

**SCHEDULE OVERRUNS OF CONSTRUCTION PROJECTS BETWEEN
GOVERNMENT AND DONOR FUNDED PROJECTS IN MMDAS IN
GHANA: A CASE STUDY OF BEKWAI MUNICIPAL ASSEMBLY**

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(BSc QUANTITY SURVEYING AND CONSTRUCTION ECONOMICS)

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Construction Management

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SEPTEMBER, 2015.

DECLARATION

I declare that I have wholly undertaken the study and the report herein under supervision and the thesis report entitled “SCHEDULE OVERRUNS OF CONSTRUCTION PROJECTS BETWEEN GOVERNMENT AND DONOR FUNDED PROJECTS IN MMDAS IN GHANA” is the results of my client research except the literature which sources have clearly stated.

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I declare that I have supervised the student in undertaking the study report herein and confirm that the students have my permission to present it for assessment.

DR. T. ADJEI KUMI
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(The Head of Department) Signature Date

ABSTRACT

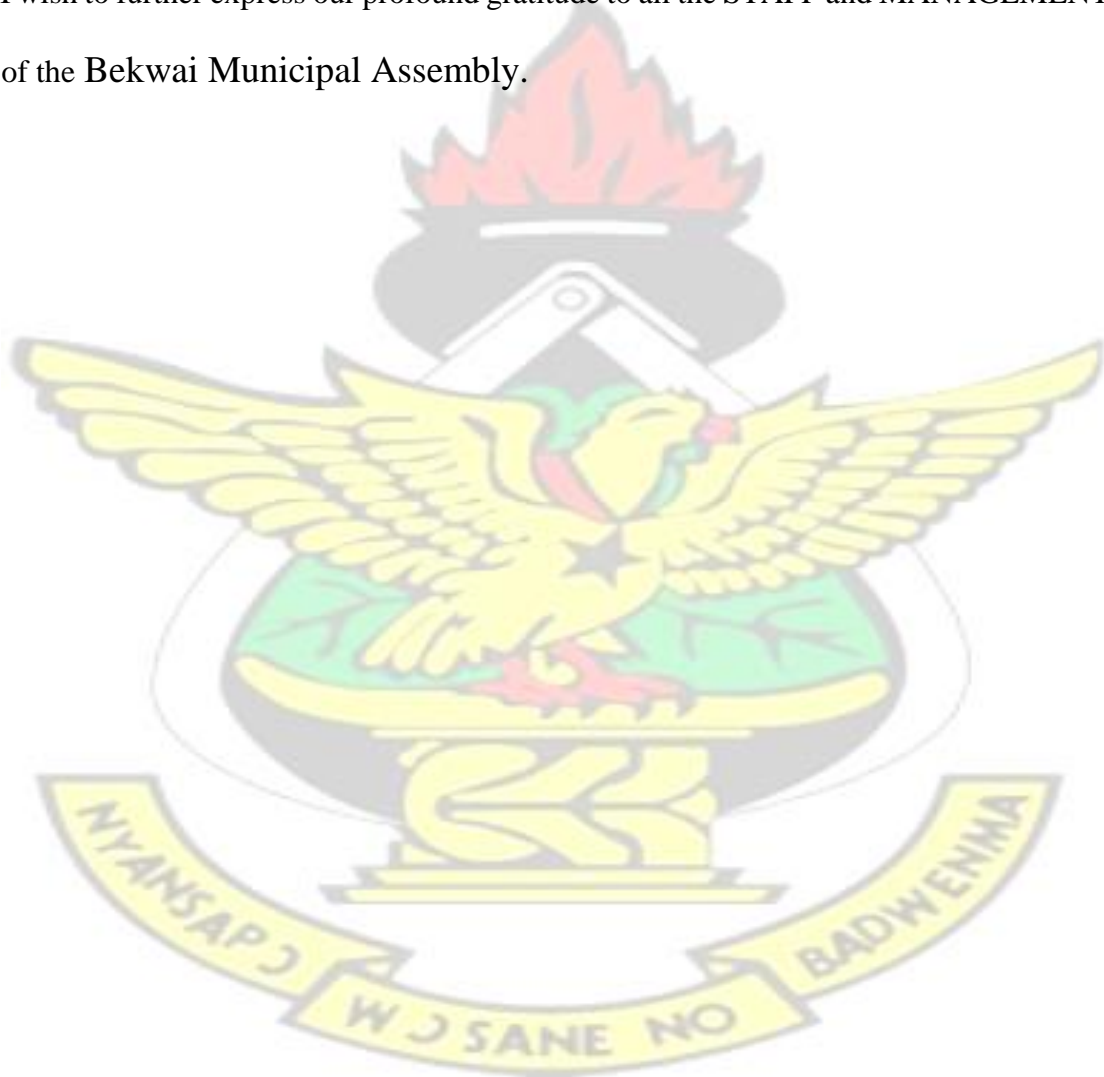
The research work seeks explore the key causal element which end up in schedule overruns of projects in construction between Government of Ghana (GoG) and Donor funded projects in Ghana. The major stakeholders who participated in survey include; the client, consultants, and contractors. From the literature forty three (43) potential causes were identified to have been the possible causes during the implementation of projects in the Bekwai Municipality. The factors which cause the delays were then ranked and prioritized to ascertain which the major causes were. The questionnaire were also administered to the target population to bring to fore the predominant causes of delays. The case study included respondents (43); 22 were contractors, 15 of them from the client end and 6 consultants. The study also took into cognizance relative importance of the various causes, the impact the delay factors and it also looked at some innovative ways of dealing with those delays. The relative importance index were calculated and ranked to ascertain which the most dominant factor(s) were. The overall results of the study pointed out fifteen (15) most severe and important schedule overrun factors. Which were grouped under three (3) broad category; *National Economic Factors, Managerial Factors and finally Enterprise Environmental Factors*. Generally, most respondents settled on National Economic Factors were ranked highest in contributing to schedule overruns of construction projects in Ghana. Some of the underlining National Economic Factors were the issues of inflation, financial difficulties of client, delay in payment of certificates of works and fluctuation in prices. Managerial factors and Enterprise Environment Factors were second and third respectively.

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I wish to further express our profound gratitude to all the STAFF and MANAGEMENT of the Bekwai Municipal Assembly.



DEDICATION

I dedicate to ALMIGHTY ALLAH for guiding me through this work successfully. I also dedicate it to my family most especially my wife and children and everybody who helped me in diverse ways to achieving this important milestone.

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LIST OF ABBREVIATIONS AND ACRONYMS



BMA	Bekwai Municipal Assembly
CPM	Critical Path Method
DACF	District Assembly's Common Fund
DDF	District Development Fund
DFP	Donor Fund Project
EOT	Extension of Time
GoG	Government of Ghana
LGCSP	Local Government Capacity Support Project
L.I	Legislative Instrument
MLGRD	Ministry of Local Government and Rural Development
MMA	Metropolitan and Municipal Assembly
MMDA	Metropolitan, Municipal and District Assembly
MPCU	Municipal Planning and Coordinating Unit
MS	Microsoft
MTDP	Medium Development Plan
NDPC	National Development Planning Commission
PMI	Project Management Institute
PERT	Program Evaluation and Review Technique
RCC	Regional Co-coordinating Council
SPI	Schedule Performance Index
SV	Schedule Variance
UDG	Urban Development Grant

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The construction industry over the years has played its economic part by providing both shelter and employment to the homeless and jobless respectively. Many through the construction industry have built the nation and sustained its progress. This is because among the pillars of the economy, construction industry is deemed a giant sector of the Ghanaian economy reasons being that, it contributes an average of 8.5% of the Gross Domestic Product from the standpoint of the Ghana Statistical Service (2007). From the perspective of Amankwa (2003), however, the sector employed about 2.3 % of the economically active population in 2002. It stands therefore to be appreciated that the construction industry cannot be underrated because of its multidisciplinary nature which has been in existent and evolved throughout the centuries passed by to date. Simply because, it is through the construction industry that physical infrastructure developments all across the nation is attained.

On the hand, as Ghana aspires to attain a middle-income status by 2015, coupled with the recent discovery of oil in commercial quantities, puts the role of the construction industry in another gear to encourage more construction projects. It is against this backdrop that estimating the contribution of key delay causal factors to project schedule overruns and recommending measures to eradicate or minimize them assume tremendous importance.

Considering the construction industry, it is in order to put forward that development projects in all sectors of the economy of every country cannot thrive without this noble industry. The foregoing makes evident that the industry plays a major role. It can

therefore be said that, the industry is very dynamic and this dynamism is what drives the national economy. The industry depends heavily on human resources, plant and material resources and supply chain of other commodities are transacted within the national economy hence the industry's linkage to the national economy.

The Local Government Act 1993, Act 462 gave birth to the creation of Metropolitan, Municipal and District Assemblies (MMDAs). This is to decentralize programmes and projects to the door step of the people. This means that most of the projects which are within the thresholds of MMDAs shall be executed at this level. The government has various sources of funding projects at the decentralized levels. Currently, the funding sources which the MMDAs implement are both Government of Ghana (GoG) and Donor Funding Projects (DFP). The DFP comprise of the District Development Fund (DDF) and the Urban Development Grant (UDG) for Metropolitan and Municipal Assemblies (MMDAs).

The increasing complexity of physical development or capital projects and the enterprise environmental factors within which they are constructed place greater demand on project team to deliver projects on schedule, within the planned budget and with high quality (Enshassi et al, 2003). This is because, the initiation of every construction work through to the closure of construction projects requires proper scheduling, monitoring and controlling of budgeted estimates and also employing the Earned Value Analysis for the successful execution of construction projects. Staying within the scope of work and executing construction projects in accordance with project management processes keeps projects within the Plan Value and schedule. In developing countries, the method of procuring works especially in the public sector is through the selection of contractors with the lowest tender price and most of these

construction works find their way through the hands inexperienced contractors who do not use scientific means of executing projects thereby causing cost and schedule overruns.

1.1.1 Construction Delay Defined

According to Aibinu and Jagboro (2002), delay can be defined as the condition where the immediate parties to the contract through their acts contributes to the failure to complete the project in the specified time or date decided in the contract. In addition, Stumpf (2000) indicated that delay include the situation where an act prolongs the schedule stated for the project to be completed.

It represents an extension of the schedule beyond then stipulated time. This can be caused by the immediate parties to the contract as well as by enterprise environmental factors. Construction delay is experienced by contractors most often on projects. It is one of the most common, costly, complex and risky difficulties that confronts contractors in projects they undertake (Alaghbariet al., 2005). The foregoing suggests that, delays in construction occurs all over the world and constitutes a debacle that militate the project success.

1.2 Statement of the Problem

Everyone both contractors and clients would ostensibly appreciate the schedule completion of project works when initiated. This has necessitated the constitution of various terms and conditions to mitigate delays of all forms. Schedule lines in construction works have then become necessary to help check delays and monitor progress and budgets. This is because delays in project work apparently run contractors and clients into various inconsequential challenges ranging from financial to legal issues.

Delays are inherent and thus often resulting in schedule overrun, cost overrun, disputes, litigation, and utmost rejection of the projects involved (Sambasivan and Soon, 2007). Projects of such nature according to Clough (1986) causes clients to suffer hardship, expense, or loss of revenue when contract schedule lines of work are delayed beyond schedule. Again, cost consequences of delay for the contractor: standby costs of non-productive workers, supervisors, and equipment, expenses caused by disrupted construction and material delivery schedules and additional overhead costs (Clough, 1986) cannot be left unsaid.

This is so because construction delay is found to be a major setback plaguing the Ghanaian construction industry for which reason many projects are left uncompleted, dilapidated and wasted eventually all because of the delay syndrome. In the light of this, the economic and social impacts of project delays have become topical and hence have been labeled “endemic” because of its pervasive nature all over the country. The worrisome nature of this syndrome however, has culminated into serious researches for which reason Frimpong and Oluwoye (2003) investigated the significant factors that cause delay and cost overruns in the construction of underground projects in Ghana. This points to the fact that, delays in the construction industry has a dire effect on projects for which reason attention should be given.

In furtherance, Sambasivan and Yau (2007) stated that about 17.3% of government contract projects in Malaysia were considered sick. This suggests that, construction works are delayed by more than three months or abandoned completely. Besides that, Assaf and Al-Hejji (2006) in his studies into the causes of delay in large construction projects discovered that only 30% of construction projects were completed within the scheduled completion dates and the average schedule overrun was between 10% and

30%. The abovementioned challenges and consequences of project delays make clear that undertaking a study to determine the level of schedule overruns of construction projects between government and donor funded projects in MMAs in Ghana will not be out of order.

Moreover, in their study Assaf and Al-Hejji (2006) reported that to a large extent, consultants, clients, and contractors agreed that project financing, economic and natural conditions and material supply were the four major categories of causes of delay and cost overrun factors. This important research leaves a gap which the current study sought to fill, namely to find the causes of delay in construction projects in Ghana. This is simply because, most stakeholders of today, in construction are becoming increasingly concerned and worried about the duration of construction projects because of increasing interest rates, inflation, commercial pressures (Nkado, 1995), and of course, it's potential to result in disputes and claims leading to arbitration or litigation. It will therefore be necessary to evaluate the schedule effect of the major factors that cause construction project schedule overruns in Ghana.

1.3 Aim of the Study

The aim of this research is to explore incidence of schedule overruns of construction projects between government and donor funded projects in MMDAs in Ghana. A case study of Bekwai Municipal Assembly.

1.4 Research Objectives

The following constitutes the specific objectives of the study;

1. To identify the key delay factors that cause construction project schedule overruns in selected MMDAs in Ghana.

2. To determine the impact of delay factors on construction projects regarding both government and donor funded projects
3. Propose innovation ways of reducing the incidence of schedule overruns.

1.5 Research Questions

1. What are the delay factors that cause construction project schedule overruns in selected MMDAs in Ghana?
2. What are the impact of delay factors on the projects?
3. How can the effects of delays can be minimized?

1.6 Significance of the Research

It is the belief of the writer that, the results of this study will inform government policy makers, design and construction teams and estate developers and clients in general on the sensitivity of their decisions in relation to causes and remedies of schedule overruns in construction projects in Ghana.

The findings of the study will inform consultants, contractors and clients alike, the relevance of schedule completion of the project and the fact that it demands the active cooperation of sponsoring authority, the contractor(s) and several other departments.

