KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI

DETERMINANT FOR DELAYS ON COCOA FEEDER ROADS PROJECT IN GHANA

By

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DECLARATION

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

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DEDICATION

This dissertation is dedicated to God and my entire family.

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I would like to express my foremost profound gratitude to Almighty God for the strength and guidance He gave me throughout this endeavour. He made everything understandable and possible. Secondly, we express our utmost gratitude and appreciation to my supervisor Professor E. Badu and the entire body of lecturers of the Department of Building Technology for their supervision, constructive criticisms, insightful suggestions, and motivation.

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ABSTRACT

Cocoa production is a major source of revenue for socio-economic development in the country and also cocoa remains the major net export and the backbone for Ghana's economic development. Recently Ghana was ranked second in the production of cocoa beans producing 700,000 tons of cocoa beans annually. These and many others are the main reasons why proper networks have to be provided to enhance the transportation of the cocoa products effectively by construction of feeder roads that connect the place of production to sales point while minimizing the occurrence of delays. It must be noted that, currently, the effective construction of road networks is facing many challenges. These challenges may originate from client or consultant and in most occasions the contractor. The aim of this paper was to examine the determinants for delays on cocoa feeder roads projects and develop strategies to curb these delay factors. In relation to the aim, the following objectives were set; identification of the causes of delays on cocoa roads projects and identification of the strategies to curb the delays on cocoa roads project. In connection to this, the methodology adopted was the quantitative approach which included the use of survey questionnaire. Thirty (30) questionnaire were administered to various stakeholders in the construction of cocoa feeder roads. The data were analysed and they demonstrated that most of the delay factors were related to construction material management and low productivity of work personnel. The analysis also showed that in spite of all the delay factors that existed in the construction of cocoa feeder roads, effective planning can be the antidote to almost all the factors. This research demonstrates how to improve on the successfulness of execution of cocoa feeder roads.

Keywords – Feeder roads, project delay

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

The execution of roads projects in Ghana needs improvement especially in cocoa road projects which remains a priority to every Government since Guggisberg's time. Thus cocoa remains the major Net export and the backbone for Ghana's economic development and also Ghana is ranked second in the production of cocoa beans producing 700,000 tons of cocoa beans annually (Ntiamoah and Afrane, 2007). However in recent times due to the harsh economic situation of the central Government, funding for these works has been taken over by Cocoa Funded Roads Improvement Project (CFRIP), where Cocobod, through the Department of Feeder Roads (DFR) has been responsible in under-taking road improvement in cocoa growing areas. Payment under this scheme is made by the Department of Feeder Roads (DFR) to executing Contractors with funds released by Cocobod through the Ministry of Finance (Amanie, 2015).Funds used to developed and maintained the cocoa community roads are generated either through taxes on cocoa or in recent times, withholding some of the amount due the farmers on per ton of cocoa (Bank of Ghana, 2015). This remarkable scheme has brought great relief to some of the cocoa growing communities. where roads has seen rapid deterioration as a result of high level of rainfall coupled with the inability of the central government in carrying out regular road maintenance due to the aforementioned financial constraints emanating from bad economy. Efforts therefore must be made to ensure the continuity and sustainability of the scheme. In recent times, the scheme has been subjected to mismanagement resulting in losses in time, (project delivery time overrun) cost and quality of roads executed. Time, cost and quality standards are vital and essential

competence for road construction projects and must be persistently improved and evolved towards the perfection of the building production so that building projects does not fail (time quality and cost).

To meet these obstacles, those in charge of projects are tested to come up with different means of perfecting building activities in order to fulfil the desires of the investors in that venture. This study attempts to shed light on how best the Department of Feeder Roads (DFR) will carry out road project in cocoa communities and how the project maybe managed and coordinated in order to avoid delays and improve performance. According to Ahmad (2003), delays in road projects are generally known as the most faced obstacle in building projects. Agyakwa-Baah (2007) states that "delay is a general phenomenon in construction project delivery. Many researchers have come out ways that leads to effective completion of building projects. The first study to determine was carried out by Ashley (1987). He acknowledged the most imperative factors in efficiently finishing a project. Mengesha (2004) specifies that, the study into success factors of construction began in 1967. This study will delve into the causes of time extension in feeder road construction and how to perfect it so us to reduce delays.

1.2 RESEARCH PROBLEM

The building business contains many indecisions in its normal processes. The recent research works indicates that building projects are normally completed with many problems (Excessive cost, time elapse and quality issues) (Frimpong, 2003. Fugar, 2010). Road fabrication is a major contributor to Ghana's development. Conversely, road condition survey data in Ghana propose that about 40 to 50% of the country's total road networks are in deprived conditions.

Department of Feeder Roads (DFR) under the Ministry Roads and Highway is responsible for managing most of cocoa feeder roads and their activities include scheduling, procurement, building and combination of new roads into their existing road network. Currently, the above activities are fraught with numerous glitches that cause excess cost, underperformance and more disapprovingly project time elapse which constantly leads to project benefactor dissatisfaction. So, there is a must to inspect the origins of these causes to avert delays, cost overruns and lower quality performance.

1.3 AIM

The aim of this study was to examine the causes for delays on cocoa feeder roads projects.

1.4 RESEARCH OBJECTIVES

The objectives of the research were:

- To identify the causes of delays on cocoa roads projects; and
- To identify strategies to curb the delays on cocoa roads project.

1.5 SCOPE OF STUDY

The study will be limited to cocoa feeder roads projects in Fanteakwa district. The study will be focused on projects executed by A1B1 and A2B2 contractors.

1.6 METHODOLOGY

The methodology adopted for this research involved the gathering and critically reviewing the literature relevant to feeder roads construction. This served as a guide to identify previous works undertaken, contributions made, criticisms, limitations, current findings and their effective applications in the Ghanaian construction environment.

Quantitative research methods were adopted to gather information concerned with the study. The quantitative approach is chosen because it helps in collection of thoughtful data from a randomly large sample. The use of structured questionnaire was exercised to gather evidence on the study. Details of the methodology were discussed in chapter three of this paper.

