses and other vital particulars of the respondents were not related with any particular answers without the clear consent of the respondents. The researcher in with principles of data collection certified that information obtained from the identified respondents were treated with the extreme in concealment that it deserved.



## **CHAPTER FOUR**

### **RESULTS AND DISCUSSION**

#### **4.1 INTRODUCTION**

The chapter presents and analyses the data and scrutinize the findings in the light of the objectives of the study.

#### **4.2 SOCIO-DEMOGRAPHIC DATA**

**Table 4. 1: Socio-Demographic Characteristics**

<b>Ages</b>	<b>Frequency</b>	<b>Percentage (%)</b>
18-25 years	20	17
26-33 years	58	50
34-41 years	33	28
42-49 years	6	5
<b>Total</b>	<b>117</b>	<b>100</b>

<b>Gender</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Male	105	90
Female	12	10
<b>Total</b>	<b>117</b>	<b>100</b>

<b>Education Level</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Diploma/Professional Certificate</b>	<b>20</b>	<b>17</b>
Polytechnic	27	24
Bachelor's Degree	50	43
<b>Masters/Postgraduate degree</b>	<b>17</b>	<b>14</b>
<b>PHD</b>	<b>3</b>	<b>2</b>
<b>Total</b>	<b>117</b>	<b>100</b>

<b>Type of construction</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Buildings</b>	<b>55</b>	<b>47</b>
Roads	25	21
Drainages	37	32
<b>Total</b>	<b>117</b>	<b>100</b>

<b>Cost of construction works</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>GHC 100, 000 to 150, 000</b>	<b>16</b>	<b>14</b>
<b>GHC 160, 000 to 200, 000</b>	<b>25</b>	<b>21</b>

<b>GHC 210, 000 to 250, 000</b>	<b>9</b>	<b>8</b>
<b>GHC 260, 000 to 300, 000</b>	<b>30</b>	<b>25</b>
<b>GHC 310, 000 to 350, 000</b>	<b>10</b>	<b>9</b>
<b>GHC 360, 000 to 400, 000</b>	<b>28</b>	<b>23</b>
<b>Total</b>	<b>117</b>	<b>100</b>

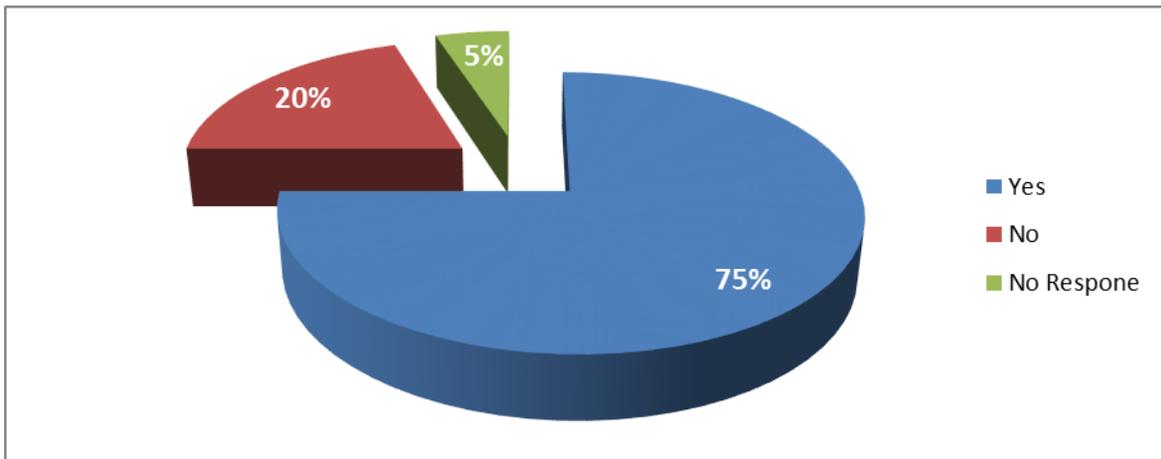
Source: Author's Field Survey, 2018

The table above shows the numerous socio-demographic features of the respondents. Primarily, age dissemination of the respondents reveals majority, thus 58% of the respondents were found to be within 26–33 years. Those in the minority were 42 to 49 years and above. The gender/sex dissemination of respondents shows 90% of the respondents being males.

In relation to educational background, majority of the respondents had University Degree; with the least being PHD represented by 3%. With respects to the type of construction embark on since 2010, most of the respondents (47%) were found to have constructed buildings. Relatively a substantial number of the respondents had cost of construction works ranging between GHC 260, 000 to 300, 000, whereas the least (8%) had cost of construction ranging between GHC 210, 000 and 250, 000.

#### **4.3 THE ROLE OF THE CONSTRUCTION INDUSTRY IN ECONOMIC GROWTH**

In this section, the main attention of the analysis and discussions of the data is on the role of the construction industry in economic growth of Ghana. Other variables such as functions of the construction industry, projects cost and their influence in the Ghanaian economy are identified, presented and analysed.



**Figure 4.1: Construction Industry and Economic Growth**

Source: Author’s Field Survey, 2018

On whether the construction industry plays any positive role in the economic growth of, 75% respondents answered in the positive, confirming the fact that, the construction industry is very useful towards the economic growth of Ghana. This was openly opposed by 20% of the respondents who articulated doubts about the authenticity of contractors in construction industry and nevertheless question the positivity of their role in the economic growth. Amazingly 5% of the respondents could not provide any significant contribution to the discussion pertaining to the construction industry plays any positive role in the economic growth.

The reasons advanced by those who rejected the above statement to support their answer relates to the fact that, most of the constructions works specifically buildings in the country are carried out with inferior works resulting in majority of the building having shorter life span, a state creating several instances of contractors causing financial loss to the state in the name of construction of the country’s wide-ranging infrastructure.