This is because whether or not a project can be delivered on schedule requires mutual cooperation among the parties involved and for that matter adequate and parties concerned are properly coordinated.

On the other hand, outcome of the study will prompt government officials and departments concerned in the MMDAs to streamline hierarchical relations among and within the government organizations to follow project works to the latter. All because

projects in MMDAs of governance often end up uncompleted. Such failures, among other factors, can cause delays and cost overruns.

The finding of this study could be used as a directive input in developing regulatory standards regarding the delays in construction of projects.

The study outcome will serve as a reference for other researchers in related area.

Thus, it can minimize the literature gap in the area of study.

1.7 Research Methodology

This research was conducted using the quantitative approach and was carried out in four stages. The stages involved the conduction of literature review, the collection of data, data analysis and conclusion. The review of extant literature is an important stage in conducting the research project. The literature review proceeded after the statement of the problem and objectives of the research was identified by using sources such as academic research journals, dissertations, textbooks, articles and the internet. The researcher also examined the progress report of construction projects in the Municipality from 2007 to 2015.

The second stage was to collect raw data to be analyzed in this research in order to achieve the set of objectives identified. A questionnaire survey was used for data collection. The targeted respondents for this questionnaire survey are consultants, contractors and clients because this research aims to estimate the contribution of key delay causal factors to construction projects schedule overruns in Ghana.

1.8 Delimitation

This mainly sought to identify the level of schedule overruns of construction projects between government and donor funded projects in MMAs in Ghana.

The study is limited to the MMDAs in Ghana. The study is undertaken and restricted to the specific the objectives discussed above.

However, the broad nature of the study necessitates that the scope be limited to only the Bekwai Municipal Assembly such that exhaustive study and analysis can be made.

The study is however limited to a schedule frame for which this must be fully completed and presented.

1.9 Organization of the Study

This study was organised into five main chapters. The first chapter included a background to the study, problem statement, aim of the study, research objectives of study, research questions, and significance of the study, research methodology, delimitations and organisation of the study.

Chapter two discussed the relevant literature from the perspectives of scholars in this area of study. Chapter three constituted the methodology employed in the study. It also included the research design, population, sample and sampling method, data collection techniques, data analysis. The fourth chapter of this work also include analysis, presentations and interpretations of collected data. The final chapter (chapter five) discusses the findings, conclusions and recommendations made.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

One of the most important problems in the construction industry is schedule overrun.

Schedule overruns is predominant in construction projects and their intensity varies between projects. It is therefore important to ensure that the major causes of schedule overrun are defined in an attempt to mitigate and avoid the recurrence of these delays in projects. This chapter reviews literature concerning the major issues of schedule overruns. Several studies identified the causes of delays in construction projects and these will be reviewed.

2.2 Definition of Schedule overruns

2.2.1 Project Schedule

Project schedules is defined as the planned duration for executing schedule activities and the planned duration for meeting schedule milestone or deliverables (PMI, 2008).

To meet the project schedule deadlines which may include significant deliverables and milestones. It is important to employ innovative ways of scheduling a project.

The applications of tools and techniques such as the use of Three-Bottom-Estimate which originated from the Program Evaluation and Review Technique (PERT), Schedule Performance Measurements (SV, SPI), Project Management Software (MS Project, Primavera, etc.) bring innovations to schedule management so that schedule overruns could be minimized.

2.2.2 Schedule overruns

Schedule overruns is defined as the extension of schedule beyond planned completion dates traceable to the stakeholders on the project (Kaming et al, 1997). Delays are situations that have negative impact on the progress of the project. The causes of delays may include natural occurrence due to weather, scarcity of material resources, delays

cause by the architectural designs, and other related issues. Generally, projects which delay have both enterprise environmental factors and internal causes and effects (Vidalis et al, 2002).

Choudhry (2004) and Chan (2001), schedule overruns can be the variations that occur between the actual completion schedule and the estimated completion schedule.

Project delays are those that cause the project completion duration to overrun (Al-Gahtani and Mohan 2007). It can therefore be inferred that schedule variance is defined as the time overrun to complete the work after planned duration which is caused by environmental factors.

2.3 Delay Types

The classification of delays have been cited by numerous researchers (Vidalis et al, 2002),

Ahmed et al (2003), Alaghabri et al (2007) and Al- Gahtani and Mohan (2007). The following are some types:

- Delays that are Justifiable
- Delays that are Concurrent delay
- Delays that are Compensable and
- Delays that are Critical

The delay types that have been enumerated above are in two folds name internal and enterprise environmental factors on the project management processes. Delay due to internal factors include challenges which may emanate from the stakeholders involved in the implementation of the project. Enterprise environmental factors of overruns emanated from outside of construction projects which the stakeholders have little to do with (Vidalis et al, 2002).

2.3.1 Delays that are Justifiable

Some delays are unforeseen and these justifiable which are absolutely beyond the control of the actors on the project. Mostly, some of delays comes with compensation and some are not. Per some provisions or clauses in the condition of contract, contractors can enjoy compensation which are financial.

Some delay can be brought about as a result of an act of God which the parties can never be held liable. Most conditions in some contracts allow the contractor to enjoy extension of time (Alaghbari et al, 2007).

Usually, due to equity clauses which are present in the conditions of contract which are measures put in place to deal with project delays may include and not limited to: Changes, differing site conditions and suspension. This is because equity cannot to be without a remedy nor should the law. The clause that support client based changes may be as follows:

2.3.1.1 Changes

Notice are important aspect of managing a project be it written or verbal, parties may allow the client alter the project scope which may include the under listed:

1. Changes in the engineering drawings and specification.
2. Amending the project duration or deliverables
3. In method statement.
4. Monitoring and evaluating the project performance.

In event that there is any act of omission or commission the contractor has to put into writing within ten (10) working days request for change in schedule by explaining the circumstances.

The client has the prerogative to either deny a written notice or approve notices or change request by writing (Ahmed et al, 2003).

2.3.1.2 Differing Site Conditions

The sub-section of the clause dealing with cost or schedule changes for different site conditions have provided. Schedule and cost requirement for performance with different site condition can eventually go upward or downward depending on the relativity of the site conditions. According to the General Condition of Contract, an adjustment must be made equitably in favour of the contractor.

However, for the contractor's claim be accepted, the client must be notified through the consultant if any. This provision is there to prevent the contractor from take undue advantage to make himself rich because of overall delay (Al-Gahtani and Mohan, 2007).

The site condition mentioned above must not be taken to be the site conditions in the contract document known as the Exculpatory clause. There should a dichotomy between differing site condition and the envisaged site condition. The motive behind is to prevent any claim whatsoever due to schedule overruns which the contractor should have anticipated. The concessions are limited to those provision in the clause that allow for differing site condition (Ahmed et al, 2003).

2.3.2 Delays that are Concurrent

Many research works have been carried out to ascertain the causal factors which result in project delays. It came it is not only one factor that causes construction delays. Associated with every delay has its corresponding schedule and cost overruns. It is therefore necessary to compute the time and money due to the overrun. However, the

issue concurrent delays goes beyond only one factor. There are therefore several factors which culminate to bringing overruns in a construction project. These may termed as concurrent delays or schedule overruns (Alaghbari et al, 2007).

Generally, concurrent delays is a shared responsibility between the contractor and the client. The issue is whether or not the contractor or client can be liable to pay remedies. Mostly, it is difficult to determine where to shift the liability. Neither the contractor nor client could be held to pay damages when the issue is hard to ascertain.

Prior to the introduction schedule analysis, such as Critical Path Method (CPM), Microsoft Project and Prima Vera we did not have an efficient methodology to measure or estimate accurately the effect of the delays to both parties. The introduction of technological software present on the market now have made it possible to clearly differentiate the effects of concurrent client and contractor delays (Alwi et al, 2002).

2.3.3 Delays that are Compensable

Delays that are compensable are mostly cause by the client themselves or the project consultants. The predominant form of these type of delays could be inaccurate architectural designs and specification. Sometimes responding to request by the contractor or his agents becomes difficult. The client mostly introduce variations which changes the scope of project which disrupt the sequence of scheduled activities.

The contractor can enjoy extension of time and financial compensation this type of delays (Alaghbari et al, 2007).

Al-Gahtani and Mohan (2007) mentioned another type delay known as pacing delay:

Pacing delay is retrogressing progress of the project work, by one of the stakeholders to provision in the contract. The objective is to maintain steady progress of work with the revised project duration.

2.3.4 Delays that are Critical

Critical delays are those that have a huge impact on the progress of work, project duration, and compensation. However, non-critical overruns or delays do not affect the life span of projects in term date of completion of the project. They affect the subsequent activities that cannot be found on the critical path of the project. This can delay the project if those activities don't have any float in the schedule (AbdulRahman et al, 2006).

2.4 Responsibility arising from Delays

According to Ahmed el al (2003) the issues relating to responsibility for schedule overrun is that of determining who is liable for the delay and whether the contractor accepts the responsibility or otherwise. The responsibilities have been divided into the following

- ❖ Client responsibility – the contractor is eligible for the award of time extension to complete the project.
- ❖ Contractor is liable – the contractor will not be awarded extension and may have to pay for any costs encountered.
- ❖ None of the parties responsible – the contractor will be granted extension to complete the project but not liable for any costs encountered as result of the delay; and

- ❖ Both parties responsible – the contractor gets an extension to complete the project. However, there will be no financial benefit allowed the contractor or remedies paid.

2.5 Causes of schedule overruns

2.5.1 Causes of schedule overruns

Schedule overruns according to this study have been categorized into following:

- ❖ The ones beyond the stakeholders control;
- ❖ Those over which the client cannot control; ❖
Those that the contractor has control over.

The major factors that impacts schedule overruns are changes to the design, poor labour productivity, inadequate planning and resource shortages.

Ahmed et al (2003) also studied two types off cause for delay in construction projects:

- ❖ Enterprise environmental factors causes ❖ Causes that are internal element.

The internal delay causes comprise the causes enumerated above. Other forms of delay which could arise include enterprise environmental factors. Examples include, government, global turn down, culture or the weather.

Chan et al (1996), Ogunlana et al (1996), Kaming et al (1997), Alwi et al (1999), Ahmed et al (2003) and Alaghbari et al (2007) mentioned the following as possible factors causing delays in construction projects: A number of researchers have categorized the factors causing delays into four (4) groups, those are:

- ❖ Responsibility of Contractor
- ❖ Responsibility of the Consultants
- ❖ Client's responsibility

- ❖ Enterprise environmental factors

2.6 Responsibilities of Parties in Construction

2.6.1 Responsibility of Contractor

Some the delay factors that related to contractor's responsibility:-

Late material delivery to site; material shortage; mistake on the part of contractor which calls rework; poor workmanship; non-availability of labour force; use of obsolete construction methods; lack of proper coordination among the construction team; poor site management; and not building quality into work from the beginning.

2.6.2 Responsibility of the Consultants

Generally, most consultants lack project management expertise to effectively manage construction project to closing stage. The consultant is there to protect the interest of the client. Lack of person competence as well as project management competence lead to factors that affect the delivery of good work by the consultant. The following are some negative factors that contribute to non-performance of consultants: risk of inexperience consultants and staff; indecisive decision making; non-standardized documentation; and delay in the issuance of site instruction.

2.6.3 Client's responsibility

With every role that has to be performed there are surely responsibility that goes with it. The factors that related to client's responsibility are; lack of technical knowledge to understand the work been executed by the contractor; inability to make informed decisions on the project; lack of proper coordination with contractors; change project scope which eventually lead to variations and additional works and change in

specifications; and lack constant cash flow which bring financial constraint on the contractor.

2.6.4 Enterprise environmental factors:

The following factors are related to the environmental factors; scarcity of building materials on the commodity market; inadequate plant and equipment from supplies; harsh weather conditions; macro-economic indicators; changes in laws and regulations; transportation delays; and enterprise environmental factors work due to public agencies (Alghbari et al, 2007).

Chan et al (2002), Alwi et al (2002), Assaf (2006), Odeh and Battaineh (2002) and Alghbari et al (2007) Categorized factors that cause schedule overrun into eight (8) groups (client, contractor, consultant, material, labour and equipment, contract, contractual relationships and enterprise environmental factors factors).

Ogunlana et al (1996) have studied schedule overruns in a booming economy: analyzing Thailand with other economies. Projects have experienced delays due to essential materials, such as cement, were in short supply, technical personnel were overstrained, having to do so much so soon in their careers.

The increasing request by clients for changes to be effected frequently can create design and coordination problems for human resource in the industry. The project management abilities was poor and schedule completion dates could not be met. Contractors working in emerging economies work under serious schedule constraints as compared to developed countries.

According to Al- Khalil and Al-Ghafly's (1999) assessment of the frequency of project delay, the extent of the delay and the responsible party for the delay, projects experience

delay frequently. This phenomenon is predominant in medium and large sized projects. The study showed contractors were blamed for causing more delays during the execution of the project but the contractor also put the blame on the client.

Averagely, the contractor carries most of the responsibilities, but the consultant caused delays can be transferred to the client to become the principal owner. An argument can be made that the contractor is not responsible because most of the requests for extension are granted by the client. Aibinu and Jagboro (2002), in studied that the growing issues of delay in construction in Nigeria, surveyed the effects of delays on projects deliverables in the country. A questionnaire survey of 61 construction works, the writers came up with, and assessed the risk and the impact of delays on the delivering the projects. Schedule and cost overruns were found to be predominant in the delays.

Odeh and Battaineh (2002) in Jordan traditional contracts a study was conducted by using questionnaire procedure in this study; a random sampling technique was used; 100 contractors and 50 consultants.

It was shown by the study that contractors and labour productivity were the predominant causes of delays. Contractor inexperience was however found to be the most significant cause of delay. Other factors agreed in that study includes client interference and financing as the most important causes.

Additionally, the delays which are caused by subcontractors, delayed decision making by clients, improper planning, and labour productivity were rated high among the top ten factors for both parties. Other factors such as labor productivity, construction methods, site management, and equipment availability and failure were also relevant to contractors than consultants.

Alghbari et al (2007) found in his study that the financial factor and coordination problems were predominant in the Malaysian construction industry as the causes of delay.

2.7 The Mitigation of Delay in the construction industry

It is crucial that an analysis is carried out to identify the effect of delay on schedule and cost and then taking the appropriate measures to mitigate the delays and the associated cost involved. It is essential to enhance the predetermined duration for an activity in consonance with the human resource levels, unexpected events, efficiency of work schedule, and mistakes and misunderstandings.