1.7 ORGANIZATION OF THE STUDY

Evolving the procedure of assembling and scrutinizing data relevant to the study area in making assumptions. This study will be ordered in five chapters. Chapter one will discuss the background of the study, emphasizing on the study problems, tenacity, and objectives. It will also include the justification for the study and proposed methodology. Chapter 2 will deal with review of all available and relevant literature important to the subject of the study. It will also examine available and existing studies conducted on the subject area. Chapter 3 will deal with the methodology used in the study. This relevant procedures will seeks to identify the major causes of delays, cost overruns and low quality performance delivery towards evolving a solution. Chapter four will deal with data gathering methods and the analytical tools used to determine the relationship between critical issues affecting success performance. Chapter five the concluding chapter five will discuss the study conclusions drawn from the analysis carried out in chapter four and provides recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

Construction delays are mostly expensive, and finishing projects within time limits is advantageous for everybody involved in the project. So it is indispensable to finish projects on time so as to reap the advantages of it. Therefore, the objective of this paper is to define the most imperative causes of delay in construction projects in Ghana from the points of view of the vendor, contractor, and consultant.

2.2 OVERVIEW OF CONSTRUCTION INDUSTRY

According to Kasimu (2012), the building trade is a huge, unpredictable, and needs great capital outlays. The building industry is an area of the economy which is in charge of the scheduling, scheme, erection, preservation and ultimate flattening of building works. Thus, gaining its inputs and products from many portions of the economy. The industry aids the economy in infrastructure building and employment of labor. Every civil engineering works and all type of new building projects as well as the care and renovation of buildings forms part of the construction industry activities.

According to Gale and Fellows (1990), and Ofori (1990) building industries in all countries face numerous challenges. Nonetheless, the difficulties facing the building industry in developing countries are suggestively extra essential, extra severe, and extra intricate. Within these countries, the tests sit alongside the general situation of socio-economic stress, lasting reserve scarcity and a overall failure to control vital matters (Ofori, 2000). In developing countries, the problems faced in building firms include:

- Instability;
- Scarce resources;
- Comparatively untrained labor;
- Overwhelming amount of waste generation;
- Deprived infrastructures;
- Dishonest practices,
- Improper financing features in developing countries; and
- Administration effect

There are a number of differences between cocoa feeder roads and other roads constructed. Cocoa feeder roads projects are funded by COCOABOD while other feeder roads are funded by the Central government. Also, most cocoa feeder roads are surface dressed roads (tarred) while other feeder roads are mostly gravel roads (untarred). Cocoa feeder roads projects are also always undertaken in cocoa growing communities.

2.3 DEFINITION OF DELAY

Construction delay is the time elapsed beyond the date agreed by the parties to contract (Assaf and Al-Hejji, 2006

2.3.1 Causes of construction delay

Mobarak (2004) deliberated on the responsibility of consultancy in reducing the interruptions of huge projects and displayed likely classifications of sources of delay such as internal and external, financial and nonfinancial. Building delay issues in Ghana was deliberated on by Amer (1994) through reviewing and investigating the roots that backs building delays in order to develop the aptitude to instrument building

projects deprived of delays. Outcomes of this revision showed that the main sources of delay in building projects in Ghana are;

- Inefficient contract supervision;
- unrealistic planning;
- Delay or non- payment of work done
- Excessive variation during construction; and
- Insufficiencies in materials on site due to inefficient pre-contract planning

2.3.2 Delay factors in construction

All contract parties have goals to complete a project according to the planned schedule, within cost limits and acceptable quality under safe conditions. However, delay has become a common problem occurred in building industry nowadays. Delay lead to many adverse effects like disagreements between sponsors and contractors, augmented costs, loss of proceeds, and termination of contract. (Kasimu, 2012). Project factors and the reason for delays should be identified by construction parties in order to control and minimize construction project delays. The demand of construction clients for timely delivery of construction projects and the susceptibility of project delays and cost overruns has attracted researcher all over the world, most of who tried to identify immediate as well as the root cause of project delay (Olusegun and Akintunde, 2012). Various thesis designates the consequence of delays as time elapse, extra cost, disagreements, adjudication and desertion (Murali, 2006; Aibinu and Jagboro, 2002; Chan and Kumaraswamy, 2002).

Ahmed et al (2003) specifies that delays can be separated into three main kinds which are:

1. Excusable and non-excusable;
2. Compensable and non-compensable; and
3. Concurrent.

Non-excusable delays are triggered by contractor or subcontractors or material suppliers. The contractor in some cases be eligible for reimbursement from the delaying subcontractor or supplier, but reimbursement cannot be required from the client. Consequently, non-compensable delays typically ends up in no extra money and no supplementary time being set for the contractor (Alaghbari, 2005). There are two categories of excusable delay which is non-compensable delay and compensable delay.

Non-compensable delay is triggered by third parties. Thus incidents outside the control of both the sponsor and the contractor. These may include acts of God, uncommon weather conditions, strikes, acts of government, etc. In this circumstance, the contractor is normally eligible to a time allowance but no reimbursement for delay damages (Kasimu, 2012).

Compensable delay is triggered by the sponsors. An example of this would be the late release of drawings from the owner's architect. An excusable, compensable delay frequently leads to a plan extension and opens up the client to financial damages. In this instance, the contractor sustains supplementary ancillary costs for both protracted field office overhead and unabsorbed home office overhead. (Kasimu, 2012)

2.3.3 Construction delay

The causes and extent of delays in area undertakings in Jordan was investigated by Al–Momani (2000). He examined the sources of delays on one hundred and thirty (130) undertakings, encompassing suburban constructions, and workplace and management constructions. The example populace was instituted by selecting one hundred and thirty (30) finished area undertakings in disparate spans of Jordan amid the years of 1990 and 1997. To examine causes of assembly delays and overruns leaked, the pursuing data were acquired from the projects' archives: Planned duration of contract:

- Real completion data;
- Design variations;
- Disagreements;
- Announcements;
- Notification of work start;
- Delays met throughout building process;
- Disagreements related to the drawings and specifications;
- Time extensions; and
- Late delivery of material and equipment.