**Table 4. 2: The Specific Functions of the Construction Industry in Ghana’s Economic Growth**

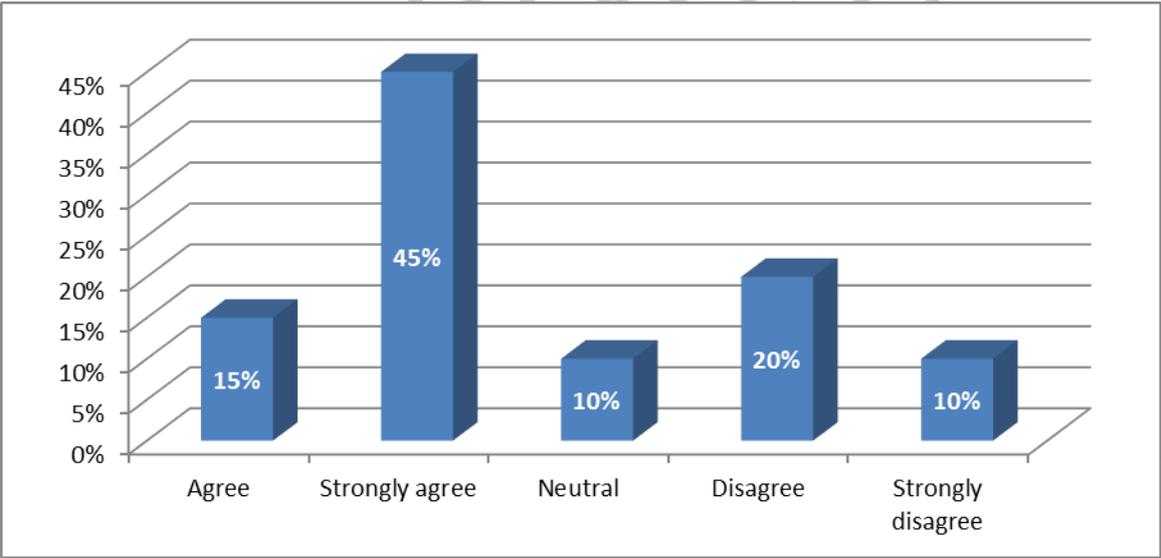
<b>Response</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Stimulates the development of other industries</b>	40	34
<b>Offers employment for citizens</b>	27	23
<b>Improves the general infrastructural base of the country</b>	15	13
<b>It ensures worth monetary</b>	35	30
<b>Total</b>	<b>117</b>	<b>100</b>

Source: Author's Field Survey, 2018

The exact functions of the construction industry in Ghana's economic growth are the main contents of Table 4.2 above. In this regard, 34% of the respondents specified that, it inspires the development of other industries in the country. As 23% of the staff indicates, the construction industry offers employment for citizens. For 13% of the respondents, the construction industry ensures the development of the general infrastructural base of the country. In view of the majority (30%) of the respondents, it was established that, if observed effectively, the construction has the potential of ensuring value for money so as to avoid the unnecessary financial losses that the country is exposed in the name of building the country's infrastructure.

The results therefore imply that the construction industry is providing significant financial resources to create useful infrastructures and significant employment opportunities. This

statement corroborates the argument of Rum and Akasah (2011), which underlined that. Internationally, significant financial resources are being made available in the construction industry, providing vital infrastructures and significant employment opportunities. The contribution of the construction industry to the growth of the economy requires better efficiency in the industry through the success of the full project implementation.



**Figure 4.2: Projects Constructed within Anticipated Cost Source:**

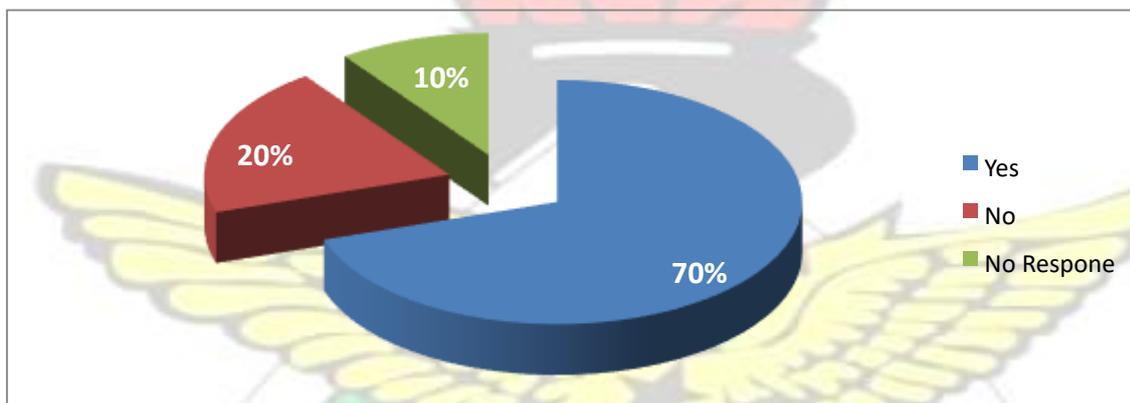
field survey, 2018.

With concerns to whether projects constructed within estimated cost has the potential of ensuring quality standards in the construction industry, 15% and 45% respectively stated their agreement and others strongly agreeing to the above statement. As shown in the figure above, 10% of respondents were un-oriented as they did not answer the topic, as 10% of respondents disagreed, projects built within the expected cost could guarantee quality standards the construction industry can never be achieved. For 20% of respondents, there was strong disagreement over the possibility that projects built within the expected cost have the potential to ensure quality standards in the construction industry. This there implies that, cost of projects structured without any variations certainly contributes to success of full project

implementation. Nevertheless, a section of the citizens out there believed that, the negligent behavior of the contractors results in the construction industry subsidizing less to services, manufacturing and even in the agriculture sector. In an interview with the consultants in the construction sector, it was exposed that; most consultants offer consultancy services if requested by clients. These they consider as part of their efforts to confirm value for money by doing everything possible to avoid cost overruns during construction,

#### 4.4 THE CAUSES OF COST OVERRUNS IN CONSTRUCTION

In this section, the various causes of cost overruns in construction are presented analyses and discussed into details.



**Figure 4.3: The Essence of Cost Overruns in the Construction Industry**

Source: Author's Field Survey, 2018

On whether respondents appreciate the essence of cost overruns in the construction industry, 70% of the respondents, especially the consultants answered in the positive, confirming the fact that, really determinants cost overruns in the construction industry. This was strongly opposed by 20% of the respondents who responded by expressing their doubts on the cost overruns in the construction industry.

Astonishingly 10% of the staff could not provide any substantial contribution to the discussion relating to the determinants of value for money in cost overruns in the construction industry.

