

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

COLLEGE OF ARCHITECTURE AND PLANNING

DEPARTMENT OF BUILDING TECHNOLOGY

**RISK MANAGEMENT PRACTICES OF FOREIGN
CONTRACTORS IN GHANA**

A thesis submitted to the Department of Building Technology, in partial fulfilment
of the requirements for the award of Master of science in CONSTRUCTION
MANAGEMENT

BY

ISAAC DWUMAH FRIMPONG B.Sc.(Hons)

NOVEMBER, 2014

LIBRARY
KWAME NKRUMAH UNIVERSITY OF
SCIENCE AND TECHNOLOGY
KUMASI-GHANA

DECLARATION

I hereby declare that I have wholly undertaken the research reported herein under supervision.

Isaac Dwumah Frimpong PG9125813



7/11/14

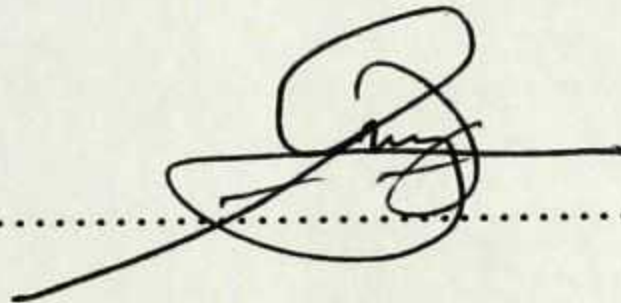
(Student name)

Signature

Date

Certify By:

Dr. Emmanuel Adinyira.....



10/11/14

(Supervisor)

Signature

Date

Certify By:

Prof. Joshua Ayarkwa.....



10/11/14

(Head of Department)

Signature

Date

DEDICATION

I wholeheartedly dedicate this work to the Almighty God for His protection; to my family, my father Mr Alex Dwumah, my brothers Samuel Obiri Yeboah, Daniel Oduro Dwumah and Blessing Dwumah Manu and my wife Maame Osaah Akua Acheampong and lastly the blessed memory of my mother Mrs Janet Dwumah Manu.

ACKNOWLEDGEMENT

This research has been made possible by the Grace of the Almighty God. I would like to sincerely thank my supervisor Dr. Emmanuel Adinyira. The Co-ordinator of post graduate Research degrees, Department of Building Technology at College of Architecture and Planning, KNUST, for the immense assistance offered me and for the supervision of this project work. His in depth knowledge in this area of study and his systematic way of approaching problems, has largely shaped the focus and content of this research.

I want to say thank you to Derek Abankwa, KNUST, for his advice and direction. The special support to this research work is greatly appreciated.

I am also indebted to my father Mr. Alex Dwumah Manu and my wife Maame osaah Akua Acheampong for their constant encouragement and support.

ABSTRACT

Managing risks in construction projects has been recognised as a very important management process in order to achieve the core element of project success in terms time, cost, quality, safety and Environmental sustainability as targeted. This Research identified risks inherent in operations of foreign contractors, the strategies used to handle risk and the severity of effects of these risks to construction projects. Fifty (50) contractors comprising D1K1 and D2K2 Foreign Contractors in Ghana were interviewed on the major risk factors, strategies and effect using a structured questionnaire. The responses were processed and analyzed to come out with Descriptive statistics for each factor identified. Mean scores were used in identifying the major risk factors faced by foreign Contractors. The results revealed emergence of new stakeholders who demand new works, delay in payments, Industrial relation problem, Incomplete design, risk mitigation, Abandonment of project as the most frequently occurring risks in the study area as revealed by the research. Also, the contractors perceived that insurance of works against risks is the most suitable approach for mitigating risk with project failure being perceived as most severe impact of the identified risks. It is recommended that foreign contractors on construction project take into consideration those major risk factors with high mean score. These risks should be identified at the early stage of construction projects to help adopt the right strategies to mitigate their effect on the project and their operations in Ghana.

Keywords: Risk Management, Foreign Contractors, Ghanaian Construction, Risk factors, Strategies.

TABLE OF CONTENT

DECLARATION	ii
DEDICATION	iii
ACKNOWLEDGEMENT	iv
ABSTRACT.....	v
TABLE OF CONTENT	vi
LIST OF TABLES.....	viii
LIST OF FIGURES	ix
ABBREVIATION AND THEIR MEANINGS	x
 CHAPTER ONE	1
INTRODUCTION.....	1
1.1 Background.....	1
1.2 Problem Statement.....	2
1.3 Aim	3
1.4 Objectives	3
The following were the objectives of the study:.....	3
1.6 Scope of the Study	4
1.7 Brief Methodology.....	4
1.8 Significance of the Study.....	4
1.9 Limitation of the Study	5
 CHAPTER TWO	6
LITERATURE REVIEW	6
2.1 Introduction.....	6
2.2 Overview of Construction Industry	6
2.3 Foreign Contractors	8
2.4 The Construction Industry in Ghana (CIG)	9
2.5 The Construction Delivery Process	13
2.6 The Conceptual Definition of Construction Risk	14
2.7 Possible Risk Associated with Construction Projects.....	15
2.8 The Strategies Contractors use in Managing Risks	18
2.9 The Effects of Risk on Construction Projects.....	20

2.10	An Overview of Risk Management in Construction.....	21
2.10.1	Risk Management Practices	21
2.10.2	The Risk Management Process	23
2.10.3	The Benefits of Risk Management.....	30
2.11	Summary.....	30
CHAPTER THREE.....		32
RESEARCH METHODOLOGY		32
3.1	Introduction.....	32
3.2	The Research Process	32
3.3	The Target Population.....	34
3.4.1	Questionnaire Design.....	35
3.4.2	Distribution of Questionnaires.....	35
3.4.3	Data Analysis	36
CHAPTER 4.....		37
RESULTS AND DISCUSSIONS.....		37
4.1	Introduction.....	37
4.2	Discussion of Results.....	37
4.3	Possible risk Associated with the operations of Foreign Contractors.....	39
4.4	Effects of Risks on Contruction.....	43
4.5	Risk Management Strategies.....	44
CHAPTER FIVE		46
CONCLUSION AND RECOMMENDATIONS.....		46
5.1	Summary.....	46
5.2	Conclusion	47
5.2.2	Hypotheses two: There are effects of risk to foreign contractors on project delivery in Ghana.....	48
5.2.3	Hypotheses three: There are risk management strategies used by foreign contractors in managing risk.....	49
5.3	Recommendation	49
REFERENCES		51
APPENDIX – A.....		58

LIST OF TABLES

Table 4.1; Demographics characteristics of the respondents.....38

Table 4.2; Possible risk factors associated with operations of foreign contractors. ...39

Table 4.3; Effects of risk.....43

Table 4.4; Risk Management Strategies44

LIST OF FIGURES

Figure 2.1: The composition of the construction industry	7
Figure 2.2 The process for delivering a construction project	14
Figure 2.3: The risk management process	24

ABBREVIATION AND THEIR MEANINGS

INTRODUCTION

IMCA	-	International Marine Contractors Association
CIDB	-	Construction Industry Development Board
OSPMI	-	Office of State wide Project Management Improvement
COBRA	-	Constructions Building and Real Estate Research Conference of Royal Institute of Chartered Surveyors
CIG	-	Construction Industry in Ghana

CHAPTER ONE

INTRODUCTION

1.1 Background

Risk management in the construction industry has been recognised as a vital management process in order to achieve projects objectives within time, cost and quality (Ashworth, 2010). Organisations of all types and sizes face a range of risks that may affect the achievement of their objectives. These objectives may relate to a range of the organisation's activities from strategic initiatives to its operations, processes and projects, and be reflected in terms of societal, environmental, technological, safety and security outcomes, commercial, financial and economic measures as well as social, cultural, political and reputation impact. The risk management strategies aids decision making by taking account of uncertainty and the possibility of future events or circumstances and their effects on agreed objectives (BS 31010, 2010). Risk and uncertainty cannot be avoided in the construction industry. An appropriate strategy such as risk management system is essential for reducing and controlling the risk. Foreign Contractors in the Ghanaian construction industry faces risk and uncertainty as other construction industries in the world. Construction industry is usually more risky compared to other business activities because of its complexity in coordinating various activities.

Furthermore each project is unique and often incorporated with new techniques and procedures. The core element of project success is to meet the time, cost and quality as targeted. In order to achieve these targets risk may appear in many ways and could result in time overrun, budget overrun, financial losses, loss of life, environmental damage and many other failures (Ayyub, 2003). A construction project is a complex system faceted with many risks and complicated relations, which influence the

construction. Thus construction projects are usually executed under conditions of varying degrees of risks with serious effects on project cost, quality and duration. Yet many contractors have a lukewarm attitude towards risk management on construction projects.

Risk and uncertainty are natural in all construction projects irrespective of project size. Factors influencing risk levels include project complexity, location, and time available for design and construction, and familiarity with the type of work. Risk management must therefore be of critical concern to foreign contractors, as unmanaged or unmitigated risks are one of the primary causes of project failure (Flanagan and Norman, 1993).

According to Mills (2001), productivity, performance, quality and cost of the project are affected by risk. Edward and Bowen (1998) identified risk management as an important tool to cope with constructional risks and to overcome above problems of a project.

1.2 Problem Statement

Indeed, the Ghanaian Construction Industry is plagued with numerous inherent problems which encroach negatively on the execution of projects and the operations of foreign Contractors. These risks usually have a serious effect on construction when they are not managed. Unmanaged or unmitigated risks are a serious concern to client, consultant and contractors (COBRA, 2010).

The specific problem of this study was that risks associated with projects are potentially having serious financial impact in all the parties involved and because it is complex and difficult problem to solve (Kangari, 1995). There is therefore the need to

evaluate and critically analyzed the risk associated with operations of foreign contractors and to adopt the appropriate risk management tools to minimize the risk.

With the increase rate of risks and their impact on construction nowadays, it has been very necessary to assess the various form of measure or method put in place by various stakeholders especially the foreign contractor to address these problems.

1.3 Aim

The purpose of the study was to identify the possible risk and the risk management practices of foreign contractors in the Ghanaian Construction industry.

1.4 Objectives

The following were the objectives of the study:

1. To identify the major risk associated with the operations of foreign contractors in the Ghanaian Construction Industry.
2. To identify the effects of these possible risk to foreign contractors on project delivery in the Ghana Construction Industry.
3. To identify Risk Management strategies adopted by the Foreign Contractors.

1.5 Hypothesis

1. There are risk associated with the operations of foreign contractors in the Ghanaian Construction Industry.
2. There are effects of these possible risk to foreign contractors on project delivery in the Ghana Construction Industry.
3. There are Risk Management strategies used by the Foreign Contractors in managing risk.