The reduction efforts are significant to reduce the losses and the achievement of such can be through various measures including, protection of uncompleted work, schedule and reasonable re-procurement, and schedule changing or cancellation of purchase orders. Identification of the problems early enough is important to find the appropriate measures to mitigate their impacts (Abdul-Rahman et al, 2006).

2.7.1 Schedule variance for building projects

Schedule variance (SV) is the difference between the planned completion and the date on which the project was actually completed.

The study showed that projects funded by governments delay in terms of schedule. The Bekwai Municipal Hospital which started in 2011 and was supposed to be completed in two (2) has been abandoned.

The effects of delays of public projects affects all project parties, amidst issues of additional costs. Even though several methods for reducing the situation have been

proposed in several studies, the shortfall of these methods gives an indication of concerns that the major causes of delays have not been addressed fully.

2.7.1.1 Policy-related Causes

Basically projects of public interest are mostly funded by the central government. Such projects are only implemented if they fall within the policy of the government. It is also important that the policy of the government incorporates the interest of the public.

These interests are complex and therefore satisfying these interest usually involves changes to the policy. An example includes extended office building projects mainly due to the change of governmental financing policies.

Governments in their quest to satisfy the needs of its people in relation to infrastructure have to either resort to postponing the project or reducing the financial commitment. This has resulted in delaying several projects. Sometimes, new policies emerge mid-way through initiated projects.

To ensure that policies are implemented, there is the need to have an adequate investment for the project. The bureaucracy involved in identifying who should take responsibility in implementing policies is a catalyst for project delay (Moungrou et al, 2003).

2.7.1.2 Client-related Causes

A feature that characterizes public sector projects include frequent changes which therefore introduce delays into the project. Mostly public clients do not enhance the progress of projects as compared to private clients who are mostly proactive.

The bureaucratic nature of the dealings of public clients induces delay into the project since they are accountable to the people and therefore transparency is vital. Public sector clients work with several departments from raising of funding to approval. This inevitable nature of the dealing of public clients introduces delays into the progress (Wang, 2010).

2. 7.1.3 Design-related causes

Insufficient or inaccurate design can also contribute to delays. Design errors are caused by several factors. This includes poor briefing from the client, unrealistic time schedule, poor design skill by architect, and the likelihood of the client to make changes during construction (Vidalis et al, 2002).

2.7.1.4 Contractor-related Causes

Contractors' contribution to project delay can be attributed to several factors. Examples include infighting between main contractor and subcontractors. Disputes between contractors and other members of the execution team can contribute massively to project delays. Other important factors include, the lack of sufficient finance, and project management shortfalls. In other desperate situations, contractors are in haste to secure projects without reasonably assessing the schedules to ensure that they are realistic. In such instances, project delay is inevitable.

2.7.1.5 Consultant-related Causes

The consultant on the project has an impact on the project. They play a key role in ensuring that the project is completed on time. They issue certificates and endorse satisfaction of the activities during construction. Delays are bound to happen if these roles are not played within time (Wang et al, 2003).

From literature, Fugar and Agyakwah-Baah (2010), ranked the causes of delays as follows;

- ❖ Delay in honoring certificates
- ❖ Underestimation of the costs of projects
- ❖ Underestimation of the complexity of projects
- ❖ Difficulty in accessing bank credit
- ❖ Poor supervision
- ❖ Underestimation of schedule for completion of projects by contractors
- ❖ Shortage of materials
- ❖ Poor professional management
- ❖ Fluctuation of prices/rising cost of materials
- ❖ Poor site management

These factors can then be divided into eight different categories based these causes. This include financing, human resource, changes, contractual relationship, scheduling and controlling, equipment, materials and environment.

Ahmed, Azhar and Kappagantula (2003) intimated that delays can be seen as a universal phenomenon on projects. Delays happens and are usually accompanied by associated cost and schedule overruns. Delays can often lead to an adversarial relationship between the parties to the project. They also leads to disputes, arbitration, cash-flow problems, and a feeling of apprehension towards each other.

Stakeholders should therefore identify the perceptions of the parties with respect to the causes of delays, the allocation of responsibilities, and the kinds of delays. This could help to tremendously reduce the occurrence of delays in construction projects.

Several disputes and misunderstandings encountered in projects can be linked to delays. It is the frequent source of litigation and disputes between parties to the project.

Several studies have been conducted to ascertain the causes of delays in construction projects. Ogunlana and Promkuntong (1998) studied the causes of delays in Thailand and came to the conclusion that the industry's problems in developing economies could be attributed to three layers:

- ❖ Shortages of infrastructure in the industry;
- ❖ Clients and consultants caused problems; and
- ❖ Problems caused by the incompetence of contractors.

Chan and Kumaraswamy (1998) and Mansfield, Ogwu and Doran (1994) studied the causes of delays in Hong Kong and Nigeria respectively. Both studies showed that, the most important causes include financing and payment for completed works, poor contract management, changes in site conditions, shortage of materials, and improper planning.

Mezher and Tawai (1998) also studied delays in Lebanon mainly soliciting for the opinion of clients, contractors, and consultants. It emerged from that study that, clients had financial concerns; contractors also regarded the contractual agreement as the most important issue and consultants were of the opinion that project management issues contributes mainly to delays in projects.

Battaineh (1999) studied the reports of several projects undertaken between 1996 and 1999 in Jordan. It showed that delays are extensive, and the schedule performance index

of actual completion schedule to the planned contract duration is 160.50% for roads projects and 120.30% for building projects.

According to Eggleston (1997), controlling cost in cost-reimbursement contracts can prove to be complex and time consuming. The documentation involved can be enormous. Against this background, interim payments are made based on costs incurred and costs estimated. Delay in payment affects the cash flow of contractors and in return the overall cost of construction.

2.8 Factors Contributing to Delay

There are four (4) factors of delay broadly categorized, namely contractor- related factors, consultant-related factors, client-related factors and external factors. Seven (7) most significant variables stemming from the contractor have been identified. These are contractor's financial difficulties, material shortages, labour shortages, poor site management, equipment and tool shortage, coordination problems as well as construction mistakes and defective works. These significant variables are discussed below.

2.8.1 Contractors' Financial Difficulties

Zagorsky (2007), indicated that financial difficulty is said to be the situation where the credit of an individual is affected. This include the inability to pay bills.

The financial difficulties of a contractor can be said to the inability of the contractor to possess the funds needed to execute the project. Situations where a contractor will require funding include payment for materials, the salary of labourers and the equipment used for the works. According to Thornton (2007), slow collection, low

profit margin and insufficient capital constitutes three major causes of financial difficulties faced by contractors.

Slow collections dominated between 2005 and 2007 in which payment was received from the client by the contractor.

Such an assertion is corroborated by Arshi and Sameh (2005), Majid and McCaffer (1998), Arditi et al. (1985), Al-Khalil and Al-Ghafly (1999), Frimpong et al. (2003), Assaf and Al-Hejji (2006), Sambasivan and Yau (2007) and Mansfield et al. (1994).

They found that client's delay to pay contractors for work done would lead to the contractor facing financial difficulties. It follows that the subsequent works cannot be executed amidst the financial difficulties. The inadequacy of profit also contributes to the financial difficulties faced by contractors.

Coulter and Kelley (1992) also agreed with this claim and further indicated that the inadequacy of profit is uncontrollable because it is warranted by economic conditions. Coulter and Kelley (1992) and Thornton (2007) both suggested that inadequate capital constitutes a major cause of financial difficulties faced by contractors.

The poor control of cost by the contractor can also contribute to inadequate capital (Liu, 2010). Therefore, there will be massive debt on the contractor which will cause them to experience financial difficulties.

2.8.2 Material Shortage

Majid and McCaffer (1998), stated that the shortage of materials stems from poor material planning, inefficient communication, unreliable suppliers and late delivery.

According to Mochal (2003) intimated that an important mistake in project management is poor planning.

Poor communication is another factor that contributes to material shortage. Dunkelberger (2009), stated that communication is an integral factor for the success or failure of projects and every business entity. Communication is therefore a very important ingredient and the inability to communicate effectively affects a project. A misunderstanding of what is being communicated between contractors and suppliers can lead to delay in the delivery of materials.

Another factor contributing to delay in delivery of material are as a result of “unreliable suppliers”. According to Dada et al. (2003, 2007), an unreliable supplier is a supplier who supplies materials short of the quantity ordered. When the materials ordered is not supplied to quantity, there is a clear case of material shortage.

2.8.3 Labour Shortage

Bruce and Dulipovici (2001) explained labour shortage as the struggle involved in locating the right people with the requisite ability to execute the work available. Labour shortage is caused by several factors. Trendle (2008), stated that the lack of skills in labour is an antidote of labour shortage and hence increase the demand for labour. It is initiated when the goods and services are in high demand. In the circles of construction the increase in the purchasing power of clients increases the rate at which buildings are constructed to meet the demand. In that sense the demand for labour increases.

Another contributor to labour shortage is the cost of foreign labour. According to Hanim, (2010), the rate at which foreign labour required can also lead to shortage of labour.

Wang (2010) and Anonymous (2010), indicated that the economic crisis that is being experienced globally is another factor contributing to shortage in labour. They stated that people are comfortable living in low cost cities than high cost cities because of the cost involved in residing in high cost cities. Sweis et al. (2008) also stated manpower shortage is a nothe contributor of labour shortage. This was also corroborated by Sambasivan and Yau (2007) who also found in their study that labour shortage is a dominating factor for project delays in the Malaysian construction industry.

2.8.4 Poor Site Management

The management of site by project managers is crucial to the success or otherwise of the project. Poor coordination of activities is amajor contributor to delay of projects. Ineffective site management may occur in cases where the contrators do not have the sufficient experience and suufers from the required knowledge to manage the project team (Kadir et al, 2005).

The leader to every project is the project manager. There is therefore the high expectation that he manages the works onsite which includes monitoring progress and the management of the administrative work in the project. It is important that the manager manages the work and workforce very well. The failure to manage site effectively can lead to delay of the project. This assertion is supported by Toor and Ogunlana (2008), Yang and Ou (2008), Sweis et al. (2008), Aibinu and Odenyika (2006), Augustine and Mangvwat (2001), Arshi and Sameh (2006), Arditi et al. (1985), Faridi and El- Sayegh (2006), and Ahmed et al. (2003)

2.8.5 Equipment and Tool Shortage

According to Chang et al (1991), the contribution of tools and equipment involved in construction are either acquired through leasing or direct investment mainly by the

contractor. Some also acquire these equipment using a hybrid of the above methods. It is therefore important that the usage of the above be planned so that they are used to capacity. This has to be done according the methods and the programme of the project. This is because, leased equipment would have to be returned after the lease period.

Again Joyce (2006) added that, there is a rise in the number of high rise buildings that are being constructed in recent times. This is due to the entrance of cranes in the construction industry. This has however contributed to shortage mainly because there not enough crane suppliers to meet the demand for them.

It is therefore not like for contractors to increase the lease period when they are due. This is a perfect indication that the lack of effective planning of the usage of plant and equipment will cause shortages.

In the Russian construction industry, theft is a major contributor to shortage of equipment (Wendle, 2008). Shree (2007) the renting cost for plants and equipment have increased by 30% to 40% within some few years. The escalating cost have affected contractors massively because of the financial difficulty they experience.

This has therefore led to the shortage of tools and equipment.

2.8.6 Construction Mistakes and Defective Works

Failure to work to specification is a major cause of mistakes and defective works (Gerskup, 2010). The quality of projects constructed in the Zambian construction industry are questionable due to poor workmanship by contractors (Zanis, 2010). Additionally, Kedikilwe (2009), in another breath indicated that poor workmanship contributes hugely to defective structures.

Using low standard materials is one indicator of poor workmanship. Several structures collapse in countries that experience light earth quakes because of the poor quality materials they are made of (Binici, 2007). It was also found that the reinforcement bars used in such structures had corroded and hence a reduction in their strength (Binici, 2007).

Where a work is found to be defective, it has to be rectified but the rectification always leads to an extension of the project duration. Lack of precision in measurement from plans and specifications can also lead to mistakes in construction (Thomas, 1991).

2.8.7 Coordination Problems

There are several parties engaged in construction projects. It ranges from owners through contractors to suppliers. The coordination of these parties can be problematic. The difficulty in managing these parties can lead to delay (Assaf et al, 1995). In addition, Majid and McCaffer (1998) agreed that problems such as this is an antidote to delay.

Ali et al (2008) and Kadir et al (2005) also stated that the inability to coordinate these parties can lead to delays. An example is where revised drawings are not released early enough for the contractor. This can lead to mistakes which will have to be rectified subsequently. This can lead to rework and hence an extension of the construction period.

Thus, an important ingredient to project early completion is the coordination of the parties involved.

2.9 Effects of Delay

There are several studies backing the effects of delay. Aibinu and Jagboro (2002), Sambasivan and Yau (2007); and Sun and Meng (2009), revealed numerous effects of delay. Six of these effects are discussed below:

2.9.1 Extension of Time (EOT)

The time allowed as a result of a request made is known as EOT (US Legal, 2010). A major contributor to extension of time is delays caused by the client (Odeh and Battaineh, 2002)

Therefore contractors are likely to request for extension of time if the delay is outside the confines of their control and especially when the delay is caused by the client (Othman et al., 2006; Williams, 2003).

2.9.2 Late Payment

Delay in payment is not contributing to delays. This problem is rife during economic crises (Nichol,2008). This assertion is supported by Still (2000), also found late payment to be predominant in the developed countries. Late payment came up the as the second ranked factor in a study conducted by Odeh and Battaineh (2002).

This situation usually happens during the execution of the project and has an impact on the duration of the project.

2.9.3 Rescheduling

To reschedule means changing the original plan in order to accommodate disruptions and problems that are encountered (Vieira et al., 2003). During construction updates of the original plan can be carried out in order to account for changes that may have occurred (Liu and Shih, 2009).

The benefits that accrue from the updates of a schedule are mentioned by Liu and Shih (2009), as;

(1) Comparison of the original schedule with the actual progress, (2) identification of all activities, (3) is identify who caused the delay; and (4) forecast and change slightly the projected progress based on the actual progress. Depending on the update done, activities that are delayed can be detected. This imply that scheduling is one of the impacts of delays.