Those, whose responses were in the positive, indicated the likelihood of identifying the causes of cost overruns in the construction industry. As consultants, the causes of cost overruns in the construction sector could be credited to lack of due diligence given infrastructure as well as the unpreparedness of contractors to engage the services of consultants for expert advice during construction works

**Table 4.3: Specific Causes of Cost Overruns in Construction**

<b>Responses</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Inability of negotiator to rely upon an independently prepared government estimates.</b>	35	30
<b>Change in requirements and existing job conditions.</b>	45	38
<b>Inappropriate project plan</b>	20	17
<b>Poor project management tools and techniques.</b>	17	15
<b>Total</b>	<b>117</b>	<b>100</b>

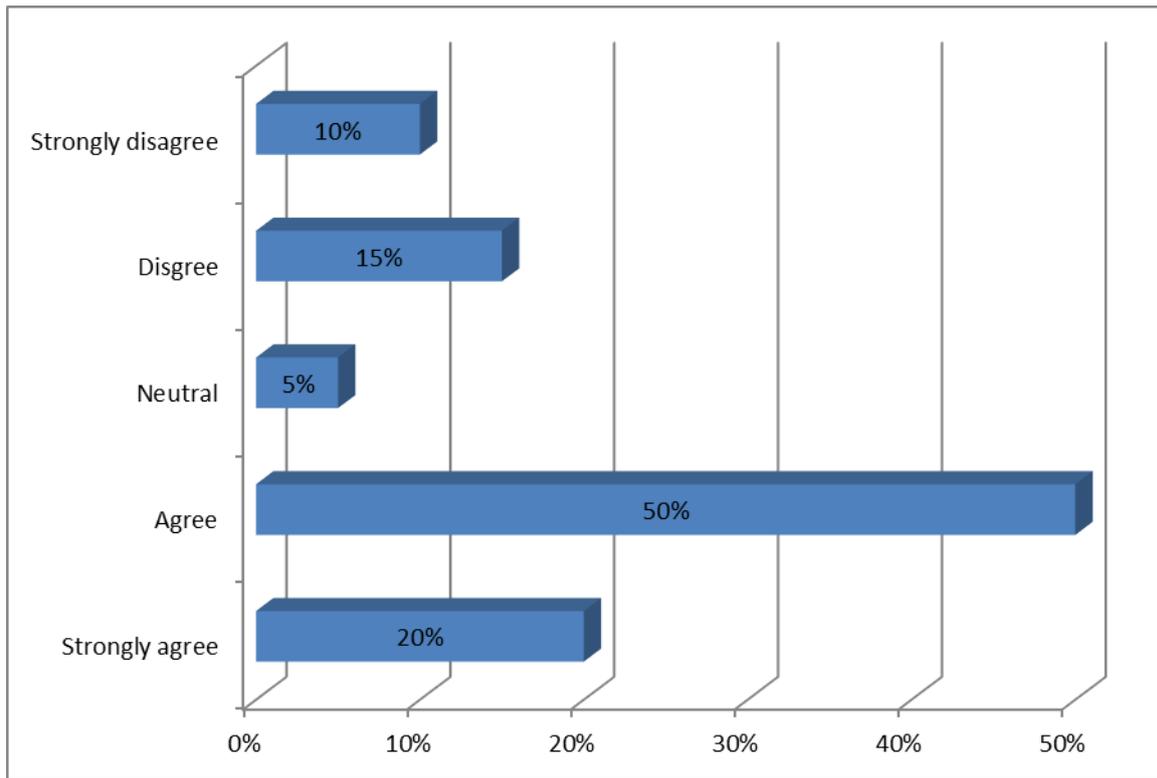
Source: Author's Field Survey, 2018

The table above contains the exact causes of cost overruns in the construction industry. Out of the total respondents contacted for data collection, 30% of the respondents identified the incapability of negotiator to rely upon an independently prepared government estimates as one of the obvious causes of cost variation in the construction industry. The second cause of cost variation according to the majority (38%) of the respondents reveals that, change in construction necessities and existing job conditions on site without a doubt also causes cost overruns in the construction industry. As highlighted by 17% of the respondents, inappropriate project plan is believed to have caused variations in cost of construction of infrastructure of different types in the study area.

The results also revealed 12% of the respondents indicating to the fact that, poor project management tools and techniques have also led to the change in cost of construction in several construction sites in the Municipality. The four underlying variables of cost overruns identified in Table 4.3 certainly affect value for money during the construction of any kind of infrastructure. Most of the contractor who took part in the study indicated to the fact that, they have in one way or the other qualified one form of causes of cost overruns or the other in the construction industry.

The available results therefore suggest that the most common cause of cost fluctuations in the construction industry is the change in requirements and existing working conditions at most construction sites. Although this study identifies several sources of cost variation, the deepest possible cause for cost variation is the lowest possible price, which usually characterizes the awarding of contracts, and the eagerness to offer more payment than necessary in order to provide sufficient incentives.

Discussion during the data analysis with the consultants point to the fact that; To avoid cost overruns, waste and corruption, the government of Ghana through the various Ministries, Departments and Agencies (MDAs), educating contractors on strategies to control contract estimations in the construction sector should be considered as a top priority. This requires laws typically aimed at the engaging procuring authority to issue public tenders during the award of contracts.



**Figure 4.4: Major Causes of Project Overruns in Construction**

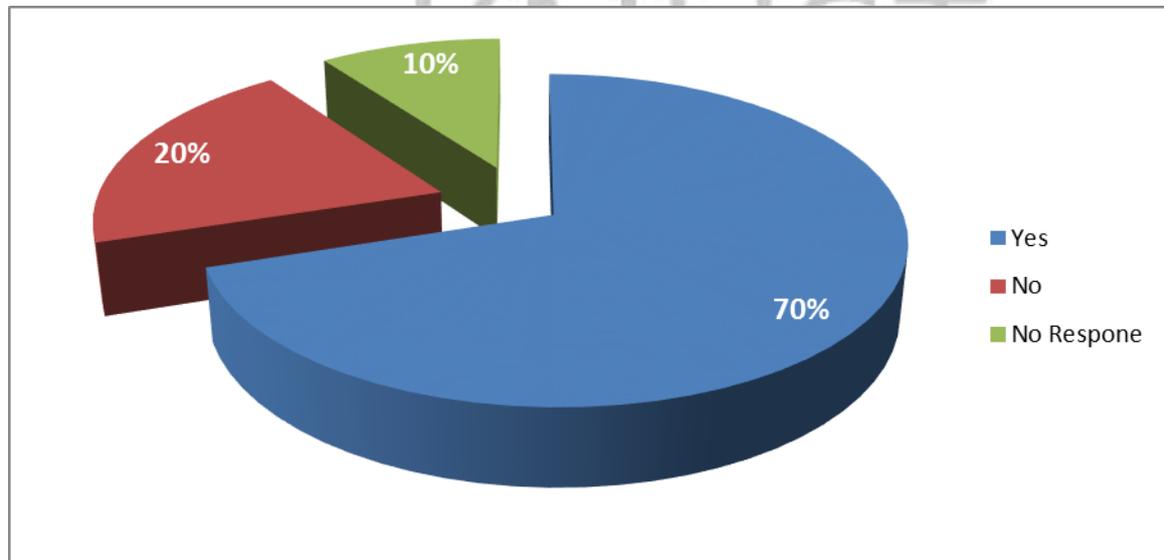
Source: Author’s Field Survey, 2018

In terms whether major causes of project overruns usually take place in the construction phase of the construction industry, 20% and 50% of the respondents individually expressed their agreement and others strongly agreeing to the statement that, major causes of project overruns usually take place in the construction phase of the construction industry. Further observation in the above figure shows, 5% of the respondents were non-aligned since they provided no response to the issue under discussion. And also, 10% of the respondents disagree to the statement that, major causes of project overruns usually take place in the construction phase of the construction industry. Whiles 15% of the respondents strong disagreed that major causes of project overruns usually take place in the construction phase of the construction industry in the construction industry.