1.6 Scope of the Study

The study was limited to D1K1 and D2K2 foreign contractors operating in the Kumasi and Accra cities of Ghana; and covered completed and uncompleted projects.

1.7 Brief Methodology

The following procedures were adopted to achieve the above stated objectives. The extensive review of literature was conducted on risks management on construction projects generally in Ghana and particularly in the Cities of Accra and Kumasi , from journals, constructions books, the internet, previous research etc.

Collection of data involved the use of carefully design questionnaire to investigate into the risk management practices by foreign contractors.

The collected data was also analyzed using various forms of statistical tools such as SPSS for descriptive statistics.

1.8 Significance of the Study

Over the years, projects have failed to accomplish their stated objectives and reasons assign for their failure have been unclear and superficial with emergence of some new stakeholders and delay of payment attributing it to issues such as; political, financial conditions etc. These uncertain and incoherent excuses do not provide solutions to these inherent and repeated problems.

Therefore, the study explored the Risk management practices by foreign contractors in Ghana and further broadened the understanding of risk issues and its effect on construction project delivery in Ghana.

1.9 Limitation of the Study

The information gathered especially from foreign contractors was inadequate because of their quest to keep trade secrets from competitors in the industry. The duration for the thesis and budgetary limitations did not allow the researcher to conduct a comprehensive test of the viability and suitability of the total population of foreign Contractors operating in Ghana.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter is a review of literature on the topic captioned above. It comes in the following format: Overview of construction Industry, Foreign Contractors, Ghanaian Construction Industry, Construction delivery process, Conceptual definition of Construction Risk, Possible risk associated with construction Projects, Strategies contractors used in Managing risk, Effects of risk on construction Projects, Overview of risk management in construction, Risk management practice, An element of the Risk management process; risk identification, risk assessment, risk response development, risk response control, benefits of risk management and summary of the review.

2.2 Overview of Construction Industry

Since the beginning of time mankind has been involved in the business of building. Technology and construction methods continually evolve; from the Egyptian post and the lintel system, the Greek pediment, the Roman arch and dome, the Byzantine basilica, and the new Renaissance perspective to the school of the Bauhaus and the International style leading us into modern times and the new millennium. Over time, societies change, construction methods change, clients change and the architect's.

Construction is a major worldwide industry accounting for approximately \$3.4 trillion USD, or almost ten percent of global Gross Domestic Product (Batchelor, 2000). Construction projects that are performed in an international context can be very complex and the risks involve a host of issues (Walewski and Gibson, 2003).

The significance of the Construction Industry cannot be overemphasized, for instance, although the United States is the largest construction market which is estimated at over \$800 billion USD, most projects accomplished outside of the domestic market, have long been and have become an even larger part of the capital investment portfolio of United States of America (Batchelor, 2000).

As shown in Figure 2.1 below, the narrow definition focuses attention on the actual on-site construction activities of contractors whilst the broad definition, which actually covers the true extent of the construction industry, draws in the quarrying of construction raw materials, manufacture of building materials, the sale of construction products, and the services provided by the various associated professionals (Pearce, 2003).

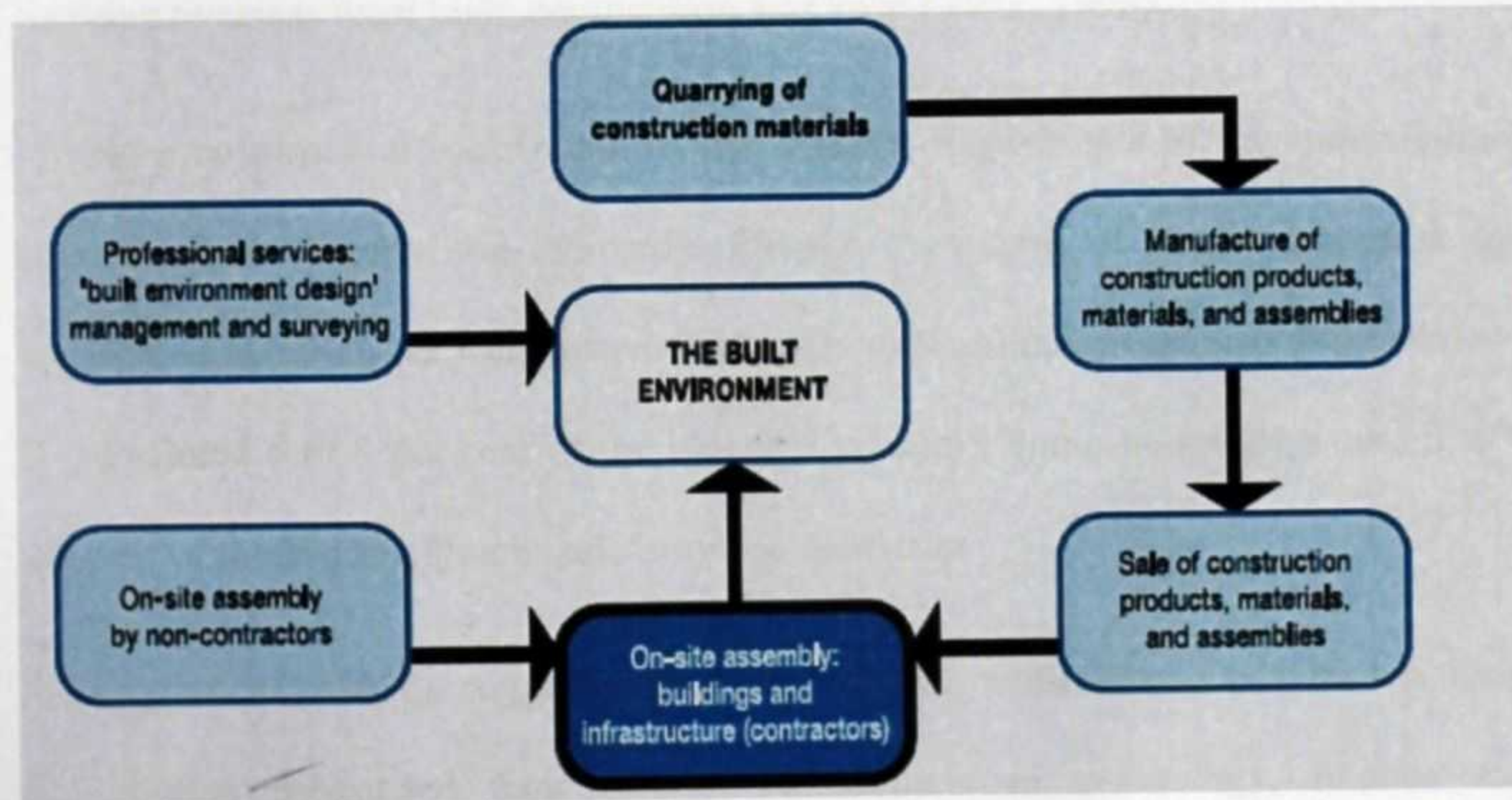


Figure 2.1: The composition of the construction industry

Source: (Pearce, 2003).The social and Economic Value of Construction

2.3 Foreign Contractors

Foreign Contractors are organizations that operate internationally and play an important role to advance local enterprise, skills and management in developing countries (Ofori, 1996). Moavenzadeh and Hagopian (1984) see foreign contractors as the sole factor influencing the development of the construction industries of poorer countries. This model is criticized by Ofori (1996) who notes that the objectives of foreign construction enterprises and host developing country governments differ.

A study of international contracting observed that foreign contractors was categorized by firms of the industrialized countries expanding their operations mostly into developing countries as well as other developed countries. There was massive potential for construction in developing countries, although the risks involved in working overseas were high, competition was keen (Ofori,1996).

Overseas construction contributed to the balance of payments of the industrialized countries both directly and indirectly, through the export of plant, equipment and specialized materials, as well as invisibles such as consultancy and insurance services. It constituted 5 to 8 per cent of the United Kingdom's domestic industry, and 3 to 6 per cent of the French, Dutch and American industries

Raftery *et al.* (1998) suggested that in the long term, the gap between local construction firms and their foreign counterparts in technology, finance and management knowhow, could be filled through technology transfer. An example is through joint ventures among the two groups of organizations.

2.4 The Construction Industry in Ghana (CIG)

Dansoh (2004) states that, the CIG was developed along lines similar to the pattern in Britain when the bricklayers acted as master builders in an organization. The Ghanaian industry, like the industry the world over has attained a broad spectrum of employees making it 87% labour intensive industry. Companies within this industrial sector operate in a constantly changing environment in the face of unpredictable economic environment, shifting political climate and a highly competitive market (Dansoh, 2004).

As Ahadzie *et al.* (2006) narrates; the early beginning of the formal CIG was a reflection of Ghana's historical link with Britain. Hitherto, construction in this country was a non-commercial family vocation restricted largely to the provision of village shelters of mud and wood. The form of construction during this period was largely very simple rectangular and circular single-storey shelters designed by family heads and constructed by family members and friends as communal labour. The rectangular buildings were often found in Southern Ghana whilst the circular shelters were common in the Northern parts. In both forms of construction, the materials used were normally located within the settlement and were in their raw form including thatch for roofing.

Ahadzie *et al.* (2006) continues by drawing from developments of global construction practices as evidenced ~~in history~~ of architecture and/or construction, it sounds reasonable to argue that the type of construction forms in Ghana in the colonial era and the immediate aftermath had its root in rudimentary crafts handed down by family heads.

Typical of pre-historic times, the construction practices could be described as crude at it best especially because of its very elementary and unscientific nature.

Obviously, traces of such shelters can still be found in many of the typical rural villages across the breadth and length of the country. To this extent, the provision of sandcrete (i.e. cement and sand) block houses based on architectural working drawings became popular (Ofori,1998).

Really, during the pre-independence era, local construction capacity especially with respect to local construction companies was totally non-existent in any identifiable form. It is therefore not surprising that, almost all construction contracts were awarded mostly to British Conglomerates during this period. Certainly, the trend began to change when the care-taker government of Nkrumah was sworn in the early 1950s.

Subsequently the then Ghana National Construction Corporation (GNCC) was formed. On attaining independence, the GNCC was renamed the State Construction Corporation (SCC). Ofori (1998) states that Political independence in 1957 saw the establishment of the Ghana Highway Authority (GHA), the defunct State Construction Corporation (SCC) and the Architectural and Engineering Services Limited (AESL) to take over the formal construction sector. According to this author, the advent of sophistication has led to the founding of other state departments as well as private organizations works with systems that have been mostly compulsory or inherited from colonial rule.

The CIG has over the years developed into two sectors: the formal sector which adopts a variety of procurement routes (Anvuur and kumaraswamy, 2006); and the informal sector which like in other African countries and indeed the world over,

adopts an approach related to the historical approach of master craftsman engaging labour in product delivery.