2.9.4 Lost Productivity and Efficiency

Productivity measures the efficiency of labour relative to time required to do the work (McDonald and Zack, 2004). It can as a result of expedition of the schedule and the quest to complete the work(Bramble and Callahan, 2000).

Rework is another component that affects the productivity of the work force or labourers.

2.10 Sources of fund for MMDAs

Under the Government's decentralisation and local government reform initiative, MMDAs have been given many responsibilities, comprising basic social amenities and other infrastructure. Additionally, the MMDAs have the responsibility of developing the areas of their jurisdiction. They therefore have critical roles to play in developing their areas and thus improving the conditions of living the people inorder to fullfill the requirement of the Millenium Development Goal (MLGRD, 2009).

It is against this background that funding at the local governance level is crucial. Decentralisation is synonymous with bring development and good governance to the door step of the people as indicated in The Local Government Act 1993, Act 462.

The sources of fund for MMDAs includes but not limited to:

1. DACF District Assembly's Common Fund (GoG)
2. DDF District Development Fund (Donor)
3. UDG Urban Development Grant (Donor)

2.10.1 District Assembly's Common Fund

The Common Fund as is commonly called is a constitutional obligation of the Government to provide funding to MMDAs to carry out the developmental agenda at the local level. This is to strengthen and deepen the decentralization concept as stipulated by the Local Government Act 1993, Act 462.

The fund by statutory provision is released every quarter in a year for development programmes and projects in the respective MMDAs.

However, in recent times the release of the fund have been with bedevil intermittent flow of cash to achieve the visions and missions of Assemblies.

2.10.2 District Development Fund

To close the financial gap in order to enhance the performance of the MMDAs, a system has been introduced that functions based on the performance of the assemblies known as the District Development Facility. In this systems, assemblies are awarded additional funding based on their performance under the Functional and Organizational Assessment Tool (FOAT). The government has dedicated parts its support towards the implementation of the performance based funding to the MMDAs. It does this with its development partners (MLRD, 2009).

2.10.3 The Urban Development Grant

The Urban Development Grant (UDG) is also given to the assemblies in the urban areas based on their performance on a yearly basis. This was initiated to take place over five years (5) starting 2012 to 2016. It is meant to be extended to 46 Municipal and Metropolitan assemblies. The allocation is given based on the terms that prevails under the District Development Facility in which grants are given annually which is purely performance-based. Under the UDG, the performance areas on which the assessments are carried on has relation to the public financial management and encompass: budgeting/auditing., revenue management, asset management and social accountability (MLGRD, 2012).

The following are the characteristics of UDG:

- a. The grant given within the stipulated period (5 years) is US\$140 million
- b. Only the forty Six MMAs at the time the fund is initiated are eligible (See Annex 1)
- c. The fund is given to complement the DDF and other funds
- d. To be eligible for the grant, the Minimum conditions of FOAT must be met and score at least the national average of DDF.
- e. The allocation of the grant will be determined by using a formula which will account for the MMA's on the performance indicator of the UDG.
- f. The distribution of the grant depends on the timely financial reporting the submission of budgets and procurement plans
- g. MMAs will receive that grant as annual fiscal transfers (treasury to treasury transfer).

- h. the grant will be given in two parts, in consonance with the regular local and national government budget cycle (i.e. in the beginning and middle of each financial year).

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CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

In this chapter the methodology adopted for the study will be discussed. It includes the research strategy, the design, population, sample size and the location of the study will be discussed. It will also include the method of data analysis adopted.

3.2 Profile of Bekwai Municipal Assembly (BMA)

The following sub headings give petty profile of BMA relevant to the study;

3.2.1 Demographic Characteristics

In the population census carried out in 2000, the population of the district was reported as 225,309. This was nevertheless affected with the split of the District into two and the creation of Amansie-Central District. The population as at 2006 stood at 150,206 (2000 Population and Housing Census) using the population growth rate of 3.1 %. A further split of the Amansie-East District into two in 2008 elevated the Bekwai constituency to a Municipal status called Bekwai Municipal Assembly and Bosome Freho constituency into a new District Assembly called Bosome-Freho District Assembly. Given a growth rate of 3.1%, the population projected for the 2010 census was 138,922.

The increase in population is partly caused by the natural increase and partly through migration into the Municipality to take advantage of the job opportunities in the agricultural and the service sectors of the economy. The increase in population have environmental, social and economic implications as the demand for infrastructure facilities such as schools, health centres, places of convenience would need to be provided to meet the population growth.

3.2.2 Age and Sex Composition

The Municipality's population can be grouped into three main age groups: 0-14 comprising children about 29.1% of the population, 15-64 constituting the active working population being about 46.7% and the 65+ constituting the aged being about 24.2% of the population. The distribution of the population is summarized in the table below;

Table 3.1 Age and Sex Structure

Age Group	Male	%	Female	%	Total	%
0-14	19,445	48.1	20,981	51.9	40,426	29.1%
15-64	31,919	49.2	32,958	50.8	64,877	46.7%
65+	15,196	45.2	18,423	54.8	33,619	24.2%
Total		49		59	138,922	100%

Source: Population and Housing Census (2000); Municipal Health Directorate Survey (2010)

3.2.3 Spatial Distribution of Population

The settlement pattern of the Municipality is similar to both the regional and the national settlement pattern of development with a higher concentration in the capitals and trickling client to the immediate surrounding settlements. Demand for land for both domestic and commercial purposes is on the increase. The site by the road side is glut of "petrol filling station", the number of satellite markets are also on the increase. These coupled with some other economic activities are on the increase along the major roads and clients within the Municipality.

Table 3.2 The Ten Largest Settlements in Bekwai Municipal Assembly

No	Client	Population 2010
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1	Bekwai	26,704
2	Poano	5,105
3	Dominase	4,194
4	Ofoase-Kokoben	4,140
5	Kokofu	3,941
6	Bogyawe	2,747
7	Boni(Behenease)	3,563
8	Koniyaw	3,277
9	Abodom	2,877
10	Essemeja	2,637

Source: Projected from the 2000 PHC to 2010 (3.1% Growth Rate)

3.2.4 Political authority in the Municipality

The Bekwai Municipality, formerly Amansie East District is among the thirty (30) part of the districts created by Legislative Instrument (L.I. 1906, 2007) known as Administrative District. It is a Municipality known for the values it holds from history. It stretches over an area of 633 sq km. Bekwai is the administrative capital of the Municipality and is about 25km from Kumasi the Regional capital of Ashanti.

3.2.5 Vision Statement

Bekwai Municipal Assembly's Vision is to become a Municipality well-versed in decentralization through effective Local government administrative system with the view of empowering its citizens in both public and private sectors, supported by vibrant civil society organization that would be capable of delivering efficient and sustainable services to the populace in the Municipality.

3.2.6 Mission Statement

Bekwai Municipal Assembly has been established to improve the condition of life of the people it governs are improved by formulating and implementing policies in a manner that is sustainable to improve the development of its people, reduce poverty and provide good governance by a well-motivated and highly skilled labour.

3.2.7 The BMA is responsible for:

1. Environmental and Waste Management
2. Income Collection
3. Fixing of Fees and Rates
4. The preparation of development budgets
5. The provision of basic socio-economic infrastructure etc. schools, health centers, markets, lorry parks etc.
6. Ensure that peace and security prevails and
7. To develop sports and culture.

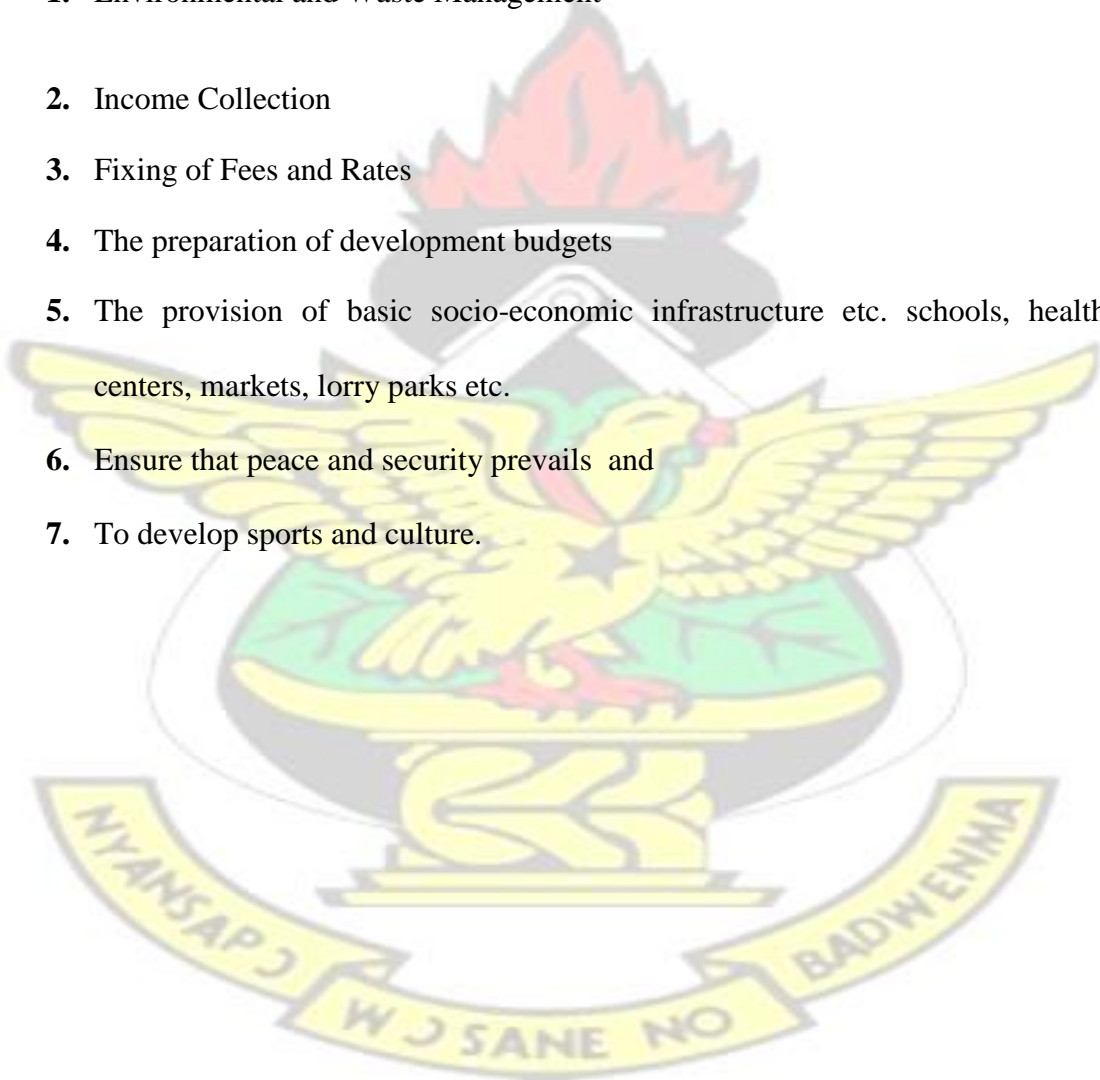




Figure 3.2: Main Administration Block of Municipal Assembly

3.3 Research strategy

Naoum (1998) has defined research strategy as the means by which the objectives of a study can be questioned. The research type adopted for this study was the quantitative method. This approach is used to gather factual data and to study the relationships that exists between facts and how those facts and relationships relate to findings of a previous study. The qualitative approach on the other hand seeks to gain understanding into the perception of people of "the world" whether as individuals or groups (Fellows and Liu, 1997).

For this study the quantitative approach have been used to comprehend the collective group perspectives of professionals regarding the contribution of key delay causal factors to construction projects schedule overruns in Ghana.

3.4 Research design

Research design refers to the planning and organization of a scientific investigation. It is the categorical preparation of plan that will guide the study to collect data (Pilot and Hungler, 1985). This study began by setting objectives and subsequent review of literature. Upon the literature review a questionnaire was developed to collect data from the target respondents. This data was then analysed and recommendations were made based on the findings of the study.

3.5 Population

For the purposes of this study, the target population included construction companies, consultants and public sector clients and companies with valid registration. The population was construction companies that are engaged in construction business such as building, roads, water and sewage, and public works.

The clients used for the study comprised of government agencies, ministries, municipalities, international agencies and public project clients.

The consultants included all consulting offices in good standing and have a valid registration certificate membership of consultants in Ghana.

3.6 Sample Size Determination

According to Wood and Habber (1998) the determination of a sample size is the selection of a proportion of a population to represent the entire population for a research study. The sample is selected on the basis that the entire population cannot be surveyed and that the selected sample can represent the population to ensure the findings from the study can be generalized. The samples were selected using the purposive sampling technique.

The data was collected in the Bekwai Municipal Assembly. The respondents in the study are as follows:

1. 22 contractors from the Bekwai Municipal Assembly,
2. 15 clients from the Bekwai Municipal Assembly,
3. 6 consultants from the Bekwai Municipal Assembly,

3.7 Data collection instrument

A questionnaire was used for data collection. It was used to obtain the opinion of clients, contractors, and consultants. Factors influencing schedule overruns in construction projects in Ghana were first examined and identified through a relevant literature review. The researcher also examined the progress report of construction projects in the Bekwai Municipality.

3.7.1 Questionnaire design

The literature review has revealed several factors that impact the schedule of a project in several construction industries around the world. These factors have been included in the questionnaire mainly soliciting for the opinion of the respondents. Assistance was sought from the supervisor in respect of the questionnaire.

The final questionnaire contains the factors that were established from the literature review. It was therefore requested of the respondents to express their opinion on the questions asked with the promise that their responses was going to be kept confidential.

3.8 Data Analysis

Once the data is collected, proper organization, summary and analysis would be done. The explanation of the data gathered was done. The response from the participants were coded in the SPSS analysis software. The data was displayed in tables and figures. The researchers will use tables to summarize numbers and figures indicated in rows and columns. Tables will facilitate the systematic presentation of the collected data.

3.9 Pre – Testing of research instruments

The research instrument used were tested in a study using a limited sample size of (n=20) of respondents to ascertain the consistency and reliability for using the instrument.

The final questionnaire that was distributed therefore contained the relevant information that sufficed for the objectives set for the study.

The researcher ensured that the responses of respondents originated from their own opinions and therefore free from any form of coercion or influence from others.

The questionnaire was pre-tested to ascertain whether or not the questions would work well and what questions should be added or discarded.

Through the pre-testing, some questions were restructured and all ambiguous words were addressed.

