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A Study of Risk Factors Affecting Construction Project Execution in the Central Region of Ghana.

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Abstract:
The construction industry is one of the most dynamic, risky, and challenging businesses. The number of risks present invariably goes beyond those found in other industries. The research was conducted with the aim of exploring the various risk factors affecting late execution of construction projects in the Central region of Ghana. Purposive sampling technique was used to select thirty (30) contractors of on-going projects for the study. Questionnaire was used to illicit information from the participants.
Findings of the research revealed that financial, economic as well as political risk are the major factors contributing to late execution of construction projects in the central region of Ghana.
The conclusion drawn from the research indicated a lot of projects have not been completed. A thorough feasibility studies should be undertaken before any project is done.

***Key words**: Contractor, Construction, Project risk.*

Introduction

Every human endeavour in life involves risk. Risk by nature may be a cause for concern as it is uncertain and unpredictable, but one needs to step up to the challenge for life to be interesting. There may be success or failure, even though the degree of failure is proportional and cannot be defined as a precise terminology (Dey and Ogunlana, 2004)

According to Mark *et al* (2004), risk is described as a potential for complications and problems with respect to the completion of a project and the achievement of a project goal. In addition, the impact or consequences of risk are unexpected, (Chia, 2006) Construction project risk can also be described as an uncertain event or condition that, if it occurs, has a negative effect on at least one project objective, such as time, cost, or quality (Jomaah, *et al* 2010). Risks are therefore threats to project delivery. Failure to adequately deal with risks has been shown to cause cost and time overruns in construction projects (Andi, 2006).

Some of the risks that affect construction projects in the Central region of Ghana are; land litigation, land guards' activities, uncoordinated activities that lead to project not living up expectation, political interferences, inadequate source of funding, Community interference, late completion of work and the final projects cost exceeding the project budget.

Sources of risks includes inherent uncertainties such as pandemic (COVID 19) and issues relative to company's fluctuating profit margin, competitive bidding process, weather change, job-site productivity, the political situations, inflation, contractual rights, and market competition (Karimi *et al*., 2011). It is important for the construction companies to face these risks by assessing their effects on the project objectives.

In view of that the purpose of the study was to explore the various risk factors that has affected long delay in the execution of construction project in the central region of Ghana.

Literature Review

Construction Project Risks

Construction project risks are uncertainties that affect construction project. Depending on the nature of risk, Researchers through the identification process have found and classified into different types. Such classification includes Contractual/legal, Construction, Political, Management, Physical, Environmental, Design, Financial, Natural hazards, Safety and Delay risk (Mustafa, 2000).

Economic Risk Factors that Affect Construction Project in the Central of Ghana

Poor financial markets, inflation and price hiking are among of the variables associated with economic risk drivers which has a direct consequence on projects overrun, (Agyakwa-Baah, 2007; Denini, 2009). Currency instability may result in cost overruns mainly because of inflation. Edwards and Bowen (1998), identified economic risks in Ghana as exchange rates, material supply, labour supply, fiscal policies and inflation. Frimpong et al. (2003) added that, the rise in inflation should also be considered in risk studies. Komenda sugar factory has economic risk factors that include the viability of the project. Projects that are also facing economic risk are the Atonkwa E-Block Educational Complex, Road's rehabilitations (Source field data, 2021).

Government influence on construction Projects in Central Region.

In developing countries like Ghana, most of the construction projects are politically motivated and viewed by many as additions to satisfy public demand. Many roads are left at the mercy of politicians and according to Agyakwa-Baah (2009), it is the ultimate goal of government to lead and fast-track infrastructure project the society and moreover, the performance of the government is assessed in the developing countries by developmental projects. This creates unnecessary pressure on government to start something which will be terminated because it is not accommodated in the government's budget. For instance, a 10 km Road rehabilitation that was started in 2016 electioneering year at Komenda in the KEEA Municipality has pass through three different contractors' hands yet they could not execute the project. It was argued by De la Cruz et al. (2006), that, winning political scores leads to unplanned infrastructure development which lacks the necessary funding and required coordination of such projects.

Environmental Risk Factors that Affect Construction Project.