In general, demand for new construction products, and hence construction activities, tend to be utmost at the early stages of economic development and level off after high level of economic development has been achieved (Edmonds and Miles, 1984). It has also been shown that: During periods of accelerated economic growth, construction output develops at a faster rate than the economy as a whole.

From the foregoing, Kirmani (1988) says that a developed construction industry is defined as a powerful engine to growth of any economy. Therefore the current resurgence in construction activities spanning from residential buildings to hydro-power dam developments is a confirmation of the above opinions; Ghana is currently classified as a middle income economy moving from the earlier developing status.

In an attempt to underscore the Ghanaian construction industry, Agbodjah (2008) emphasized that Contractors in Ghana are grouped into eight categories (A, B, C, S, D, K, E and G) according to the type of works they undertake. These are:

- 1) Roads, Airports, and Related Structures (A);
- 2) Bridges, Culverts and other Structures (B);
- 3) Labour based road works (C);
- 4) Steel bridges and structures: rehabilitation and maintenance (S);
- 5) General building works (D);
- 6) General civil works (K);
- 7) Electrical works (E); and
- 8) Plumbing works (G).

In each category, they are grouped into 4, 3, 2 and 1 financial classes in increasing order.

In addition, Dansoh (2004) notes a combined category of AB for road contractors. According to Dansoh (2004), Class 4 contractors can tender for contracts up to \$75,000; class 3 up to \$200,000; class 2 up to \$500,000 and Class 1 take contracts of all amounts.

Usually the category D contractors are main Contractors together with categories E and G being generally engaged as sub-contractors for general building works. Categories E and G contractors act as main contractors when the work is of a specialized nature. The industry is dominated by large number of small- and medium-sized firms, that is, classes 3 and 4, especially in the categories D groups, E and G.

Agbodjah (2008) states further that this is largely because such firms are able to register with as little equipment as possible. Mostly, they are sole proprietors, (few cases of partnerships), and are characterised by high attrition rate. This is because they are vastly influenced by the boom and slum nature of the industry in Ghana. They are the least organized and because they lack the resources to employ and retain very skillful labour, their performance is usually below expectation and they have often being blamed of producing shoddy works. Because there are usually more jobs within their financial class than those above their limits, and because they form the largest group, their performance impacts seriously on the performance of the industry.

Because of this, the classification by the Ministry has been criticized as being too general and outdated with the registration criteria, list of contractors and monetary thresholds not frequently updated (World Bank, 1996). The two upper classes (D1 and D2) are more organized and therefore more stable, taking on both bigger and smaller

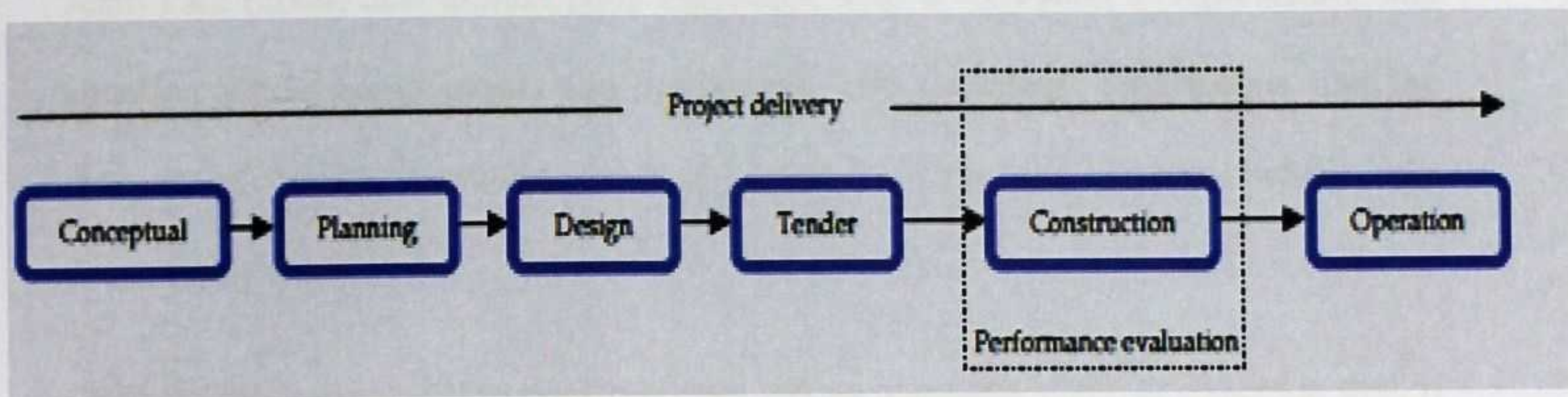
works. However, these firms (especially the D2 firms) do not always employ the very qualified workers. The Ghanaian-based foreign contractors are able to do this and hence performance better.

Vulink (2004) notes that because of the poor performance of Ghanaian local contractors most of the nation's major projects are mostly awarded to foreign contractors. This is arguably attributable to the lethargic, unprofessional and the non-business like culture with which indigenous companies operate in Ghana and the high level of attrition which leads to loss of organisation memory which effect negatively on the project execution.

2.5 The Construction Delivery Process

Generally construction involves the organisation and coordination of all resources for the project- labour, construction equipment, permanent and temporary materials, supplies and utilities, money, technology and methods and time to facilitate successful completion of a desired project on schedule, within budget and according to the standards of quality specified by the Architectural Engineering Drawings.

The delivery process itself occurs in a number of phases. From the project Management perspective, a more suitable classification of phases may be set out in the research studies of Lim and Mohammed (1999), Takim *et al.* (2003) and Ahadzie *et al.* (2006) with six phases of conception, planning, design, tender, construction and operational phase clearly identified (Figure 2.2).



Source: Lim and Mohamed (1999)

Figure 2.2 The process for delivering a construction project

2.6 The Conceptual Definition of Construction Risk

Risk is multi-facet and has been defined by different authors in varying ways. According to Wang *et al.* (2004), risk in construction could be the likelihood of the occurrence of a definite event or combination of events, which occur during the whole process of the construction to the detriment of the project. Also, COBRA (2010) claims that risk is said to exist when a decision is expressed in terms of a range of possible outcomes and when known probabilities can be attached to the outcome. Cooper *et al.* (2005) further explains constructional risk as an exposure to the consequence of the uncertainty. In the construction context it is the chance of something happening that has an impact upon objective of the construction. It includes the possibility of loss or gain or variation from desired or planned result as a consequence of the uncertainty associated with a particular cause of the action. However, risk in the construction industry can be defined as an uncertain event or condition that results from the construction, having an impact that opposes expectation (Klemetti, 2006).

Jean- Paul (2004) also defines risks associated with construction as representing any situation where some events are not known with certainty. This means that the prospect of risks is prevalent and it is hard to consider any condition where risks doesn't play role.

OSPMI (2007) discussed to constructional risk as uncertain event or condition that, if it occurs, has a positive or a negative effect on at least one project objective. A risk may have one or more causes and, if it occurs, one or more impacts. Kajsa (2006) is of the view that risk is something that happens and which was neither foreseen in the project description nor in the contract, often being caused by lack of knowledge with one or many of the parties involved. From the above definitions it can be realized that risk has two elements: the likelihood or the probability of something occurring and the consequence or impact if it does occur.

2.7 Possible Risk Associated with Construction Projects.

Risk abounds in the construction industry as any other industry in the world. There are different types of risks associated with construction activities. These are physical, environmental, design, logistics, and financial, legal, political, and operational risks (COBRA, 2010). Constructional risks types depend on whether the project is local (domestic) or international (Flanagan & Norman, 1993 as cited in COBRA, 2010). International projects tend to ~~be exposed~~ to the external risks such as unawareness of the social conditions, economic and political scenarios, unknown and new procedural formalities, regulatory framework and governing authority, etc. Internal risks are important to all projects irrespective of whether they are local or international. Risk identification begins at the earliest stages of a project and continues throughout the project life cycle. The practice of risk identification centers on reducing the

probability of occurrence and impact of a threat while increasing the probability and impact of an opportunity. During risk identification phase, the contractor must establish the various risk categories that are pertinent to the project before selecting the appropriate tools and techniques to identify risks. Classification of risks entails identifying the type, consequence and impact of risk. Wiguna and Scott (2006) have derived a risk hierarchy under four risk categories: external and site condition risks, economic and financial risks, technical and contractual risks, and managerial risks. This classification of risks adopted in this research. According to Bunni (1997), when a risk has been identified, assessed and analyzed, it must be allocated to various stakeholders in order to keep it under control and to prevent the occurrence of harmful consequences.

According to (IMCA, 2006), the key risks connected with construction at site are identified as: Performance risk which includes the nature and duration of work, schedule interactions, safety and environmental performance. Political risks include interference from political forces, disturbance which come as result of change in laws, national labour strike due to change of political party in power. Political risk also ascends due to statutory amendments being made to industrial relations legislation after a change in government. Technical risks include the emergence of new technology. Geographical risks involve risks pertaining to the location of the project. Operator risks also include ~~Operator's~~ areas of influence, insurance, problems which have impacts on the operator and the contractor. IMCA (2006) has categorized risk associated with construction as follows:

Unpredictable which is an external risks, are risks beyond the control of the individual or operator and are entirely unpredictable. They arise from external influence such as

third parties, acts of God etc. Also predictable risks but uncertain risks are those that are beyond the control of individuals or firms. They are expected, but to what extent? There is usually data to determine a norm or average, but the actual impact can be above or below this norm. Bad weather is an example. Conversely, technical risk which is an internal risks, are risks arising directly from the technology of the project work, of the design, construction or operation of the facility. Non-Technical risks are within the control of individuals or the operator and usually arise from a failure of a project team to attain its expected performance. They may result in schedule delays, cost over-runs or an interruption to cash flow.

Treasury (2004) views and categorises risk into external risk arising from the external environment, not solely within the contractor's control, but where action can be taken to mitigate the risk. Some of the external risks which are associated with construction are: political risk which deals with change of government, cross cutting policy decisions; machinery of government changes. Also economic risk involves the ability to draw and retain staff in the labour market. Socio culture risk tackles demographic change affects demand for services; stakeholder expectations change.

Treasury (2004) mentions that, technological risk includes obsolescence of current systems; cost of procuring best technology available. Legal or regulatory risks impose requirements on contractors, such as health and safety or employment legislation. Service or product failure risks include operative or subcontractor's failure to provide the service to the main contractor within agreed or set conditions. Project delivery failure risks is when the contractor fails to deliver on time or budget his time with specification. Also resources financial risks discuss inadequate funding, poor budget management, pilfering, poor storage of material poor waste control system etc.

Information risks are adequacy for decision making which lead to physical loss at site, damages and theft and relationships delivery risks grants the relationship or clarity of roles and accountability.

