

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
COLLEGE OF ART AND BUILT ENVIRONMENT
DEPARTMENT OF CONSTRUCTION TECHNOLOGY AND MANAGEMENT

**AN EXPLORATION OF CONSULTANTS-RELATED CAUSES OF PROJECT
DELAYS OF ROAD CONSTRUCTION CONTRACTS IN GHANA**

**A Master's Thesis Submitted to the Department of Construction Technology and
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MASTER OF SCIENCE IN PROJECT MANAGEMENT**

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DECLARATION

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

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Glory be to the Lord Almighty, great things He has done and great things He will do. Glory, honour, praise and adoration are unto him for the wisdom, strength, protection and guidance given me to complete this research work.

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I also thank all the respondents to the questionnaires and many friends who helped me in diverse ways while I worked through this project.

DEDICATION

I whole-heartedly dedicate this work to my wife Sheila Eguakun, whose efforts has seen me to this level. I also dedicate this dissertation to my family most especially my beloved family for their encouragement has seen me through this educational ladder.

Lastly and most importantly, the entire work is dedicated to God Almighty for his mercies, strength and grace that has seen me successfully through this work.

ABSTRACT

The study explores consultants-related causes of project delays of road construction contracts in Ghana. The study employed quantitative research strategy and convenience sampling technique, which was used to ensure that only consultants in the road sector were selected for study. In all 130 respondents, which constitute the sample size were selected and administered with a questionnaire. The data collected were analyzed using analytical tool, Relative Importance Significance index of each variable was calculated to identify the major consultants' - related causes of project delays. The Statistical Package for Social Sciences (SPSS) version 20 was the software that was used to code and interpret the data for analysis. The findings indicate that the most significant causes of consultant - related road construction project delays with respect to cost and time as perceived by consultants are Poor contract management and Discrepancies between contract documents respectively; majority of these are as a result of economic issues or indicators. The study recommended that delays could be mitigated if construction stakeholders increase working time of workers in order to meet schedules. The government should strengthen the procurement and bidding process when awarding road contract. This should be made available to all stakeholders in the construction sector through open and competitive tendering. The process should have punitive sanctions for consultants with bad reputation. The findings call for urgent attention in improving the Ghanaian road construction industry's ability and performance to achieve improved cost performance and to mitigate against further project failure.

Keywords: Consultants, Delays, Projects, Project-Related Causes, Road Construction

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LIST OF ABBREVIATIONS

1. CPM - Computerized Project Management
2. UK - United Kingdom
3. SPSS – Statistical Package for Social Sciences
4. SMTDP - Road Sector Medium-Term Development Programme
5. FIFA – Federation of international Football Association
6. MRH – Ministry of Roads and Highway
7. CIOB - Chartered Industry of Building

CHAPTER ONE

GENERAL INTRODUCTION

1.0 INTRODUCTION

The section gives a general insight of the background to the study followed by the statement of the problem. The aim and objectives of the research have also been outlined, followed by the significant, methodology to be adopted, entirety and finally structure of the research.

1.1 BACKGROUND TO THE STUDY

The construction sector according to Road Sector Medium-Term Development Programme (SMTDP) 2014-2017 has over the years been guided by government policies and various strategies that are geared towards providing effective and efficient transport services that act as a driver of economic growth. According to Oxford Business Group (2017), the Ministry of Transport of Ghana has drafted regulations and framework in the form of SMTDP in line with the Ministry of Finance policy on Public Private Partnerships (PPPs) in laying out their plan for every four years. The vision of the road transport section of the country is to render “an undivided, efficient, sustainable and cost-effective transportation system that responds to the provisions of society, giving to growth, reducing poverty, establishment and maintenance of Ghana’s transportation hub of the Western part of Africa. The sector draws guidance from the National Transport Policy, Integrated Transport plan and National Medium-Term Plans rolled out by the government every four years towards the achievement of the government’s Agenda. The road transport is the readiest transport service in the country, which connects main villages, towns and cities to areas that are involved in agriculture and moves about more than 96% of passengers. Despite this fact, 40-50% of all roads are not in good condition (Gidisu, 2009). A performance review of the sector indicates that the road construction sector is fraught with a myriad of challenges among which includes inadequate funding, poor contract management by consultant engineers and low capacity.

Project delay as the variation between real completion period and the approximated completion period (Chan, 2001). These definitions can be deduced as the period or cost of increased project completion after planned date that is because of internal and external factors that surrounds the work (Chan, 2001). Trends of project delays in various countries in Africa indicate a varying degree of overruns or delays. It is estimated that the holding of FIFA world cup in South Africa in 2010 led to the completion of 10 stadia on time but the projects experienced significant overruns amounting to US\$267 million over budget. This was attributed to a lack of communication, late issuing of methods and slow to making decisions (Baloyi and Bekker, 2011). In the capital city, Tshwane, all of the road and storm water projects completed between 2006 and 2010, experienced 67% of delays attributable to insufficient production rates, lack of services planning and weather delays (Cruywagen, 2012). Again, in Nigeria, it is estimated that transport infrastructure projects cost on average 14% more than the initial cost estimates and take approximately 188% longer to complete (Omorie and Radford, 2006). Seven out of ten projects in Nigeria are delayed (Seboru, 2015). The main causative factors of delay are planning in an improper way and insufficient funds to finance projects to be completed, lack of effective communication leading to inaccurate estimates and slow-decision making (Owolabi et al., 2014). In Ghana, contractors who work on 4 main road projects that are among “Gang of Six” roads have left the site of the project for lack of payment and other pertinent technical issues with government (Fobi, 2015). The Ghana COCOBOD is currently funding three programmes in the six cocoa producing regions, namely; Eastern, Volta, Western, Central, Ashanti and Brong Ahafo regions respectively. The eastern corridor road was awarded and was expected to be executed in Phase 1 and 2 but work was abandoned in 2016 and re-awarded in 2018 leading to significant delays. A number of other significant projects experiencing delay are at various

stages of completion including Central Corridor: Nsawam By Pass (98%), Kwafokrom – Apedwa (62%), Techiman-Kintampo (87%), Buiepe – Tamale 84%), Construction of Sunyani Road in Kumasi. Eastern Corridor: Asikuma Junction – Kpeve 4.4%), Dodo-Pepesu to Nkwanta road project (38.14%), Nkwanta – Oti Damanko 7.5%). The delays escalations were caused by monthly payment difficulties resulting from bureaucracy, poor contract management, problems with material procurement due to excessive processing times, lack of technical skills and an escalation in the price of materials due to currency fluctuations (Ministry of Roads and Highways, 2017).

Incidents that impact a project's progress and postpone project activities are referred to as delays. Weather delays, unavailability of resources, design delays etc. are all delay causing incidents. Project delays generally happen due to project activities that have both external and internal cause and effect relationship (Vidalis and Najafi, 2002). Time overruns are the difference between the actual completion time and the estimated completion time. It was measured in number of days (Konotey, 2015). Enshassi et al. (2010) explained that project delays are those that cause the project completion date to be delayed. According to Odeck (2004), cost overrun is defined as excess of actual cost over budget. Cost overrun is also sometimes called "cost escalation," "cost increase," or "budget overrun".

Project delays of road construction contract prevail because of project activities, which have internal and external causative factors, and effect relationship, which involves delays in weather resource unavailability and delays in design (Vidalis et al., 2002). Sector estimates by Gbahabo and Ajuwon, (2017) indicate that rail project constitutes 45% of delays, 34% for bridge projects and 20% for road projects. Nine out of 10 global megaprojects experience

delays (Omoriegbe and Radford, 2006). Even though mean approximations of overrun differ greatly, certain academic works say that this could be more than 70% for overrun costs and 183% for time overruns (Gbahabo and Ajuwon, 2017). Identifying, recognizing and determining the different causative factors of the delay in the period of design and construction are jobs of the consultant engineer in order to delays in the period of the project (Edwin et al., 2005). An omission from consultants may cause such effects like negative relationships, cash flow problems, disbelief and lawsuit as well as abandonment of project on the cost of the project (Ahmed et al., 2000). It is therefore relevant to address the challenge of time and overruns of cost to result in successful road construction projects.

1.2 STATEMENT OF THE PROBLEM

Delay in the road construction sector is a global phenomenon and is increasingly becoming a constant phenomenon leading to cost overruns, long delays in completing project, abandonment of projects, time overruns or extension, contractors and sub-contractors going bankrupt, disagreement and litigation (Sambasivan and Soon, 2007; Okumbe and Verste, 2008). Consultants are paid to oversee the project management process (from project conception to formation, planning and control until implementation) to delivery of these road projection in other to forestall these difficulties. The supervising consultant is responsible for the project management cohesion in ensuring effective realization of project outcomes in conjunction with owners, contractors, architect and engineers.

While a lot of academic works have been conducted on why road construction projects run into delays, what is interesting is that despite this wealth of knowledge a substantial share of projects still experience these challenges in delays despite the adoption of computerized aided applications, design management approaches, management of projects and various software's utilized by architects, designers and consultants (Frimpong et al., 2003; Omoriegbe and

Radford, 2006; Owolabi et al., 2014; Gbahabo and Ajuwon, 2017). Again, many as contributing to road construction project delays in Ghana have singled out consultants. For instance, a report commissioned by Construction Industry Development Board (2007), it pointed out that 50 percent of project failures is attributable to consultant engineers while only 10 percent were caused by contractors.

In addressing these issues, not much attention is given to the real value drivers of projects (consultants – related issues) which significantly affect road construction delays in the sector. The current study therefore examine consultant related- causes of road construction delays to forestall future consequences of road construction projects being executed in Ghana. The results of the work were done depending on the questionnaires that were developed and interviews that were conducted. Most of the consultants identified delay causes in road construction sector from consultant- related causes.

1.3 AIM AND OBJECTIVES OF THE RESEARCH

1.3.1 Aim of the Research

The main aim of the research is to explore underlying consultants-related causes of project delays of road construction contracts in Ghana

1.3.2 Specific objective of the Research

In order to achieve stated aims, the following objectives have been set:

1. To determine the most significant project delays indicators of road construction contracts in Ghana
2. To identify the underlying consultant-related causes of the most significant project delays of road construction contracts in Ghana

3. To establish the mitigating factors/strategies for addressing the consultant-related causes of project delays of road construction contracts in Ghana

1.4 RESEARCH QUESTIONS

1. What are the most significant project delays indicators of road construction contracts in Ghana?
2. What is the underlying consultant-related causes of the most significant project delays of road construction contracts in Ghana?
3. What mitigation factors/strategies can be adopted to address the consultant – related causes of project delays of road constructs in Ghana?

1.5 SIGNIFICANCE OF THE STUDY

Project overruns constitutes a great loss to the Ghanaian economy in many respects. Key stakeholders in the construction industry will find this study useful as it will contribute to construction management and could shape or guide policy makers opinions in addressing the challenges of consultant related delay causes in the construction sector.

The work identified several causal factors bedevilling the construction industry in Ghana and possible measure that could be implemented to mitigate the situation.

The study would again raise the existence of delay problems. Therefore, rising the comprehension of implementation of a good project regulation approach. Also, the study exposes the challenges faced by consultants who are at the Apex of the construction chain in the execution of the Ghanaian construction projects.