#### 4.5 THE IMPLICATIONS OF COST OVERRUNS IN THE CONSTRUCTION INDUSTRY

This section presents the several implications of cost overruns in the construction industry.

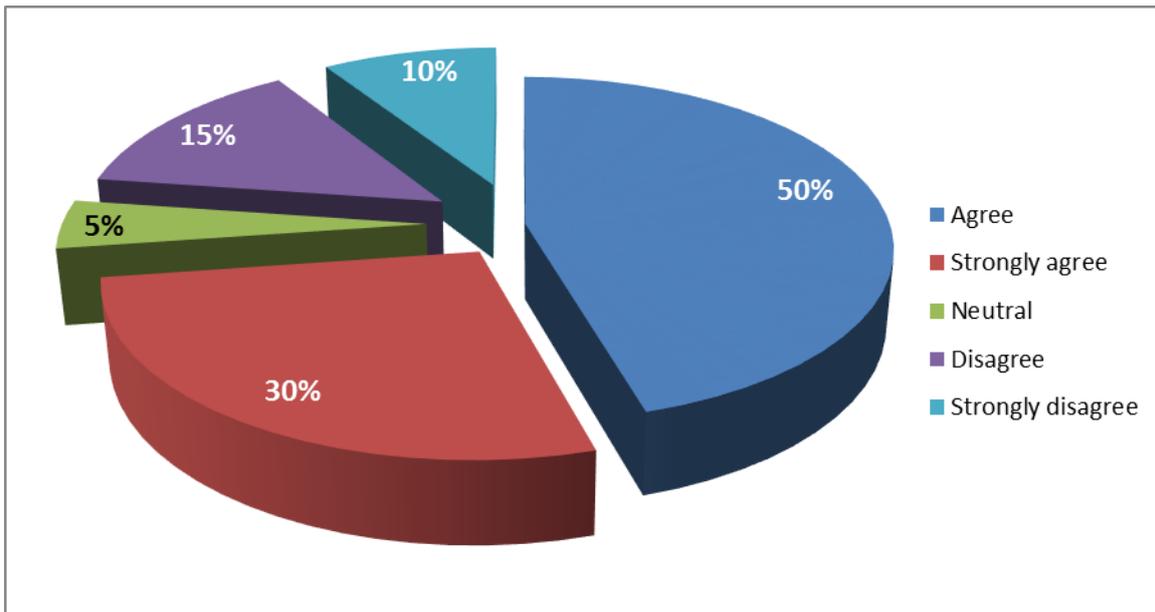
These implications of cost overruns identified in the following discussions.



**Figure 4.5: Repercussion for Contractors Due to Cost overruns**

Source: Author’s Field Survey, 2018.

On whether there is any impact for contractors due to cost overruns in the construction projects, 70% respondents answered in the positive, confirming the impact contractors experienced as a result of cost overruns during the construction projects. This was not largely accepted by all the respondents since 20% rejected the above response. Surprisingly some of the respondents represented by 10% could not provide any meaningful contribution to the discussion relating whether there is any impact for contractors due to cost overruns in the construction projects. Those whose responses are in the positive identified the fact that, cost overruns in the construction of projects really results in projects overrun which thus affect the success of Value for Money in the construction industry.



**Figure 4.6 Cost overruns results in Delay in Project Implementation in the Construction Industry**

Source: Author's Field Survey, 2018.

In responding to whether cost overruns result in delay in project implementation in the construction industry, 50% and 20% of the respondents individually expressed their agreement and strongly agreeing to the statement that, cost overruns results in delay in project implementation in the construction industry. As further observation is made in the above figure shows, 5% of the respondents were unsure since they provided no response to the issue under discussion. Again, 10% of the respondents expressed their disagreements to the statement that, cost overruns result in delay in project implementation in the construction industry. At the same time as, 15% of the respondents strong disagreeing in this respect, there seem to be some form of mixed reaction relating the issue being discussed in this section. This thus implies that, cost overruns also have serious implications on the physical, social and financial environment in the construction landscape.

**Table 4.4: Specific Challenges Due to Cost Overruns**

<b>Challenges</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Inadequate skilled in estimating total project cost.</b>	21	18
<b>Disrespect for expert advise by contractors</b>	26	22
<b>Problem of non-compliance with laid rules concerning bidding for constructs</b>	30	26
<b>Lack of appropriate bidding process</b>	17	14
<b>Inadequate measures for evaluating the projects under construction</b>	23	20
<b>Total</b>	<b>117</b>	<b>100</b>

Source: Author's Field Survey, 2018

Table 4.4 contains figures on the challenges affecting the contractors during estimating total project cost. The first challenge in the view of 18% of the respondents is insufficient skilled personnel in conducting estimates for total project cost. Disregard for professional advice by contractors according to 22% of the respondents has propensity and potential of hindering the effectiveness of undertaking costing for project implementation. Problem of noncompliance in the laid rules regarding bidding for constructs also pose serious challenges for constrictors and consultants. This was the opinion of 26% of the respondents. Furthermore, 14% responded that the lack of appropriate bidding process. All the challenges identified points to the crucial consequence which result in cost overruns, this similarity is line with Al-Tabtabai (2012). As a significance, the Project Manager found a performance issue in determining the exact project

performance. To achieve better profits, the Project Manager must make a timely and informed decision. Nonetheless, today's shortages in project operation monitoring and control cannot successfully manage the Project Manager, leading to the main cause of project failure.