He discovered that the momentous reasons of stay were poor design, variations, meteorological situations, locale conditions, delayed transport, commercial circumstances, and rise in quantities. The four core reasons of stay were poor design, variation orders and locale and commercial situations.

2.3.4 Sources of delay in construction projects

Assaf et al. (1995) research encompassed of two segments. The early period encompassed a works study and talks alongside innate contractors, architectural builders, and proprietors, whereas 56 reasons of stay were recognized. These features were gathered into 9 main groupings:

- Materials – reasons of stay connected to shortages, physical adjustments, transport, harm, and producing of materials;
- Labor – lacks of labor and labor ability;
- Equipment – stay connected to wreck, lack, and transport of the supplies, or the output or skill of operators of the equipment;
- Financing – contractor's financing necessities and progress payments paid by owners;
- Environment – climatic conditions, communal and traditional encounter, geological conditions;
- Changes – delays as an import of oversights, errors, and adjustments of scope by owners;
- Government relations – stay connected to licenses, labor visa necessities, and power administrative procedures;
- Contractual connection – setbacks including the contractual connection amid the assorted parties encompassed in a undertaking, who have fluctuating and from time to time contradictory interests;
- Scheduling and manipulating methods – poor arranging and arranging habits, absence of association proficiency in undertaking domination and poor conservation.

2.4 SUCCESS FACTORS IN CONSTRUCTION

A constructing undertaking is finished across a blend of countless activities and contact, projected or unintended, above the existence of ability, alongside changing members and procedures in a steadily dynamic setting. Precise aspects are extra important to a project's accomplishment than others. These issues are shouted critical undertaking accomplishment factors. The term Critical Accomplishment Factors (CAF) in the context of the association of undertakings was early utilized by Rockart in 1982 and is described as the factors forecasting accomplishment on projects. Accomplishment is described by Ashley et, al. (1987) as "results far larger than anticipated or normally noted in words of price, design, quality, protection and member satisfaction". The investigation of the accomplishment factors of assembly undertakings has enticed the attention of countless researchers and countless studies have been led, alongside the target of bestowing contract parties alongside priceless vision into how to consistently accomplish superior aftermath for their projects. Even though assembly undertakings are by their nature monotonous hobbies, every single one has its own physiognomies and conditions. According to British Standards Association (BSI, 1996), a undertaking is a exceptional set of synchronized hobbies, alongside definite commencing and finishing points undertaken by individual or an association to encounter specific goals alongside described design, price and presentation parameters. A little factor is extra critical to a accomplishment of undertaking than supplementary factors and it is shouted as critical undertaking accomplishment factor. The word Critical Accomplishment Factors in the context of the association of undertakings was early utilized by Rockart in 1982 and is described as those issues forecasting accomplishment on projects.

Success is described by Ashley et al (1987) as “results far larger than anticipated or normally noted in words of price, design, protection and member satisfaction”. There are countless studies have been grasped out to furnish critical accomplishment factors in assembly industry.

2.4.1 Elements of construction project efficiency

Previous studies discovered countless success factors but a study by Ashley et al. (1987) created an understanding of the issues that brings about building projects effectiveness. The methodology he adopted included interviews with construction personnel and a literature review of pertinent works. Now there are forty six success factors gathered into 5 major classes. The classes are as follows:

1. Management, organization, and communication;
2. Scope and scheduling;
3. Controls;
4. Environmental, economic, political, and social

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter talks about the methodology adopted for this research. It describes how the data was collected, handled and how it was utilized in addressing the issues brought out by the research aim and objectives. It also explained the method used to analyse the data, how the sampling population and sample size was determined. In brief, this chapter pursues to label the whole method that addressed the research intention and objectives and questions.

3.2 RESEARCH DESIGN

Research design basically talks about a collection of guides or rules or data collection (Ogoe, 1993). Researchers stipulate that, research design shows the structure for data collection and analysis. The structure influences the technique for collection and analysis of data and provides the connection between empirical data as well as its conclusions in a logical sequence to the initial research question of the study (Baiden, 2006).The research adopted a questionnaire survey in the quest to explore the various challenges that causes delay in the construction of cocoa feeder roads.

3.3 RESEARCH STRATEGY

This section constitutes the approach that was approved for this study. It describes the theoretical locus of the study, the approach that was implemented, and why that strategy was adopted. This section also describes the quantitative approach to research: what it entails and the main reasons why the quantitative system was

selected over qualitative. Finally the section seeks to justify the strategy that was adopted for this research.

Philosophical positions have significant effects on research design. (Christou, *et al.*, 2008).There are two core theoretical loci of research, namely ontology and epistemology (Bryman 2004). Ontology is the nature of reality (Hudson and Ozanne, 1988) while epistemology is the relationship between the researcher and the reality (Carson et al., 2001) or how this reality is known. There are two main ontological and epistemological ideologies: Positivism and "Interpretivism."At the ontological level, the position adopted for this research is objectivism. The positivist ontology believes that the world is external (Carson et al., 1988). Positivist researchers are detached from the participants therefore they are emotionally unbiased to make clear distinctions between reason and feeling (Carson et al., 2001).This paper looks at delays in the construction of cocoa feeder roads. This objective is completely out of the influence of the researcher hence objectivism ontological position was the best option. At the epistemological level, this research follows the positivists approach. Statistical and mathematical techniques are central to positivist research, which adheres to specifically structured research techniques (Carson et al., 2001).This research was carried out using statistical tools. This brought out the ability to generalize the outcome of the research.

3.3.1 Quantitative Research

According to Bryman (2004), quantitative research is a research approach that stresses on measurement and quantification in the gathering and investigation of data. By definition, measurement must be objective, quantitative and statistically valid and the

sample size for a survey is calculated using formulas to determine how large a sample size will be needed from a given population (Anderson, 2006).

The reason for adopting quantitative approach is that, it is associated with verification of theories and hypothesis testing and it also employs the use of questionnaires and existing databases. It also involves the use of statistical tools in analysing large sample size from a population to get an outcome that can be generalized. It also obeys all the rules of positivism.