Consequently, this study serves as a guideline for further studies that pertains to the management of road construction projects delays and for future development to lessen the risk involving overruns.

1.6 RESEARCH METHODOLOGY

The method of the research is considered as the general strategy to the design procedure of a study from the written foundation to the gathering of data and its subsequent examination (Thurairajah et al., 2006). The approach to this research was addressed by adopting the appropriate paradigm base on post-positivism, which combined empirical observation with logical reasoning in collection of appropriate data and subsequently the analysis of the findings. It is suitable to adopt a philosophical stance that combined both epistemological and ontological research philosophies, as divorcing the two will not allow human contact with external reality (Brimah et al., 2014).

The objectivist represents an approach of using standardized data collection tools like surveys. Since road construction project delay factors variables are independent, the objectivists' ideology was adopted with respect to ontology. This was done using the Post-positivist approach. Qualitative and quantitative approaches were used in the study. Quantitative strategy was used to comprehend the consultant's perception – related delays factors influencing road construction project in Ghana. The research design adopted for the study is a survey design. This approach measures parameters and examine their effect through statistical analysis. Consultants were evaluated using questionnaires and a mean testing using Relative Significance Importance was done to rank the factors causing delays of road construction projects.

The calculated sample size of the study consisted of 130 individual consultants who are undertaking various construction works in Ghana. The study employed the use of primary data collected from consultants in the road sector using a standardized questionnaire. However secondary data from sources such as journals, articles, books, and the internet was also used to review theoretical and empirical studies underpinning consultant - related causative factors of delays in project.

1.7 SCOPE OF THE RESEARCH

The research sought to assess the phenomenon of consultant – related causative factors of road construction project delays contract. It seeks to highlight the various causal factors and how implementation challenges can be addressed. The scope of the research is limited to the perspective of project consultants who constitute the apex in the construction chain and thus oversee the execution of construction projects. The study is also limited to registered consultants in the city of Ghana (Accra and Kumasi) who are the beneficiary of most government projects. The research is again limited in relation to resources and time because it is being undertaken concurrently with semester’s academic work. This makes it difficult to deal extensively with other related matters that mitigate road construction projects in Ghana.

1.8 STRUCTURE OF REPORT

The breakdown and organization of this study is a composition of 5 primary chapters. The model below was used to explain the questions in the research.

Chapter one consists of the background to the study, the aim and objectives of the study, Research Objectives and questions, Significant, scope, methodology and the structure of the study.

Chapter two presented the literature review (both theoretical and empirical review) on project delays of road construct in Ghana from consultants’ perspectives and answers sub-question one “What are the most significant project delays indicators of road construction contracts in Ghana?” and two “What are the underlying consultant-related causes of the most significant project delays of road construction contracts in Ghana?”. It also identified mitigation factors/strategies that can be adopted to address the consultant – related causes of project delays of road.

Chapter three presented the methods used to analyse the data. The descriptive and inductive methods were applied to the study.

Chapter four described the results of the analysis of project delay situation of road contracts in Ghana. The results of the mean testing and standard deviation were given which provided answers to the fourth and final sub-questions.”.

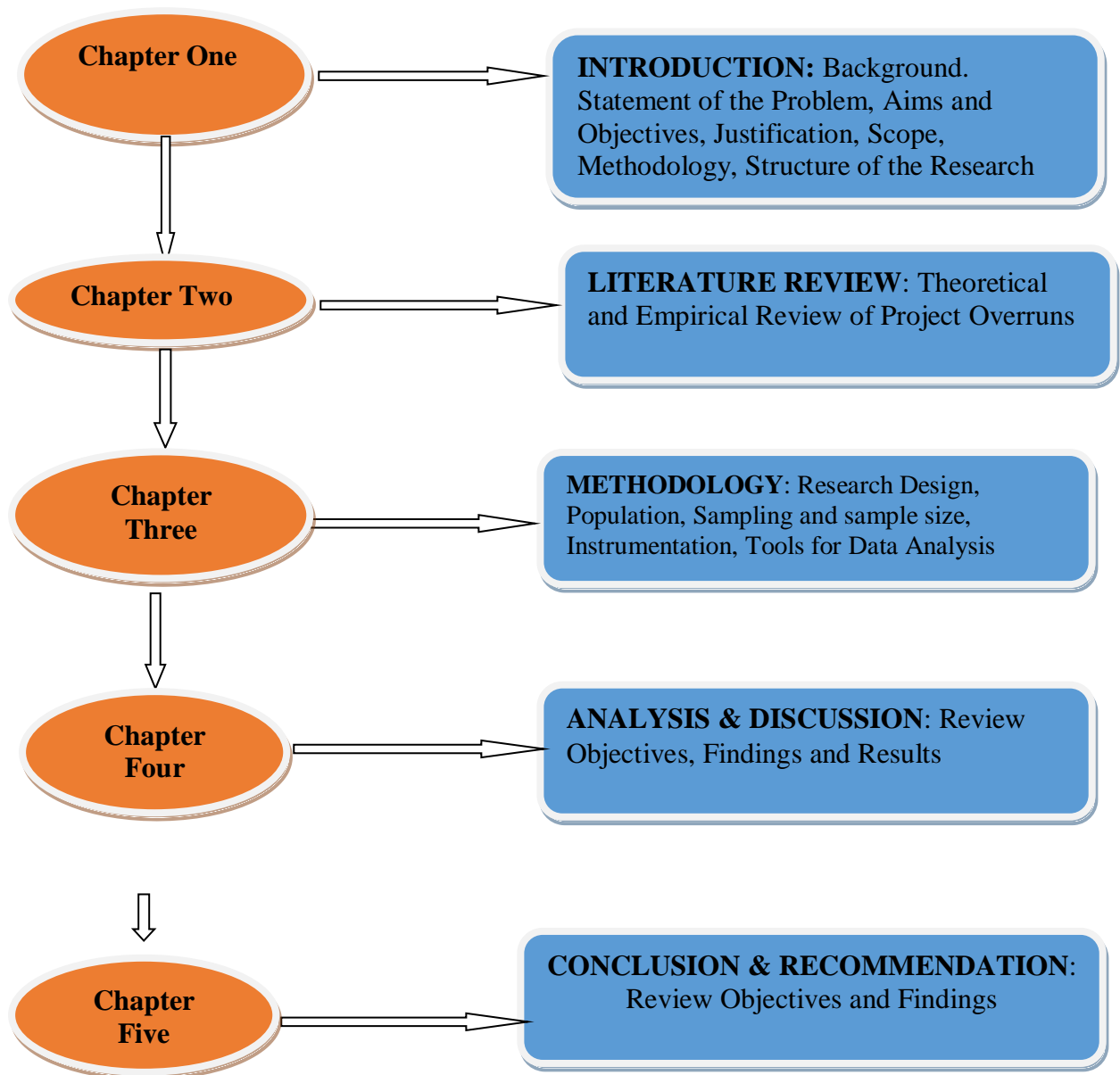


Figure 1: Conceptual Framework of the Research Process

Source: Author’s Own Construct (2018)

It answers all sub-questions “What are the most significant project delays indicators of road construction contracts in Ghana?” and “What are the underlying consultant-related causes of

the most significant project delays of road construction contracts in Ghana?” and “What mitigation factors/strategies can be adopted to address the consultant – related causes of project delays of road constructs in Ghana

The fifth chapter presented summary of key finding, conclusions and recommendations from the research constructs in Ghana leading to the establishment of a conceptual framework for the study.

1.9 CHAPTER SUMMARY

The current chapter discusses the background by developing a historical, theoretical, conceptual and contextual overview of project cost and time overruns as it pertains to road construction industry in Ghana. It then proceeds with the problem statement, aims and objectives, and a justification for the study made. Research questions were posed to help achieve the objectives and the aim of the study eventually. Subsequently, the methodology followed and defines the scope of the thesis and some reasonable assumptions made. The author reveals what these are and how these drew back the study. Even so, research has its importance in contributing to knowledge

CHAPTER TWO

LITERATURE REVIEW

2.0 INTRODUCTION

This section of the study appraises previous work done with this area of research that are pertinent to the topic under consideration. In this regard, this section presents the concept, theoretical and empirical review of consultant - related causes of road construction delays in Ghana.

2.1 CONCEPT OF ROAD CONTRACTION PROJECT DELAYS

Project delay in construction is a state in which the actual progress of the phases of a construction project becomes sluggish relative to strategic or completing the project not on time (Dallas, 2008). Delay in the setting of construction refers to prolonged period of construction and interruptions of events that distracts the program of the construction. Construction delay is also defined as the extra periods, within which a project is done relative to the actual time set in advance of the building. The holdup can be taken care of or not (Adeleke et al., 2018). Delay is acknowledged as the most risky, costly, common, and complex problem encountered during projects (Sambasivan et al., 2017). Delay has been established as one of the commonest experiences in the construction project globally (Abdelnaser et al., 2005). Multiple studies have identified incident of delay as a major problem facing construction projects in the world (Abd El-Razek et al., 2008). A project is considered delayed only when its postulated time of completion has been exceeded (Abdullah et al., 2011). According to Aiyetan (2010), project delays form the major challenges for the industry of construction in the emerging countries. However, delays are not only experienced in the emerging countries, delays are a global phenomenon (Ahmed et al., 2003). Holdups are cases which influence the process and suspend of the operation of a project; holdup resulting in situations might comprise weather holdups, inaccessibility of materials, project holdups,

etc. Generally, the holdup of design happens due to design operations, which possess both extrinsic and intrinsic reasons as well as influence connection (Abdul-Rahman and Berawi, 2002).

2.2 TYPES OF ROAD CONTRACTION PROJECT DELAYS

The major kinds of delay were reported by several academicians included understandable holdup, simultaneous holdup, compensable holdup, as well as crucial holdup. The kinds of delays mentioned possess intrinsic or extrinsic influence on project operations. Intrinsic reasons of holdup comprise reasons, which arise out of owners, builders and advisers. Extrinsic reasons of holdup arise out of outdoor construction projects like usefulness firms, administration, sub-contractors, dealers, work unions, state, etc. (Aibinu, and Odeyinka, 2006; Ahmed et al., 2003; Aiyetan et al., 2008; Alaghbari et al., 2007).