Further exposes pointed out very relevant issue such as;

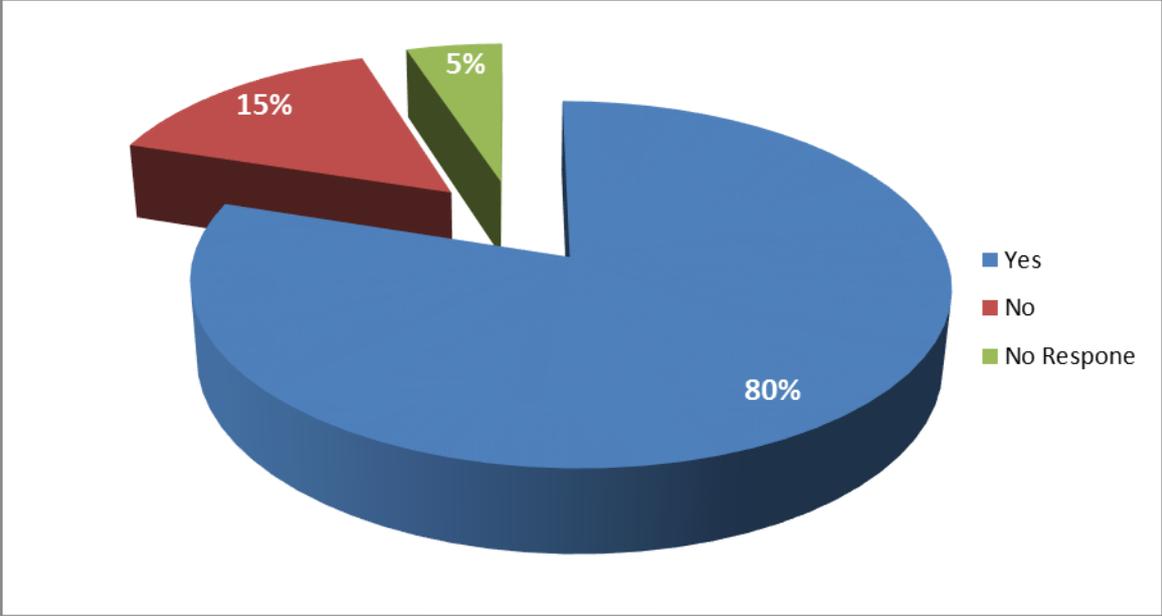
The consultancy services work in close partnerships with the public procurement system so as to prevent the culture of giving gifts or bribery with the aim of influencing the persons in positions of trust of awarding contracts. Planning procurement which includes operation and procedure depends on the skill level of the consultancy services. The use of sample planning models in facilitating pre-tender and procurement processes as the consultants indicates must to be given a top priority.

The most critical issues in the consultants view among all the challenges in the pre-contract awarding activities are the extreme documentation. Minimum of seven different document (requisition, enquiry, quotation, order acknowledgment, advice note, goods receive note as well as invoice) are involved and in some cases, some of documents have to be copied and given to the other departments which in effect slows procurement process. Unnecessary documentation in public procurement is a worrying problem that slows down the procurement process and leads to delays and tediousness.

#### **4.6 APPROPRIATE STRATEGIES AIMED AT ADDRESSING THE CHALLENGES POSED BY COST OVERRUNS IN CONSTRUCTION**

In this section, the numerous ways by which the cost variation challenges affect the success of value for money in the construction industry are considered so as to solve the emerging difficulties during the implementation of contracts in the construction industry. This section

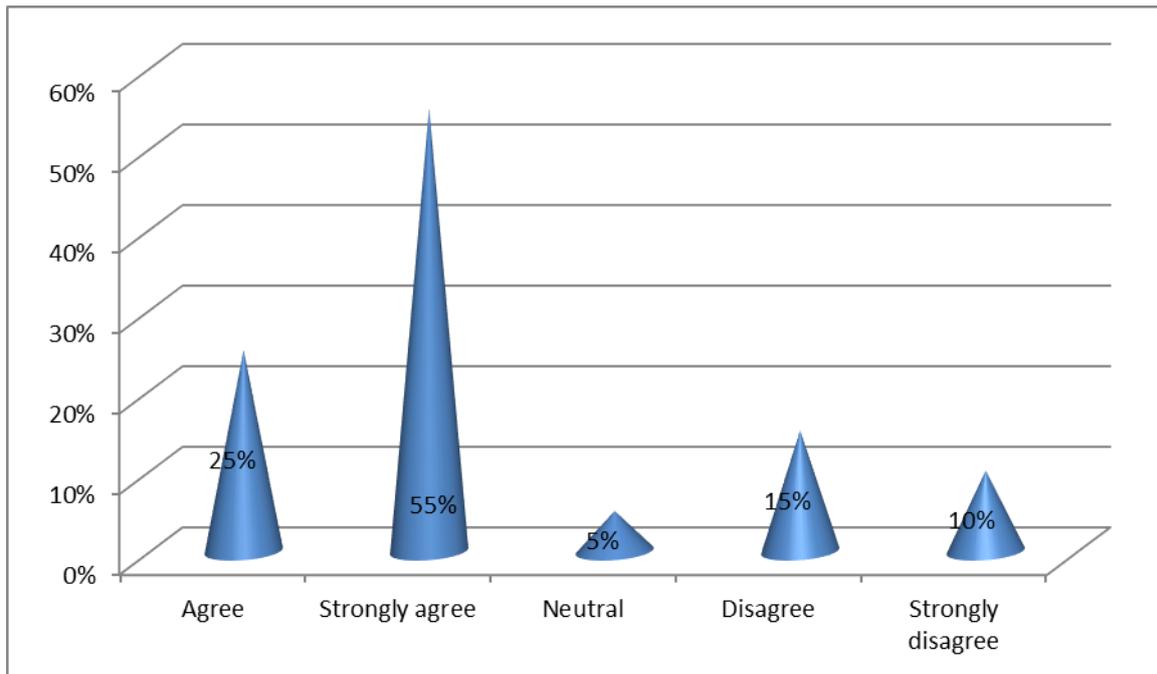
thus contains the numerous strategies aimed at addressing the challenges affecting the implementation of contracts in the construction industry.



**Figure 4.7: Possibility of Suggesting Appropriate Strategies**

Source: Author’s Field Survey, 2018

On the whether it is possible to recommend appropriate strategies aimed at addressing the challenges posed by cost overruns in construction, 80% respondents answered in the positive, ratifying the fact that, challenges posed by cost overruns in construction could be addressed. This was bluntly opposed by 20% of the respondents who responded by debating the statement that, challenges posed by cost overruns in construction could be addressed. Remarkably 10% of the respondents could not provide any important contribution to the discussion pertaining to the challenges posed by cost overruns in construction could be addressed.



**Figure 4.8: Monitoring of Cost Overruns for Actual Project Progress**

Source: Author’s Field Survey, 2018

In responding to question on whether monitoring of cost overruns for actual project growth could result in preventing cost overruns in construction, 80% of the respondents largely expressed their agreement to the issue being discussed. As further comment is made in the above figure shows, 5% of the respondents were unsure since they provided no response to the issue under discussion. Again, 10% of the respondents expressed their disagreements to the statement that, cost overruns result in delay in project implementation in the construction industry. At the same time as, 15% of the respondents strong disagreeing in this regard, there seem to be some form of mixed response pertaining the issue being discussed in this section. This thus indicates that, cost overruns also have serious implications on the physical, social and financial environment in the construction landscape. The results hence go a long way to confirm the fact that, the capacity of consultants to establish the actual project status based on objective forecasts could avoid cost overruns on final project performance in the construction industry.