2.8 The Strategies Contractors use in Managing Risks

According to Flanagan and Norman (1993), the methods used to mitigate risks are the umbrella, ostrich, intuitive, brute force methods. Flanagan and Norman (1993) mentions that, the umbrella approach is where a contractor must allow for every possible eventuality by adding a large risk premium to the price. Flanagan and Norman (1993) further mentions that the ostrich approach is where contractor conceals his head in the sand and assume everything will be alright, that somehow you will muddle through. The intuitive approach emphasizes that the contractor should not trust all the fancy analysis, trust your intuition and gut feel; The brute force approach focuses on the uncontrollable risk and that the contractor can force things to be controlled, which of course they cannot.

TAMO4-12 (2004) also classifies four strategies or approaches for mitigating constructional risks and their consequences. They are, risk prevention, impact mitigation, risk transfer, insurance and risk acceptance. Risk prevention is directed towards eliminating sources of risk or substantially reducing the likelihood of loss from their occurrences. Examples include the selection of alternative proposals, design and engineering changes, quality assurance procedures, asset utilization studies, operations reviews, regular audits and checks and preventive maintenance. TAMO4-12 (2004) again mentions that, impact mitigation is directed to minimizing the consequences of risks. Some risks, such as those associated with market variations or weather, cannot be evaded. Accordingly risk Management must then be directed to

coping with their impacts. Impact mitigation measures include contingency planning, contract terms and conditions, inspections. Risk transfer on the other hand, shifts responsibility for a risk from the agency to another party, who eventually bears the consequences if the risk arises. The agency will normally incur a cost for the other party assuming the risk. Insurance unlike those mentioned above, is a well-known risk transfer strategy for physical and other assets and activities and for a limited range of construction risks. Most risk transfer strategies require decisions to be taken very early in the life of a project, usually in the pre-tender phases. Finally, risk acceptance occurs when risks cannot be avoided or transferred, or the costs of doing so would not be worthwhile. Risks must then be accepted. Impact mitigation measures and monitoring may be appropriate and should be recommended in these circumstances.

CIDB (2004) presents the strategies and approaches to mitigate risks associated with construction. The strategies and approaches are, monitoring of the risk, risk acceptance, risks avoidance, risks control and risk transfer. Monitoring of the risks is to check, supervise, observe critically, or record the progress of an activity on site, action or system on a regular basis in order to identify change. Risk acceptance also tackles an informed decision to accept the consequences and the likelihood of a particular risk. Risk avoidance is an informed decision not to become involved in a risk situation. Also risk control deliberates the part of risk management which involves the implementation of policies, standards, procedures and physical changes to eliminate or minimize adverse risks and finally risk transfer is the shifting of the responsibility or burden of loss to another party through legislation, contract, insurance or other means or shifting a physical risk or part thereof elsewhere.

2.9 The Effects of Risk on Construction Projects

Flangan and Norman (1993) outlines the following impacts of risk associated with construction: Failure to stay within the estimated cost of the project. Failure to achieve the require complete time thereby resulting delay of the project Failure to achieve the required quality of work. Failure for the project to meet the required operational need.

They also suggested that, the impact of these risk usually have a negative effect on the project cost, schedule, or project objective as a result of derailing the smooth running of the project. It is further mention that, Institutional owners of major construction projects are faced with a series of critical issues. For many institutions, capital expenditures are reaching an all-time high, and represent a potential substantial risk in nearly all aspects of project delivery.

Often complicated, fast-paced and risky endeavors, construction projects are prone to cost overruns, fraud, misconduct, waste and abuse, as well as being carried out in a constrained and demanding environment subject to increased scrutiny. The execution of major capital projects presents owners with enormous challenges. Having an appropriate level of oversight and controlling place is critical, only in doing so can risks be mitigated.

2.10 An Overview of Risk Management in Construction

This section reviewed literature on the practices, processes and benefits of risk management in the construction industry.

2.10.1 Risk Management Practices

According to the BS 31100 (2008), risk management should be part of the organization's general approach or framework for governance. The organization should base its risk management practices on the following principles:

- i. **Risk management should be tailored:** the organization should have an approach to risk management which is proportionate and scaled to report the situation;
- ii. **Risk management should take into account organizational culture, human factors and behavior:** the organization's risk management processes should take into account the capabilities, perceptions and objectives of the people in the organization. The code further mentions that, other relevant stakeholders who might facilitate or hinder achievement of the organization's objectives should be taken into account;
- iii. **Risk management should be systematic and structured:** the approach to risk management should be constantly applied within the organization. this helps ensure that the outputs of the risk management process are both reliable and comparable, and gives managers increased confidence to make effective decisions;

- iv. **Risk management should operate under a common language:** the organization should apply a mutual language when identifying, assessing and responding to risks, and maintaining its risk management framework;
- v. **Risk management should be based on the best available information:** the inputs to the risk management process should be based on relevant information sources, such as reported experience, subject knowledge, expert judgment and projected forecasts. Managers should be aware of any restrictions to the data or divergence of opinion among experts;
- vi. **Risk management should explicitly address uncertainty:** the organization should use risk management to help simplify the nature of uncertainty, how this might affect decisions and how it might be treated;
- vii. **Risk management should be part of decision making:** risk management should support informed decision making by helping to understand risks. this helps the organization in making a decision concerning its risk appetite and ability to manage the risks effectively;
- viii. **Risk management should protect everything of value:** risk management should contribute to the accomplishment of objectives and maximize benefits through integration with management processes, taking account of legislative, regulatory and compliance requirements;
- ix. **Risk management should be transparent and inclusive:** the organization's managers should ensure that all stakeholders are identified, informed and properly involved in risk identification, assessment and response;

x. Risk management should be dynamic, iterative and responsive to change:

the organization should ensure its risk management persistently identifies and responds to changes affecting its operating environment (in construction context); and

xi. Review of the principles: the way in which the risk management principles are applied should be subject to systematic review to reflect changes in the organization's nature and context.

2.10.2 The Risk Management Process

According to Azhar *et al.* (2008), risk management is a practical approach to control the level of risk and to mitigate its effects. It also prepares project managers to take risks when a time, cost, and/or technical advantage is possible. Successful management of project risks gives the project manager better control over the future events and can significantly improve chances of reaching project objectives on time, within budget, and meeting required technical/functional performance (Gray and Larson, 2008). The major components of the risk management process are depicted in Figure 2.3 below.

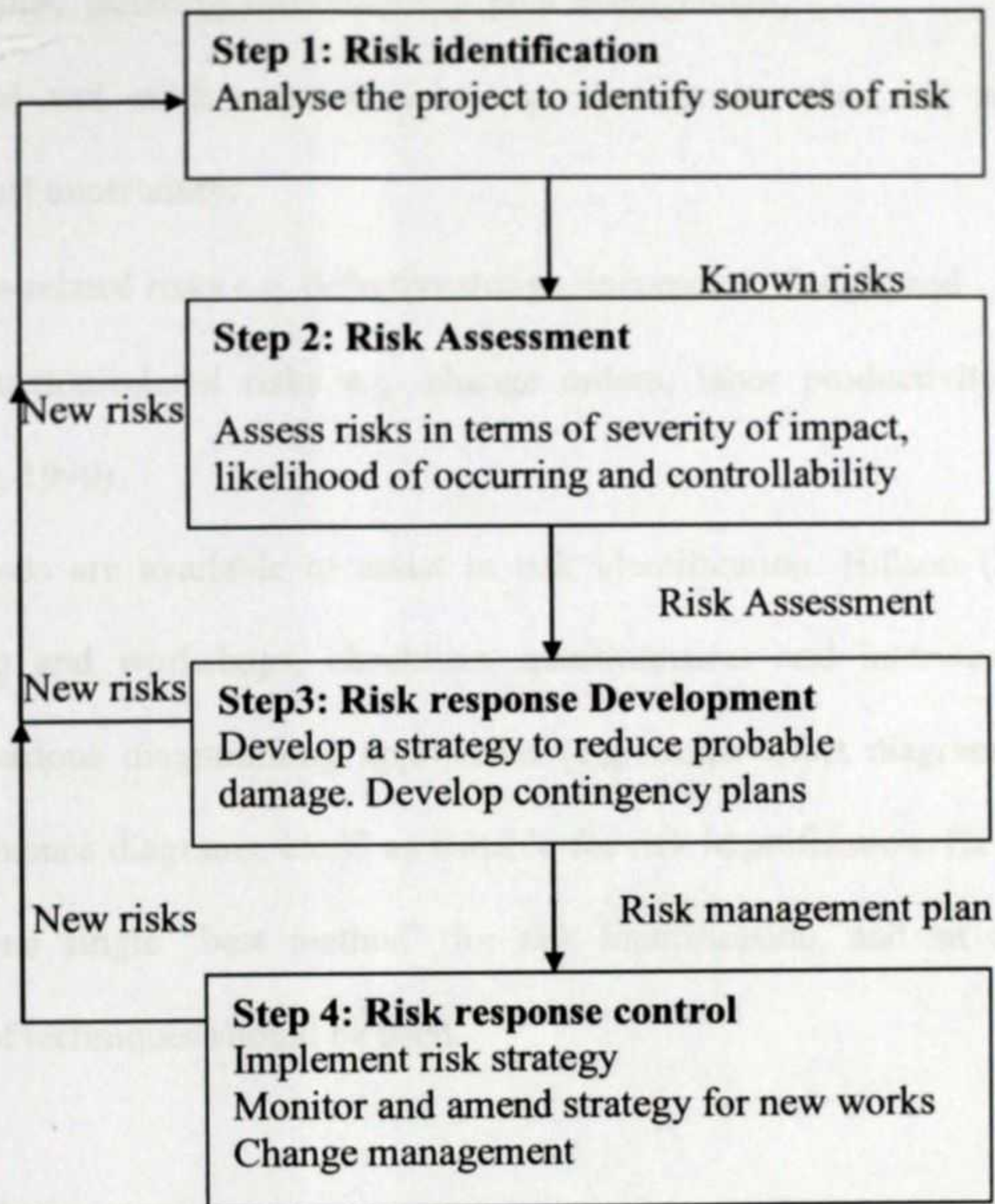


Figure 2.3: The risk management process (Gray and Larson, 2008)

Step 1: Risk Identification

The risk management process begins by trying to create a list of all the possible risks that could affect the project. Risks in construction can be classified into six categories as follows:

- Acts of God e.g. floods, hurricanes;
- Physical risks e.g. labor injuries, fire, damage to equipment;

- Financial and economic risks e.g. Availability and fluctuation in foreign exchange, pilfering, unavailability poor management;
- Political and environmental risks e.g. changes in rules and regulations, political uncertainty;
- Design-related risks e.g. defective design, incomplete design; and
- Construction-related risks e.g. change orders, labor productivity, etc (Al-Bahar, 1990).