3.4 DATA COLLECTION AND INSTRUMENTATION

3.4.1 Questionnaire Design and Development

Questionnaire includes instruction for completion, response alternatives where appropriate and specific means for recording responses (Frazer and Lawley, 2000).Oppenheim (1992) described questionnaire design as a crucial part of the research design stage. Questions in a questionnaire can be open-ended, close-ended or a mixture of the two (Frazer and Lawley, 2000; Oppenheim, 1992). There are four main methods of questionnaire administration. These include mail questionnaire; personally administered questionnaire; telephone questionnaire; and internet questionnaire (Frazer and Lawley, 2000).

In order to achieve the aims and objectives of the research an elaborate questionnaire was developed based on the stated objectives of the research. The questionnaire used in this research (Appendix A), consist of two parts, with the first part considering the background information of the respondent. The section B of the questionnaire was developed in accordance to the objectives of the study, in relation to the comprehensive literature review conducted on the topic. The opinions and perceptions of the various construction personnel were collected and scaled with scores ranging

from 1-5 popularly called the likert scale. The questions addresses the factors that causes delays in the construction of cocoa feeder roads and the factors that will ensure the success of its construction.

3.4.2 Sampling Technique and Sample Size

Sample means a part of a population drawn to reflect the remaining of the population (Naoum, 1998).The population of a research is the universe of units from which the sample is selected (Bryman, 2004).The targeted group was A1B1 and A2B2 road contractors in Fanteakwa district. This sample size was chosen because non-empirical evidence shows that these companies have good organizational set up that lend themselves to refined academic research work than the lower class of companies.

Furthermore, snowball sampling was utilized in attaining the sample size because of the difficulties encountered in assessing the population size of the class. With this technique links are created to meet other respondents by asking previous respondents. The targeted group were A1B1 and A2B2 road contractors in Ghana. This strategy viewed as a response to overcome the problems associated with concealed or hard-to-reach populations. The process based on the assumption that a 'link' exists between the initial sample and others in the same target population, allows series of referrals made within a circle of acquaintance (Berg, 1988; Atkinson & Flint, 2001).

3.4.3 Instrument Administration

The questionnaires were self-administered by hand delivery by the researcher to personnel in the road construction firms. Some of the questionnaires were retrieved on the spot whiles the rest were retrieved a week or two after their administration. In all thirty (35) questionnaires were administered and thirty (30) of them where retrieved representing a response rate of 85.71%

3.5 DATA PREPARATION AND STATISTICAL TOOLS INTENDED FOR THE ANALYSIS

This section talks about how the quantitative data collected was processed and analysed. Oppenheim (1992) prescribed a way of going about analysing collected data. He proposed that, routines, which should be followed, has to be set. This includes: assigning numbers to instruments; giving each entry a name; entering them into relevant statistical package; producing a simple two way matrix of variables versus responses; giving respondents serial numbers to ensure there is no mix-up; and coding the data to allow for statistical analysis. In relation to the above the individual responses collected were processed and entered into the Statistical Packages for Social Sciences (SPSS version 16) and later processed by Excel 2007 for analysis. The statistical tool used to run the analysis was descriptive statistics and the Relative Importance Index (RII) was used to rank the identified variables.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION OF RESULTS

4.1 INTRODUCTION

This chapter analyses the data collected from the thirty road construction professionals operating in the Eastern region. This chapter deals with the analyses and discussion of the factors that causes delay in the construction of cocoa feeder roads in Ghana.

The analysis of this study is strictly based on the objectives in chapter one which is:

- To identify the causes of delays on cocoa roads projects; and
- To identify success factors to curb the delays on cocoa roads project.

The organization of the data presentation, description and analyses were done using Statistical Package for Social Sciences (SPSS) and Microsoft Excel. The statistical tools used for the analysis were the Frequency Index and Relative Importance Index (RII), which were used to rank the various variables. This chapter also presents the results of the analysis and discussions in the form of texts, figures and Tables.

4.2 DEMOGRAPHIC/ BACKGROUND INFORMATION

This section presents background information on various respondents. The background information included the respondent's financial class, his academic qualification, his position in the firm and the respondent's level of experience.

4.2.1 Financial class

The purpose of this question was to know the respondents financial capabilities which also depicts the class of the contractor in road construction classification. Respondents were ask to indicate whether they belonged to class A1B1 or A2B2. **Table 4.1** and **Fig. 4.1** shows a summary of the responses. The table vividly shows that 16.7 percent of the respondents belonged to class A1B1 and 83.3 percent belonged to A2B2 class. This depicts that the outcome of this research will be based on responses from highly experienced road contractors with good financial standings.

Table 4.1: Financial class

Class	Frequency	Percent (%)	Cumulative Frequency (%)
A1B1	5	16.70	16.70
A2B2	25	83.30	100.00
Total	**30**	**100.00**	