**Table 4.5: Specific Strategies aimed at Preventing Cost Overruns in Project Construction**

<b>Strategies aimed at Preventing Cost overruns</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Effective evaluation of project-cost relationship</b>	19	16
<b>Taking into consideration the scheduled for the Contract.</b>	28	24
<b>Regular training for procurement project consultants.</b>	22	19
<b>Regular analysis to shorten duration trade-off time-cost.</b>	13	11
<b>Apply critical path planning with all activity durations.</b>	23	20
<b>Implementing fair criteria for the selection of contractors.</b>	12	10
<b>Total</b>	<b>117</b>	<b>100</b>

Source: Author's Field Survey, 2018

The responses in Table 4.5 show the various specific strategies aimed at preventing cost overruns in project construction. As it can be detected in the above Table, quite a reasonable number of the respondents representing 16% considered effective evaluation of project-cost relationship as a very good move since it will go a long way to avoid cost overruns so as to

ensure the success of value for money in construction. The results again reveal that, implements ways of finding remedy to cost overrun through effective policy implementation. There is a correspondence between this finding and that of Apolot et al. (2012) that: improvement of team management; change from old system of contract to design build and to develop the client's cash flow to reduce payment delays.

Also, 24% of the respondents considered the fact that, taking into concern the scheduled for the contract could prevent cost overruns since is hyped as a prudent measure towards the success of value for money in the construction industry. This when effectively implemented will go a long way to assure the full implementation of the views of the legal contracts in the construction industry.

This particular challenge relates to the failure to provide timely information; Conclusion of the design drawing before project initiation and project management correspondence is therefore concluded with Kikiasi, (2012) stresses that a satisfactory budget is needed; adequate output information; confirmation the design drawing then the start of the project and the possibilities of project management should be at the center of project procurement.

In terms of providing consistent training for project consultants during construction, 19% of the respondents detained the view that, it will enable the officers to be well-informed with the best practices associated with the precise contract executed so as to achieve value for money during procurement process. The training provides a platform for the effective communication of effective strategies to compensate for cost fluctuations. This refers directly to Bentil's (2014) statement, which has shown that in order to achieve a flawless design requires: communication to all the design professional, coordination of the required design process is paramount, therefore, correct Planning, a lot of time to modify errors Comprehensive

examinations and controls during the planning phase are important prerequisites for minimizing construction delays.

Regular time-cost trade-off analyzes, which limit project duration to 11% of respondents, have the potential to achieve the processes that lead to the selection of experienced contractors in the contract execution process. On the part of the 20% of respondents, the application of critical path planning with all activity periods prevents difficulties in understanding the calculations of estimates for contracts that are carried out to avoid cost fluctuations in the construction industry.

Finally, 10% of the respondents revealed that, implementing fair criteria for the selection of contractors should be set and agreed by all the parties because this could help set some values to be used as the main standard for measuring the quality of contracts awarded to contractors in the construction industry.



## **CHAPTER FIVE**

### **CONCLUSION AND RECOMMENDATIONS**

## **5.1 INTRODUCTION**

This chapter presents the findings of the study and draws conclusion based on the findings exposed by the study. Recommendations for redress leading to the success of financial worth relative to cost overruns in the construction industry prevent the enraging challenges.

## **5.2 SUMMARY OF THE FINDINGS**

This section deals with the main headings indicated below:

### **5.2.1 Socio-Demographic Characteristics**

The study showed that, majority of the staff was aged between the 26-33 years which shows youthful workforce in the construction industry. The respondents were conquered by men with University Degree (Both first and second) being the leading educational qualification. Majority of the respondents representing 55% were buildings contextures, with majority of them winning contractors value GHC 260, 000 to 300, 000.

### **5.2.2 The Role of the Construction Industry in Economic Growth**

Having established the role construction industry plays in the economic growth, the study further covered the precise functions of the construction industry in Ghana's economic growth, these include motivation of the development of other industries, it offers employment for citizens, improves the general infrastructural and to guarantees worth monetary. Also, projects constructed within expected cost has the possibility of ensuring quality standards in the construction industry.

### **5.2.3 The Causes of Cost Overruns in construction**

The study established an appreciation of the principle of cost overruns in the construction industry. And again revealed specific causes of cost overruns in construction such as

incompetence of negotiator to rely on independently prepared government estimates, variation in requirements and existing job conditions, unsuitable project plan, poor project management tools and techniques and change in requirements and existing job condition. Again, project overruns generally take place in the construction phase of the construction industry. The study found some impact for contractors due to cost overruns in the construction projects.

#### **5.2.4 Challenges affecting Cost Overruns in the Construction Industry**

The main challenges due to cost overruns were poor skilled in estimating total project cost, disregard for expert advice by contractors, problem of non-compliance with laid rules regarding bidding for contracts, lack of suitable bidding process and insufficient measures for evaluating the projects under construction.

### **5.3 CONCLUSION**

The study has established the role of construction industry plays any positive role in the economic growth; however, the lack of trustworthiness of implementation of contract estimates to the letter has to the rise of cost overruns in the construction landscape in the country. This is endorsed to a number of challenges such as inability to rely on self-sufficiently prepared government estimates by contractors, change in requirements and existing job conditions, unsuitable project plan, poor project management tools and techniques and change in requirements and existing job condition. Adherence to the laid down rules in cost estimate in construction is hence not a choice but a directive based on the whole life costs of the project in infrastructural construction in the country. Given the inadequate resources available to government, guaranteeing value for money in construction is key to ensuring the optimum application of scarce budgetary resources.

It is hence authoritative that, joint efforts from contractors, consultants, government and the stakeholders overseeing wide-ranging kinds of construction in the country to improve appropriate modalities of costing and estimates so as to introduce in contractors' principles of correctness and accuracy during the implementation of contracts so as to achieve monetary worth. This is aimed at securing the public purse, hence the concept of value for money should be considered as a top priority since it will completely prevent cost overruns in the construction industry.

#### **5.4 RECOMMENDATIONS OF THE STUDY**

From the findings of the study, a well-functioning national consultancy services system is critical for the better delivery of project estimates in order to avoid the lack of adherence to the basic views of government estimates by contractors.