Various methods are available to assist in risk identification. Hillson (2002) lists “brainstorming and workshops, checklists, questionnaires and interviews, Delphi groups, and various diagramming approaches (e.g. cause-effect diagrams, systems dynamics, influence diagrams, etc.)” as suitable for risk identification. He mentioned that there is no single “best method” for risk identification, and an appropriate arrangement of techniques should be used.

Step 2: Risk Assessment

Risk assessment helps in appraising potential impacts of risk and in making decisions regarding which risks to retain and which risks transferring to other parties. Both quantitative and qualitative methods are available for risk assessment. The quantitative methods rely on probability distribution of risks and may give more exact results than the qualitative methods, if the available data is strong and reliable. On the other hand, qualitative methods depend on personal judgment and past experiences of the analyst and the results may differ from person to person. Hence the quantitative methods should be given preference if both choices are available

Step 3: Risk Response Development

There are four typical ways of responding to risks in a construction project, which are:

- Risk elimination, e.g. by placing preconditions in the bid.
- Risk transfer, e.g. hiring subcontractors or buying insurance.
- Risk retention, e.g. reducing the impact of risk through preplanned strategies; and
- Risk reduction, e.g. training the staff about risk perception and its management

Step 4: Risk Response Control

The last step in the risk management process is risk response control which includes executing the risk response strategy, monitoring triggering events, initiating contingency plans, and watching for new risks. Establishing a change management method to deal with events that require formal changes in the scope, budget, and/or schedule of the project is an important element of risk control (Gray and Larson, 2008).

Andi (2006) has argued that "construction risks can barely ever be eliminated. They can simply be transferred or shared from one party to another through contract clauses". This is supported by Mak and Picken (2000) who underscore the fact that contractors should be prepared to accept a certain level of risk due to unexpected costs they incur during construction and that risk is also an issue for clients. Such allocation of risk becomes part of the risk management process.

According to CIDB (2004), risk management is to institute the framework, identify risks, analyse risks, evaluate risks, treat risks, monitor and review and communicate

and consult. Instituting the context involves establishing the strategic, organizational and risk management context in which the rest of the process will take place. Conditions against which risk will be assessed should be established and the structure of the analysis defined. Also, identification of risks discusses what, why and how things can arise as the basis for further analysis. Analyzing the risks, is determining the existing controls and analyze risks in terms of significance and likelihood in the context of those controls. The analysis should consider the range of potential consequences and how likely those consequences are to occur. Significance and likelihood may be combined to produce an estimated level of risk.

Also evaluation of risks is comparing estimated levels of risk against the pre-established conditions. This enables risks to be ranked so as to identify management priorities. If the levels of risk established are low, then risks may fall into an acceptable category and treatment may not be required. Treatment risks however, is to accept and monitor low-priority risks. For other risks, develop and implement a specific management plan which includes consideration of funding (CIDB,2004).

Monitoring and reviewing the performance of the risk management process and changes which might affect it make up the monitoring concept and finally communicating and consulting with internal and external stakeholders as appropriate at each stage of the risk management process and regarding the process as a whole.

Risk associated with construction cannot be eliminated, but can be managed; it is better to be proactive rather than reactive. Risks, however, need to be identified, quantified and understood if they are to be managed appropriately. Risk management is an iterative process consisting of well-defined steps which, taken in sequence, support better decision-making by contributing a larger insight into risks and their

effects. The risk management process can be applied to any condition where an undesired or unforeseen outcome could be significant or where opportunities are identified. Decision makers such as contractors need to know about possible outcomes and take steps to control their impacts (CIDB, 2004).

According to Latham (1994), no contraction project is risk free. Therefore risks should manage minimized, shared, transferred or accepted but it cannot be overlooked. According to Flanagan *et al.* (1993), Construction projects have many risks, contractors cope with and owners pay for them. Traditionally: The client or owner is responsible for the investment or finance risk the design team is accountable for the design risk. The contractor and specialist contractors are responsible for the construction risk. The suppliers and manufacturers are responsible for the performance risk of their components, and materials. The client/owner is responsible for operating and maintenance risk. The insurance industry carries the risk of failure by any of the parties through negligence, accident or force majeure. Government agencies are responsible for ensuring their codes and regulations set the minimum acceptable standards.

Maintenance teams and facilities managers played no part in the design and they take the risk of ensuring the project works in use. Cooper *et al.* (2005) described risk management as the culture of process and structure that are focused towards effective management of potential opportunities and adverse effects. And the risk management process involves the systematic application of management policies, processes and procedures to the takes of establishing the context identifying, analyzing, assessing, treating, and monitory and communication the risk.

Risk identification is the process of determining what, how and why things may occur. Risk analysis is the systematic use of accessible information to determine how often specified events may occur and the magnitude of their consequences. It may use any of a wide range of mathematical and other models and techniques. Risk evaluation determines whether the risks should be given the highest priority in the developing responses for risk treatment.

Gary (2002) also views risk mitigation in the following options; Risk assumption - To accept the potential risk and continue operating or to implement controls to lower the risk to an acceptable level, Risk Avoidance - To avoid the risk by eliminating the risk cause and or consequence, Risk Limitation - To limit the risk by implementing controls that minimize the adverse effect of a threat's exercising vulnerability (e.g., use of supporting, preventive, detective controls), Risk planning - To manage risk by developing a risk mitigation plan that prioritizes, implements, and maintains controls, Research and Acknowledgment - To lower the risk of loss by admitting the vulnerability or flaw and examining controls to correct the vulnerability, Risk Transference - to transfer the risk by using other options to compensate for the loss, such as purchasing insurance the goals.

Kwakyie (2004) looks at risk management by describing risk management as the identification, measurement and economic control of risk that threaten the assets and earnings of a business other enterprise. Risk management is therefore a management tool which assists in the systematic examination of areas of risks and deliberately defines how each should be treated and generally involves: Identifying preventive measures to avoid a risk or to reduce its effects, establishing contingency plans to deal with risks (if they should occur), Initiating further investment to reduce

uncertainty through better information, Considering risk transferred to insurance and
Considering risk allocation in contracts.

2.10.3 The Benefits of Risk Management

The following are some of the advantages of risk management:

- i. Better work planning – risk management enables you to balance high-risk projects with lower-risk projects.
- ii. Better partnering – risk management help provide partners with a common purpose.
- iii. Clearer accountability – once risks are established, risk-minimization can be assigned to individuals within your team.
- iv. Minimizing uncertainty on projects or during changes in the organization.
- v. Better decision-making – risk management either as stand-alone projects or linked with a value management exercise, can ensure that strategic decisions are well founded.
- vi. Providing a hard focus on critical problems. For construction projects these will include risks associated with design, construction and maintenance/operation.

2.11 Summary

The literature reviewed construction industry usually very risky as compared to other business due to the nature of works. Political risks, financial risks, Constructional risks, and Technical risks were the major risk categories identified during the review

of relevant data. These were the possible risks associated with the operations of foreign contractors (COBRA, 2010).

Flanagan and Norman (1993) outline the following effects of risk associated with construction: Failure to keep within the estimate cost of the project. Failure to achieve the required complete time thereby resulting delay of the project. Failure to achieve the required quality of work. Failure for the project to meet the required operational need. In Attempt to manage these possible risks, TAMO4-12 (2004) identifies four strategies or approaches for managing risks and their consequences. These strategies include but not limited to: risk prevention, risk mitigation, risk transfer, and risk acceptance.

Risk management is an ongoing, iterative process. Although every construction project undertaken is different and unique, the approach to the management of risk is usually the same (Powell, 1996). Generally, this Chapter discussed the overview of construction and its delivery process, the construction industry in Ghana and the definition of foreign Contractors.

The Chapter also emphasized on Risk management practices, effects and benefits of risk associated in construction.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the methods used for the research. It addresses issues on research strategy, design and process. It is indicated that the next important step in any research process after the study literature and identifying the objectives is deciding on the most suitable methodology. More so, Collis and Hussey (2003) argued that research is the overall approach to the design process from hypothetical foundations to the collection of data and analysis adopted for a study. Methodology is therefore the way in which we discover how to go about a task of finding out what we believe to be true (Christou *et al.*, 2008). Hence, the research methodology for this research comprises a comprehensive literature review, a questionnaire to the foreign contractors and a statistical analysis of the survey. Some of the specific areas considered were data collection instruments, population of the study, sampling technique and sample size and data preparation. These methods were adopted to bring to bear the Risk management practices of foreign contractors in Ghana.

3.2 The Research Process

The Research process involves literature reviews, development of questionnaire to establish the risk management practices of foreign contractors in Ghana.

The research process reports the topics of data collection instruments, methods, and procedures (Bergold and Thomas, 2012). According to Burns and Grove (1999), methods include the design, setting, sample, methodological limitation and data collection and analysis techniques in a research. It also contains the details of each of the methods used and how the methods adopted are employed to address the aims,

objectives and research questions. This study in its conduct adopted the quantitative approach. Bryman (2004) defines quantitative research as a research strategy that emphasizes measurement and quantification in the collection and analysis of data.

Oppenheim (1996) has given a very concise definition of quantitative research as a type of research that is explaining phenomena by collecting numerical data that are analyzed using mathematically based methods (in particular statistics). The specificity of quantitative research lies in the next part of the definition. In quantitative research we collect numerical data. This is closely connected to the final part of the definition: analysis using mathematically-based methods. In order to be able to use mathematically based methods our data have to be in numerical form. This is not the case for qualitative research. Qualitative data are not necessarily or usually numerical, and therefore cannot be analyzed using statistics.

Quantitative research and/or questions are searching for quantities in something and to establish research numerically hence adopted for this study. It gathers realistic data and study relationships between facts and relationships in accordance with theory. It consists of hard data, structured, large sample size, conclusive findings used to recommend a final course of action, and finally natural science model, in particular positivism (Leedy and Omrod, 2005).

In doing this, a survey process was used in collecting data from respondents using questionnaire. Kincheloe (2001) describe survey research as posing series of questions to willing participants; summary of the responses from participants using statistical tools; and drawing inferences about the population involved in the study from the responses of the participants sampled for the study. The need to simplify the outcomes of the study across the construction industry buttressed the use of survey

questionnaire for data collection. Additionally, the study enhances the reliability of observations and improves replications because of the inherent consistent measurement and sampling procedures (Oppenheim, 1996).

The main aim in carrying out the literature review was to gather information on the research topic. The study employed secondary sources of data which includes articles, journals paper, paperwork, thesis and books which were later stated in the references at the end of the project report. Questionnaire was also design in four sections to achieve the objectives of the research under study.