Source: Field survey 2015

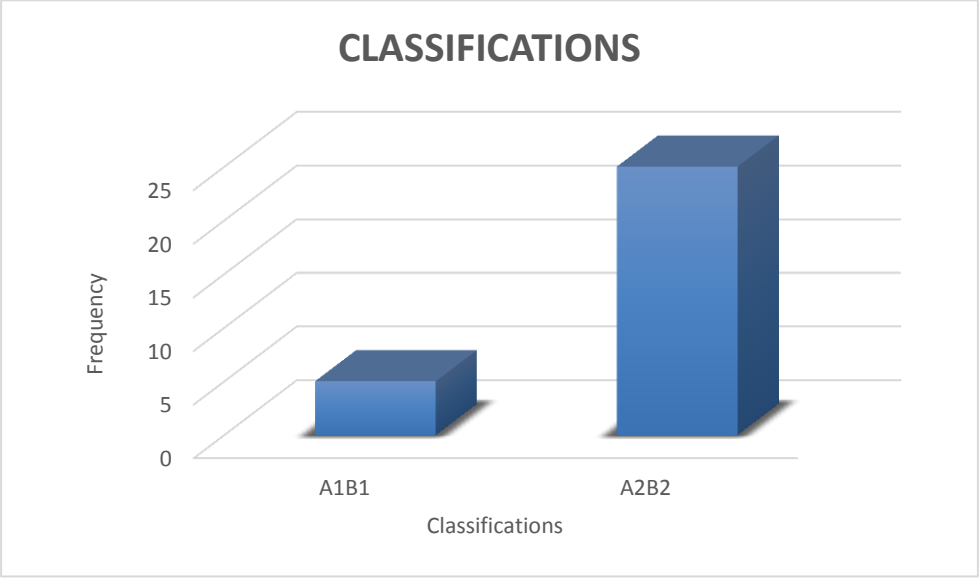

Fig. 4.1 Contractor's classification

4.2.2 Academic qualification

Table 4.2 and **Figure 4.2** shows a summary of the responses to the question that demanded the respondents to indicate their academic qualification. The purpose of this background information was to help determine the academic experience of the respondents. The table shows that, 33.3 percent of our respondents had BSc degree while 23.3 percent were holders of MSc degree. 26.80 percent of our respondents had HND degree. The rest had other lower degrees which is shown on the table below. In relation to this findings, it shows that the results of this research will be based on responses from educated personnel.

Table 4.2: Academic qualification

Academic qualification	Frequency	Percent	Cumulative Frequency
City and guilds	5	16.60	16.60
HND	8	26.80	43.40
BSc	10	33.30	76.70
Msc	7	23.30	100.00
Total	**30**	**100.0**	

Source: Field survey 2015

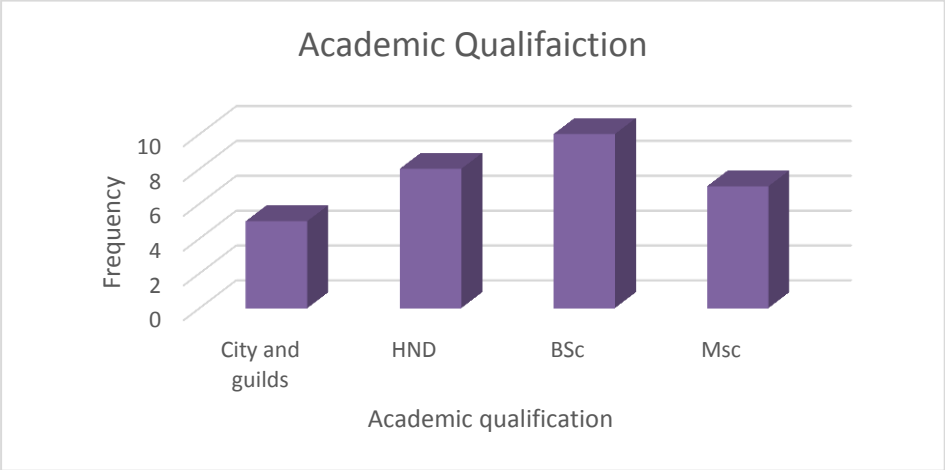

Fig. 4.2: Academic qualification

4.2.3 Level of experience

The main intent of this question was to ascertain how long the respondents have worked with their respective companies. This information will give relevance to the quality of answers given out by the respondents. Also if respondents have gained more experience from working with their respective companies, it is likely they will be in the position to ascertain the main reasons of delay in construction of cocoa feeder roads and that will validate the responses. **Table 4.3** and **Figure 4.3** below represents the respondent's years of service with their respective companies. From the Table, 36.70 percent representing 11 respondents have worked for 1-5 years and 40 percent have been working with their current companies for between 6-10 years and only 7 respondents representing 23.30 percent have been working for their company for over 10 years. From this findings, it can be realized that most of the respondents are highly experienced in the road construction field which help increase the authenticity of the outcome.

Table 4.3: Respondents years of service

Years of service	Frequency	Percent (%)	Cumulative Frequency (%)
1-5	11	36.70	36.70
6-10	12	40.00	76.70
Over 10	7	23.30	100.00
Total	**30**	**100.0**	

Source: Field survey 2015

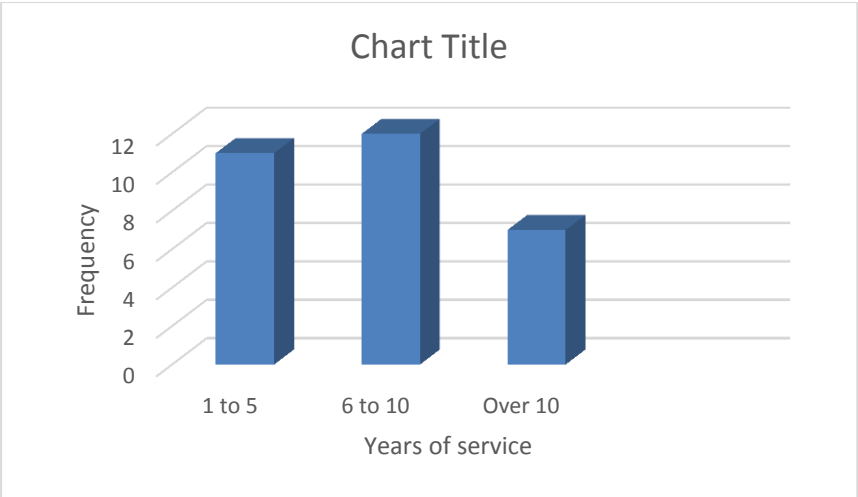

Fig. 4.3: Years of service

4.2.4 The number of projects executed

Table 4.4 and **Figure 4.4** shows the summary of analyses of the number of clients that our respondents work with successfully. The ability of contractor to execute a project successfully adds to his reputation and experience. Majority of our respondents have worked on 8-10 projects representing 36.70 percent. Only 6.70 percent representing 2 respondents have worked on 4-7 projects.30 percent also represented respondents who have worked on 1-3 projects. This findings implies that the outcome of the report will be based on responses from contractors who have executed a sizeable quantity of construction projects.