- Due diligence should always be at the beginning of every project in the country so as to supplementary avoid the situation of introducing new changes in contract requirements and existing job conditions.
- In order to avoid the unsuitable project plans, there should be proper project plan by construction firms and their respective consultants in the implementation of contracts. By so doing, there would be adherence to the laid down rules governing cost estimates in construction.
- Since insufficient skills in estimating total project cost and disregard for expert advice by contractors has insistently led to cost overruns in construction, efforts should be made by all stakeholders involved in contract implementation to provide regular training so as to equip contract contractors and consultants to accept better project cost estimates.

- In view of the fact that, the challenges posed by cost overruns has put massive burden on the national purse, there should be effective evaluation of project-cost relationship by the suitable agencies tasked with the above stated responsibility.
- Taking into consideration the core schedule for the contract implementation, regular time-cost trade-off analysis should at each and all levels of the progress of the contract to be meticulously carried out so as to shorten the project duration and to further get rid any possible emergence of cost overruns in construction.
- For further and better relevance in contract cost estimates calculations, the application of critical path scheduling is of grave essence since it will ensure that, the duration specified for the completion of contracts is not affected and in order that, contract sum is not affected. Finally, procurement contract documents should be stated in simple language devoid of different understandings for better contract implementation.

## **5.5 LIMITATION OF THE STUDY**

Like any other scientific study, this study also had some limitations which are listed below:

- The limitation of the survey to only stakeholders in the Accra Metropolis may affect the generalizations of the findings.
- The analytical tool used for the analysis may affect the generalization of the results of the study.

## **5.6 FURTHER STUDIES**

The study focused in the Accra Metropolis within the Greater Accra Region of Ghana. A similar study could be conducted in other jurisdictions where data could be gathered to aid the extent of generalization of the findings.

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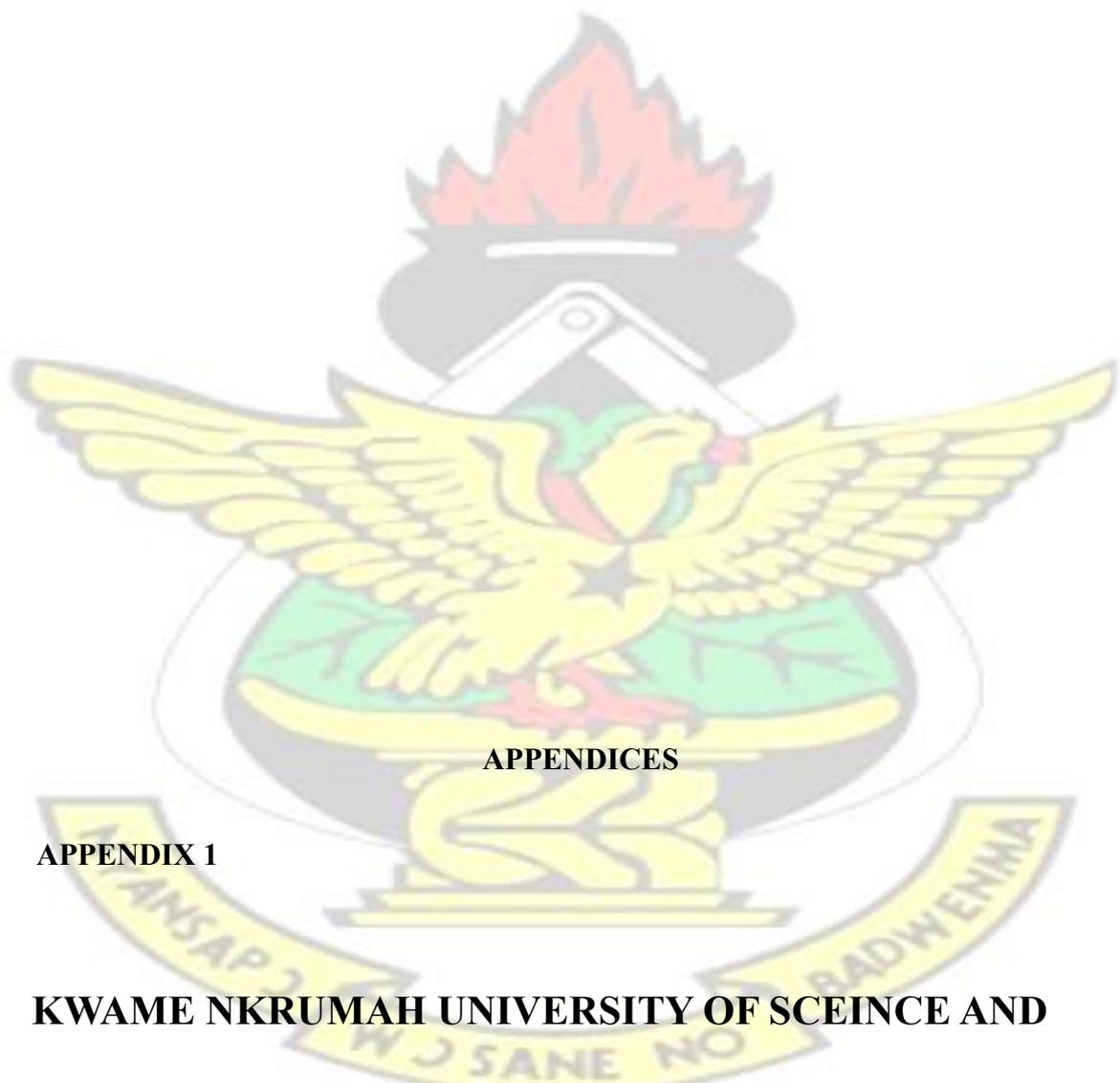
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**APPENDICES**

**APPENDIX 1**

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND  
TECHNOLOGY**

**QUESTIONNAIRES FOR CONTRACTORS**

Dear Sir/Madam,

I am Monica Korkor Nartey, a final year MSc. Project management student of the Kwame Nkrumah University of Science and Technology carrying out a research on the construction industry. I will be grateful if you could provide answers to the following question below. This research instrument is designed to study **Assessing the Implications of Cost Overruns in the Construction Industry in Ghana: The Accra Metropolitan Area as a Case Study.**

This is in particular partial fulfillment for the award of the Master's Degree in Project Management. This is just a study for academic purposes. It has no bearing on anyone or company. Confidentiality of respondents is assured. Thank you.

*Please tick and fill in the blank spaces appropriately.*

**SECTION A: SOCIO-DEMOCRATIC CHARACTERISTICS**

1. Age?

18-25 26 - 33 34 - 41 42 - 49 50 - 57 58 - 65 66 and above

2. Sex?

Male Female

3. Level of education?

Primary J.S.S S.S.S Tertiary other specify.....