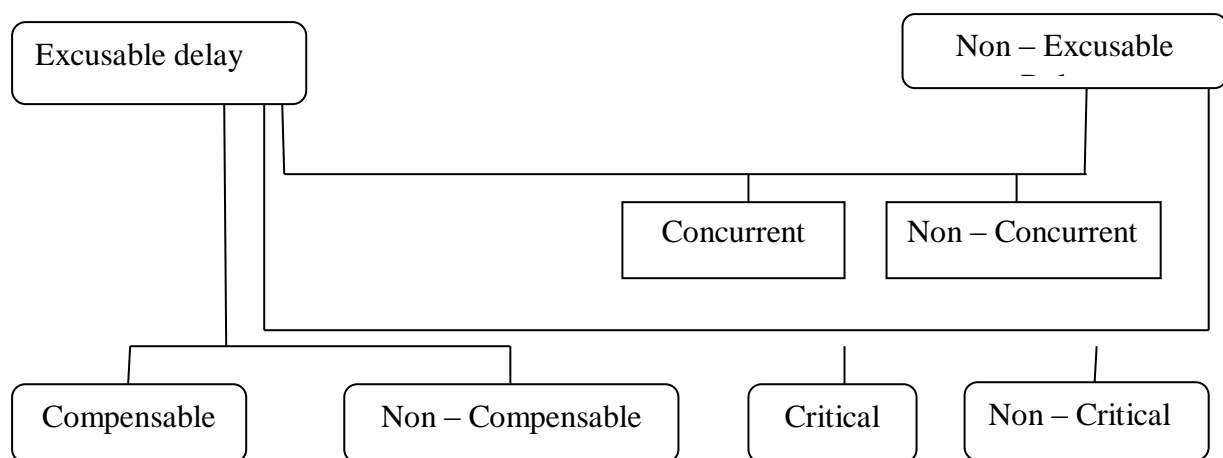


Figure 2: Sequential relationships of various categories of delays

Source: Vidalis and Najafi (2002)

2.2.1 Excusable and Non – Excusable delays

Excusable delays are unexpected proceedings outside anybody's power. They are additionally divided into compensable and non-compensable holdups. Considering the delay

to be compensable means the contractor has the right to extra monetary payment and additional project period. Within some instances in which non-compensated excusable holdups happen, the contractor takes additional period however not additional cash for the extra finished job. Excusable holdups, termed “force majeure” holdups, as well as frequently named “acts of God” for the reason that they aren’t obligation or problem of any specific entity. Numerous numbers of contracts permit contractors to get a projection of period for understandable holdups, however not extra cash (Albogamy et al., 2012). The writer additionally elucidated non-compensable holdups as the ones that notwithstanding being excusable don’t have the right to the any payment. AlMobarak et al. (2013) stated that excusable non-compensable delays are usually above the regulation of either proprietor or service provider like poor weather, force majeure, struggles, nationwide disasters, deluges, fires or workers strikes.

2.2.2 Concurrent and Non – Concurrent delays

When a single determinant is holding the construction, it is normally impartially simple estimate both the period and cash as a result of that individual determinant or problem. A much complex-however as well much characteristic – case is the one where an extra determinant holds the project at similar period or in overlying periods. Such are termed concurrent/simultaneous delays (Alzan et al., 2011).

Simultaneous holdups happen once both proprietor and the service provider are accountable for the holdup. In general, when the holdup is indissolubly tangled, neither the service provider could be held accountable for the holdup nor could he recuperate the delay losses out of the proprietor. Till the establishment of computerized project management (CPM) agenda examination, there was not a dependable approach to distinguish the influence of holdups coming from the contractor and that coming from the proprietor. With the

complicated computerized approach currently obtainable, nonetheless, it has come to be capable to separate the influences of seemingly simultaneous proprietor and service provider holdups (Al-Kharashi and Skitmore, 2009).

2.2.3 Compensable and Non – Compensable delays

Compensable delays are the one, which are usually brought about by proprietor or their mediators. The much available kind of compensable holdup is insufficient drawings as well as stipulations, nonetheless compensable holdups could as well originate out of proprietor's alterations in project or resources, as well as proprietor's disturbance and/or alteration in the series of operation. The contractor possesses the right to both extra cash and extra period coming out of compensable holdups/delays (Alaghbari et al., 2007). These compensable delays are understandable holdups, postponements, or disturbances to every or aspect of the operation resulting from an activity or disappointment to operate by the proprietor originating out of proprietor's outlet of a responsibility, specified or indirect, in the deal. When the holdup is compensable, then the service provider has no right to a projection of period however as well to a change for every upsurge in charge as a result of delay (Al-Gahtani and Mohan, 2007). Al-Gahtani and Mohan (2007) additionally pointed out another kind of delay termed pacing delay: Pacing delay is slowing down of the design operation, by a single entity. This is due to a holdup to the finishing time of the project, resulting from certain parties. The objective is to uphold constant advancement with the reviewed project plan.

2.2.4 Critical and Non – Critical delays

Critical delays are holdups, which disturb the advancement, period as well as payment. Non-critical holdups don't disturb the finishing time of the project. They disturb the following

events, which aren't on the crucial lane of the agenda. Such could delay operations when they don't have a float within the agenda (Assaf and Al-Hejji, 2006).

2.3 CAUSES OF CONSULTANT - RELATED DELAYS OF ROAD CONTRACTION IN GHANA

Several researches were carried out pertaining to delays in project constructions for over years with academicians progressing several determinants and categorizes of determinants, which add to the holdups. Accessible literature appraised shows groupings of the diverse determinants in categorizes of up to 11 groups of consultant-linked, design-linked, equipment-linked, externality-linked, labor-linked, material-linked, owner-linked, project-linked, engineer-linked and human-attitude linked amid some. Such research nonetheless re-gathered such determinants into 4 wide groups of consultant-linked, contractor-linked, client-linked and extrinsic-related determinants. Artidi and Chotibongs (2005) recognized and groups project delay into the following:

2.3.1 Policy-related Causes

Fundamentally, civic division projects are funded or authorized by the government. The meaning of such king of project need to be in accordance wot the administrative strategy. Conversely, administrative strategy has to integrate several measures interests, specifically, the civic interest. Such interest is manifold, lively as well as complex, and to meet such interests, alterations in strategy are inevitable. The administration either suspended or decreased the monetary promises to several construction projects in an effort to reduce the 'over heated' building bazaar. Current strategies are frequently established in the mid of the design's building procedure, for instance, extra security actions, or fresh excellent supervision schemes. The institution of novel strategies would usually comprise funding from

the project bodies. The operation of finding out the one to take what obligation to institute such regulations could significantly holdup project advancement (Apolot et al., 2012)

2.3.2 Owner-related Causes

A civic division project in general comprise much alterations, therefor encouraging holdups in the operation of establishing the project. The civic subsector proprietor generally, is not operational in enforcing the advancement of project once related to a personal owned section. There exists the absence of expertise in regulating construction programing. The delays are present in every process, which a civic division project must go through, that additionally advancement holdup. A civic division proprietor must operate with several administrative sections once alterations to a project happen. He must devote a significant quantity of period interacting with several other administrative sections that moreover encourages project holdups (Apolot et al., 2012).

2.3.3 Design-related Causes

The inadequate or wrong project information is a key adding to the holdup of the projects. The challenge occurs due to the proprietor's bad consultation, inadequate period permitted for project, the designer's bad experience and the proprietor's missions for alteration as at the building activity (Berrego et al., 2009).

2.3.4 Contractor-related Causes

An architect's operation could holdup a building design in numerous approaches. Characteristic instances, major architects frequently possess diverse conflicts having subcontractors as well as resources providers that could result in predominant holdups. Actually, these conflicts are counted as key reasons for project holdup. Certain determinants,

like the designer's inadequate monetary materials, flaws in establishing choices on regulation advancement as well as the entire incapability once carrying out managerial roles, are as well potential causes for delay of projects. It is essential to take notice that, a key architect would occasionally intentionally request an irrationally small time of contract though the designer acknowledges that the period for finishing the project is unlikely. Within such a circumstance, the architect just desires to guarantee a contract and therefore settles on an impractical agreement time enforced by a project contract period compulsory by a project holder. Accordingly, project holdup can't be prevented (CIOB, 2008).

2.3.5 Consultant-related Causes

The advisor partakes in a project could disturb the advancement of building programing via several supervising conditions like provision of certificate as well as authorizing the gratification of some operations in the building operation. Advancement holdup could occur when such supervising conditions aren't established appropriately. Management planners are offered power to authorize the gratification of some processes like support, brace setting, the excellence of major resources, prior the building programing could progress onward. It was observed that monitoring planners frequently can't authorize such processes at the apt period, therefore building holdups are brought about (Couto, 2009.).

2.4 DISCUSSION OF CONSULTANT – RELATED FACTORS CAUSING ROAD PROJECT DELAYS

There exist numerous reasons or determinants of delay, which were observed by investigators in the building company. Numerous researches have observed consultant-linked determinants to bring about program holdups. Aibinu and Odeyinka et al. (2006) stated that unfinished drawings, untimely of orders as well as insufficient monitoring, seriously influenced on consultant-linked category of delay. Crawford (2005) ended that insufficient monitoring of

location by the consultant was the key reason for delays. Dayi (2010) recognized delay in permitting main alterations in the area of operations, insufficient expertise of the consultants as well as untimely appraising project document as crucial. Within a different research, Enshassi et al. (2009) found delay in project operation and insufficient monitoring of the location as a major reason of consultant-linked delay. Assaf and Al-Hejji (2006) found the consultant-linked holdup determinants as; holdup in carrying out supervision and analysis by advisor, holdup in authorizing key alterations in the area of operation by the consultant, firmness of consultant, bad interaction as well as management amid consultants and certain bodies, untimely appraisal and authorization of project documents by consultant, struggles amid consultants and project planner, insufficient expertise of consultants. Fagbenle et al. (2004) observed project mistakes created by architects, alterations in kinds and stipulations as at building, inadequate interaction amid proprietor and consultants at the crucial phase of the project.

Kumar (2011) investigated the causative factors of time delays in MARA building designs from the viewpoint of “project managing adviser” and observed that major determinants were bad location handling by designers, absence of designer expertise, absence of location workers, increase of resource cost, behavior of giving contract to lowest bidders, challenge with subcontractors, absence of interaction amid agencies, as well as alteration handling. To find the determinants the influence apt finishing construction projects as conducted by Alaghbari et al. (2007) in Klang Valley, Malaysia. The research identified that monetary challenges and absence of management amid building agencies are major determinants commencing period overrun in building projects. The conceptual frame of the reasons building projects delay is established out of 7 research papers (Rahman et al., 2013) as follows: Frequent design changes, Errors in design, Delay in design preparation, Delay in

approval of drawings, Lack of supervision, Slowness in making decision, Lack of consultants experience, Incomplete documents, Lack of consultant's site staff experience, Incomplete documents, Under estimate project duration, Incompetent designers, Delay in approving major changes in scope of work, Conflict between consultant and design engineer.

Kaliba et al. (2009) describe some of the causes of delays as follows: Poor contract management, Mistake in design, Underestimate project duration, Slow down in design preparation, Delay in approval of design changes, Lack of cost plan / monitoring, Inadequate project preparation, Lack of coordination at design phase, Incomplete design at tendering stage, Lack of consultant team's experience, Errors in design and contract documents, Changes in the original design, Drawings are not efficient enough, Non – availability of consultant's staff on site, Delay in giving instructions, Delay in the approval of project drawings, Poor communication and coordination between the consultant's and staff, Qualifications of consultant staff – poor, Discrepancies in contract documents, Consultant staff not available on site at the correct time, Unfamiliarity of consultant with local conditions.