3.3 The Target Population

Since the purpose of the research is on risk management, D1K1 and D2K2 Foreign Contractors were purposively targeted on the basis that they under take big construction projects and are liable to bigger risk (Eyiah and Cook, 2003). The actual population of foreign contractors was not identified but in all a total number of fifty (50) Contractors was used for the study.

3.4 Data Collection

Data is a collection of facts, such as values or measurements. It can be numbers, words, measurements, observations or even just descriptions of things. The primary source of data collection was through the administration of questionnaires. This was done both personally (self-administered) and electronically. The secondary source of data collection was literature review. The literature review was obtained from peer – reviewed journals, articles, newsletters, text books and other departmental resources.

3.4.1 Questionnaire Design

The Main Instrument for data collection was structured questionnaire which was designed taking into consideration the scope of the respondents operation in the construction industry and objectives of the Study.

No survey can achieve success without a well-designed questionnaire. A questionnaire is a formalized set of questions for obtaining information from respondents. It includes instruction for its completion, response alternatives where appropriate and specific means for recording responses (Maisha, 2012).

Oppenheim (1992) described questionnaire formulation as an integral part of the research design stage. Questions in a questionnaire could be open-ended or close-ended or a mixture of the two based on the expected outcome. The Questionnaire consisted of four sections as attached at the appendix.

The questionnaire was design in such a way that it was easy for respondents to answer them with ease. The privacy of the respondents was taking into consideration and personal questions were avoided. This is to enable respondents to respond to the questions without fear and intimidation. Enough instructions, guides and keys were provided to aid respondents. The questions were largely closed ended with a few open-ended ones.

3.4.2 Distribution of Questionnaires

The questionnaire was sent through emails and hand delivered to foreign contractors to answer. In some Occasions the hand delivered questionnaire were retrieved on the spot. After Administering the questionnaire the research used two (2) weeks to retrieve the answered questionnaires.

Initially, Thirty-two questionnaires were self-administered by hand delivery by the researcher to D1K1 and D2K2 foreign contractors to respond adequately to the questions. Some of the questionnaires were retrieved on the spot while the rest were retrieved five (5) days after their administration. Eighteen (18) questionnaires were sent electronically to respondents. Reminders were constantly sent to and after two weeks fifteen (15) were retrieved. The total number of responses received out of the fifty (50) questionnaires was thirty (30). This represents a response rate of 60 percent.

3.4.3 Data Analysis

All the collected data from the questionnaire was analyzed using Statistical Package for Social Sciences (SPSS version 16) and Microsoft Office Excel 2010 to perform descriptive statistics.

Prior to the parametric test of the research, preliminary descriptive analysis such as mean scores and standard deviations of each of the variables conducted were used to ascertain the outcome of the survey. For this endeavor, the rating scale adopted credited higher ratings of 1 to 5 to significant and very significant strategies, an arbitrary mean fixed at an appropriate level of 3.5 (Ling, 2002 and Ahazie, 2007). The significance level was also set at 95% in accordance with predictable risk levels (Cohen, 1992). For each factor, the mean score was calculated using SPSS. The ranking of the mean responses was done using Microsoft Excel.

The method adopted for presentation of findings from the field is frequency distribution table which enabled meaningful inferences from the field data to set the basis for discussions.

CHAPTER 4

RESULTS AND DISCUSSIONS

4.1 Introduction

Previous chapters addressed the introduction, the review of relevant literature, and the research methodology adopted. This chapter discusses the results of the study in the form of Charts and Tables. This chapter is also divided into sub-headings to throw more light on questions asked on the field. A total of Fifty (50) questionnaires were sent to respondents. A total of Thirty (30) questionnaires were received representing a response rate of 60 Percent.

The questionnaire was carried out to meet the objectives of this study to determine the Risk management practices of Foreign Contractors in Ghana.

4.2 Discussion of Results

Section A: Demographics characteristics of the respondents

This section of the questionnaire comprised questions demanding personal information to provide detailed respondent characteristics (Table 4.1). Data in this section included: the class of firm, Gender of respondent, highest level of education completed by respondent and respondents' years of experience.

Table 4.1; Demographics characteristics of the respondents

Demographics Characteristics	Frequency	% Distribution
Class of firm		
D1K1	9	30%
D2K2	19	63%
Job description		
Project Manager	6	20%
Construction Manager	9	30%
Quantity Surveyor	15	50%
Level of Education		
Post Graduate	6	20%
First Degree	24	80%
Working Experience		
0 - 5 years	9	30%
6 - 10 years	12	40%
11 - 15 years	6	20%
16 - 20 years	3	10%

Source: field survey, September 2014

From Table 4.1, it is worth noting that, 63 percent of the respondents were of D2K2 Foreign Contractors while 30 percent emerging from D1K1 foreign Contractors. From the field survey, majority (50%) of the respondents were Quantity Surveyors. Besides that 30% were Construction Managers and 20% were Project Managers. This proportioning is shown in the Table 4.1 above.

The respondents from the University with 1st degree were 80%. No respondent had PhD qualification in all the institution. There was more first degree holders, followed by masters. Again the Construction industry has become very attractive to the young graduates for various reasons amongst them are the improved working conditions. From the results, the industry is attractive enough for the Master degree holders and this not surprising since the working conditions and salary levels are usually adequate for them.

The work experience level of respondents is also evenly distributed. This is to aid in analysing information from respondents with varying work experiences who have different perceptions to issues related to risk. It can be concluded that the construction industry is now not the preserve of highly experienced employees but rather has now become good starting point for people to undergo training before moving to pursue other career goals.

4.3 Possible risk Associated with the operations of Foreign Contractors

Table 4.2; Possible risk factors associated with operations of foreign contractors.

(One Sample Statistics Test Value = 3.5)

Risk factors	Mean	Std. Deviation	Ranking
New Stake holders emerge	4.2100	1.18613	3rd
Influential Stakeholders Request	4.1667	0.64772	6th
Political Change	4.1000	1.24152	7th
Inconsistent cost,time,scope	4.0000	0.90972	8th
Availability and fluctuation in forex	3.5000	1.45626	14th
Delay in Payment	4.4000	0.67466	1st
Local taxes and Inflation	3.5000	1.45626	15th
Improper Control and Storage of Material	3.0000	0.90972	18th
Uncertain productivity of resources	3.0333	1.21721	17th
Weather and Seasonal implication	3.9000	1.53914	9th
Industrial relation problems	4.2333	1.0063	2nd
Iaccurate contract time estimate	3.7000	1.36836	11th
Changes during construction require additional coordination	4.2000	0.61026	4th
Incomplete Design	4.1767	0.59209	5th
Inaccurate assumptions on technical issues at planning stage	3.1000	1.60495	16th
Uncertainty over the source and Availability of materials	3.6000	1.03724	13th
Incomplete environmental impact analysis	3.6333	1.21721	12th
Inadequate cultural assessment	3.8000	0.88668	10th

Source: field survey, September 2014

With Political risk, New Stakeholders emergence was observed to have a mean score of 4.20 which showed that the respondents strongly agree or agree to this political risk. Table 4.2 also reveals Influential stakeholders Request with a mean score of 4.166. D1K1 and D2K2 foreign contractors consider these as a serious political risk.

Political unrest can bring other challenges to the construction industry because usually such situations do call for suspension of work. When this happens people without the needed expertise portray themselves as new stakeholders who demand new works. This change can disorganize the contractor setting back the progress of work. Also change of government brings about statutory amendment being made to industrial relations. Therefore a structured methodology and technique should be identified to overcome the effect of local political and economic situations on the performance of construction projects in Ghana.

However in Table 4.2, Delay in payment was observed to have the highest mean score of 4.40 which showed that the respondents strongly agree or agree to this financial risk. Delay in payments was ranked first (1st) which is an indication that, it has a major influence on the operations of foreign contractors in Ghana. This affirms on new stakeholders from political risk which delays payments for D1K1 and D2K2 foreign contractors executing construction projects in Ghana. Most Respondents disagree with improper Control and storage of Material as a financial risk associated with their operations in Ghana. As such it was the lowest ranked at 18th among the other risk factors. Availability and fluctuation in foreign exchange, and local taxes and inflation experience the same score as the test value of 3.5. This also indicated the level of acceptance as a risk factor from respondents.

Industrial Relation problems were observed to have a mean score of 4.23 which showed that the respondents strongly agree or agree to this Construction risk. The results suggest that there is the need for early identification of possible events that might trigger industrial unrest. D1K1 and D2K2 foreign contractors should consider this necessary in order to avoid the consequences in case any industrial unrest occurs. This is because industrial relations has become one of the most delicate and complex

problems in our modern society. Industrial progress is impossible without cooperation of labour and harmonious relationships. Therefore, it is in the interest of all to create and maintain good relations between contractors and employees.

Uncertain productivity of resources was observed to be 3.03 which indicate that respondents disagree with this as a constructional risk that affects the operations of foreign contractors in Ghana. Other constructional risks listed above in table 4.2 were agreed by respondents because their mean score was greater than the test value of 3.50.

It is a general phenomenon that most at times designs are not completed before projects begin. Risk is inherent and difficult to deal with, and this requires a proper management framework both of theoretical and practical meanings. In view of this, Table 4.2 reveals incomplete design with a mean score of 4.176 and ranked fifth (5th). The contractors therefore agree that incomplete design possess a challenge to their operations in Ghana. This leads to various challenges during construction process as designs are often inadequate and poorly articulated to enable contractors to clearly understand what to build without several meetings with designers. The result agrees with Laryea (2010) assertion that risk due to incomplete design related problems such as inadequate and insufficient design information, inconsistent information among design documents affect risk identification. This therefore suggests that risk identification cannot be effectively done when designs are incomplete.

Table 4.2 reveals that, inadequate Cultural assessment had a mean score of 3.8. This result reflects how important to assess the Cultural practices of the people, especially to every new project.

All over the world, there are clashes between state and indigenous peoples' cultures and systems of livelihood (pastoralism, hunting and gathering, and shifting cultivation). It is a clash between the desire of many indigenous peoples to live on traditional lands, and the general thrust of government policies aimed at using indigenous peoples' lands for other purposes. Whether this is the establishment of natural reserves or mega-projects such as hydro-electric dams or infrastructure development, indigenous peoples are frequently portrayed as an obstacle to national development plans. It is therefore important that most laws and customs of the land should not be ignored during the operations of foreign contractors in execution of construction projects in Ghana.

Generally, the results of this objective as discussed are found to reflect the true situation in Ghanaian construction industry, particularly the construction sector. It shows that foreign Contractors responded to questions based on their experience within the industry over the years. Delay of payment being the highest ranked risk factor affirms with Laryea (2010) assertion that contractors biggest problem on contracts was payment. A payment-related delay indicates that contractors cannot predict cash flow. The difficulty in predicting cash flow means that banks consider contractors as a high risk and thus the interest on money to construction firms is higher.