4. Type of construction are you engaged in? .....

5. The cost range of construction works undertaken since 2010.

From GHC 100,000 to 200,000 From GHC 210,000 to 300,000 From GHC 310,000 to 400,000 From GHC 410,000 to 500,000 From GHC 500,000 and above

6. Period of construction experience.

Under 2 years  3-5 years  6-10 years  11-15  16-20  21 and above.

*Please tick and fill in the blank spaces appropriately.*

**SECTION B: The Role of the Construction Industry to Economic Growth in Ghana.**

7. Do you think the construction industry plays any positive role in the economic growth of Ghana?

Yes  No  Don't know.

8. Give reasons to support your answer in question 7.

.....  
.....

9. What are the specific functions of the construction industry in Ghana's economic growth stimulates the development of other industries?

Offers employment for citizens  improves the general infrastructural base of the country.

*Kindly indicate the extent to which you agree with the following statements. Likert scale on a range 1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly Agree.*

Code	The Role of the Construction Industry to Economic Growth in Ghana	Relevance				
		1	2	3	4	5
10	Projects constructed within anticipated cost ensure quality standards.					

11	Cost of projects structured without any variations contribute to successful project execution.					
12	Construction contributes less to services, manufacturing and agriculture sectors.					

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*Please tick and fill in the blank spaces appropriately.*

**SECTION C: The Causes of Cost Overruns in construction.**

13. Do you appreciate the essence of cost overruns in the construction industry?

Yes No Don't know

14. Give reasons to support your answer in question 13.

.....  
 .....

15. If you really appreciate the essence of cost overruns, can you identify the causes of cost overruns in the construction industry?

Yes No Don't know.

16. What then are the specific causes of cost overruns in construction? Inability of negotiator to rely upon an independently prepared government estimate?

Change in requirements and existing job conditions Inappropriate project plan Poor project

management tools and techniques

17. Have you ever as a contractor experience of the above causes of cost overruns in construction.

.....

.....

18. If your response in question 17 is in the affirmative, which of the following causes of cost variation is the most prevalent? Inability of negotiator to rely upon an independently prepared government estimate.

- Change in requirements and existing job conditions  Inappropriate project plan  Poor project management tools and techniques.

*Kindly indicate the extent to which you agree with the following statements. Likert scale on a range 1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly Agree.*

Code	The Causes of Cost overruns in construction.	Relevance				
		1	2	3	4	5
19	Major causes of project overruns usually take place in the construction phase.					

*Please tick and fill in the blank spaces appropriately.*

**Section D: The Implications of Cost Overruns in the Construction Industry.**

20. Do you think there is any repercussion for contractors due to cost overruns in the construction projects?

- Yes  No  Don't know.

21. Cost overruns also have serious implications on the physical, social and financial environment in the construction landscape. Do you agree?

Yes No

22. Does cost overruns also have implications on the interest rates being charged on the loan secured for construction?

Yes No  Don't know.

23 In what ways are the constructions of projects affected by cost overruns?

.....  
 .....

*Kindly indicate the extent to which you agree with the following statements. Likert scale on a range 1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly Agree.*

Code	The Implications of Cost overruns in the Construction Industry	Relevance				
		1	2	3	4	5
24	Cost overruns in the construction of projects really results in projects overrun.					
25	Delay in project construction is possible following the emergence of cost overruns.					
26	Actual project status is affected since objective predictions on final project performance cannot be feasible due cost overruns					

*Please tick and fill in the blank spaces appropriately.*

**Section E: Appropriate Strategies Aimed at Addressing the Challenges Posed by Cost**

**Overruns in Construction.**

27. Do you think it is possible to suggest appropriate strategies aimed at addressing the challenges posed by cost overruns in construction?

Yes No Don't know.

28. What specific strategies could be used to prevent cost overruns in project construction?

Effective evaluation of Project-cost relationship?

Taking into consideration the scheduled for the duration Regular time-cost trade-off analysis

to shorten the project duration Applying critical path scheduling with all activity durations is also a panacea to avoiding cost overruns

29. What are the other strategies aimed at addressing cost overruns in construction.

.....  
 .....  
 .

*Kindly indicate the extent to which you agree with the following statements. Likert scale on a range 1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, 5 = Strongly Agree.*

Code	Appropriate Strategies Aimed at Addressing the Challenges Posed by Cost Overruns in Construction	Relevance				
		1	2	3	4	5
30	Monitoring of cost and time variances for actual project progress could result in preventing cost overruns in construction					

31	Establishing the actual project status based on objective predictions could avoid cost overruns on final project performance					
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Any other remarks?

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.....

.....

**Thank for responding to the questionnaire**

**Appendix 2**

**KWAME NKURUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**QUESTIONNAIRE FOR CONSULTANTS OF PROJECTS CONSTRUCTED**

Dear Sir/Madam,

I am Monica Korkor Nartey, a final year MSc. Project management student of the Kwame Nkrumah University of Science and Technology carrying out a research on the construction industry. I will be grateful if you could provide answers to the following question below. This research instrument is designed to study **Assessing the Implications of Cost Overruns in the Construction Industry in Ghana: The Accra Metropolitan Area as a Case Study.**

This is in particular partial fulfillment for the award of the Master's Degree in Project Management. This is just a study for academic purposes. It has no bearing on anyone or company. Confidentiality of respondents is assured. Thank you.

*Please tick and fill in the blank spaces appropriately.*

### SECTION A: Professional Information/Profile

1. Age?

18-25 26 - 33 34 - 41 42 - 49 50 - 57 58 - 65 66 and above

2. Sex?

Male Female

3. Level of education?

Technician Diploma / HND Degree Masters PhD other specify.....

4. Name of consulting Firm.....

5. Year of establishment.....

6. Nature of consultancy services.....

7. Do you offer consultancy services if requested by clients? Yes  No

*Please tick and fill in the blank spaces appropriately.*

### SECTION B:

**The Causes of Cost Overruns in construction.**

8. In your own view as a consultant, indicate the causes of cost overruns in the constructions of a given infrastructure.

.....  
.....

9. How does each of the above identified causes of cost overruns in question 5 impact on construction.

.....  
.....

**Significance of Cost Overruns in construction.**

10. How Significant is cost overruns to the construction industry.

.....  
.....

**The Implications of Cost Overruns in the Construction Industry.**

11. What are the implications of cost overruns in the construction industry?

.....  
.....

12. How do the implications of cost overruns impact on the construction industry?

.....  
.....

**Appropriate Strategies Aimed at Addressing the Challenges Posed By Cost Overruns in Construction.**

13. What do you think should be done to help contractors deal with the challenges of Cost overruns in Construction?

.....  
.....

14. What other functions do you play apart from the consultancy services for contractors?

.....  
.....

15. Any other remarks?

.....  
.....  
.....

**Thank you for responding to the questionnaire**