2.5 EFFECT OF CONSULTANT – RELATED DELAYS OF ROAD CONTRACTION IN GHANA

2.5.1 Cost Overruns

The influence of building delay has a subsequent impact on the building agencies as well as the populace in the system. Different from the reasons, which might possess certain geographical; limitations, the influence is naturally global. In the research carried out by Kazaz et al. (2012), they graded the response from the participants with respect to the frequency of reactions obtained for separate influences observed. It was observed that every

participant selected time and price overrun giving it the utmost rank. Price overrun would be the extra price in the calculated project price. Such extra price is uncomfortable to the agencies to the building project. In the situation of administration, tax payers are not obtaining worth due to the price overrun. Likewise, for the architects, they go through irregular damages and occasionally a money flux incidence. To the architects, it still a dent in their status as customers fail to have assurance in their implementation strategy (Kallantzis et al., 2007).

2.5.2 Creates Financial Hardship

It was projected that untimely imbursement could produce monetary toughness on the architect. For examples, the major architect is responsible to pay the subcontractor for their labor. Hence, except the agreement specifically needed the architect pre-funding the project, the architect shouldn't be projected to pre-funding the work for their customers. The monetary toughness would not just disturb the major contractors however the other agencies and showed in the subsequent sub-segment.

2.5.3 Creates Negative Chain Effect on other Parties

Lim (2005) reported that, the building imbursement blues have domino influences. A held-up imbursement by an agency might disturb the entire delivery series of imbursement of a building project for example, when a worker delay in paying the architect, such lead to builders' holdup in paying sub-contractor. The additional results of the adverse series impact would produce money flux challenges. The waterfall scheme of imbursement commences from the monetary organization to major architects, major architect to sub-contractors and follow suit in the series (Lo et al., 2006). The bankruptcy of an agency in the imbursement series can critically result in serious influence s to the agencies under him. The challenges are

additionally complex with the point that it is usually empirical to comprise “pay when paid” sections delivery in the sub-agreements. The load of the major architect’s non-imburement as a result of his own responsibilities would be moved to the sub-contractor and such tend to influence the subcontractor’s money flux. Such is intensified if the cause of the non-imburement by the boss to the major architect is just because of their mistakes and not as a result of the subcontractor.

2.5.4 Create Cash Flow Problems

Several lower architects as well go through challenges in getting cash out of money organizations to support their industry because of the huge amount of insolvency in the firm; therefore, the primary principal for the industry should be sourced from the architect (Kim et al., 2008). There remain architects that come and leave, not for excellent operation and handling, however for the absence of money to compensate their bill. When the architect’s money flux is seriously disturbed, such might result in the holdup in finishing of project as deliberated hereunder.

2.5.5 Results in Delay in Completion of Projects

As earlier elucidated, delay imburement on the side of the owner could result in money flux challenges for the architect that might disturb the entire advancement of jobs. Conferring to Rahman et al. (2011), monetary challenges is established by the highest managing opinion within the research as the major reason of delays additionally to workforce reduction.

2.5.6 Leads to Bankruptcy or Liquidation

A letdown on the side of the owner to compensate the architects in an effective as well as apt approach might disturb the architect’s previous monetary. Such might disturb architect’s money flux that tend to result in architect’s bankruptcy because of unintended money flux

challenges. Within United Kingdom, in the early nineties, several industries and firms came to be bankrupt with huge sums of work been destroyed (Sambasivan and Soon, 2007). Architects bankruptcy seriously influence the architect's operation in finishing the job that would lead to leaving of the project.

2.5.7 Leads to Abandonment of Projects

An additional influence of building delay is the entire leaving of the project. Delay in building could result in the agencies leaving the projects totally. When building projects is been left, it decreases the rate of occupation, decline the speed of financial events, administration losses income and outside stakeholders are discouraged form sponsoring building projects in the economy. Apart from such, there exist intense destruction to the status of the agencies to the building agreement. Such would result in leaving of the project. Unavoidably, arguments would intensify, and both agencies would opt for argument resolve action (Shah, 2016).

2.6 MITIGATING MEASURES IN ADDRESSING CONSULTANT – RELATED ROAD CONTRACTION IN GHANA

Remedies for Securing Payment Debt

According to Lim (2005), there are several ways available to better the project delays problems in the industry. In developed countries, mostly such remedies are fused into construction contracts or statutes for instance, payment of stipulated interest, suspension of work, eradication of “pay when paid” clause, adjudication, liens, trust and payment bonds.

2.6.1 Payment of Stipulated Interest

According to Amoako (2011), payment of stipulated interest is one of the ways through which project delays are been controlled in construction. Often, there are many issues

pertaining to contractors claims for loss of interest as a result of delays and nonpayment of the employer is indecipherable. For instance, in the case between FG Minter Ltd vs. Welsh Health Technical Services Organization, where the Court of Appeal stepped in to continue the claim of interest as a result of late payment. This was so similar to the case between Hadley and Baxendale, the rationale behind the intervention of the Court of Appeal was because claims on interest for default in payment is regarded as loss and/or expense tantamount to claims for damages. This is statute under section 74 of the Contracts Act 1950. Moreover, in the trail of Hadley vs Baxendale with regards to whether damages in the form of interest could be paid for, is hooked around the question of whether both parties foresaw the likeness of the happening of losses during the formulation of the contract taking into consideration the knowledge the of the parties as at that time (Eisenberg, 1997).

2.6.2 Suspension of Work

According to Amoako (2011), another avenue to better the delay in project contract is through suspension of work. There is no law that demands the right to suspension of work as a result of default of payment. Irrespective, of a contractor not being paid for a service been rendered previously, that contractor is, however, is compelled to carry on with work in a steady and more diligent manner. For instance, the case between of British Pipe Lines and Christchurch Drainage where the Court of Appeal of New Zealand ruled that under no circumstances will a contractor temporary halt/suspend work due to non-payment on the part on the employer. These ruling was afterwards followed by a case in England between Lubenham vs. South Pembrokeshire which supported the stands of contractor's right of suspension. As said by Judi and Rashid (2010), it is unusual to discover that a contractor or sub-contractor deliberately abandon or threatened to suspend work or service as a result of non-payment or before a payment is made.

However, it must be observed that, in the absence of any authorized consent or contractual right to suspend the work, no contractor has the right to halt work much so when employer default in payment with the stipulated time in the contract. In this regard, a failure to comply with or if the contractor halts the work, will attract the court of competent jurisdiction to find the contractor guilty of disowning the contract. This will result in certain agencies to receive the renunciation and annul the agreement, as well as prosecute for loses. Additionally, the calculated duration of halt of job by architect will be factored as the time of projection, which would be legitimately combined to the initial finishing of work, and damages encountered is remunerative. According to Seyram (2017), in respect to the essence of this right, it will be prudent to comprise such supply within every normal condition obtainable in Ghana. Such provision into the Construction Contracts Act of Ghana will go a long way to force the combination of the privilege to interrupt every normal kind of contract. This will offer certain compulsory requirements, which will guide the construction firm's contracts that is under the scope of the Act. Failure will attract a non-payment system where both parties will be compelled to obliged accordingly.

2.6.3 Right to Slow Down Work

Right to slow down the execution of the work is also not acknowledged by law as apart from the right to suspend the work (Lim, 2005). Presently, such right is not constituted in Construction Contract Act globally. However, it will be more prudent to carve this into Ghana's Construction Contracts Act since, most at times when the work/service is halted may render machines and equipment idle on site, yet the contractor suffers for the payment accumulation of debt of hiring this machines /equipment over a prolong period of time

2.6.4 Eradication of “Pay When Paid” Clause

As mentioned by Amoako (2011), most sub-contracts or sub-sub contracts incorporates “pay when paid” or “pay if paid” clauses. “Pay when paid” clauses create conditional room in a contract whereby upon receive of payment of service rendered by an employer the contractor also pays the sub-contractors. For instance, a sub-contractor only gets paid on the condition that the client pays the main contractor. However, in such circumstances sub-contractors suffers such that, their payment of work /service rendered is beyond their control since there is a middle agent (the main contractor) who has to receive payment from client first before sub-contractors are been paid. Consequently, these implies that, irrespective of sub-contractor fulfilling part of its contract diligently to the main contractor, when the client for what so ever reason decides to freeze payment of contract will still not offer payment to the sub-contractor if such clause is in play. Therefore, it is unjust on behave of the sub-contractor for fulfilling part of his bargain, yet its payment is been frozen due to failure of others part of the deal

2.6.5 Payment Bond

Lim (2005) also considered payment of bond as an avenue to reduce the delay in project contracts. Payment bond is a simple service which mostly requires a third party in most cases banks or insurance companies to offer in payment. Fundamentally, it needed the agency given building contract in abundance of certain quantity to offer an imbursement bond to architects.

2.6.6 Mandatory Creation of a Trust Account or Retention Sums

The theory of trust accounts has not been established in Ghana yet, however it has been employed in nations such as Malaysia after the acceptance of the JCT63 of the UK kind of agreement in the PAM 69 condition of agreement although its alike with the theory of retaining cash that is as well offered in the PAM 98 and CIDB 2000 (Lim, 2005). In an

instance where they are untimely imbursement the architect might employ the sum of trust to enhance his money flux and could progress with the conducting of the job.

2.7 EMPIRICAL REVIEW OF RELATED STUDIES ON ROAD CONSTRUCTION PROJECT DELAYS

Pourrostan et al. (2011) researched into 26 determinants that result in price overrun in building of groundwater project in Ghana, 55 questionnaires were administered to holders, 40 to architects and 30 to consultants. Conferring to the architects and consultants, monthly imbursements challenges from parties was the predominantly significant price overrun determinant, whereas holders graded bad architect handling as the predominantly significant determinant. It was observed that the main determinants, which result in extreme ground water projects overrun in evolving nations comprise bad architect handling, monthly imbursement challenges form parties, resource purchase, bad practical operations, and increase of resource cost conferring to impact rate.

The sum of price-upsurge augmented with an upsurge in the entire price of housing projects. Nevertheless, individual house holders that use a lot of period on the pre-strategizing stage used a lot of cash on the project stage; delivered fewer alteration instructions; chose much knowledgeable contracting firms; as well as employ a monitoring planner to sovereignly monitor the advancement of the operation and guarantee the supply of resources—experienced less and price-upsurge at the time of the establishment stage of their housing project. A key determinant adding to the tester project and price-upsurge was the inadequacy of cash and time given to it project stage (Sunjka and Jacob, 2013).

A research carried out by Asante (2014) to study the crucial determinants the result in bad project operations on building project in Ghana. The outcome showed that, insufficient

sponsoring of projects, holdup of operation by possess or the architect, money challenge at the time of building, insufficient strategizing for project prior to beginning; customer holdup in imbursement documents; as well as insufficient strategizing were the majorly graded determinants observed, which resulted bad operation of projects. Likewise employing the principal factor analyses, the determinants, which resulted in bad operations of projects, were categorized as planning-related determinants, client-related determinant, practical-related determinant, material-related determinants, price-related determinants as well as location-related determinants. Actual time handling activities, operational excellence handling activities, actual price handling, operational project programming were as well observed, the operational plans to alleviate the observed bad project operation determinants.