These risks associated with the natural environment has to do with the weather and this factor is hardly experience in Ghana such as harsh weather condition like typhoon or tornados but the two seasonal changes are witness in Ghana such as the wet and dry seasons. De la Cruz et al. (2006). The New sugar factory at Komenda is at the mercy of the weather as Komenda is a coastal town. The sea breeze is affecting the equipment and moreover the rainfall pattern is not the best. This has affected a few sugar cane that were nursed. The central coastline sea defense project has paved way for the tidal wave to affect the other communities that are not part of the project.

Technical Risk Factors

Moreover, technical incompetence of designers has resulted to inaccurate design details or the inexperience of working on complex projects and risk prone projects. In addition, Oladapo (2007) identified that, variations are very profound in construction projects and its effect is inevitable on project objectives such as time and cost. To provide a simple understanding of variations, Baxendale and Schofield (1986) said the addition or subtractions made to the scope of the project amount to variation.

Inadequate and faulty Plants and equipment have been suggested to be an influential problem in construction firms, although local contractors mostly use labours for their works (Berko, 2007). Moreover, materials shortage, defective materials unavailability of the required skills and the abysmal performance of labour as well as the lack of technical expertise to operate plant and equipment have also been identified as risk most local contractors are experiencing internally as well as stealing of materials by workers (Berko, 2007; Agyakwa-Baah, 2009).

Table 2.1 Summary of Risk Factors affecting some ongoing Project in Central region of Ghana

Project	Risk factor	Year started	Year of completion	Expected duration of Contact.
New Komenda sugar factory	Economic, Financial, Environmental, Political, Social, land issues	2016	not completed	12 months
Central Coastal line sea defense project	Environmental, Economical	2020	not completed	12 months
10 km road from Komenda junction to Komenda college of Education	Political, financial and Technical	2016	not completed	6 months
4 Storey-building administration block at Komenda college of Education	Financial	2011	not completed	12 months
New auditorium for Komenda college of education	Economic, Financial Environmental and Social	2016	not completed	12 months

Source: field data (2021)

Methodology

Descriptive Research Design.

The researcher used descriptive Survey design. It involves the collection of information from a sample of individuals and organisations through their responses to questions and observation. When we want to describe individuals, groups, activities, events, or situations, descriptive research is appropriate.

Population

The population for the study was the contractors (D1K1), in the Construction Industry in the Central Region of Ghana who were undertaking on-going project.

Sampling Techniques and Sample Size

Purposive sampling was used. The researcher main target of the population was experience contractors who have been in the industry for not less than 3 years and who are executing ongoing projects in the central region of Ghana.

Questionnaires

The researcher designed and developed questionnaires for contractors as the main respondents.

Among the issues dwelled on involved:

1. The organization profile (contractor): This information dealt with the demographics with respect to the firm's financial class, years of experience in the construction, professional background of respondents, kind of projects they undertake, the duration and the cost.
2. Identified risk factors and their severity that affect construction projects: The second section dealt with the awareness of risk in general and risk that affect particular project.

Results and Discussion of questionnaires from Contractors

Table 4.2 Contractors' response rate.

Respondents	Frequency	Percentage (%)
Management staff	9	30.0
Directors	2	6.6
Senior management staff	8	26.7.

Site engineers	11	36.7
Total	**30**	**100**

The result in table 4.2 shows the breakdown of participant's organizational background information. Most of the contractors were represented by the personnel to respond to the questionnaires.

The results show that out of the total of number of 30 participants, 9 representing 30.0% management staff made up the largest proportion of the total responses; 2 Directors who participated made up the smallest proportion. 8 respondents were Senior Management staff, making up 26.7% of the total, and the remaining 8 representing 36.7% was made up of Site Engineers. The various groups gave a fair idea about the topic under discussion.

Table 4.3 Project executed by contractors

Range	Frequency	Percentage (%)
10 or less	4	15.4
11-15	7	26.9
16-20	6	23.1
21 or more	9	34.6

Table 4.3 also gives information regarding the number of projects executed by the firms in the last five years. The results indicate that the participating contractors who had executed 21 or more projects made up the largest proportion of total responses at 34.6%. Seven (7) respondents had executed projects between 11-15 representing 26.9%. Six representing 23.1% had executed projects between 16-20. made up 29.3%. The remaining 15.4 % was made up of four (4) contractors with ten or less executed projects.