The questionnaire pre-tested comprise 7 Officers from the client side, 10 Contractors who have registered with the Assembly and 3 Consultants.

3.10 Ethical Considerations.

Ethical Considerations are very important in the research of this nature. As a result the consent of the participant was sought first as to whether they were interested to participate in the research. It was not imposed on them. The purpose and methodology of the research was explained in detailed to the respondents before the research was carried out. The researcher did not in any way forcefully influence the decision of the respondents by cohesion or other means to deliver the information against their wishes. Moreover, data and information collected from the participants were treated as private as confidential documents. The information given by respondents was used for the purpose of the research only.

3.11 Questionnaire content

The questionnaire was divided into three parts mainly on the objectives of the study. These parts were, respondents profile, factors contributing to schedule overruns, the impact of delay factors on construction projects regarding both government and donor funded projects and to propose some innovative ways of dealing with schedule overruns.

3.12 Process of data and analysis

In order to evaluate and analyze the contribution of key delay causal factors to construction projects schedule overruns in Ghana, a range of personnel involved in construction projects the Bekwai municipal - Ghana were targeted. Personnel were randomly selected from Ghanaian project consultants, contractors, and clients' organizations.

A questionnaire of 43 factors on schedule overruns was carefully designed. It was organized in the form of a priority scaling (1=very low, 2=low, 3=medium, 4=high, and 5=very high). In addition, the respondents could add other causes that they experience in their projects. These very few added causes, however, were not significant additions.

The questionnaire was directed towards three groups in a public organization (Bekwai Municipal Assembly), clients of the construction projects, consultants, and contractors working in the construction industry. The questionnaires were purposively distributed to the targeted respondents; 15 clients, 22 contractors and 6 consultants. The sample selected for each of the three groups is described below as:

1. Clients comprising the government agency (key decision-makers) responsible for the projects, private organizations (industries), and individual clients.
2. Consultants working in the construction industry.
3. Contractors who are involved in the housing construction project.

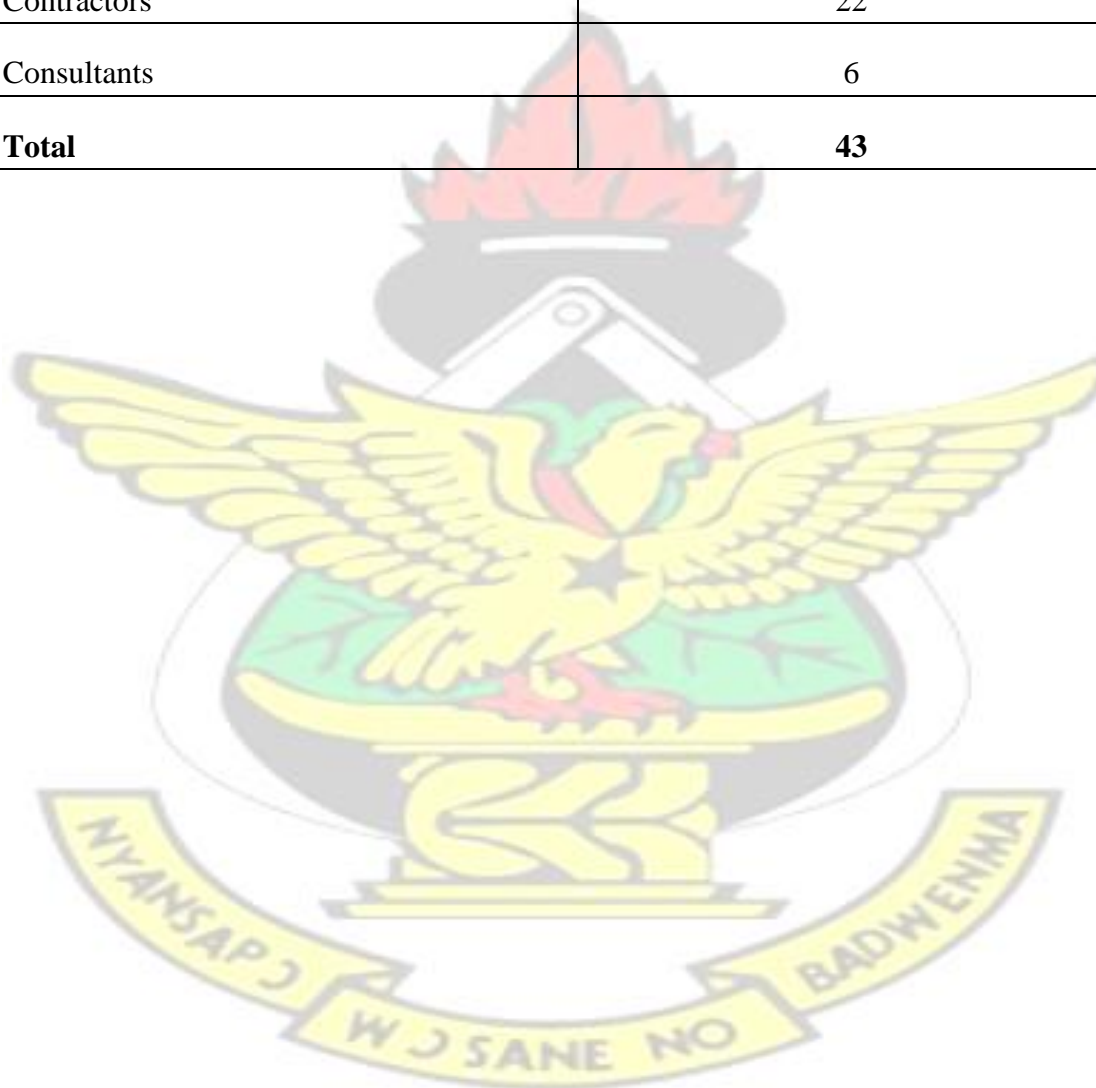
Respondents were from public and private agencies that sponsor housing construction projects, and the contracting and consulting organizations that work for them.

3.13 Presentation of data

A total of 50 questionnaires were distributed to three (3) groups of targeted respondents that is clients, consultants and contractors (see Table 3.1 below).

Table 3.1 Percent of questionnaire distributed

Description	Questionnaire distributed
Clients	15
Contractors	22
Consultants	6
Total	43



CHAPTER FOUR

SURVEY RESULTS AND DATA ANALYSIS

4.1 Introduction

The procedure used in analyzing the results was aimed at establishing the severity and importance of the various factors responsible for delay and schedule overruns in Construction projects in Ghana.

The analysis is presented in four sections; the first section discussed the sociodemographic data and general organisation information. The subsequent sub-sections addressed research objectives; key delay factors that cause construction project schedule overruns in selected MMDA in Ghana, the impact of delay factors on construction projects regarding both government and donor funded projects and proposed innovative ways of reducing the incidence of schedule overruns. The statistical tools used for the analysis were descriptives (mean score and standard deviations), simple frequency with percentages and severity index (S.I). The results were presented in tables and figure (charts).

A total of 50 questionnaires were distributed to three (3) groups of targeted respondents that is clients, consultants and contractors. Out of this, 43 questionnaires were returned completed forming 86 percent response rate of which: 15 were from client representing 100 percent of clients' response rate; 6 from consultants representing 60 percent; and 22 from contractors representing 88 percent of the contractors' response rate.

Table 4.1 Percent of questionnaire distributed and their response.

Description	Questionnaire distributed	Number of respondents	Percentage of responses
-------------	---------------------------	-----------------------	-------------------------

Client	15	15	100.00
Contractors	25	22	88.00
Consultants	10	6	60.00
Total	50	43	86.00

Source: Field Study, 2015

4.2 Analysis

The questionnaire was analyzed from contractors, client and consultants' perspective in order to identify the most severe and important factors that influence delay and schedule overruns in Construction projects in Ghana.

On the basis of ranking of the factors by the various groups, it was possible to identify the most severe and important factors that caused delay and schedule overruns in Construction projects in Ghana.

A summary of all the factors of delay and schedule overruns in Construction projects in Ghana with respect to its severity and importance, ranking by the groups, and overall ranking as identified by all groups is presented in the Table 4.2 to table 4.4.

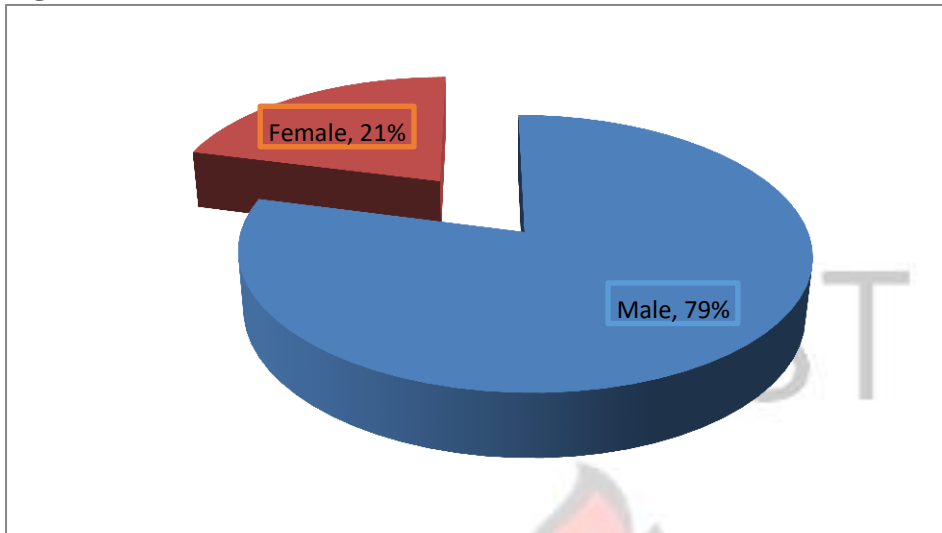
4.3 Socio-Demographic Data and General Organization Information

4.3.1 Socio-Demographic Data

This section of the analysis presented the demographic data of the Respondents. The emphasis were on position/title, gender, highest level of education and the number of years respondents have been working in the construction industry.

Figure 4.1, 4.2 and 4.3 presented the gender, the number of years respondents have been working in the construction industry and their highest level of education respectively.

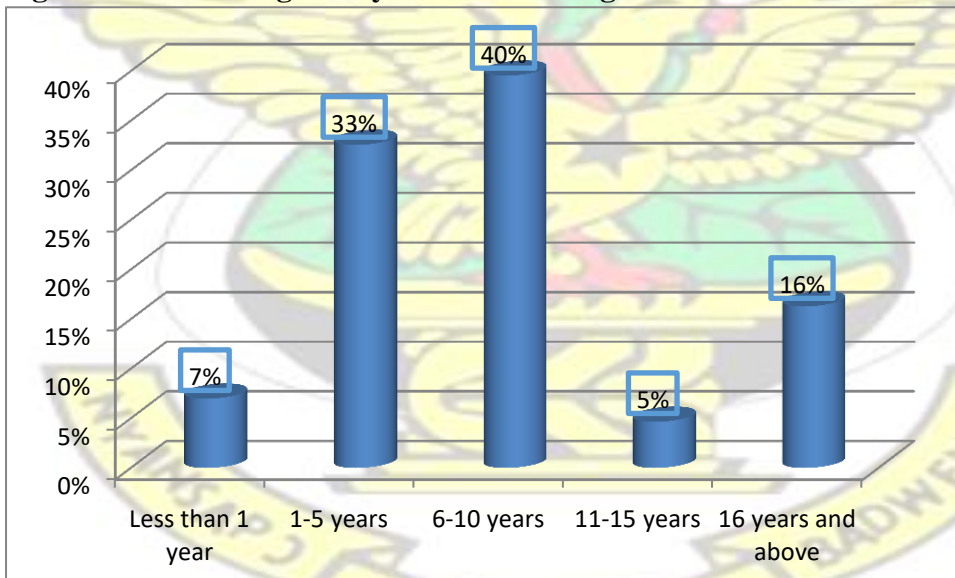
Figure 4.1: Gender



Source: Field Study, 2015

In figure 4.1, respondent it was observed that greater percentage of the respondents were male representing 79 percent and 21 percent were female.

Figure 4.2: How long have you been working in the construction industry

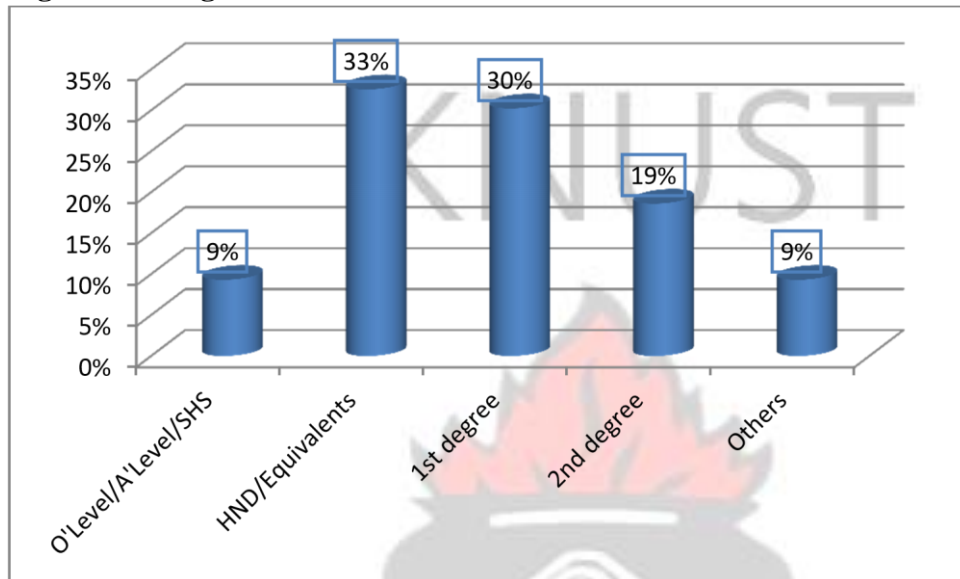


Source: Field Study, 2015

In figure 4.2 respondents were asked to specify the number of years they have been working in the construction industry. Majority of the respondents have been in the industry for 6 to 10 years, 33 percent have been working in the industry for 1 to 5 years.

It was observed that 5 percent have been working for 11 to 15 years and 16 percent have been working for over 16 years and over.