Again Fobiri (2015) commission a study on the management of delays that pertains to construction projects in Bia West District. Delay in construction project management is endemic in Bia West District and it is demanded therefore to be recognized since delay recurs from one project to the other. Its alarming rate is likely to go out of hand if reliable project management approach is not put in place to curtail it. The objectives of the research are to identify the critical factors that caused delays of government construction projects in Bia West District, to study the present use of project management knowledge tools and techniques in managing delays in construction project and to develop a framework to enhance management of construction project delays in Bia West District. Targets groups of respondents were A2 B2 and D2 K2 classified financial roads and building contractors respectively. The study was limited to contractors in Western Region and it was thus conducted with the use of literature review and surveys.

Questionnaires and personal interview techniques were also used to collect data. Results from the study divulge that the actual sources of delays in project delivery are; Inadequate financial resources of clients, delays in honouring payment for work done, underestimation of project

duration, poor communication between contracting parties, complexity, difficulties in accessing bank credit (client); change orders during construction and others. It was recommended that, initial proper planning and controlling is essential to the client in order to have proper action plan, procurement plan, and budget plan prepared before commencement of project. Payment schedule must be agreed by the parties involved. On the part of the contractor adequate knowledge of project management, principles, tools and techniques is required to reduce delays.

Okumbe and Verste (2008), researches into the bases of building delays at traditional contract in Jordan, they administered 100 questionnaires to contractors and 50 to consultants. It was observed from the investigation that, per the architects, work output was the major significant determinant for delays. Insufficient architect skill, nonetheless, was the major significant determinant for delays per the consultants. In general, it was settled with the grading of the various determinants for delay. They approved that insufficient architect skill, holder meddling, as well as funding of project were amid the top five predominantly significant determinants. Working determinants like work output, building approaches, location handling and resource accessibility as well as disappointment were significant to architects relative to the consultants.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 INTRODUCTION

The methodology of the study is considered as general strategy to the design procedure of a study from the written foundation to the gathering of data and its subsequent examination (Thurairajah et al., 2006). This part introduces the work's methodology which was employed to conduct the research. It was mainly based on the study approach and design, population and sampling theory, sampling approaches, instrumentation, procedure for collecting data, and techniques for analyzing data.

3.1 RESEARCH PHILOSOPHY

The philosophy of the study adopted for this study was based on post-positivism which combined empirical observation with logical reasoning in collection of appropriate data and subsequently the analysis of the findings. It is suitable to adopt a philosophical stance that combine both epistemological and ontological research philosophies, as divorcing the two will not allow human contact with external reality (Braimah et al., 2014).

Ontology is our assumption about how the world is viewed. It has two broad devotees - the objectivist and the subjectivist (Saunders et al., 2009). Epistemology is our assumption about the ideal method to study the globe. The objectivist represents an approach of using standardized data collection tools like surveys. Since road construction project delay variables are independent, the objectivists' ideology was adopted with respect to ontology. This was done using the Post-positivist approach.

3.2 RESEARCH STRATEGY

The approach of the research is the manner which guides the way of obtaining information. (Naoum, 1998). Qualitative and quantitative study strategies are used in collection and analyzing raw information. The researcher used questionnaire which he personally administered as data collection method. Conversely, the quantitative method is collecting, analyzing, and interpreting data by observing what people do and say. The study employed the quantitative research strategy as the researcher sought to address the research problem to satisfy the objectives of key road construction project delays in Ghana from consultant's perspective.

3.3 RESEARCH DESIGN

Research design according to Kothari (2004) refers to the way in which a researcher plans to collect information or data. Thus, according to Bell et al. (2016) is the term used to refer to the general orientation to the conduct of social research. The research design adopted for the study is a survey design. This approach does not control for or manipulate independent variables but measures these variables and test their effect using statistical methods. The current study designed is segmented in to five chapters with the first one stating the general background, problem statement, scope and organization of the study. The second review both theoretical and empirical literature on road construction delays from consultants - related perspective in Ghana. The third is a field survey of consultants with questionnaires as a means of collecting primary data for study. Prior pilot study was conducted to test and prove the effectiveness of questionnaires as well as modified to suite the study. The forth focus on data analysis and discussion. The last section of the research includes the conclusion and recommendation of the study.

3.4 RESEARCH APPROACH

The approach to the conduct of social research can be grouped in to two main groups namely deductive or Inductive. Williaman (2015) asserted to the fact that deductive approach is to test or verify a theory rather than develop it while inductive is to make inferences base on theory. This study adopted the deductive approach to verify the state of consultant related causes of road construction project delays.

3.5 POPULATION AND SAMPLING OF THE STUDY

3.5.1 Population of the Study

The population refers to the total collection of elements which one would like to study or make inferences to. It is the unit of study (Khalid et al., 2012). The population of interest for this study were consultants with valid registration who undertake construction works such as buildings, roads, water and sewage, and public works in the country.

3.5.2 Sampling Techniques

Sampling serves to provide practical ways of ensuring that data collection and processing aspects of research are done whilst making sure that the sample is a true reflection of the population (Fowler Jr, 2013). Convenience or availability sampling approach was used in the selection of respondents. It is described in Fugar and Agyakwah-Baah (2010) that convenient and available sampling is used when the researcher uses cases that are most convenient and available. According to Etikan et al. (2016), convenient sampling is made up of whoever is willing to participate. The disadvantage of this approach is the greatest probability to be partial. Nonetheless, considering the preliminary study, convenience sampling was appropriate. This study employed the use of convenience sampling technique which helped to ensure that the respondents are consultants undertaking construction work in the greater Accra region and Ashanti region.

3.6 SAMPLE SIZE

Burns & Grove (2010) posited that historically a minimum of 30 subjects as a sample size can be used but describes 30 subjects as inadequate as a sample size for most research works. By the use of the convenient sampling method, a sample size of 130 consultants were arrived at. Therefore, the sample size for the study is 130 consultants which is deemed large enough to enable meaningful conclusions to be drawn on the population.

3.7 INSTRUMENTATION

The data for the study was collected mainly using survey questionnaire because according to Mohajan (2017), questionnaire among other data collection instruments is an easy and practical means of gathering data from a large population. The questionnaire is divided into four sections. Section A has items on the demographic characteristics of Consultants (e.g. gender, age and marital status), Section B, C and D looks at the various factors and indicators constituting consultant - related road construction project delays. The questionnaires were organised on a Likert scale format from 1 = not significant to 5 = extremely significant. The various causes were organized under the two main categories of road construction project delays (i.e. Cost and Time delay impact).

3.8 PRE-TESTING (VALIDITY AND RELIABILITY)

In order to reduce the possibility of getting wrong responses, attention need to be paid to: Reliability and validity (Saunders and Thornhill, 2011).

3.8.1 Reliability

Operationally, reliability is defined as the internal consistency of a scale, which assesses the degree to which the items are homogenous. The Cronbach Alpha method of internal

consistency was used to compute the reliability of the measures of the variables of the study using the various questionnaire items administered to respondents. Cronbach's alpha of well above 0.7 implies that the instruments were sufficiently reliable for the measurement (Taber, 2018).

3.8.2 Validity

According to Ntalianis (2009), validity is the degree by which the sample of test objects epitomises the content test is intended to cover. To establish the validity of the instrument the researcher sought opinions of specialists in the field of study particularly the researcher's supervising lecturer or instructor. This required correction, modification, and alteration of the study instrument subsequently upgrading and enhancing validity.

3.9 DATA COLLECTION PROCEDURE

The primary source of data collection was employed through the use of questionnaires. The researcher made a list of all registered consultants who are undertaking various projects in Accra. Out of this list a required sample size of one hundred (130) was chosen for enumeration. A convenience sampling technique was adopted to select the individual consultants for enumeration. All the consultants were prior contacted on the phone to inform them about the rationale behind the project and their availability to complete a questionnaire. Each individual consultant was scheduled at their place of work at various working hours convenient to them and asked to complete the questionnaire since they are literate; thus, could read to understand issues of consultant related - road construction project delays. The selected consultants were also assured of the confidentiality of their responses and further informed that it's for academic purpose. They were also informed they could opt out if they feel uncomfortable with the study.

3.10 DATA ANALYSIS TECHNIQUES

The first Section A of the questionnaire was compiled, sorted, classified and coded into a coding sheet and analyzed using a computerized data analysis package known as the Statistical Package for Social Sciences. Simple frequency distribution was obtained and interpreted for analysis. The second procedure (For Section B, C, D) used in analyzing the results aimed at establishing the relative importance of the various factors responsible for consultant - related road construction delays. The ordinal scale is a system of rating data using integers in ascending or descending order. The codes assigned to the degree of influence (1, 2, 3, 4, 5) do not indicate that the interval between codes or scales are equal neither do they indicate absolute quantities. Therefore, the levels of importance as indicated by consultants were used to measure the relative significance importance of each factor which is further ranked to determine the major causes for each factor.

The relative significance importance was computed using the following equation:

Relative Significant Importance

$$(RSI) = \frac{\sum_{i=1}^5 a_i \cdot n_i}{\sum_{j=1}^N x_j} \times 100$$

Where x_j = the sum of the j th factors 1,2,3,4 ----- N ; N = total number of factors

(26); a_i = constant expressing the weight given to the j th response: $i=1, 2, 3, 4, 5$

For a response of “extremely significant” $a_1 = 5$

For a response of “very significant” $a_2 = 4$

For a response of “moderately significant” $a_3 = 3$

For a response of “slightly significant” $a_4 = 2$

For a response of “not significant” $a_5 = 1$

n_i = the variable expressing the frequency of the i th response.

n_1 = frequency of “extremely significant” response,

n_2 = frequency of “very significant” response

n_3 = frequency of “moderately significant” response.

n_4 = frequency of “slightly significant” response.

n_5 = frequency of “not significant” response

3.11 ETHICAL CONSIDERATIONS

The researcher upheld all ethical consideration as to the conduct, design, analysis and dissemination in the entire study. The questionnaires for the study were framed in a manner that did not pose any form of inconvenience and embarrassment to the respondents. The participants were well informed of the aim of the study and their consent were sought prior to their participation in the study, the respondents were also informed that the study was voluntary and adequate measures were taken to protect confidentiality of the respondents as well as information provided and hence information retrieved was treated as such. Again, accuracy was adhered to in data collection analysis, interpretation and report findings. Finally, the researcher ensured ethics in a manner that the write up meet academic standard.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.0 INTRODUCTION

The current study explores in to consultants – related causes of project delays of road construction contracts in Ghana. It is structured in to demographic characteristics of respondents, causes of consultant related delays and mitigation measures to adopt in addressing the problem.

Out of a total of 130 questionnaires distributed, 100 questionnaires representing 76.92 percent were responded, and these were retrieved and analysed. The high response rate at 76.92 percent may be due to the strict adherence to the techniques employed in distributing the questionnaires and the constant follow ups to get the questionnaire completed. The whole survey process took approximately 8 weeks to complete. The data was analysed using the Relative Significance Importance. Other analysis adopted were the Cronbach's Alpha Coefficient test to test the validity of the data.