4.4 Effects of Risks on Contruction

Table 4.3; Effects of risk

(One Sample Statistics Test Value = 3.5)

Effects of risk	Mean	Std. Deviation	Ranking
Abandonment of project	3.6207	1.49795	1st
Failure of the project	3.5	1.03724	2nd
Project schedule delay	3.2	1.68973	3rd
Compromising quality on project delivery	3.1	1.24152	4th
Budget shortfall	2.9	1.72906	5th
Project cost over run	2.4667	1.79527	6th

Source: field survey, September 2014

Many construction or engineering projects have remained unfinished at various stages of development. The work may be finished as a blueprint or white print and never be realized, or be abandoned during construction.

Table 4.3 reveals Abandonment of construction projects as the significant effects of risk to projects executed by foreign contractors with a mean score of 3.62

Failure of projects has been identified as one of the significant effects of risk associated with construction with a mean score of 3.5. A project is considered a failure whenever it does not meet its expectations. A project fails because nobody

stops it from failing. Poor risk management can lead to project failure (Flangan and Norman, 1993).

From table 4.3 two variables have mean score above the test mean of 3.5, it is reasonable therefore to conclude that they constitute the effects of risk on construction projects executed by foreign contractors in Ghana.

4.5 Risk Management Strategies

Table 4.4; Risk Management Strategies

(One Sample Statistics Test Value = 3.5)

Risk Management Strategies	Mean	Std. Deviation	Ranking
Risk mitigation	4.1	0.95953	1st
Risk Reduction	3.9	1.24152	2nd
Risk Retention	3	1.11417	3rd
Risk transfer	3.5	1.03724	4th
Risk Avoidance	3.3	1.20773	5th

Source: field survey, September 2014

The risks strategies used predominately for majority of foreign contractors are mitigation, reduction, and/ or transfer techniques from results in Table 4.4. Depending on where the risk source lies in the risk matrix, mitigation may be done either by reducing the probability of risks or by reducing their impact or both. If the impact of the risk is high, risk reduction may be done by lessening the extent of the damage. If the risk occurs very often, it is wiser to tackle the risk sources at their root by inhibiting their trigger (Hillson, 1999). Whenever the risk probability and the impacts are high, the response strategy should be to reduce both.

Transfer of risk through third party guarantees and bonds. This is common in the industry when contractors are requested to provide performance bonds and guarantees, advance payment guarantees etc. before award of contracts. This measure transfers the risk to the contractor who intends transfers to the third party who issues the bonds or guarantees.

From Table 4.4 the three risk strategies passed the test value of 3.5. However, Risk avoidance and Risk Retention had a mean score of 3.3 and 3.0 respectively. The indication is that these strategies are not often and always used by foreign contractors in their operations in Ghana on construction projects.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Summary

The Construction industry has always been and continues to be risky. It is considered as an important sector in the world as it develops and achieves the goals of society. However, the performance of the construction industry is affected by risks. This research studies the Risk management practices of foreign contractors in Ghana with the following objectives in mind:

- To identify the major risk associated with the operations of foreign contractors in Ghana.
- To identify the effects of these possible risk to foreign contractors in Ghana.
- To identify Risk Management strategies adopted by foreign contractors in Ghana.

This study identified Eighteen (18) possible risk associated with the operations of foreign contractor and their construction projects. These risk were listed under four (4) groups based on literature review. These groups give a comprehensive summary of the main key risks associate with the operations and construction projects of foreign contractors. The main groups considered in this research are Political risk, financial risk, Constructional risks, and Technical risks, effects of these possible risks and approaches use by contractors in managing risks.

The research questions under political risks therefore address issues by identify risks pertaining to political environment in Ghana where foreign contractors operates.

Financial risks associated with construction project have also been duly identified.

The Third part construction risks seek to identify risks during the construction delivery process while risk affecting the technical aspect of project was also look at.

Moreover, the third part in the group involves question to determine the effect of these possible risks to foreign contractors.

The last part focuses on the approaches contractors use to manage risks associated with construction project.

5.2 Conclusion

From the analysis and discussions in the previous chapter the following conclusions can be made at this stage of the research. From the result obtained from the questionnaire, the conclusion will be written according to the hypotheses that have been set.

5.2.1 Hypotheses one: There are risk associated with the operation of foreign contractors in Ghana.

The respondents were asked to tick the possible risks associated with the operations of foreign contractors in Ghana. In all 18 risks associated with the construction industry were listed. The risks factors were grouped in a subgroup of four. From the analysis in chapter 4, the respondent ticked some of the risk factors according to their extent of encountering them on their projects in Ghana. These are the possible risk majority of the respondent ticked and are associated with the operations of foreign contractors in Ghana:

- Concerning political risks the following major factors identified from the research were; the emergence of new stakeholders who demanding new works, Influential stakeholders request additional needs to serve their own commercial purposes and

Political change, been a threat to the project cycle. Among these political risk, emergence of new stakeholders demanding new works was the most occurring risk.

- However, Delay in payment, Availability and fluctuation in foreign exchange, local taxes and inflation were identified as the major factors with respect to financial risks. The most occurring risk was Delay in payment.
- Meanwhile, Industrial Relation problems, Changes during construction that requires additional work, were the problems with constructional risk. Industrial Relation problems was the highest factor among risk relating to construction.
- Major Technical Risks identified were, incomplete design, inadequate cultural assessment and incomplete environmental impact analysis. The most occurring risk was incomplete design as reveal by the research.

5.2.2 Hypotheses two: There are effects of risk to foreign contractors on project delivery in Ghana.

The respondents were asked to tick the effects of risks to foreign contractors on project delivery in Ghana. In all 6 effects on project delivery in the construction industry were listed. The research uncovered that, the effect of risks on construction are: Abandonment of project, failure of project, project schedule delay, project cost over run, compromising quality on project delivery and budget shortfall. Abandonment of project was a very significant effect on construction project delivery.

5.2.3 Hypotheses three: There are risk management strategies used by foreign contractors in managing risk.

The research also revealed that strategies adopted by foreign contractors in handling risks, were risk mitigation, risk avoidance, risk retention and/or risk transfer. The major strategy used always in managing risk was identified to be risk mitigation.

Finally, the research revealed emergence of new stakeholders who demand new works, delay in payments, Industrial relation problem, Incomplete design, and risk mitigation are the most frequently occurring risks in the study area as revealed by the research. Delays in payment had the highest mean score as revealed by the research and therefore, poses a serious risk that affect the operations and construction projects of foreign contractors.

5.3 Recommendation

The researcher therefore recommends that risk management practice should be the focus for Foreign Contractors on construction projects.

- There should be proper measures in place to combat delays of payment during the construction stage.
- There should be records of written documentation with previous stakeholders so that new works emerging from new stakeholders will be clearly defined.
- There should be dynamic processes of managing risk associated with construction in all the phases of the project by foreign contractors. This can be

achieved through the organization of training courses and seminars for contractors on risk management on projects.

- It is also recommended to foreign contractors to develop risk mitigation framework and modeling system in order to mitigate risks on construction project. In addition, it is recommended that contractors study and evaluate the most important factors of risk associated with their operations during construction projects in Ghana.
- Finally, it is recommended that a structured methodology and technique should be identified by foreign contractors to minimize risks at early stage of project implementation in order to avoid abandonment and failure of construction project. Moreover, documentation is critical, and properly recording the identification, analysis, and risk mitigation plans and results for each risk element allows for lessons to be learnt and actions to be taken if necessary. It is expedient that foreign contractors would document all risk in order to know how to deal with them.

5.4 Suggestions for future Studies

Due to varying limitations encountered during the study, the researcher acknowledges that adequate investigations were not conducted into identification of actual population size of foreign contractors operating in Ghana. The researcher therefore recommends a further study into this area to highlight the most acceptable Risk management options which foreign Contractors would adopt and adapt for operating in the Ghanaian Construction Industry.

REFERENCES

- Agbodjah, L.S. (2008). A Human Resource Management Policy Development (HRMPD) Framework for Large Construction Companies Operating in Ghana. Submitted to the School of Graduate Studies of the Kwame Nkrumah University of Science and Technology in Partial Fulfillment of the Requirements for PhD degree.
- Ahadzie, D. K., Proverbs, D. G., Olomolaiye, P. & Gameson, R. (2006). A conceptual predictive model for evaluating the performance of project managers in MHBPs. Cited in: BEAR. (2006). Construction Sustainability and Innovation/CIB W 89 International Conference on Building Conclusions and recommendations Education and Research, Hong Kong.
- Ahadzie, D.K (2007). A Model for Predicting the Performance of Project Managers in Mass House Building Projects in Ghana, *PHD Thesis, University of Wolverhampton, UK*.
- Al-Bahar, J.F. (1990). "Systematic Risk Management Approach for Construction Projects". Journal of Construction Engineering and Management,.
- Andi (2006). The Importance and Allocation of risks in Indonesian Construction Projects, Construction Management and Economics.
- Anvuur, A., Kumaraswamy, M. (2006), Taking Forward Public Procurement Reforms in Ghana, CIB W107 Construction in Developing Economies International Symposium —Construction in Developing Economies: New Issues and Challenges! January 18th – 20th; 2006 – Santiago, Chile.
- Ashworth, A. (2010). Cost Studies of Buildings. (5th ed).UK: Pearson Prentice Hall.

- Azahar, William C. Ginder and Rizwan U. Farooqui (2008) An Assessment of Risk Management Practice in the Alabama Building Construction Industry.
- Ayuub, B. M. (2003). Risk Analysis in engineering and Economic. Chapman & Hall/CCRC, pp. 35.
- Batchelor, C. (2000). Construction: Global Growth in Civil Engineering to Top 6 Percent. Financial Times, 11 February 2000.
- Bryman, A. (2004). Social Research Methods (2nd Ed), Oxford: Oxford University Press.
- BS 31010 (2010). BSI British Standard, Risk Management - Risk Assessment techniques.
- BS 31100 (2008). BSI British Standard Risk Management Code of Practice.
- Bergold, J and Thomas, S.(2012). Participatory research methods: A methodological approach in motion. In *Qualitative Social Research*. Available online: http://www.qualitative_research.net/index.php/fqs/article/view/1801/3334. [Accessed 30 August, 2014].
- Burns, N and Grove, S.K. (1999). *Understanding Nursing Research*. (2nd edn), Philadelphia: W.B. Saunders Company.
- Bunni, N.G. (1997). The FIDIC Form of Contract. 2nd editon. Blackwell Science Ltd, Oxford.
- Christou, E.,Valachis,I. and Anastasiadou, C.(2008). Research Methodology in Hospitality Industry: The role of the inquiry Paradigm.
- Collis, J. and Hussey, R. (2003). Business Research: A practical Guide for undergraduate and post graduate students 2nd Ed, New York : Palgrave Macmillan.