Figure 4.3: Highest level of education



Source: Field Study, 2015

Figure 4.3 showed the level of education of the respondents. It was observed that few respondents have O'Level/A'Level/SHS educational level representing 9 percent. HND/equivalents were 33 percent of the respondents, first degree and second degree were respectively representing 30 percent and 19 percent of the respondents. Aside these educational level, 9 percent of the respondents indicated they have P.G.D Architecture.

4.3.2 General Organization Information

In analyzing the general organization information of the respondents, the emphasis were made on the major type of work the organization involved in, respondents designation, relevant working experience (in years), average project executed per year (in GH¢) and number of constant employees. The table 4.2 presented the results of these variables.

Table 4.2: General Organization Information

		Frequency	Percent
Major type of work involved	Buildings	14	33%
	Roads	3	7%
	Water and Sewage	9	21%
	Building and Roads	3	7%
	Building & Water and Sewage	3	7%
	Buildings, Roads Water and Sewage	6	14%
	All	5	12%
	Total	43	100%
Respondents designation	Clients	15	35%
	Contractor	22	51%
	Consultant	6	14%
	Total	43	100%
Relevant working experience (years)	Less than or equal to 5 years	21	49%
	6-10 years	13	30%
	11-15 years	2	5%
	16 years and above	7	16%
	Total	43	100%
Average of projects executed per year	Less than 1 hundred thousand	13	30%
	1-5 hundred thousand	9	21%
	5-9 hundred thousand	9	21%
	More than 9 hundred thousand	12	28%
	Total	43	100%
Number of constant employees	Less than 10	25	58%
	10-15	16	37%
	16-20	2	5%
	Total	43	100%

Source: Field Study, 2015

4.3.2.1 The Major Type of Work the Organizations were Involved

In table 4.2, the major type of work they were involved in the organization was buildings representing 33 percent. 21 percent were work as water and sewage, 7 percent work in the roads and 7 percent. Some of the respondents indicated they undertake more than one type of major work; 7 percent work undertake building and roads, 14 percent of the

respondents undertake buildings, roads and water and sewage and 12 percent work undertake all the four major type of work.

4.3.2.2 Relevant Working Experience (years)

It was observed that 49 percent of the respondents have worked for less than or equal to 5 years. 51 percent of the respondents have worked for more than 5 years; 30 percent have work for 6 to 10 years, 5 percent had 11 to 15 years relevant working experience and 16 percent have had 16 years and above working experienced.

4.3.2.3 Average Number of Project Executed per Year

30 percent of the respondents averagely executed project less than one hundred thousand per year, 21 percent of the respondents indicated they averagely executed 1 to 5 hundred thousand project per year and 5 to 9 hundred thousand cedis per year each. About 28 percent of the respondents indicated they averagely executed more than 9 hundred thousand Ghana cedis per year.

4.3.2.4 Number of Constant Employees

Majority of the respondents indicated they their number of constant employees was less than 10, representing 58 percent, 37 percent had 10 to 15 number of constant employees and 5 percent of the respondents indicated they have 16 to 20 number of constant employees.

4.3.5 Summary of Socio-Demographic and General Organization Information

It was important to assess the socio-demographic and general organization information of the respondents in order to ascertain the validity of information provided for this research work. This helped in ensuring that data were gathered from the appropriate quarters. In perusing this result, it has been realized that the respondents designation

were contactors, clients and consultants, respondents have had relevant working experience and executed hundreds of thousand projects. This goes to explain that the information gathered reflect the respondents capability for providing relevant information for the measures, hence are in the position to thoroughly provide the key delay factors that cause construction project schedule overruns in selected MMDA in Ghana, the impact of delay factors on construction projects regarding both government and donor funded projects and help propose innovative ways of reducing the incidence of schedule overruns.

4.4 Factors Responsible for Project Delays and Schedule Overruns

This section of the analysis seek to identify the key factors that cause the delay of construction project schedule overruns in selected MMDAs in Ghana. Severity index was used to identify the major cause from the three designation point of view; client, consultants and contractors and the overall view.

Table 4.3 presented the first fifteen factors that cause delay in construction project schedule overruns and how each scaled was ranked. The result indicated clearly that inflation was ranked first with an overall severity index of 0.88, followed by financial difficulties of clients with severity index of 0.86. The price fluctuations, shortage of materials, plant/equipment parts, poor contract management and material procurement were ranked 3rd, 4th, 5th and 6th with severity index of 0.83 for price fluctuations and 0.82 for each of the other three causes. The first six ranked factors that causes project delay and schedule overruns indicated respondents scaled them as very severe.

4.4.1 Clients' Severity Ranking

Clients ranked the causes of delay in construction project schedule overruns as follows; the first factor observed to cause delay in project construction was inflation with

severity index of 0.77, the second ranked factor was shortage of materials, plant/equipment parts with severity index 0.76, the third was slow payment of completed with severity index of 0.75, then fourth factor was financial difficulties of client with index of 73. Fifth, sixth and seventh ranked factors were cash flow during construction, material procurement and price fluctuations with severity index of 0.72 for each.

4.4.2 Consultants Rankings for Factors Causing Project Delay

The study observed some similarities and variations in ranking of the factors that causes delay in project construction. Consultants ranked financial difficulties of client first with severity index of 0.87 which indicated consultants consider it to be very severe cause of delay in construct project. The second ranked factor that consultants considered causal to project delay was inflation with severity index of 0.83 showing very severe cause. The third, fourth and fifth ranked delay in project construction were price fluctuations, poor contract management and obsolete or unsuitable construction methods with severity indices of 0.83, 0.80 and 0.80 respectively. These factors were observed to be significantly cause delay in construction project.

4.4.3 Contractors Rankings for Factors Causing Project Delay

The results observed that all the factors according to how contractors scaled the severity of the factors that cause construction project schedule overruns in selected MMDAs in Ghana were highly significant. Severity index of 0.70 and above are significant and 0.90 was extremely significant. The first ranked factor that causes construction delay by the contractors was inflation with severity index of 0.96, the second and third ranked factors were financial difficulties of clients and inaccurate estimates with severity index of 0.95 each. The fourth ranked factors that cause construction project schedule

overruns through to the twelfth factor were indicated as very severe cause of delay in construction project. Their severity indices ranged from 0.95 to 0.90 showing contractors considered these factors to be very severe factors causing delay in construction project. These factors with high indices like these were highly significant.

4.4.4 Variations and Similarities in determining severity of the factors causing

Clients and contractors scaled inflation as first factor causing delay in construction project schedule overruns. Financial difficulties of client was ranked second by contractors and first by the consultants. Shortage of materials, Plant/equipment parts was ranked second by the clients, however, it was ranked 10th by the consultants and 13th by the contractors. This factor was considered critically delaying construction project by the clients as compared to the other two stakeholders. Price fluctuations was the 3rd for the consultants while clients ranked it 7th and contractors 9th delay factor.



Table 4.2 – Rank of factors responsible for project delays and schedule overruns

Factor/Cause Description	Client		Consultant		Contractor		Overall	
	(S.I)	Ranking	(S.I)	Ranking	(S.I)	Ranking	(S.I)	Ranking
Inflation	0.77	1	0.83	2	0.96	1	0.88	1
Financial difficulties of client	0.73	4	0.87	1	0.95	2	0.86	2
Price fluctuations	0.72	7	0.83	3	0.91	9	0.83	3
Shortage of materials, Plant/equipment parts	0.76	2	0.73	10	0.89	13	0.82	4
Poor contract management	0.68	9	0.80	4	0.92	6	0.82	5
Material procurement	0.72	6	0.70	15	0.92	7	0.82	6
Inaccurate estimates	0.64	19	0.77	7	0.95	3	0.81	7
Contractor's financial difficulties	0.65	16	0.80	6	0.91	10	0.80	8
Slow payment of completed	0.75	3	0.67	18	0.88	18	0.80	9
Mistakes during construction	0.65	14	0.73	12	0.91	11	0.80	10
Cash flow during construction	0.72	5	0.63	23	0.89	15	0.80	11
Obsolete or unsuitable construction methods	0.67	13	0.80	5	0.88	16	0.80	12
Deficiencies in cost estimates prepared	0.61	23	0.67	20	0.95	4	0.79	13
Low bid	0.59	30	0.77	8	0.93	5	0.79	14
Financial difficulties of contractor	0.65	17	0.70	17	0.90	12	0.79	15

Source: Field Study, 2015

Table 4.3 - Rank of factors responsible for project delays and schedule overruns

	Client		Consultant		Contractor		Overall	
	SI	Ranking	SI	Ranking	SI	Ranking	SI	Ranking
Difficulties in obtaining construction materials at official current prices	0.67	12	0.70	16	0.89	14	0.79	16
Shortage of skilled labour	0.64	21	0.63	24	0.92	8	0.78	17
Incompetent subcontractors	0.68	10	0.73	11	0.85	32	0.77	18
Late delivery of materials and equipment	0.67	11	0.67	19	0.85	29	0.76	19
Poor project management assistance	0.59	33	0.77	9	0.87	23	0.76	20
Delays in work approval	0.69	8	0.57	29	0.85	30	0.76	21
Poor technical performance	0.59	34	0.67	22	0.88	19	0.75	22
Monthly payment difficulties	0.61	25	0.67	21	0.86	26	0.75	23
Shortages of skilled workers	0.61	28	0.57	31	0.87	25	0.74	24
Delays in inspection and testing of work	0.60	29	0.63	25	0.86	27	0.74	25
Slow decision-making	0.56	37	0.63	26	0.88	20	0.73	26
Obstacles from government.	0.64	20	0.57	30	0.85	34	0.73	27

Ground problems	0.59	31	0.53	34	0.88	21	0.73	28
Inaccurate site investigations	0.56	36	0.73	13	0.85	33	0.73	29
Planning and scheduling deficiencies	0.49	41	0.73	14	0.88	17	0.73	30

Source: Field Study, 2015

Table 4.4- Rank of factors responsible for project delays and schedule overruns

	Client		Consultant		Contractor		Overall	
	SI	Ranking	SI	Ranking	SI	Ranking	SI	Ranking
Design changes	0.64	18	0.47	37	0.85	31	0.73	31
Shortages of technical personnel	0.63	22	0.53	32	0.84	35	0.72	32
Poor site management and supervision	0.56	38	0.50	36	0.88	22	0.72	33

Mistakes in design	0.51	40	0.63	27	0.87	24	0.71	34
Unexpected geological conditions	0.59	32	0.40	41	0.86	28	0.70	35
Waiting for information	0.61	24	0.53	33	0.80	38	0.70	36
Labour shortages	0.65	15	0.33	42	0.78	42	0.67	37
Inadequate control procedures	0.53	39	0.53	35	0.79	39	0.67	38
Additional works	0.47	42	0.47	39	0.84	36	0.66	39
Slow information flow between parties	0.47	43	0.60	28	0.80	37	0.66	40
Bad weather	0.61	27	0.27	43	0.79	40	0.66	41
Frequent breakdowns of construction plant and equipment	0.56	35	0.43	40	0.78	41	0.66	42
Slow mobilization of labour	0.61	26	0.47	38	0.72	43	0.65	43

Source: Field Study, 2015

4.5 Impact of delay factors on construction projects regarding both government and donor funded projects

Table 4.5 presented the impact of delay factors on construction projects regarding both government and donor funded projects. The delays in construction projects regarding government and donor funded project were highly significant. Consultants and contractors scaled these delays as very severe; the first ranked delay was change of government with index of 0.89 and the second overall ranked factor that its delay was severe was gross disregard to schedules or approved milestones with index of 0.89. The 3rd, 4th, 5th, 6th, 7th and 8th ranked delays that significantly affect construction projects for government and donor funded projects were respectively; poor quality work leading rework, unreliable funding to construction projects, lack of proper technical supervision, undefined project scope, harsh climatic condition at site and execution of construction projects without the use of scheduling technique. The last five factors were scaled as severe in the overall ranking.

Table 4.5: The Impact of Delay factors on Construction Projects Regarding Both Government and Donor Funded Projects

The Impact of Delay Factors	Client		Consultant		Contractor		Overall	
	SI	Ranking	SI	Ranking	SI	Ranking	SI	Ranking
Change of government	0.73	3	0.97	1	0.97	1	0.89	1
Gross disregard to schedules or approved milestones	0.76	2	0.90	2	0.97	2	0.89	2
Poor quality work leading rework	0.67	7	0.90	3	0.96	3	0.85	3
Unreliable funding to construction projects	0.69	6	0.80	4	0.95	6	0.84	4

Lack of proper technical supervision	0.67	8	0.80	5	0.95	5	0.83	5
Undefined project scope	0.63	9	0.73	7	0.96	4	0.81	6
Harsh climatic condition at site	0.81	1	0.27	13	0.95	7	0.80	7
Execution of construction projects without the use of scheduling technique	0.61	12	0.80	6	0.93	8	0.80	8
Designing quality into the project from starting of the work	0.71	4	0.53	10	0.91	9	0.79	9
Stakeholder conflict on the project	0.61	11	0.67	8	0.90	10	0.77	10
Inadequate cash flow to contractor	0.57	13	0.63	9	0.90	11	0.75	11
Unavailability of funding source	0.61	10	0.50	11	0.90	12	0.74	12
Frequent additional works	0.69	5	0.40	12	0.86	13	0.74	13

Source: Field Study, 2015

4.6 Knowledge about the Use of Both Government and Donor Funded Project

Respondents' knowledge about the use of government of Ghana (GoG) funded and donor funded projects.

Table 4.6: Knowledge

Variable	Category	Frequency	Percent
Assessing knowledge about the use of Government of Ghana (GoG) funded projects	Very high	23	53
	High	12	28
	Low	8	19
	Total	43	100

	Very high	25	58
	High	12	28
How do you assess your knowledge about the use of Donor Funded projects	Low	2	5
	Very low	4	9
	Total	43	100

Source: Field Study, 2015

The table below showed the results of these knowledge about the respondents. It was observed that 53 percent of the respondents assessed their knowledge about the use of government of Ghana funded projects as very high, 12 percent said high and 19 percent said low.

It was observed that 58 percent of the respondents assessed their knowledge about the use of donor funded projects as very high, 28 percent said high, 5 percent said low and 9 percent indicated it to be very low. It could be concluded that the knowledge of respondents about the use of donor funded projects was very high. Similarly, their knowledge about the use of Government of Ghana (GoG) funded projects was very high.