4.1: DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Mathers et al. (2007) affirm that the characteristics of survey respondents exert great influence on their choices or the kind of answer they give to questionnaires. Variables like gender, age, marital status, educational levels and the number of projects executed in a year greatly influence respondents' answer to questionnaires. Therefore, it is important that the current study subjects the qualitative factors of the respondents to scrutiny and assesses their likely impacts on the data and the research outcome in general. In Table 4.1 below, various qualitative factors of the survey respondents have been presented.

Table 4. 1:Demographic data of Respondents

Variables	Frequency	Percentages
Gender of Respondents		
Male	76	76.0
Female	24	24.0
Total	100	100.0
Ages of respondents		
18 – 25 years	2	2.0
26 - 35 years	20	20.0
36 - 45 years	28	28.0
46 – 55 years	42	42.0
Above 56 years	8	8.0
Total	100	100.0
Marital Status		
Single	20	20.0
Married	66	66.0
Divorced	14	14.0
Total	100	100.0
Educational level of respondents		
Advanced Diploma	6	6.0
Bachelor's degree	42	42.0
Postgraduate diploma	22	22.0
Master's Degree	30	30.0
Total	100	100.0
Number of years practicing as consultant		
Below 5 years	14	14.0
6 - 10 years	36	36.0
Over 10 years	50	50.0
Total	100	100.0

Source: Field Study (2018)

The percentage of males (76.0%) and female (24.0%) gives a wide sampling variation but conforms to sampling theory. This indicates that road construction project is male dominated in Ghana. The dominant age groups were 46 to 55 years (42.0%). The average of between 46

and 55 years connotes that the average consultant has responsibility towards family. A confirmation of this is found in the marital status variable where over 66% (thus 66 out of 100 respondents) of the sample are reported to be married. Indeed, a careful look at the number of years the respondents have spent as consultants in the road sector gives marginal (weak) evidence that they are likely to switch to other fields in the construction spectrum such as building, civil, drains or real estate. This is because about 14.0% have been practicing in similar roles up to 5 years, 36.0% between 6 to 10 years and 50.0% has been practicing for over 10 years. Most of the respondents were bachelor's degree holders (42.0%). Juxtaposing the educational level and age of the study's sample may suggest that consultants practicing in the road sector are relatively young and they may upgrade or peruse career advancement in the future. These respondent characteristics point to the fact that they have in-depth knowledge and understanding of road construction to be able to fully understand the demands of the questionnaire.

4.2 NUMBER OF PROJECT EXECUTED IN A YEAR

An evaluation of the number of consultant - related road contracts executed in a year reveals the following as shown in figure 4.1 below.

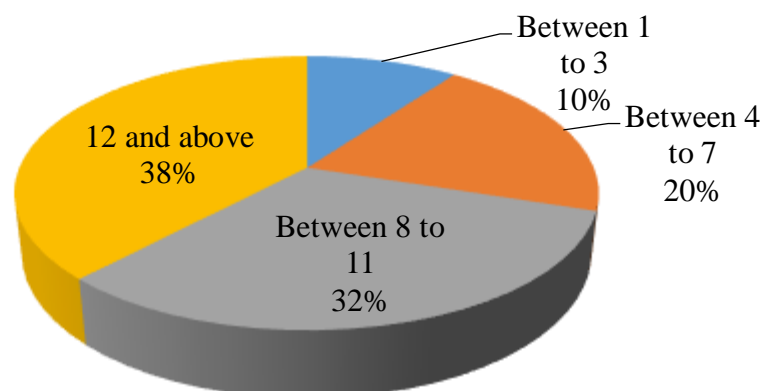


Figure 4.1: Number of Project Executed in a year

Source: Field Study (2018)

Figure 4.1 shows the results obtained when consultants were asked to indicate the average number of projects they execute in a year. Out of 100 respondent 38.0 percent stated at least 12 projects, 32.0 percent said “Between 8 to 11”, 20.0 percent said “Between 4 to 7”, and 10.0 percent said “Between 1 to 3” projects. This therefore indicates that consultants execute at least 12 projects in a year.

4.3: MOST SIGNIFICANT PROJECT DELAYS INDICATORS OF ROAD CONSTRUCTION

An evaluation of the most significant project delays indicators of road construction contracts in Ghana is indicated in table 4.2 below.

Table 4.2 shows that the respondents consultants ranked “Economic Related Indicators” in the first position with a Relative Significance Importance Index of (RSI = 82.4). The inflation pressures, financial difficulties of clients, and slow payment of completed works accounts for adverse economic indicators that are seen as consultant – related causes of road construction project delays in Ghana. This indicates that economic indicators are the most important cause of road construction project delays from consultants’ perspective. Abd et al. (2008) corroborate this by emphasizing that financial-related factors are one of the most critical factors that cause delay in construction projects. Delay in payment results in the slow progress of work on site leading to project delays. Delayed payment by the client may have a negative impact on the supply chain process which can lead to a project coming to a standstill. Financial market instability due to constant inflation exchanges lead to cash flow problems like interest on loans increasing, inflation of the prices of materials, increases in transportation and labour charges.

Table 4. 2:Most Significant Project Delays Indicators of Road Construction

	Descriptive Statistics		
Ranking		N	RIW
1	ECONOMIC RELATED INDICATORS	100	82.4
	Inflation exchanges	100	81.3
	Financial difficulties of clients	100	78.3
	Slow payment of completed work	100	77.3
2	MANAGEMENT RELATED INDICATORS	100	74.3
	Shortage of materials	100	73.2
	Mistakes during construction	100	72.2
	Obsolete or unsuitable construction method	100	71.1
3	COST RELATED INDICATORS	100	70.1
	High interest rate by banks	100	69.0
	Cost of insurance	100	69.0
	Transportation cost	100	68.9
4	PROJECT PARTICIPANT RELATED INDICATORS	100	67.9
	Disputes on site	100	67.9
	Poor financial control on site	100	67.5
	Poor planning	100	67.4
5	ENVIRONMENTAL RELATED INDICATORS	100	66.4
	Level of competitors	100	66.4
	Absence of construction – cost data	100	66.3
	Effect of weather	100	66.2

Source: Field Study (2018)

The second important indicator ranked by respondents' consultants was "Management related Indicators" with a Relative Significance Importance Index of (RSI = 74.3). This indicator encompasses variables like shortage of materials, mistakes during construction and obsolete or unsuitable construction methods are seen as consultant – related causes of road

construction project delays in Ghana. This indicates that “management issues” are the second most important cause of road construction project delays from consultants’ perspective. Abdul-Rahman et al. (2011) agree that material delivery is generally blamed for overall project delays. Late material delivery has a negative consequence on the success of a construction project. It may lead to low productivity on site accompanied with payment for idle time. Also, mistakes during construction and unsuitable construction method might lead to rework hence pushing a project time table or schedule backwards causing delays.

The third important indicator ranked by consultants was “Cost related – indicators” with a Relative Significance Importance Index of (RSI =70.1). The cost related indicators encompass variables such as high interest rate by banks, cost of insurance and transportation costs. This indicates that “cost related issues” are the third most important cause of road construction project delays from consultants’ perspective.

The forth important indicator ranked by consultants was “Project participants Indicators” with a Relative Significance Importance Index of (RSI = 67.9). The project participant’s indicators encompass variables such as disputes on site, poor financial control on site and poor planning. This indicates that “project participants issues” are the forth most important cause of road construction project delays from consultant’s perspective.

The fifth important indicator ranked by consultants was “Environmental related indicators” with a Relative Significance Importance Index of (RSI = 66.4). The environmental related indicators encompass levels of completion, absence of construction cost data and effect of the weather. This indicates that “environmental issues” are the fifth most important cause of road construction project delays from consultants’ perspective.

4.4: CAUSAL FACTORS INFLUENCING PROJECT DELAYS OF ROAD CONSTRUCTION PROJECTS

This part consists of results and discussion of factors that influence consultants – related causes of project delays of road construction contracts in Ghana. These were discussed base on their impact on cost and time (delays). The causes of road construction delays on time were grouped into 29 factors.

Table 4. 3: Consultant - related causes of project delays (time) of road construction in Ghana

Ranking		N	RIW
1	Poor contract management	100	85.4
2	Delays in payment	100	84.3
3	Underestimate project duration	100	84.3
4	Lack of cost plan / monitoring	100	83.3
5	Unfamiliarity of consultant with local conditions	100	82.3
6	Waiting time for approval of tests and inspections	100	81.3
7	Contract management by Consultant Preparation and approval of tests and inspections	100	80.2
8	Errors in design and contract documents	100	79.2
9	Consultant staff not available on site at the correct time	100	78.1
10	Drawings are not efficient enough	100	77.1
11	Incomplete design at tendering stage	100	77.0
12	Lack of coordination at design phase	100	76.0
13	Non – availability of consultant’s staff on site	100	75.9
14	Poor contract management	100	75.9
15	Delay in approval of design changes	100	74.9
16	Slowdown in design preparation	100	73.9
17	Delay of materials approval by consultant	100	72.8
18	Delay in the approval of project drawings	100	71.8
19	Inadequate project preparation	100	70.8

20	Lack of consultant team's experience	100	69.8
21	Conflict in amount of payments	100	68.7
22	Mistake in design/ Variations (design changes/ extra work)	100	67.7
23	Changes in the original design	100	66.6
24	Previous disputes between contractor and consultant	100	65.6
25	Centralization of decision-making process from consultant party	100	64.6
26	Conflict in amount of payments	100	63.6
27	Delay in giving instructions	100	62.5
28	Lack of job security for the consultancy team Bad past history	100	61.5
29	Qualifications of consultant staff – poor	100	60.5
	Valid N (listwise)	100	

Source: Field Study (2018)

Table 4.3 shows that the respondents consultants ranked “Poor contract management” in the first position with a Relative Significance Importance Index of (RSI = 85.4). The incidence of corruption and the corrupt nature of certain road construction bidding processes affect the outcome of selecting competent consultants with the requisite expertise in handling contract. A faulty bidding process and a corrupt application of contract leads to project delays due to the lack of expertise of the consultant. A faulty consultant produces major errors in road projects conception to completion. This results in poor contract management. Assaf et al. (2006) describe design errors commonly committed by designers, the variety in types and specifications throughout the construction, deficiency in communication that exist between owner and consultant throughout the design stage as very vital. Additionally, Chan et al. (2016) also pointed out delays in design information, inexperience design team and errors and divergences in design documentations as symptoms of poor contract management.

The respondent also rated “Delays in payment” as the second essential element in accordance with a Relative Significance Importance Index of (RSI = 84.3). The incessant delay in payment for completed phases of project leads to time delays stalling on - going projects. Delays by consultants in project has also been highlighted by various academicians as a major contributing causes of construction project delay (Abdul-Rahman et al., 2006; Lo et al., 2006). The third important factor ranked by consultants was “Underestimate project duration” with a Relative Significance Importance Index of (RSI = 84.3). The desire to win bids for road construction projects leads many bidders to underestimate projects duration which differs from actual duration it requires to complete projects. This makes consultants to make changes to scope of work and review timelines or project phases downwards. This assertion is in line with Al-Kharashi and Skitmore (2009) who pointed out delays in affirming major changes in the range of works, under estimation of project duration, inadequate experience of the consultant and late in reviewing design documents as critical.