Table 4.4 The number of projects executed

Number of projects	Frequency	Percent (%)	Cumulative Frequency (%)
1-3	9	30.00	30.00
4-7	2	6.70	36.70
8-10	11	36.70	73.40
Over 10	8	26.60	100.00
Total	**30**	**100.0**	

Source: Field survey 2015

Fig. 4.4 Number of project executed

4.3 DELAYS IN CONSTRUCTION OF COCOA FEEDER ROADS

The segment of the questionnaire wanted to give respondents the chance to demonstration by indicating on a five point Likert scale, the causes of delays on cocoa roads projects; and to identify success factors to curb the delays on cocoa roads project

4.3.1 Causes of Delay

Building delay problems in Ghana were discussed by Amer (1994) via studying and analysing the causes that contribute to construction delays in order to progress the aptitude to device construction projects without delays and he came out with series of factors that causes delay.

Table 4.3.1a in the appendix B represents the average percentile ratings of all the listed delay factors and how they affect the construction industry. A critical look at the table shows that an average rating of 4.45 percent of our respondents proposes that the delay factors outlined least affects construction of cocoa feeder roads while an

average rating of 25.55 percent shows that the factors propensity of causing delays in construction is low. The table also depicts those factors having high effects on the construction of cocoa feeder roads amounts to 28.45 percent. 22.67 percent proposed that, the delay factors have a rather higher effect on construction and 18.90 percent showed that the delay factors effect is highest. From the respondent's response, it can be said that majority was of the view that the outlined delay factors had high effects on the construction of cocoa feeder roads in Ghana.

The delay factors identified were also analysed using Relative Importance Index (RII) and critical success factors were identified from literature and respondents were asked to rate them respectively to their degree of significance. The score of each factor obtained from the analysis were considered by summing up the scores given to it by the correspondents. The computation of the Relative Importance Index (RII) was done using the formula below.

$$RII = \frac{\Sigma W}{A * N}$$

Where W is the; Weighting assigned to the factors by the respondents and the range set was from 1 to 5.

A – Is the highest possible response for the factors, and N is- the total Number of Respondents.

The (**RII**) values ranges from 0 to 1 with 0 not inclusive. It shows that the higher the value of **RII**, the more significant was the critical success factor and vice versa. According to Chen et al. (2010), the comparison of RII with the corresponding significance level is measured from the transformation matrixes which are as follows:

High (**H**)	0.8 < RII < 1.0
High-Medium (**H-M**)	0.6 < RII < 0.8
Medium (**M**)	0.4 < RII < 0.6
Medium-Low (**M-L**)	0.2 < RII < 0.4
Low (**L**)	0.0 < RII < 0.2

Table 4.5 below shows the Relative Importance Index (RII) values and its significant levels for success factors in the construction of cocoa feeder roads.

Table 4.5: Causes of delay in the construction of cocoa feeder roads.

ITEM	Delay factors	Total	∑W	Mean	RII	Significance level
1	Contractors financing necessities	30	128	4.27	0.85	**H**
2	Progression payment	30	123	4.1	0.82	**H**
3	Shortage of material	30	116	3.87	0.77	**H-M**
4	Consequences of omissions	30	100	3.33	0.67	**H-M**
5	Productivity of equipment operators	30	96	3.2	0.64	**H-M**
6	Transportation of material	30	96	3.2	0.64	**H-M**
7	Physical adjustment to materials	30	95	3.17	0.63	**H-M**
8	Shortages of labor skills	30	92	3.07	0.61	**H-M**
9	Poor record keeping	30	91	3.03	0.61	**H-M**
10	Lack of expertise	30	89	2.97	0.59	**M**
11	Climatic conditions	30	89	2.97	0.59	**M**
12	Damage of materials	30	86	2.87	0.57	**M**
13	Contradictory interest	30	85	2.83	0.57	**M**
14	Permits bureaucracy	30	82	2.73	0.55	**M**
15	Geological conditions	30	81	2.7	0.54	**M**

Source: Field survey 2015

4.3.1.1 Contractor's financing necessities

Contractor's financing necessities had RII value of 0.85 thus high (H) significant levels and it also had the highest RII value. This implies that the respondents deem contractor's financing necessity as the most imperative factor that causes delay in the construction of cocoa feeder roads. Most highly experienced contractors predict its financing necessities prior to the commencement of the project through the use of cashflow diagrams but most clients delay in payments thus causing the contactor to be in financial needs. In most cases contractors halts construction progress until they receive payments from clients. This causes delays in the project and this is the normal trend in government projects as payments are almost always delayed and in extreme cases contractors do not receive payments at all. So, it's not surprising the respondents ranked this factor as most significant

4.3.1.2 Progression payment

This factor was ranked by respondents as the second most significant factor that causes delay in the construction of cocoa feeder roads with RII value of 0.82 thus high (H) significance level. This depicts that progress payments is also recognized as an essential feature that causes delay in the laying of cocoa feeder roads. Works done are normally valued by the consultant or a quantity surveyor for payments to be made by the client to the contactor. These payments are sometimes delayed as consultants or quantity surveyors may take much time than necessary for the valuation. Contractors then become cash strap and halt the progress of the project for a while which obviously causes project delay.

4.3.1.3 Shortage of materials

Shortage of materials was ranked third and had an RII value of 0.77 thus High-Medium (H-M) significance level. Therefore the significance of this factor cannot be overlooked. Material shortages like butimen emulsion and chippings will obviously cause progress of the project to come to a standstill as there will be materials to work with. Materials shortages can originate from contractors mismanagement or unrealistic planning. It may also originate from client's inability to provide for materials. Either ways causes contraction of feeder roads to halt.

4.4 SUCCESS FACTORS IN THE CONSTRUCTION OF COCOA FEEDER ROADS

The segment of the questionnaire sought to give respondents the opportunity to show by indicating on a five point Likert scale, the success factors in the construction of cocoa feeder roads.

4.4.1 Success factors in cocoa feeder roads construction

Numerous success factors exist in laying of feeder roads. A few of these factors were outlined and respondents were ask to indicate how important it is in the construction industry.