Table 4.7: Propose Innovative Ways of Reducing the Incidence of Schedule Overruns

	Yes		No		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Do think in the current economic dispensation it will be prudent to rely sole on Donor Funded projects	19	44	24	56	43	100
Should the client secure adequate funding for projects before commencing projects	38	88	5	12	43	100
Would you propose the use project planning and control techniques such as Bart chart, Precedence Diagram and other project software (Ms Project, Prima Vera)	43	100	0	0	43	100
Should the selection of contractors and consultants be based on expertise, financial standing, capacity and experience	42	98	Not necessary	2	43	100
Are liquidated ascertained damages (LAD) charge on project that are far behind schedule	12	28	31	72	43	100
Should the selection of contractors and consultants be based merely on prices and time offerings as well as fraternal acquaintances	2	5	41	95	43	100

Source: Field Study, 2015

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Respondents were asked about their thought that the current economic dispensation it will be prudent to rely solely on Donor Funded projects. It was observed that greater percentage of the respondents disagreed with the statement, representing 56 percent. The other percentage, 44 indicated they think in the current economic dispensation it will be prudent to rely sole on Donor Funded projects.

88 percent of the respondents agreed with the assertion that client should secure adequate funding for projects before commencing projects.

It was indicated by all the respondents that they would propose the use of project planning and control techniques such as Bart chart, Precedence Diagram and other project software (Ms Project, Prima Vera).

Almost all the respondents indicated the selection of contractors and consultants should be based on expertise, financial standing, capacity and experience. Only 2 percent of the respondents indicated that the selection of contractors and consultants be based on expertise, financial standing, capacity and experience was not necessary.

Majority of the respondents indicated that Liquidated Ascertained Damages (LAD) charge on project that are far behind schedule were not charged. Few percentage indicated that LAD was charge on project that are far behind schedule.

About 95 percent of the respondents showed that the selection of contractors and consultants should be based merely on prices and time offerings as well as fraternal acquaintances, while 5 percent said the selection of contractors and consultants should not be based merely on prices and time offerings as well as fraternal acquaintances.

4.7 Schedule Variance

Schedule variance is the differences between the scheduled completion and time elapsed per the provisions in the contract document.

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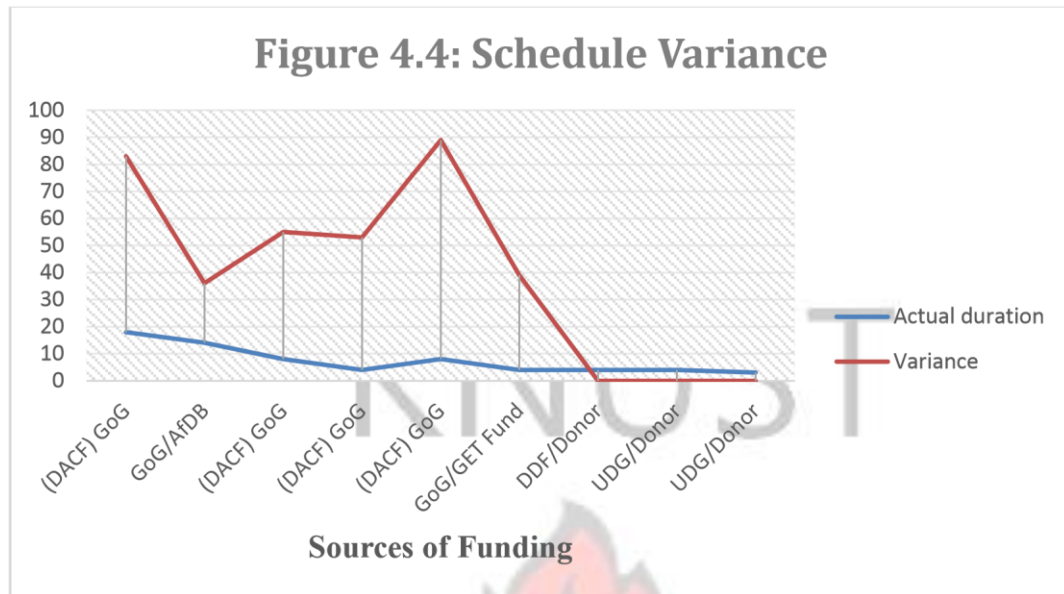
Table 4.8: Schedule variance

Project Description	Source of Funding	Actual duration	Award Date	Completion Date	Variance	Status
Construction of a fence wall and office Accommodation	(DACF) GoG	18	12/3/2007	12/9/2008	83	On-going
Construction of Bekwai Municipal Hospital	GoG/AfDB	14	2011	2012	36	On-going
Construction of 1-Nos 2 storey semi-detached block.	(DACF) GoG	8	2/12/2010	5/8/2011	55	On-going
Rehabilitation of Administration block	(DACF) GoG	4	2/12/2010	30/03/2011	53	On-going
Construction of 2- Nos. dormitory with facilities at Deyanseman Senior High School	(DACF) GoG	8	11/9/2007	12/3/2008	89	On-going
Construction Of 1no. 6-Unit Classroom Block With Ancillary Facilities at Ntraoku	GoG/GET Fund	4	2/1/2012	3/5/2012	39	On-going
Construct-ion of 1no. 2-unit classroom block	DDF/Donor	4	21/02/13	21/06/2013	0	Completed on schedule
Construction of 1 no. 3-unit classroom block, office, store and toilet	UDG/Donor	4	21/02/13	21/06/2013	0	Completed on schedule
Construct-ion of culverts and reshaping of road	UDG/Donor	3	21/02/13	21/06/2013	0	Completed on schedule

Source: Annual Progress Report, Bekwai Municipal Assembly, 2015

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Source: Annual Progress Report, Bekwai Municipal Assembly, 2015

Figure 4.4 presented the schedule variance of government and donor funded construction projects. It depicts the actual project durations and variations in completion schedules. It was observed the donor funded projects were completed within schedule while all of the selected projects being funded by GoG are far behind schedule.

From the figure 4.4, Construction of a fence wall and office Accommodation and Construction of 2- Nos. dormitory with facilities at Deyanseman Senior High School have significantly overrun the completion schedules. This is purely due the cash flow from the Central Government. On the other hand, donor fund the projects were completed with the contractual schedule.

4.8 Discussions and Conclusion

For the purpose of analysis, the identified fifteen (15) most severe and important Delay and Schedule overrun factors have been arranged into three (3) broad categories viz;

1. National Economics Factors

2. Managerial Factors

3. Enterprise Environmental Factors

The fifteen (15) most severe and important Delay and schedule overrun factors from table (5) above are shclient in table 4.6 below:

Table 4.6 - The fifteen (15) most severe and important Delay and schedule overrun factors

Overall Rank (Position)	Factor Description	Category
1	Inflation	National Economics Factors
2	Financial difficulties of client	National Economics Factors
3	Price fluctuations	National Economics Factors
4	Shortage of materials, Plant/equipment parts	Managerial Factors
5	Poor contract management	Managerial Factors
6	Material procurement	National Economics Factors
7	Inaccurate estimates	Managerial Factors
8	Contractor's financial difficulties	National Economics Factors
9	Slow payment of completed works	National Economics Factors
10	Mistakes during construction	Managerial Factors
11	Cash flow during construction	Managerial Factors
12	Obsolete or unsuitable construction methods	Managerial Factors
13	Deficiencies in cost estimates prepared	National Economics Factors
14	Low bid	Enterprise Environmental Factors
15	Financial difficulties of client	National Economics Factors

Source: Field Study, 2015

4.9 National Economics Factors

The delay and schedule overruns due to cost of construction is basically the cost of money, the cost of material, the cost of labour and the cost of management. Based on the factors identified by the survey results, escalation of material prices, inflation, price fluctuation, deficiencies in cost estimates prepared and material procurement are market related problems.

However, the construction industry is mainly market driven. Prices can and some schedules do change on an almost daily basis. These rapid changes in many cases cause problems for vendors to commit to one fixed price. Some of the factors which contribute to dramatic price fluctuations include:

1. World commodity prices for basic materials.
2. The current state of the local economy.
3. The quality of materials and workmanship required.
4. Simple supply and demand forces.

The basic reason of cost overruns is that most contractors quote prices based on their projected estimates, unfortunately the prices change so quickly that the initial budget figures become completely unrealistic.

Costs related to the construction industry have been volatile in recent years. Some of the volatility may be related to higher energy prices, prices for iron and steel, cement and concrete. Commodities used heavily in construction projects rose sharply within the last few years and shortages have been reported.

4.10 Managerial Factors

Some delay and schedule overruns causes are unavoidable because they cannot be reasonably prevented. However, delay and schedule overruns due to design

changes/plans, poor project management, monthly payment difficulties, mistakes during construction, mistakes in design problems are avoidable because they could have reasonably been foreseen and prevented.

As indicated in the survey, reasons such as poor technical performance, additional works, cash flow during construction, planning and scheduling deficiencies are the mere negligence by contractors and project managers and can be controlled considerably with little attention.

Management needs to modify the project schedule and estimates because of changes or discrepancies that may occur during the construction period. Efficient management is essential to managing a productive and cost efficient sit. Scope changes are due largely to inadequate planning and feasibility studies.

If importance is attached at the right schedule, scope changes and additional works can be considerably reduced. Another cause is poor scheduling i.e. not having the right materials, the right tools, the right information, the right training and the right people all at the right place at the right schedule.

Such improper planning is the major cause of schedule delays as well as cost overruns. In order to control the project effectively, the project manager must monitor the schedule to avoid housing construction delays and additional costs.

4.11 Enterprise Environment Factors

Majority of contractors have weak financial positions, unskilled labour force, poor organizational structures and lack of vision for growth and development. They are highly vulnerable to government policies and changes in government policies. This encourages corner cutting and unsound construction methods.

The prevailing practice of the government to implement its lowest bid price method has various inbuilt problems and cannot produce the best value. The major shortcoming of the low-bid method, frequently used for competitive bidding, is the likelihood of awarding construction contract to a contractor that submits, either unintentionally or on purpose, an unrealistically low bid price.

Often, such an occurrence works to the client's and contractor's harm by creating disputes, cost overruns, and schedule delays. Methods used for cost estimation during the project cost scheduling are not adequate enough to cover all aspects of cost of projects.



CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter identified the fifteen most important key Delay Factors to that Contribute to Construction Projects Schedule Overruns in Ghana. It also focused on the degree of agreement among the three respondents; consultants, contractors and client. Conclusion and recommendations were made with regard to the factors that cause delay and schedule overruns of construction projects.

5.2 Conclusions

The survey focused on identifying and ranking in order of severity and importance, the main causes of project schedule overruns. The conclusions of the survey are as follow:

According to the contractors and client, inflation was the most important delay and schedule overrun factor, while consultants ranked financial difficulties of client as the most important factor. Despite some differences in viewpoint held by the respondents, there is a high degree of agreement among them with respect to their ranking of the factors.

The overall ranking results indicated that, the three groups felt that the major factors that can cause excessive construction projects delay and schedule overruns are Poor Contract Management, Poor Technical Performance, Escalation of Material Prices, Inflation, Additional Works, Deficiencies in Cost Estimates Prepared, Material Procurement, Cash Flow During Construction, Monthly Payment Difficulties, Price

Fluctuations, Design Changes, Planning and Scheduling Deficiencies, Low bid, Mistakes During Construction and Mistakes in Design according to their degree of influence.

Other factors that emerged clearly as not very important, but of interest, are bad weather and unexpected natural events. These are the natural factors. In view of these, good practices such as the use of project management software must be looked at.

Finding revealed that enterprise environmental factors contribute to delay and schedule overruns in construction projects. National economic factors affect the schedule in construction project most severely.

Among all factors leading to delay and schedule overruns in construction projects, managerial related factors are those which can be controlled and prevented most easily as they are the micro-economic factors. The enterprise environmental factors is dysfunctional and need drastic changes, more scientifically proven methods, tools and techniques may be adopted instead of the orthodox practices. Almost every project in the local industry faces delay and schedule overruns when executed.

Change in government was the overall factor that could hinder the implementation of development projects.

The study also solicited the views that there should be innovations in managing projects right from initiation to the closure of the projects.

The schedule variances also revealed that donor funding is more reliable than source of funding from the Government of Ghana.

5.3 RECOMMENDATIONS

Based on this study conducted to achieve the overall objective, some recommendations are given as follows:

- a. Construction managers should provide adequate contingency allowance in order to cover increase in cost materials due to inflation.
- b. Appropriate funding levels should always be determined at the planning stage of the project so that regular payment should be paid to contractors for work done.
- c. In order to improve contractors' managerial skills, there is need for continuous personal development for personnel in the construction industry to update their knowledge and be familiar with project management techniques and processes, to have effective and efficient performances.
- d. Effective and efficient material procurement systems should be established within projects. Material procurement has the potential to cause major delays to construction projects. Therefore, the material procurement process should be executed properly by improving the procurement process in order to avoid supply delays.
- e. Developing effective and efficient technical performances in the construction industry through different types of training programmes. The training should cover project planning, scheduling, schedule and cost control, and the information systems.
- f. Fluctuations in prices of raw materials and cost of manufactured materials are severe when these elements are in short supply to stabilize the cost of materials and increases in the supply of materials can be useful in breaking the monopoly of few suppliers controlling the supply chain of the market.

- g. As a matter urgency the government should strengthen the policy of the Public Private Partnership as an alternative method of procurement. This will surely ease the burden on the as far capital project investments are concern.
- h. The selection of contractors and consultants by the client should be based on expertise, financial standing, capacity and experience and not based merely on prices and time offerings as well as fraternal acquaintances.



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APPENDICES

APPENDIX A - QUESTIONNAIRE

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

COLLEGE OF ART AND BUILT ENVIRONMENT

DEPARTMENT OF BUILDING TECHNOLOGY

PROGRAMME: MSc. CONSTRUCTION MANAGEMENT

NOTE OF PERMISSION:

Dear Sir/Madam I respectfully ask that you help answer this survey questionnaire concerning the “Schedule Overruns of Construction Projects between Government and Donor Funded Projects in MMDAS in Ghana. Case Study: Bekwai Municipal Assembly”. All information provided shall at utmost be treated confidentially. Thank you.

DATE: ____, ____, 2015.

(Please tick (✓) your answers and fill spaces provided where necessary. However you are not under any compulsions to provide answers that beat your thinking).

Please, note that on the Client side we have: - Architect, Works Engineer, Planning Officer, Budget Officer, Auditor and others.