The forth important factor ranked by consultants was “Lack of cost plan / monitoring” with a Relative Significance Importance Index of (RSI = 83.3). A cost plan is a detail evaluation and itemization of direct and indirect cost associated with various phases of the project. The lack of cost plan and inefficient monitoring of projects is seen as a significant factor in road construction project delays. This is in line with Arditi et al. (1985) who identified delays in design work, lack of cost plan and inadequate site inspection as the main causes of consultant related delays.

The fifth important factor ranked by consultants was “Unfamiliarity of consultant with local conditions” with a Relative Significance Importance Index of (RSI = 82.3). The familiarity of consultants with local conditions is a significant factor in formulating design, scope of work

and allocating cost to projects. Most road projects in Ghana are donor driven where the value chain of project management is all undertaken by foreign personnel who has little or no knowledge about local conditions such as the sources of construction material, the nature of local human resource base, climatic conditions of the area among others. Assaf and Hejji et al. (2006) pointed out the consultant linked delay factors as; long awaiting to perform inspection and testing by consultant, delay in affirming major changes in the range of work by consultant, rigidity (lack of flexibility) of consultant, lack of communication and coordination between consultant and other associates, late reexamination and approval of design documents by consultants, differences between consultant and design engineer, inexperience in consultancy.

The inability of a consultant to approve changes in design on time, approve project drawings, slow down in design preparation, inadequate project preparation, changes in original design, poor contract management among other factors discussed, will interrupt the progress of a project. A consultant's failure to communicate clearly and respond to request on time will cause a delay and a project as the consultant represents the client's interest on site and most changes to project scope and design cannot be undertaken by the contractor without the consultant's approval.

4.5: CONSULTANT - RELATED CAUSES OF PROJECT DELAYS (COST) OF ROAD CONSTRUCTION IN GHANA

This part consists of results and discussion of factors that influence consultants – related causes of project delays of road construction contracts in Ghana. These were discussed base on their impact on cost (delays). The causes of road construction delays on cost were grouped into 16 factors.

Table 4.4 demonstrates the respondent's consultant's ratings. First on the list is "Discrepancies between contract document" with a Relative Significance Importance Index

of (RSI = 84.5). This significant cause is in line with Abdul-Rahman et al. (2006) who pointed out delays in design information, inexperienced and errors and divergences in design documents. Discrepancies between contract document can cause project delays and cost overruns. It can lead to contractors requesting for further instructions at the very last-minute leading to delays. Changed order and mistakes as well as disparities between drawings and specifications causes delays in projects. To avoid such delays there must be correspondence between bill of quantities, drawings, specifications, preliminaries and the contract document.

Table 4. 4: Consultant - related causes of project delays (Cost) of road construction in Ghana

Ranking		N	RIW
1	Discrepancies between contract document	100	84.5
2	Lack of consultant's experience	100	83.4
3	Reputation of consultants (corruption)	100	82.3
4	Lack of consultant's site staff experience	100	81.3
5	Under estimate project duration	100	80.3
6	Incomplete documents	100	79.2
7	Lack of consultant's site staff experience	100	78.2
8	Conflict between consultant and design engineer	100	77.2
9	Delay in approving major changes in scope of work	100	76.0
10	Errors in design	100	75.0
11	Delay in approval of drawings	100	74.0
12	Slowness in making decision	100	73.9
13	Incompetent designers	100	72.7
14	Delay in design preparation	100	71.6
15	Lack of supervision	100	70.6
16	Frequent design changes	100	69.6
	Valid N (listwise)	100	

Source: Field Study (2018)

The second important factor ranked by respondents' consultants was "Lack of consultant's experience" with a Relative Significance Importance Index of (RSI = 83.4). This is a strong indication that any discrepancy between the documents will cause delay. Sometimes the

drawings of project differ from technical specification or bill of quantity, which in turn creates confusion in the implementation of contractor's work. Assaf and Al-Hejii (2006) also identified design errors made by designers, changes in types and specifications during construction, deficiency in communication between proprietors and consultant during design stage as very vital.

“Reputation of consultants (corruption)” with a Relative Significance Importance Index of (RSI = 82.3) was rated third as essential factor on the list. Corruption plays a key role in project delay due to the fact that undeserving consultants are awarded projects for which they have no capacity or expertise in executing. As asserted by Assaf and Al-Hejii (2006) an incompetent consultant is associated with design errors, deficient changes in drawings and specifications during construction and consultant discrepancies in documentations which leads to project delays.

The forth significant determinant graded by consultants was “Lack of consultant’s site staff experience” with a Relative Significance Importance Index of (RSI = 81.3). The flux of data amid colleagues assist to elucidate what is happening with respect to the different actions, assists to elucidate the obligations of everyone taking part. Assaf and Hejji (2006) observed the consultants linked delay determinants as; delays in conducting checkups and analysis by consultants, delays in authorizing key alterations in the working zone by consultants, flexibility of consultants, bad interaction as well as organization amid consultants and certain agencies, untimely appraisal and authorization of project files by consultant, struggles amid consultants and project technicians, insufficient skill on the part of consultants.

The fifth important factor ranked by consultants was “Under estimate project duration” with a Relative Significance Importance Index of (RSI = 80.3). Sunjka and Jacob (2013) observed a sluggish training as well as authorization of drawings, unfinished drawings, stipulations as well as documentation and alteration in drawings as determinants of consultant linked delay. Atout (2016) found delay in conducting checkups and analysis, bad interaction as well as organization with certain agencies, and struggles amid consultants and architects as the predominantly vital reason for delay.

4.6: A CROSS TABULATION OF THE CONSULTANT - RELATED CAUSES OF PROJECT DELAYS OF ROAD CONSTRUCTION IN GHANA

A cross tabulation of the two groups of consultants – related causes of project delays (**Time and Cost**) reveals the following.

Table 4. 5: Cross Tabulation of Consultant - related causes of project delays

Project Delays Impact	Correlation Coefficient	P - Values
COST / TIME	0.432	0.003

* Correlation is significant at 0.05 significance level

Source: Field Study (2018)

Table 4.5 shows the correlation coefficient for the set amid “Cost and Time”. The correlation coefficient between Consultant – related causes of project delays impact on Cost and Time = 0.432 with P = 0.003. Since the probability was lower relative to the level of significance, $\alpha = 0.05$, there exist a significant relation amid consultants’ opinion on road construction project delays. This indicates that similar factors affect projects delays in the road construction sector with respect to its impact on cost and time.

4.7: MITIGATION FACTORS TO ADDRESS ROAD CONTRUCTION PROJECT DELAYS

An evaluation of the mitigating factors/strategies for addressing the consultant-related causes of project delays of road construction contracts in Ghana is indicated table 4.6 below:

Table 4. 6:Mitigation Factors of Consultant - Related Causes of Project Delays

	Descriptive Statistics		
Ranking	MITIGATION FACTORS TO ADDRESS ROAD CONTRUCTION PROJECT DELAYS	N	RIW
1	Professional, technical qualifications and competence of consultants	100	86.2
2	Financial resources	100	75.2
3	Equipment and other physical facilities	100	64.1
4	Consultants using computerized software	100	53.1
5	Managerial capability, reliability, experience in the procurement object	100	52.1
6	Blacklisting consultants of low repute	100	51.1
7	Must have the requisite personnel to perform the procurement contract	100	40.0

Source: Field Study (2018)

Table 4.6 shows that the respondents consultants ranked " Professional, technical qualifications and competence of consultants" in the first position with mean a Relative Significance Importance Index of (RSI = 86.2). The professional integrity of the consultant is very important at reducing the high incidence of road project delays. A sound competent, professionally qualified consultant with the requisite qualification is able to prepare documents free of errors or mistakes which results in project delays. This was indicated by consultants as the most significant measure to address road construction delays.

The second important factor ranked by respondents' consultants was "Financial resources" with a Relative Significance Importance Index of (RSI = 75.2). Undertaking road construction project requires huge outlay of financial commitment and mobilization before the start of road projects. Most consultants in the industry lack the financial backing to sustain ongoing projects leading to many projects uncompleted due the lack of funds or funds drying up. To mitigate this project delays a consultant ought to have the financial acumen or an ability to mobilize funds for road projects. This was indicated by consultants as the second most significant measure to address road construction delays.

The third important factor ranked by consultants was "Equipment and other physical facilities" with a Relative Significance Importance Index of (RSI = 64.1). The consultant's ability to mobilize other key stakeholders to contribute equipment and other physical facilities should be a key requirement for consultant selection. Most road construction projects are stalled due to the lack of equipment to do excavation works, filling, deep earthen among others. An efficient and competent consultant is able to identify these needs before projects implementation starts. This was indicated by consultants as the third most significant measure to address road construction delays.

The forth important factor ranked by consultants was "Consultants using computerized software" with a Relative Significance Importance Index of (RSI = 53.1). The use of a computerized project management and other construction related jobs is seen as an efficient time saving way of avoiding long delays on projects. A consultant who is very well vex in the use of this software is able to save time and resources needed for speedy completion of road contract. This was indicated by consultants as the forth most significant measure to address road construction delays.

The fifth important factor ranked by consultants was “Managerial capability, reliability, experience in the procurement object” with a Relative Significance Importance Index of (RSI = 52.1). In order to mitigate delays in road construction projects a consultant must have the managerial capability, must be reliable and experience in procurement processes. This saves him time and resources needed to achieve project objectives. This was indicated by consultants as the fifth most significant measure to address road construction delays.

The sixth important factor ranked by consultants was “Blacklisting consultants of low repute” with a Relative Significance Importance Index of (RSI = 51.1). A consultant who has a long history of non – performance and corruption must be struck out of the list of tendering for road contracts. This is because they have the tendency of taking on projects and performing poorly on those jobs. Consultants indicated this as the sixth most significant measure to address road construction delays.

The seventh important factor ranked by consultants was “Must have the requisite personnel to perform the procurement contract” with a Relative Significance Importance Index of (RSI = 40.0). The human resource component determines the success or failure of most construction projects. A consultant bidding for road contract must demonstrate the ability to mobilize the needed human resources required to completing the job on schedule. Consultants indicated this as the seventh most significant measure to address road construction delays.

The consultant must ensure that the project activities are implemented according to the proper sequence and schedules by following plans to avoid delays. Most consultants fail to ensure that a practical project plan and programme of works are designed and adhered to. Proper

scheduling would ensure that projects do not encounter resource bottlenecks at any stage of implementation. Also, the consultant must ensure that working time is increased and idle time reduced to the barest minimum as they contribute to project delays.

There must be capacity building and training for workers on a project constantly to maintain a positive working environment that would increase the productivity of the workers leading to completing projects on schedule. There should be increasing of the manpower on site to avoid overburdening the few staff. The consultants must ensure that all subcontractors needed on a project are engaged ahead of time to avoid delays.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.0 INTRODUCTION

This section of the research deals with the summary of the major findings, conclusion and recommendations.

5.1 SUMMARY OF THE FINDINGS

It will be recalled that the study sought to answer the following objectives:

To determine the most significant project delays indicators of road construction contracts in Ghana

The most significant project delays indicators of road construction contract in Ghana are in descending order Economic indicators, Management related indicators, cost related indicators, Participants related indicators and Environmental related indicators.