Table 4.4.1a in the appendix represents the average percentile ratings of all the listed success factors in the construction of feeder roads. A critical look at the table shows that an average rating of 0.28 percent of our respondents proposes that the outlined factors are not important success factors while an average rating of 4.44 percent showed that the factors outlined are least important success factors in feeder roads construction. The respondents responded to the factors with are important

success factors as 23.90 percent. 35.81 percent proposed that, the factors are very important success factors and 35.57 percent showed that the outlined factors are the most important success factors in the construction of cocoa feeder roads. From the respondents' response, it can be said that majority were of the view that the factors outlined are very important success factors in the construction of cocoa feeder roads.

Table 4.6 below shows the Relative Importance Index (RII) values and its significant levels for strategies to curb delays in the construction of cocoa feeder roads.

Table 4.6 Strategies to curb delays in the construction of cocoa feeder roads

ITEM	Strategies	Total	∑W	Mean	RII	Significance level
1	Effective planning	42	133	4.43	0.63	**H-M**
2	Establish realistic goals	42	127	4.23	0.61	**H-M**
3	Financial support	42	127	4.23	0.61	**H-M**
4	Effective resource management	42	125	4.17	0.60	**H-M**
5	Effective collaboration	42	123	4.1	0.59	**M**
6	Understanding the work scope	42	122	4.07	0.59	**M**
7	Allocation of responsibilities	42	124	3.13	0.59	**M**
8	Project team motivation	42	116	3.87	0.55	**M**
9	Effective material management	42	115	3.83	0.55	**M**
10	Well establish procedures	42	110	3.67	0.52	**M**
11	Continuous reviews	42	92	3.07	0.44	**M**

Source: Field survey 2015

4.4.1.1 Effective planning

Effective planning was ranked first as the most important success factor with RII value of 0.63 thus High-Medium (H-M) significance level. The respondents believe that effective planning can help curb the occurrence of delays in construction of cocoa feeder roads. Planning effectively will ensure that there are no shortages during the progress of the project and there will be the right amount of materials available at a particular time. Thus operatives will not come to work just to realize there are no materials which in turn will cause delay to the whole project.

4.4.1.2 Establish realistic goals

This factor had RII value of 0.61 with a mean score of 4.23.It had a significance level of high-medium **(H-M)** which shows that establishment of realistic goals can help reduce the occurrence of delays in the construction of cocoa feeder roads**.** Formulation of company goals is a very important step in every industry but the goals being realistic and feasible is what the industries should look up for. These goals could be long or short term but the establishment of both long and short term goals could prove very useful because every activity would be undertaken concentrating on the goals.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

This dissertation, which essentially delves into the causes of delay in the construction of cocoa feeder roads is divided into five (5) independent but interrelated chapters. The main introduction to the research covered in Chapter One. The review of literature on the topic, which covered the various objectives listed in chapter 1.4, was captured in Chapters two. In Chapter three, the methodology adopted for the study including the philosophical positions, research design, and research strategy was discussed. The research process was in one main phase; survey questionnaires. Chapter four presented the empirical analysis and provided detailed discussions on the survey results. This chapter (Chapter five) summarizes the issues addressed throughout the study. It begins with a summary of how the research objectives were achieved, followed by contributions of this research to knowledge. The chapter concludes with recommendations for further research that can be conducted based on the conclusions and limitations of the study

5.2 SUMMARY OF FINDINGS

This research was initiated with the primary aim of identifying and delving into factors that cause delay on cocoa feeder roads project in Ghana.

In order to achieve the stated aim, two research objectives were set in Section 1.4. Objective 1 and objective two were achieved mainly through literature reviews and the survey questionnaires, which were conducted. Below is a discussion on the various findings from the research.

Literatures on the causes of delays on cocoa roads project were reviewed covering a number of relevant issues. The review began with a general definition of delay followed by the causes of delay. The literature review also delved into the various factors of delay in the construction industry. From the various literatures, it was observed that all contract parties (client, consultant and contractor) have a basic aim to complete a project according to the planned schedule, within cost and in safe conditions. However, delay has become a common problem occurred in construction industry nowadays. From the literature, the delays were attributed to factors like poor contract management, unrealistic planning, lack of owner's financing/payment for completed work etc. Delays in construction causes a lot of problems including: disagreements between clients and contractors, increased costs, loss of productivity and revenue, and termination of contract. Fifteen (15) variables were identified then thirty(30) questionnaires were distributed to various construction firms to indicate the delay factors with the highest effect on the construction of roads and using Relative Importance Index, contractor's financing necessities came up top.

The second finding began with the twelve (12) strategic factors and questionnaire distributed for respondents to indicate their degree of affirmation to the various success factors identified. RII was also adopted to rank the numerous factors and identify the most important success factor. After the rankings it was noticed that effective planning when incorporated into construction of feeder roads will reduce the delays that occurs in its construction.

5.4 RECOMMENDATIONS

The main aim of the thesis was to examine factors that cause delay on cocoa feeder roads project in Ghana. Consequently objectives were set to prescribe strategies for addressing the delays in construction of cocoa feeder roads. In view of the findings of this research, the following recommendations are therefore prescribed for formulation and implementation so as to increase the success of construction of feeder roads.

- Contractors should opt for formulation of long term goals to and incorporate them with short term goals so as to give the firm a focus,
- Planning of the firms activities should be a major pre-contact activity for all contractors and
- Incentives should be given to contactors for completing projects on time in order to motivate contactors in that respect.

5.5 DIRECTIONS FOR FUTURE RESEARCH

There are numerous research avenues in the future as a result of this study. An open avenue for future research can be directed to study of the challenges road constructors face in the construction of feeder roads.

5.6 CONCLUSION TO THE RESEARCH

The paper demonstrated delays in construction of cocoa feeder roads can be attributed to various factors but effective planning is the key to a successful construction project. There should be advanced research in thisarea of cocoa feeder roads construction to help improve effectives and durability in its construction since cocoa production in Ghana is a major income generation for our economy.