Contact of researcher:

Ahmed Abubakar Siddiq. E-mail: de03dat@yahoo.com. Mobile No.: 0244376076, 0206494847

SECTION A: socio-demographic data

1. In which of following below are you?

☐ Contractor

☐ Architect

☐ Auditor

☐ Works Engineer

☐ Planning Officer

☐ Budget Officer

☐ Consultants

☐ Other, Please specify.....

2. Your gender?

☐ Male ☐ Female

3. What is your highest level of education?

O' Level /A' Level/SHS ☐ HND/Equivalents ☐ 1st Degree ☐ 2nd Degree ☐

Other, Please specify

4. How long have you been working in the construction industry? Less than 1 year

☐ 1-5 years ☐ 6-10 years ☐ 11-15 years ☐

16 years above ☐

SECTION B: GENERAL ORGANIZATION INFORMATION

1. Major type of work involved:

☐ Buildings ☐ Roads ☐ Water and Sewage ☐ Building and Roads

☐ Drains & Culverts

2. Respondents designation:

☐ Client ☐ Contractor ☐ Consultant

3. Relevant working experience (Years) :

☐ less than or equal to 5 Yrs ☐ 6-10 Yrs ☐ 11-15 Yrs

☐ 16 Yrs and above

4. Average of projects executed per year (GH¢):

☐ Less than 1 Hundred Thousand ☐ 1-5 Hundred Thousand ☐

☐ 5-9 Hundred Thousand ☐ More than 9 Hundred Thousand

5. No. of constant employees:

☐ Less than 10 ☐ 10-15 ☐ 15-20 ☐ More than 20

SECTION C: FACTORS INFLUENCING SCHEDULE OVERRUNS OF CONSTRUCTION PROJECTS IN GHANA

6. To identify the key delay factors that cause construction project schedule overruns
in selected MMDA in Ghana

The priority scaling are (1 = very low severity, 2 = low severity, 3 = medium severity, 4 = high severity, and 5 = very high severity). (Tick ☒ where is applicable)

Factors Influencing Schedule Overruns	Level of severity on Construction Projects				
	1	2	3	4	5
Planning and scheduling deficiencies					
Deficiencies in cost estimates prepared					
Inadequate control procedures					
Delays in work approval					
Waiting for information					
Mistakes during construction					
Delays in inspection and testing of work					
Cash flow during construction					
Frequent breakdowns of construction plant and equipment					
Shortages of technical personnel					
Labour shortages					
Monthly payment difficulties					
Poor contract management					
Shortage of materials, Plant/equipment parts					
Contractor's financial difficulties					
Low bid					
Material procurement					

The priority scaling are (1 = very low severity, 2 = low severity, 3 = medium severity, 4 = high severity, and 5 = very high severity).

Factors Influencing Schedule Overruns					
	1	2	3	4	5
Slow mobilization of labour					
Late delivery of materials and equipment					
Inaccurate site investigations					
Slow decision-making					
Inflation					
Difficulties in obtaining construction materials at official current prices					
Ground problems					
Bad weather					
Unexpected geological conditions					
Poor site management and supervision					
Poor project management assistance					
Financial difficulties of contractor					
Financial difficulties of client					

The priority scaling are (1 = very low severity, 2 = low severity, 3 = medium severity, 4 = high severity, and 5 = very high severity).

Factors Influencing Schedule Overruns	level of severity of construction project				
	1	2	3	4	5
Design changes					
Slow payment of completed works					

Inaccurate estimates					
Mistakes in design					
Obstacles from government.					
Shortages of skilled workers					
Additional works					
Slow information flow between parties					
Poor technical performance					
Incompetent subcontractors					
Obsolete or unsuitable construction methods					
Price fluctuations					
Shortage of skilled labour					

SECTION D – TO DETERMINE THE IMPACT OF DELAY FACTORS ON CONSTRUCTION PROJECTS REGARDING BOTH GOVERNMENT AND DONOR FUNDED PROJECTS

7. What are the impact of delay factors on construction projects regarding both government and donor funded projects? The parameter are defined on a five point scale as 1=not severe, 2=less severe, 3=moderately severe, 4=severe, 5=very severe

The Impact of Delay Factors on Construction Projects Regarding Both Government and Donor Funded Projects	level of severity of construction project				
	1	2	3	4	5
Harsh climatic condition at site					
Inadequate cash flow to contractor					

Unavailability of funding source					
Undefined project scope					
Change of government					
Stakeholder conflict on the project					
Frequent additional works					
Poor quality work leading rework					
Lack of proper technical supervision					
Gross disregard to schedules or approved milestones					
Execution of construction projects without the use of scheduling technique					
Unreliable funding to construction projects					
Designing quality into the project from starting of the work					

SECTION E- PROPOSE INNOVATIVE WAYS OF REDUCING THE INCIDENCE OF SCHEDULE OVERRUNS

8. How do you assess your knowledge about the use of Government of Ghana (GOG) funded projects?

☐ Very high ☐ High ☐ Low ☐ Very Low

9. How do you assess your knowledge about the use of Donor Funded projects?

☐ Very high ☐ High ☐ Low ☐ Very Low

10. Do think in the current economic dispensation it will be prudent to rely sole on Donor Funded projects?

a. ☐ Yes b. ☐ No c. Other, specify.....

11. Should the client secure adequate funding for projects before commencing projects?

a. ☐ Yes b. ☐ No c. Other, specify.....

12. Would you propose the use project planning and control techniques such as Bart chart, Precedence Diagram and other project software (Ms Project, Prima Vera)?

- a. ☐ Yes b. ☐ No c. Other, specify.....

13. Should the selection of contractors and consultants be based on expertise, financial standing, capacity and experience?

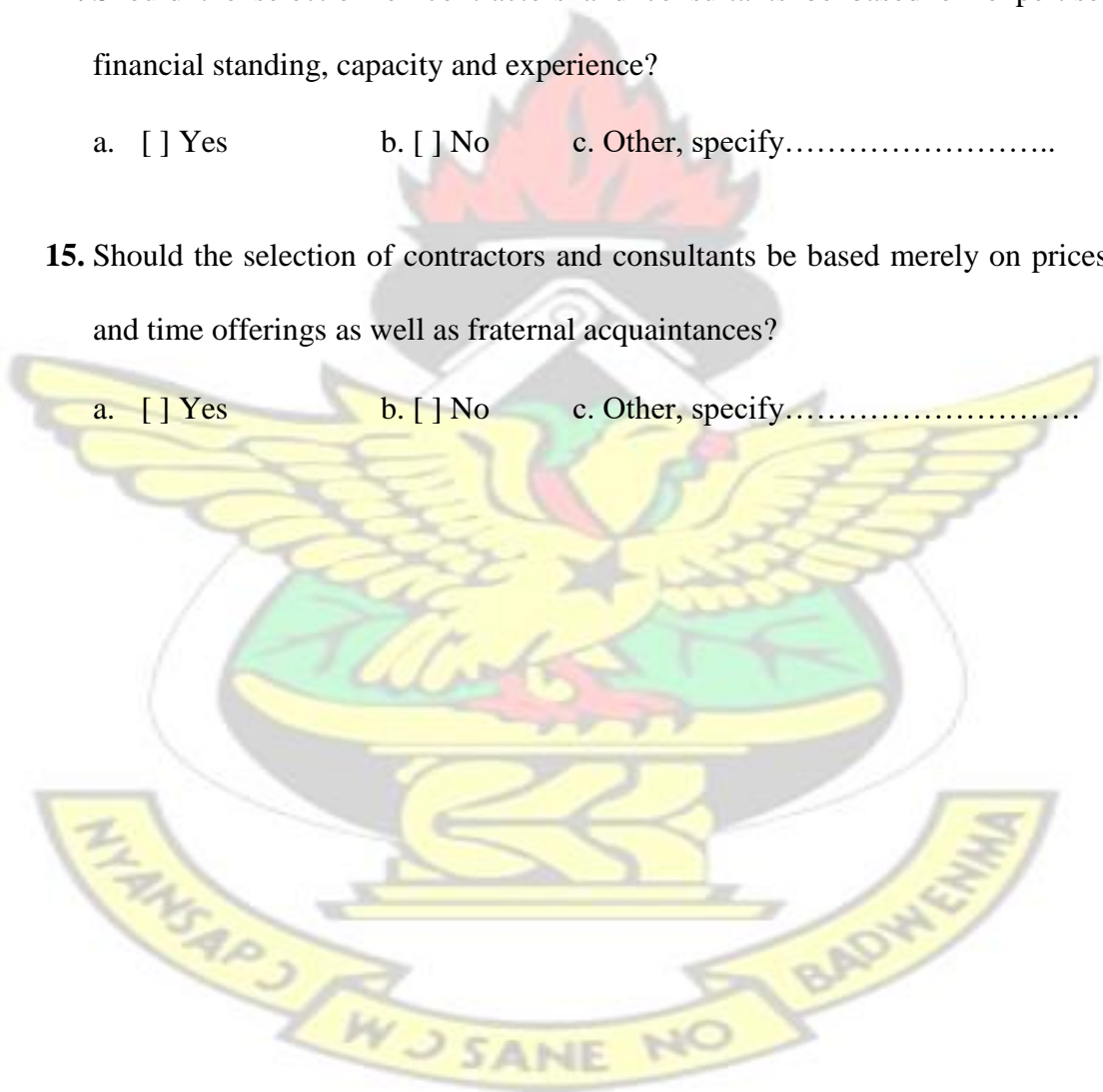
- a. ☐ Yes b. ☐ No c. Other, specify.....

14. Should the selection of contractors and consultants be based on expertise, financial standing, capacity and experience?

- a. ☐ Yes b. ☐ No c. Other, specify.....

15. Should the selection of contractors and consultants be based merely on prices and time offerings as well as fraternal acquaintances?

- a. ☐ Yes b. ☐ No c. Other, specify.....



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APPENDIX B- STATUS OF PROJECT IMPLEMENTATION FOR 2015 FROM THE ANNUAL ACTION PLAN 2015

Progress Report on the Status of UDG (April-June, 2015)

No	Project Title	Output	Sector	Project Location	Contractor	Date Started	Expected Completion Date	Source of Fund	Implementation Status
1.	Rehabilitation of 15 no. boreholes	To enhance access to water supply in various communities	Water	Wioso , Achiasse, Bogyawe, Subriso, Poano, Huntado, Sehwi, Asanso, Kyekyewere Kwabena Nkwanta, Ehwiren, Abodom & Edwinase	Arthurs Construction Co. Ltd	21/02/13	21/06/13	UDG	Completed and in use
2.	Rehabilitation of 8 no. defective toilets	To improve sanitary conditions of these Communities	Sanitation	Esumaja, Dominase, BoniBehene-ase, Dwoamin, Adankranja Asokwa Tusum, Bekwai Zongo	Jacob Aborah Construction Works	21/02/13	21/06/13	UDG	Completed
3	Construction of culverts and reshaping of road	To ensure easy movement of run-off water to avoid flooding and also for easy vehicular movement	Road	Mrs. Lamptey Road	Banicob Construction Works	21/02/13	21/06/13	UDG	Phase 1 of project completed

4	Constructi on of 1 no. 12 Seater Aqua Privy toilet	To improve Sanitary conditions of the people in the community	Sanitation	Edwinase	Dirinaa Enterprise	21/02/13	21/06/13	UDG	Completed
5	Supply office Furniture and Medical equipment	To aid in quality health care delivery	Health	Kensere CHPS Compound	K. A's Kwapee Enterprise	21/02/13	21/06/13	UDG	Furniture and Medical equipment supplied
6.	Constructi on of 1 no. 3-unit classroom block, office, store and toilet	To increase educational infrastructure for enhanced teaching and learning	Education	Ehwiren	AsunTaaba Company Ltd.	21/02/13	21/06/13	UDG	Completed and Toilet in progress

96 Progress Report on the Status of DDF (April-June, 2015)

No	Project Title	Sector	Project Location	Contractor	Date Started	Expected Completion Date	Source of Funding	Implementation Status
1.	Construct-ion of 2 no. 12 Seater Aqua Privy toilet	Water and Sanitation	Bogyawe Ankaase	Jubicon Company Ltd	21/02/13	21/06/13	DDF	Finishing work in progress
2.	Construct-ion of 2 no. 12- seater aqua privy toilet	Water and Sanitation	Wioso – Nerebehi / Sebedie	Jubilee Contractors Ltd	21/02/13	21/06/13	DDF	Sebedie completed, Wioso-Nerebehi finishing works in progress
3	Renovat-ion of health director's bungalow	Good Governance	Bekwai	Jubilee Contractors Ltd	21/02/13	21/06/13	DDF	Completed
4	Renovat-ion of agric director's bungalow	Good Governance	Bekwai	Jubicon Company Ltd	21/02/13	21/06/13	DDF	Completed
6.	Construct-ion of 1no. 2-unit classroom block	Education	Sehwi	Arthurs Construction Co. Ltd	21/02/13	21/06/13	DDF	Completed

Progress Report on the Status of DACF (April-June, 2015)

NO	PROJECT TITLE	LOCATION	CONTRACTOR	START DATE	EXPECTED COMPLETE D DATE	SOURCE OF FUNDING	SECTOR	STATUS
1.	Construction of 2-Nos. dormitory with facilities at Deyanseman Senior High School	Poano	M/S Blacksta International Business Centre	11/09/07	12/03/08	DACF	Education	Girls' dormitory completed. Dining Hall (screening, plastering and wiring completed. Boys' dormitory (fielding of foundation.
2.	Construction of a fence wall and office Accommodation	Bekwai Administration	M/S F-Nyark Enterprise	12/03/07	12/09/08	DACF/IGF	Good Governance	Fence wall(80% complete) Office accommodation roofed.
3.	Construction of 1Nos 2 storey semidetached block.	Bekwai	M/S Panguit Co LTD	02/12/10	05/01/11	DACF	Good Governance	Casting of floor and erection of columns completed.

4.	Rehabilitation of Administration block	Bekwai	AgyaNti Construction LTD	02/12/10	30/03/11	DACF	Good Governance	Painting of doors completed
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Table 2.4 Progress Report on GETFUND (GoG) Projects in the Bekwai Municipal (April-June, 2015)

S/N	Project Title	Location	Contractor	Award Date	Implementation Status
	Construction Of 1no. 6-Unit Classroom Block With Ancillary Facilities	Ntroaku	M/S Harleedo Co. LTD	02/01/12	Roofing In Progress