Figure 4.1 Contractors' level of experience

Figure 4.1. gives the number of years of experience of Contractors in construction. The figure shows that majority of the construction organisation numbering fifteen (15) that made up 57.7% of the total have practiced or executed projects for more than ten years. 23.1% of the construction organisation representing six respondents have between 6 to 10 years' experience in construction. Few of the organisation numbering five and at 19.2% have more than three years but less than five years.

Significant, much of the information used for this study is obtained from very experienced Contractors in terms of projects executed and from respondents (senior managers) who are at the decision-making positions and thus will have better information regarding risk and its management in the firm and can be considered as expert judgments on behalf of the firm and thus credible for the purposes of the study carried out. Interestingly it came out that contractors who have been on the job for long time have also executed more projects. There is a correlation between number of years in the industry and the number of projects executed.

Table 4.4: Categories of project executed by contractors.

Project types	Frequency	Public	Private
Buildings	125	93	32
Roads	25	25	-
Bridges	5	5	-
Others	28	20	8
Total	**183**	**143**	**40**

Categories of project executed by contractors is represented in table 4.4 which shows a kind of project contractors executed for their respective clients. Out of 183 projects, building took 125 representing 68.3%, whereas the rest (58) were represented by 31.5%.
Moreover, 143 projects which make up of 78.1% of the 183 projects were initiated by the government and only 40 (21.9%) were initiated by the private clients. This Cleary show that contractors mostly rely on the state institutions for project contract.

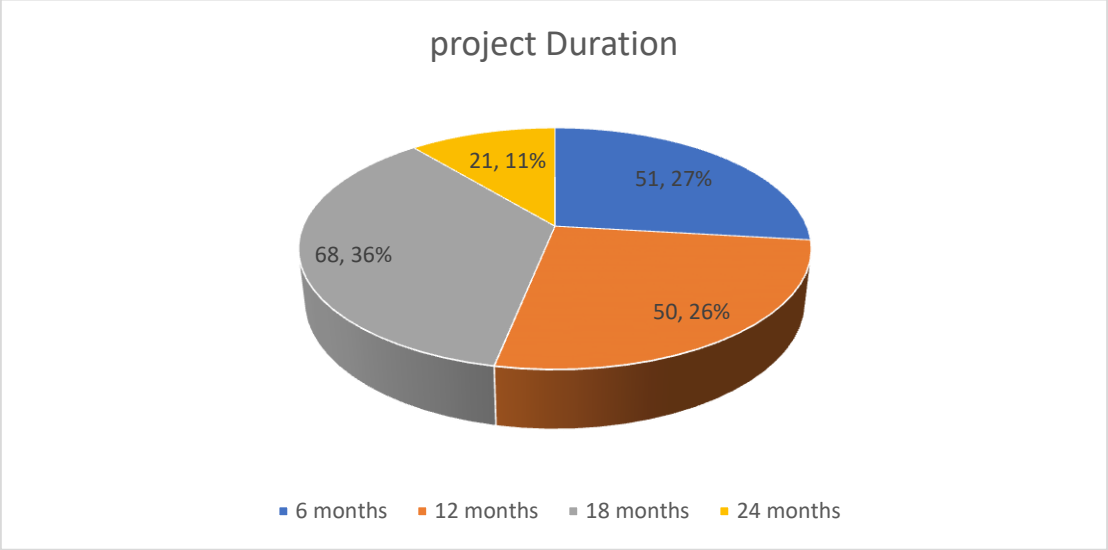

Figure 4.11 Project Duration.
The researcher wanted to know the duration for the project undertaken by the contractors. Figure 4.11 show that 68 representing 36% of the 183-project studied was given a duration of 18 months to complete. Fifty-one (51) representing 27% were design to take 6 months to complete. Fifty representing 26% and the least 21 representing 12% were design to take 12 and 24 months to complete respectively. This shows that most of the projects taken by contractors are short- and medium-term project that takes less than 15 months to complete.