CIDB (2004). Best Practice Guideline #A5 Managing Construction Procurement risks.

Cooper, D., Grey, S., Raymond, G., Walker, P. (2005). Project Risk Management Guidelines: Managing Risk in Large Projects and Complex Procurements.

COBRA. (2010). The Construction, Building and Real Estate Research Conference of the Royal Institution of Chartered Surveyors.

Dansoh, A. (2004). Strategic Planning practices of Construction Project Risk. Phd Thesis submitted to the University of Nottingham, Department of Civil Engineering.

Edwards, P.J. and Bowen, P.A. (1998). Risk and risk management in construction: review and future directions for research, Engineering Construction and Architectural Management.

Edmonds, G.A. and Miles, D. (1984). Foundation for Change: Aspects of the Construction Industry in Developing Countries. London: Intermediate Technology Publications.

Eyiah, A.K. and Cook, P. (2003) Financing small and medium-scale contractors in developing countries: a Ghana case study, Construction Management and Economics, 21, 357-367.

Flangan, R. and Norman, G. (1993). Risk management and construction, Oxford: Black well Scientific Press

Flangan, R. and Norman, G. (1993). Risk management and construction, (1st ed) USA: Wiley- Blackwell.

Gary, S. (2002). Risk Management Guide for Information Technology Systems.

- Gray, C.F., and Larson, E.W. (2008). Project Management: The Managerial Process, 4th edition McGraw Hill.
- Hillson, D. (2002). "Extending the Risk Process to Manage the Opportunities." International Journal of Project Management,
- HM Treasury, (2004). The Orange Book Management of Risk-Principle and Concepts.
- IMCA, (2006). Identification of and Assessing Risks in contraction contract.
- Jaen- Paul chavas, (2004). Risk Analysis in theory and practice.
- Kincheloe, J.L. (2001). Conceptualizing a new rigor in qualitative research, *Qualitative Inquiry*, Vol.7, pp. 679-692.
- Kirmani, S. (1988). The construction industry in development: issues and options Discussion Paper, Infrastructure and Urban Development Department, World Bank, Washington DC.
- Kwakyie, A. A. (2004). The official newsletter of the quantity Surveying Division of the Ghana Institution of Surveyors. Issue 1.
- K.Kahkonen and K.A Arttor (1997). Managing Risk In Projects. E & FN Spon ,London, UK.
- Kajsa Simu, (2006). The Construction Site Manager's Impact on Risk Management Performance.
- Klemetti Anna, (2006). Risk Management in Construction Project Networks.
- Latham, M. (1994) Constructing the Team. Final report of the Government /Industry review of procurement and contractual arrangements in the UK construction industry.

Laryea, S. (2010) In: Laryea, S., Leiringer, R. and Hughes, W. (Eds) Procs West Africa Built Environment Research (WABER) Conference, 27-28 July 2010, Accra, Ghana, 215-226.

Leedy, Paul & Omrod, Jeanne Ellis (2005). Practical Research. Pearson Merrill Prentice Hall.

Lim, C. S. and Mohamed, M. Z. (1999). Criteria of project success: an exploratory re – examination. International Journal of Project Management, 17 (4), pp.243-248.

Ling, F.Y.Y.(2002) Model for predicting performance of Architects and Engineers, Journal of Construction Engineering and Management, ASCE,128(5),pp 446-456.

Maisha (2012). “the new quantity surveying syllabus and the practitioners’ perception on the competencies acquired by graduates”. Department of Building Technology, KNUST.

Mills, A. (2001). A systematic approach to risk management for construction, Structural Survey.

Moavenzadeh, F. and Hagopian, F. (1984). The construction industry and economic growth. Asian National Development, June/July, pp. 56-60.

Mak, S. and Picken, D. (2000). Using risk analysis to determine construction project contingencies, Journal of Construction Engineering and Management-ASCE.

Oppenheim, A.N. (1996). *Questionnaire Design, Interviewing and Attitude Measurement*, New York: Basic Books.

- OSPML, (2007). Project Risk Management Hand Book Threat and opportunities.
- Ofori, G. (1996). International contractors and structural changes in host-country construction industries: Case of Singapore. *Engineering, Construction and Architectural Management*, 3(4), pp. 271-288.
- Piney, C. (2002). Risk Response Planning: Selecting the Right Strategy. Fifth European Project Management Conference, PMI Europe.
- Pearce, D. (2003). The social and Economic Value of Construction. The Construction Industry Research and Innovation Strategy Panel Great Britain: nCRISP Publishers.
- Powell, C. (1996). "Laxton's Guide to Risk Analysis & Management". Oxford: Laxton's Publishers.
- Raftery, J., Pasadilla, B., Chiang, Y. H., Hui, E. C. M. and Tang, B. S. (1998). Globalization and construction industry development: implications of recent developments in the construction sector in Asia. *Construction Management and Economics*, 16, pp. 729-737.
- TOM04-12 (2004). Total Asset Management Risk Management Guideline.
- Thobani, M. (1999). Private infrastructure, public risk. Finance and Development.
- Takim, R., Akintoye, A. and Kelly, J. (2003). Performance measurement systems in construction. Cited in: Greenwood, D. (Ed.). 19th annual ARCOM conference, University of Brighton, ARCOM, pp. 423-431.
- Vulink, M (2004), Technology Transfer in the Construction Industry of Ghana: Human Resource Development through International Collaboration between Foreign and Local Contractors in the Greater Accra Region.

Wang, S. Q., Dulaimi, M. F., and Aguria, M. Y. (2004). Risk management framework for Construction projects in developing countries. Construction Management and Economics.

Wiguna, I.P.A. and Scott, S. (2006). Relating risk to project performance in Indonesian building contracts, Construction Management and Economics.

Walewski, J and Gibson G. E. (2003). International project Risk Assessment: Methods, Procedures, and Critical factors. USA: The University of Texas Press.

World Bank (1996). Ghana 1996 Country Procurement Assessment Report. Washington DC: The World Bank.

APPENDIX – A
QUESTIONNAIRE

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
(KNUST) – KUMASI

COLLEGE OF ARCHITECTURE AND PLANNING

DEPARTMENT OF BUILDING TECHNOLOGY

TOPIC;

RISK MANGEMENT PRACTICES OF FOREIGN CONTRACTORS GHANA

The researcher is a post-graduate student at the Kwame Nkrumah University of Science and Technology studying for a Master of Science degree in Construction Management. The researcher is conducting a research into Risk management practices of foreign contractors in the Ghanaian Construction Industry. The aim is to identify the possible risks, their effects and the Risk management strategies adopted by foreign contractors in Ghana.

With this background, kindly answer the questions in this questionnaire as accurately as you possibly can. Your response to this research will be confidential and will be used exclusively for academic purposes. The questionnaire is divided into four main sections and will require not more than five minutes of your precious time.

SECTION A: (SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS)

Please answer or tick ☒ where appropriate

1. Class of your Construction firm

D1K1 ☐

D2K2 ☐

2. Job description:

Project Manager ☐

Construction Manager ☐

Architect ☐

Quantity Surveyor ☐

Civil Engineer ☐

Others please specify

.....

3. What is your level of education?

Post graduate ☐

First Degree ☐

HND/ Diploma ☐

Technician (CTC I, CTC II, CTC III) ☐

others please

specify.....

4. How long have you been working in this institution

0 – 5 yrs ☐

6 -10 yrs ☐

11 – 15 yrs ☐

15 – 20 yrs ☐

20 yrs and

above ☐

5. Gender:

Male ☐

Female ☐

6. Age Group:

18-30 yrs

☐

31-40 yrs

☐

41-50yrs

51-60yrs

☐

61- 70yrs

☐

**SECTION B: POSSIBLE RISK ASSOCIATED WITH THE OPERATIONS OF
FOREIGN CONTRACTORS IN THE GHANAIAN CONSTRUCTION
INDUSTRY**

Please answer or tick ☒ where appropriate

Please, answer the following questions by indicating to what extent you encounter the following risks on your projects in Ghana.

Strongly Agree— (1); Agree - (2); Disagree— (3); strongly disagree— (4); Not sure –
(5)

POSSIBLE RISK ASSOCIATED WITH THE OPERATIONS OF FOREIGN CONTRACTORS IN GHANA		1	2	3	4	5
	POLITICAL RISKS					
1	New stake holders emerge and demanding new works	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	Influential stakeholders request additional needs to serve their own commercial purposes.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3	Political change been a threat to the project cycle	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4	Inconsistent cost , time, scope, due to change of government	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	FINANCIAL RISKS					
5	Availability and fluctuation in foreign exchange	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
6	Delay in payment	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
7	Local taxes and Inflation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
8	Improper Control and Storage of materials	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	CONSTRUCTION RISK					
9	Uncertain productivity of resources	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

10	Weather and seasonal implications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Industrial relation problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Inaccurate contract time estimate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	Changes during construction require additional coordination with resource agencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	TECHNICAL RISKS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	Incomplete design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	Inaccurate assumptions on technical issues at planning stage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	Uncertainty over the source and availability of materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	Incomplete environmental impact analysis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	Inadequate cultural assessment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	Other, Please specify.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**SECTION C: IDENTIFYING THE EFFECTS OF THESE POSSIBLE RISKS
TO FOREIGN CONTRACTORS IN GHANA**

Below are effects of possible risks associated with the operations of foreign contractors in Ghanaian construction industry.

Please use the scale 1-5 below which of them do you experience on your projects

Not an effect – (1); Insignificant Effect - (2); Neutral – (3);
Significant effect – (4); Very significant effect – (5)

Effects of these possible risks to foreign contractors		1	2	3	4	5
1	Project cost over run	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Project Schedule delay	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Abandonment of project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Failure of the project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Compromising quality on project delivery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Budget shortfall	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Other, Please specify.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**SECTION D: THE RISK MANAGEMENT STRATEGIES ADOPTED BY
FOREIGN CONTRACTORS IN GHANA**

Please which of these strategies do you use in managing risk at your firm on
construction projects?

Please use the scale below to answer the questions.

Not at all – (1); Not always- (2); Not sure – (3); Quit often – (4); Always –
(5)

Risk management strategies adopted by foreign Contractors		1	2	3	4	5
1	Risk mitigation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Risk Avoidance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Risk transfer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Risk Retention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Risk Reduction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Other, please specify.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please do you have any recommendation for risk management strategies foreign
contractors adopt whiles operating in Ghana? Kindly indicate below

.....

.....

.....

.....THANK YOU VERY MUCH FOR YOUR TIME!!!