To identify the underlying consultant-related causes of the most significant project delays of road construction contracts in Ghana

The most significant causes of consultant related project delays with respect to **cost** as perceived by consultants are: “Poor contract management” in the 1st position, “Delays in payment” in the 2nd position, “Underestimate project duration” the 3rd position, “Lack of cost plan / monitoring” in the 4th position, “poor site management” in the 4th position, and “Unfamiliarity of consultant with local condition” in the 5th position.

The most significant causes of consultant related project delays with respect to time as perceived by consultants are: “Discrepancies between contract document” in the 1st position, “Lack of consultant’s experience” in the 2nd position, “Reputation of consultants (corruption)” the 3rd position, “Lack of consultant’s site staff experience” in the 4th position, “poor site management” in the 4th position, and “Under estimate project duration” in the 5th position.

A chi - square analysis of the two opinions indicates a significant relationship between consultants related - causes of project delays on cost and time. Meaning consultant's views are unanimous on the two perspective (cost and time) of project delays in the road construction sector.

To establish the mitigating factors/strategies for addressing the consultant-related causes of project delays of road construction contracts in Ghana

The most significant strategy that can be adopted to address consultant related causes of project delays of road contract in Ghana as perceived by consultants are: "Professional, technical qualifications and competence of consultants" in the 1st position, "Financial resources" in the 2nd position, "Equipment and other physical facilities" the 3rd position, "consultants using computerized software" in the 4th position, "Managerial capability, reliability, experience in the procurement object" in the 5th position, "Blacklisting consultants of low repute" in the 6th position and "Consultant must have the requisite personnel to perform the procurement contract" in the 7th position.

5.2 CONCLUSIONS OF THE STUDY

The result shows that the most significant causes of consultant - related road construction project delays with respect to cost and time as perceived by consultants are Poor contract management and Discrepancies between contract documents respectively; majority of these are as a result of economic issues or indicators. These delays could be mitigated if a Professional consultant with technical qualifications and competence is selected, a consultant with the capacity to mobilise Equipment and other physical facilities, consultants using computerized software, a consultant with managerial capability, reliability, experience in the procurement object, Blacklisting consultants of low repute and Consultant who have the

requisite personnel to perform the procurement contract is selected for road contract projects. The findings call for urgent attention in improving the Ghanaian road construction industry's ability and performance to achieve improved cost performance and to mitigate against further project failure.

5.3 RECOMMENDATIONS

From the findings of this study, a number of recommendations are provided:

1. The findings revealed that the most significant cause as outlined by consultants is the poor contract management, which is a symptom of selecting undeserving consultants during bidding or tendering for road contract. The government should strengthen the procurement and bidding process when awarding road contract. This should be made available to all stakeholders in the construction sector through open and competitive tendering. The process should have punitive sanctions for consultants with bad reputation.
2. The problems associated with delay payment for completed project is reported as a second significant factor in construction delays. Several sub-contracts comprise “pay when paid” or “pay if paid” clauses. This should be abolished in contract documents in road construction. Again, the payment bond which is a straight forward device basically requiring a third party such as bank or an insurance company to guarantee payment in the event of default on the part of the paying party should be explored in to.
3. A detail cost plan and monitoring should be made mandatory from conception to execution of projects. Consultants bidding or tendering should outline detail cost plan and those cost should be monitored to ensure less variations in projected cost.
4. Consultants must establish a computerized scheme to conduct documentation procedures for every operation in the work place, to be able to identify operation in the work as well as to

keep track of the period schedule unceasingly. They must possess time program, which elucidates their requirement for instruments at the location, so it could be ready where required without holdup.

5. Consultants must prevent centralism of choices particularly the ones connected to consultant's job for the reason that this might result in project holdup. This might result in relegation of location technician and then to the happenings of several challenges within the location. Consultants must not be rigid in assessing architect performance and compromising amid the price and excellence must be taken into accounts.

6. The Ministry of roads and highway should ensure that Professional consultant with technical qualifications and competence is selected, a consultant with the capacity to mobilise Equipment and other physical facilities, consultant using computerized software, a consultant with managerial capability, reliability, experience in the procurement object, Blacklisting consultants of low repute and Consultant who have the requisite personnel to perform the procurement contract is selected for road contract projects.

5.4 LIMITATIONS OF RESEARCH

Every research has its own setback. For this study, the limitations were seen in the form of the collection of data and determination of the population. In the collection of data aspect, it was difficult retrieving data from respondents. The respondents of the questionnaires were consultant of road and construction firms in Ghana as most of the time they were busy and hence some of them did not have time to even look at the questionnaire than to respond. Although I faced this challenge, there was quite an appreciable number that still had time out their busy schedule to help me with the questionnaire did an excellent job. Nonetheless, this

challenge did not affect the credibility of the work done. Also, most of the consultants available were not willing to participate in the study.

5.5 NEED FOR FURTHER RESEARCH

The current study explores in to consultants – related causes of project delays of road construction contracts in Ghana. It is suggested that future research in this area should attempt to focus on contractor engineers who executes most of these road projects in Ghana. Again, further research should be conducted to cover wider geographical area or city in order to enhance the generalization of the findings and to further investigate potential differences between rural road projects and urban roads project construction delays.

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APPENDIX

QUESTIONNAIRE

CONSULTANT RELATED CAUSES OF ROAD CONSTRUCTION PROJECT DELAY

SECTION A: BIO - DATA OF CONSULTANTS

1. Name of Organisation
2. Gender a. Male [] b. Female []
3. Please, indicate your level of education
 - a. Doctorate [] b. Masters' Degree [] c. Postgraduate diploma []
 - d. Bachelors' degree [] f. Advanced diploma [] g. Certificate [] h. Others (*Please specify*)
4. Marital status a Single [] b. Married [] c. Divorce []
5. How long have you been practicing as a consultant?
 - a. Between One to 3 years [] b. Between 4 to 6 years c. Between 7 to 10 years d. 10 years and above []
6. What is the average number of project you execute in a year?
 - a. Between 1 to 3 [] b. Between 4 to 7 [] c. Between 8 to 11 d. 12 and above []

SECTION B: CONSULTANTS-RELATED INDICATORS OF ROAD CONSTRUCTION PROJECT DELAYS CONTRACTS IN GHANA

Please indicate the level of significance for each construct by ticking the appropriate boxes on a likert scale from 1 to 5. **E.S. = extremely significant (5)** **V.S. = very significant (4)**

M.S.= moderately significant (3) **S.S. = slightly significant (2)** **N.S. = not significant (1)**

7. What are the most significant project delays indicators of road construction contracts in Ghana?

	NS= 1	S.S= 2	M.S= 3	V.S= 4	E.S= 5
ECONOMIC RELATED INDICATORS					
Inflation exchanges					
Financial difficulties of clients					
Slow payment of completed work					
MANAGEMENT RELATED INDICATORS					

Shortage of materials					
Mistakes during construction					
Obsolete or unsuitable construction method					
COST RELATED INDICATORS					
High interest rate by banks					
Cost of insurance					
Transportation cost					
PROJECT PARTICIPANT RELATED INDICATORS					
Disputes on site					
Poor financial control on site					
Poor planning					
ENVIRONMENTAL RELATED INDICATORS					
Level of competitors					
Absence of construction – cost data					
Effect of weather					

SECTION C: CONSULTANTS-RELATED CAUSES OF PROJECT DELAYS OF ROAD CONSTRUCTION CONTRACTS IN GHANA

Please indicate the level of significance for each consultant related causes of road construction delays in Ghana by ticking the appropriate boxes on a likert scale from 1 to 5.

E.S. = extremely significant (5)

V.S. = very significant (4)

M.S.= moderately significant (3)

S.S. = slightly significant (2)

N.S. = not significant (1)

8. Consultants - Related Causes of Construction Project Delay on Cost Variables

No:	Consultants - Related Causes of Construction Project Delay on Cost	NS=1	SS=2	MS=3	VS=4	ES=5
1.	Poor contract management					
2.	Mistake in design/ Variations (design changes/ extra work)					
3.	Underestimate project duration					
4.	Slow down in design preparation					
5.	Delay in approval of design changes					
6.	Lack of cost plan / monitoring					
7.	Inadequate project preparation					
8.	Lack of coordination at design phase					
9.	Incomplete design at tendering stage					
10.	Lack of consultant team's experience					
11.	Errors in design and contract documents					
12.	Changes in the original design					
13.	Drawings are not efficient enough					
14.	Non – availability of consultant's staff on site					
15.	Delay in giving instructions					
16.	Delay in the approval of project drawings					
17.	Poor communication and coordination					

	between the consultant's and staff					
18.	Delay of materials approval by consultant					
19.	Qualifications of consultant staff – poor					
20.	Centralization of decision making process from consultant party					
21.	Previous disputes between contractor and consultant					
22.	Lack of job security for the consultancy team Bad past history					
23.	Delays in payment					
24.	reputation of the consultant (corruption)					
25.	Consultant staff not available on site at the correct time					
26.	Unfamiliarity of consultant with local conditions					
27.	Waiting time for approval of tests and inspections					
28.	Conflict in amount of payments					
29.	Contract management by Consultant Preparation and approval of tests and inspections					

9. Consultants - Related Causes of Construction Project Delay (Time) Variables

No:	Consultants - Related Causes of Construction Project Delay (Time)	NS=1	SS=2	MS=3	VS=4	ES=5
1.	Conflict between consultant and design engineer					
2.	Delay in approving major changes in scope of work					
3.	Incompetent designers					
4.	Under estimate project duration					
5.	Lack of consultant's site staff experience					
6.	Incomplete documents					
7.	Incomplete documents					
8.	Lack of consultant's site staff experience					
9.	Slowness in making decision					
10.	Lack of consultant's experience					
11.	Delay in approval of drawings					
12.	Frequent design changes					
13.	Lack of supervision					
14.	Delay in design preparation					
15.	Errors in design					

**SECTION D: FACTORS / STRATEGIES THAT CAN BE ADOPTED TO ADDRESS
THE CONSULTANT – RELATED CAUSES OF PROJECT DELAYS OF ROAD
CONSTRUCTS IN GHANA**

Please indicate the level of significance for each consultant related causes of road construction delays in Ghana by ticking the appropriate boxes on a likert scale from 1 to 5.

E.S. = extremely significant (5)

V.S. = very significant (4);

M.S.= moderately significant (3)

S.S. = slightly significant (2);

N.S. = not significant (1)

10. What mitigation factors/strategies can be adopted to address the consultant – related causes of project delays of road constructs in Ghana?

MITIGATION FACTORS TO ADDRESS ROAD CONTRUCTION PROJECT DELAYS	NS= 1	S.S.= 2	M.S= 3	V.S= 4	E.S= 5
Professional and technical qualifications and competence					
Financial resources					
Equipment and other physical facilities					
Consultants using computerized software					
Managerial capability, reliability, experience in the procurement object					
Blacklisting consultants of low reput					
Must have the requisite personnel to perform the procurement contract					

- THANK YOU VERY MUCH FOR YOUR TIME -