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APPENDIX

APPENDIX A: QUESTIONNAIRE

QUESTIONNAIRE

Dear Sir / Madam

RE: FINAL YEAR RESEARCH PROJECT – MSc CONSTRUCTION MANAGEMENT

I am a final year MSc Construction Management Student of KNUST. In fulfilment of the requirement for graduation, I am carrying out research on 'Determinant for Delays on Cocoa Feeder Roads Project in Ghana.

Your participation in this research will be greatly appreciated in order to find solution to problems regarding construction delays in Cocoa Feeder Roads Project in Ghana.

I wish therefore to ensure you that any information you provide will be treated with the strictest confidence and will only be used for the purpose of this research.

I count on your favourable consideration.

Yours faithfully, Signature

Signature Signature

SECTION A: Background Information

Please tick [√] the most appropriate answer or option for each question only where it is applicable. Where you are required to state please write your answer in the space provided.

1. Name of your construction firm …… (Optional)
2. Please Indicate the financial class of your firm
   A. [ ] A1B1
   B. [ ] A2B2
3. Highest Academic Qualification
   A. [ ] City and Guilds
   B. [ ] HND
   C. [ ] BSc
   D. [ ] MSc
   E. [ ] PhD

Others …….. (Please Indicate)

4. Please indicate your position in the Ghanaian Construction Industry
   A. [ ] Health and Safety Officer
   B. [ ] Site Supervisor
   C. [ ] Site Engineer
   D. [ ] Project Manager
   E. [ ] Assistant Project Manager
   F. [ ] Project Co-ordinator
5. Number of years you have worked in the Ghanaian Construction Industry
   A. [ ] 0-1 year

B. [ ] 1-2 years

C. [ ] 3-5 years

D. [ ] 6-10 years

E. [ ] Over 10 years

6. Please indicate the number of construction projects you have been involved in Ghana

A. [ ] None

B. [ ] 1 project

C. [ ] 2-3 projects

D. [ ] 4-7 projects

E. [ ] 8-10 projects

F. [ ] Over 10 projects

DELAY FACTORS QUESTIONNAIRE

SECTION B:

Please tick [√] the most appropriate answer or option for each question only where it is applicable. Rankings; 1=Least, 2=Low, 3=High, 4=Higher, 5=Highest

NO.	FACTORS	1	2	3	4	5
1	Shortages of material					
2	Physical adjustments to material					
3	Transportation of material					
4	Damage of materials					
5	Shortages of labour skill					
6	The productivity of operators of the equipment					
7	Contractor's financing necessities					
8	Progression payment paid by owners					
9	Climatic conditions of environment					

10	Geological conditions of constructions of construction site					
11	Consequences of omissions, errors, and adjustments of scope					
12	Connected to permits and power bureaucratic procedures					
13	Contradictory interest between assorted parties					
14	Lack of associated expertise in undertaking domination					
15	Poor record keeping and maintenance					

IF OTHER PLEASE ADD

NO.	FACTORS	1	2	3	4	5

SUCCESS FACTORS QUESTIONNAIRE

SECTION C

Please tick [√] the most appropriate answer or option for each question only where it is applicable. Rankings; 1=Not Important, 2=Least Important, 3=Important, 4= Very Important, 5=Most Important.

NO.	FACTORS	1	2	3	4	5
1	Effective management of the resource and people					
2	Continuous reviews					
3	Effective planning, controlling, and organizing of the activities					

4	Effective collaboration / communication between assorted parties and employees					
5	Understanding on scope and work definition					
6	Establish clear and realistic goals					
7	Effective planning in job sequence					
8	Allocation of responsibilities to employees in line with competencies					
9	Adequate resources and financial support					
10	Project team motivation and goal orientation					
11	Well established conventional procedure					
12	Effective management for materials, equipment and supplies					

IF OTHER PLEASE ADD

NO.	FACTORS	1	2	3	4	5

APPENDIX B: FREQUENCY TABLES

Table 4.3.1a: Average ratings of delay factors in construction of cocoa feeder roads

Factors	Least	Low	High	Higher	Highest
Shortage of material	0.00	10.00	33.30	16.70	40.00
Physical adjustment to materials	6.70	26.70	23.30	30.00	13.30
Transportation of material	3.30	23.30	40.00	16.70	16.70
Damage of materials	6.70	50.00	10.00	16.70	16.70
Shortages of labor skills	6.70	36.70	16.70	23.30	16.70
Productivity of equipment operators	3.30	23.30	26.70	43.30	3.30
Contractors financing necessities	0.00	3.30	26.70	10.00	60.00
Progression payment	0.00	3.30	30.00	20.00	46.70
Climatic conditions	0.00	33.30	40.00	23.30	3.30
Geological conditions	0.00	50.00	30.00	20.00	0.00
Consequences of omissions	0.00	36.70	10.00	36.70	16.70
Permits bureaucracy	13.30	10.00	50.00	13.30	13.30
Contradictory interest	16.70	36.70	10.00	20.00	16.70
Lack of expertise	6.70	3.30	60.00	16.70	13.30
Poor record keeping	3.30	36.70	20.00	33.30	6.70
Average Ratings (%)	**4.45**	**25.55**	**28.45**	**22.67**	**18.90**

Table 4.4.1a: Success factors in cocoa feeder roads construction

Success Factors	Not important	Least important	Important	Very important	Most important
Effective resource management	0.00	0.00	33.30	16.70	50.00
Continuous reviews	0.00	33.30	36.70	20.00	10.00
Effective planning	0.00	0.00	3.30	50.00	46.70
Effective collaboration	0.00	6.70	16.70	36.70	40.00
Understanding the work scope	0.00	3.30	26.70	30.00	40.00

Establish realistic goals	0.00	0.00	16.70	43.30	40.00
Effective planning	0.00	0.00	6.70	43.30	50.00
Allocation of responsibilities	0.00	0.00	30.00	26.70	43.30
Financial support	0.00	0.00	26.70	23.30	50.00
Project team motivation	0.00	6.70	20.00	53.00	20.00
Well establish procedures	3.30	0.00	36.70	46.70	13.30
Effective material management	0.00	3.30	33.30	40.00	23.30
Average Ratings (%)	**0.28**	**4.44**	**23.90**	**35.81**	**35.57**