Contractors' views on Risks that affect construction project.
Table 4.5. Risk Severity allocation by contractors. 1=Low, 2=Medium, 3=High

SN	Risk category	Frequency	Yes	No	3	2	1
R1	The final project cost exceeding the project budget	26	-	-	26	-	-
R2	Late completion of project	26	-	-	26	-	-
R3	Shortage of resources	26	-	-	26	-	-
R4	Late payment	26	-	-	26	-	-
R5	Political/Government influence	26	-	-	19	7	-
R6	Force Majeure	26	8	18	13	4	13
R7	Technical	26	14	12	10	4	10
R8	Contractors' performance below expectations	26	6	18	4	4	18
R9	Poor safety conditions	26	10	16	8	9	8
R10	Environmental conditions	26	10	16	5	10	10

This section of the questionnaire includes 10 main risks listed for the contractors, asking them to rank their severity from low to high (1-3). Table 4.5 shows the level of severity for the construction project risks in central and Greater Accra regions of Ghana. As it is seen, the first four risks in terms of severity are the final project cost exceeding the project budget, late completion of project, shortage of resources and late payment. Referring to the risk categorization presented earlier, it can be determined that all these three risks are sub-categories of Economic and Financial category. This indicates the great significance of influences of economic and financial risks on the construction projects in central and greater Accra regions. This is also followed by political or government influence on construction projects. environmental and poor safety conditions ranked lowest.

Table 4.6 Mean distribution of contactors responses.

Categories of risk	**N**	**Mean**	**Std. Deviation**	**Std. Error**	**95% Confidence Interval for Mean**	
					Lower Bound	**Upper Bound**
The final project cost exceeding the project budget	26	2.00	.000	.058	1.48	1.72
Late completion of project	26	2.00	.000	.024	1.89	1.99
Shortage of resources	26	2.00	.000	.058	1.50	1.74
Late payment	26	2.00	.000	.033	1.66	1.79
Political/Government influence	26	1.73	.452	.026	1.32	1.65
Force Majeure	26	1.50	.510	.024	1.74	1.99
Technical	26	1,73	.452	.037	1.42	1.64
Contractors' performance below expectations	26	1.71	.460	.025	1.51	1.70
Poor safety conditions	26	1.31	.471	.058	1.49	1.74
Environmental conditions	26	1-19	.402	.033	1.56	1.79

Table 4.6 shows the mean responses of the respondents that made it easier for allocation of the risk categories in to High, Medium and low severity.

Each risk in the questionnaire had a scale of 1-3 to for its severity. While analyzing, numbers in this scale have been grouped together in order to make the understanding of the results easier: as low, medium and high severity. Conforming Table 4.6 with table 4.7, it can be realized that the first 5 risks in figure 4. has been fallen in the "High severity" group, followed by the next three risks in the "medium" group, and the last two risks in the "low severity" group.

Table 4.7. Contractors' allocation of 10 construction project risks to three groups of high, medium and low severity

Low	Medium	High
Poor safety conditions Environmental conditions	Force Majeure Technical Contractors' performance below average	The final project cost exceeding the project budget. Late completion of project. Shortage of resources Political /Government Late payment

Summary of the Findings of the Study.

The study found out that there are various risk factors that are affecting the construction project in the Central region of Ghana. Notable among them are:

1.Economic/Financial risk factor: This risk factor is affecting New Komenda sugar factory, Komenda College of Education Administration Block, Central coastline Sea defense project, Road rehabilitation from Komenda Junction to Komenda College of Education, Weija Junction cement factory project.

2 Political/Governmental Risk Factors has affected, the New Komenda sugar factory, central sea defense coastline and Road rehabilitation from Komenda Junction to Komenda college of education as a result of change of Government and political influence.

3. Environmental Risk factor has also affected the New Komenda Sugar factory project, Atonkwa E-Block project and weija cement factory project.

4. Social/Cultural risk factors, this risk factor has affected the Central coastline sea defence construction project.

5. Technical risk factor: This risk factor has affected the New Komenda sugar factory project, Atonkwa E-block construction project and Komenda junction to Komenda College of Education Road Rehabilitation

Conclusion

The following conclusion can be drawn from the study;

- Finance and economic risks as well as political and Government interferences are considered as severe risks that affects construction projects significantly.
- . Contracts are awarded not based on accurate estimated.
- Exchange rate fluctuation is a risk factor.
- Most of the time background of contractors are not checked on their financial background before contract are awarded to them.
- The design process is the most important phase in the construction process. Design products should be at the highest level of quality, because of that it should have more focus by clients.
- Payments of work done are not paid early.
- A thorough feasibility studies should be undertaken before any project is done.
- Beneficiary communities are not consulted when taking some of the project.

Suggestion for Future Research

- Some suggestions are provided below for future research to focus on:
- Investigation on risk management of private construction projects in Ghana
- Comparison between private and public construction projects in Ghana and their risk management

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