

JIMMA UNIVERSITY
JIMMA INSTITUTE OF TECHNOLOGY
SCHOOL OF CIVIL AND ENVIRONMENTAL
ENGINEERING
CIVIL ENGINEERING DEPARTMENT
CONSTRUCTION ENGINEERING AND
MANAGEMENT STREAM

**Assessment on causes of construction dispute in South Western
district of Ethiopian Road Authority Projects**

A thesis submitted to the School of Graduate Studies of Jimma University in Partial fulfillment of the Requirements for the Degree of Masters Science in Civil Engineering (Construction Engineering and Management Stream).

BY:
KEBENE ADEBA

September, 2016
Jimma, Ethiopia

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September, 2016

Jimma, Ethiopia

DECLARATION

This thesis is my original work and has not been presented for degree in any other university

Name	Signature	Date
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This thesis has been submitted for examination with my approval as university supervisor

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ABSTRACT

Construction Industry plays a considerable role in socio-economic development of any nation, largely for developing countries. like many developing countries Ethiopia is also facing various management problems among which construction of disputes are quite well-known .South Western part of Ethiopia is experiencing the largest improve in road infrastructure. In this district Roads Authority has planned and executed a number of road projects and some of them are in progress.

Disputes are one of the problems that construction project may face. They are common in the construction industry. Disputes might cause some effects such as delayed and cancelled Projects, Reduced Numbers of Bidders, Higher Project costs, conflict among Parties and Technical failure due to poor construction if they are not determined in a proper manner.

Hence the main objective of this research was assessment of the causes of construction Dispute in South Western District of ERA Projects by: identifying problems of construction Dispute and its adjustment in South Western district of ERA Projects.

The data analyzed was calculated using relative importance index (RII) and the numerical formula to determine causes of construction Dispute. Questionnaire survey was distributed to the client, consultants, and contractors. They were and still are engaged in road construction projects within the city and also as data sources and population in South Western district of ERA Projects.

In order to identify causes of construction Disputes that occur in South Western District of ERA Projects out of 50 questionnaires, 11 were distributed to client, 19 for contractors and 20 were consultant to identify Dispute causes that occurred in. 88% of the questionnaires were received from respondents. The quantitative data were analyzed to identify the main factors of Dispute development. While qualitative was analyzed by content analysis.

The main factors of cause of construction Dispute in study area were identified. These reasons further categorized into four groups as; client related, contract document related, contractor related and consultant related factors and technical failure due to poor construction, budget based on incomplete data and quality concerns were identified as major exposure for loss on ERA construction project of the study area. Finally types of delays, knowing the strength and weakness of the project (project complexity) and conditions of the contract were identified as the factor to be consider in the selection of appropriate methodology for assessment of cause of construction Dispute.

Therefore, this study recommended that in order to minimize cause of construction Dispute on road projects were practicing good construction management, using proper work schedules practicing on time payment and knowing the strength and weakness of the projects.

Keywords: Cause, Disputes, factors and Road Project.

TABLE OF CONTENTS

ACKNOWLEDGMENT.....	i
ABSTRACT.....	v
LIST OF TABLES	vi
LIST OF FIGURES.....	viii
ACRONYMS.....	xi
CHAPTER ONE.....	Error! Bookmark not defined.
INTRODUCTION	Error! Bookmark not defined.
1.1 Background	1
1.2 Statement of the Problem	5
1.3 Research questions	6
1.4 Objectives.....	6
1.4.1 General objective.....	6
1.4.2 Specific Objective.....	7
1.5. Scope and delimitation of the study.....	7
1.6. Significance of the study.....	7
CHAPTER TWO	9
LITERATURE REVIEW	9
2.1. Construction Industry.....	9
2.2 Classification of Construction Industry.....	10
2.3. Construction disputes	11
2.4 Different types of disputes were:	13
2.4.1. Price Escalation disputes	13
2.4.1.1 Price Increase: Definitions.....	14
2.4.1.2. Factors Causing Price Escalation.....	14
2.4.2. Contractual disputes	20
2.4.3. Extra work disputes:	20
2.4.4. Delay disputes:	20
2.5. Occurrence of Causes for disputes.....	22
2.6 Effects of disputes.....	Error! Bookmark not defined.

2.7. Factors considered in the selection of appropriate methodology for the dispute analysis	
Conditions of the contract:.....	Error! Bookmark not defined.
2.7.1. The Contract Documents.....	28
2.7.2. Contractor related factor.....	29
2.7.2.1 Some of contractor related factors that cause disputes were:	29
2.7.3 Consultant related factor	30
2.8 Construction Contract	31
2.9 Methods of Price Adjustment in construction dispute resolution.....	32
2.9.1. Basic Prices/Proven Cost Method	33
2.9.2. Indices/Formula Method.....	33
2.10. Current Practice of Dispute Resolution methods	35
2.10.1 Dispute Resolution Systems Design.....	37
2.10.2. A Flexible Framework for the Prevention and Resolution of Construction Disputes	38
CHAPTER THREE	Error! Bookmark not defined.
RESEARCH METHODOLOGY	Error! Bookmark not defined.
3.1. General	43
3.2 Description of the Study Area	44
3.3 Research Process	47
3.4 Study Period	47
3.5 Data Collection.....	48
3.5.1 Source of Data	48
3.5.2 Study Population.....	48
3.6 Study Design	48
3.7 Sample size and sampling procedure	49
3.7.1 Sample size	49
3.7.2 Sampling procedures	49
3.7.3. Data Collection Tools/Instruments	50
3.7.3.1. Questionnaire.....	50
3.8. Method of Data Analysis.....	50
3.8.1. Questionnaire Analysis.....	50

3.9. Relative importance index (RII).....	51
3.10. Data Measurement.....	53
3.11. Ethical Consideration	54
3.12. Study variables	54
3.12.1 Dependent variable:	54
3.12.2 Independent Variable:.....	54
3.13. Data collection process.....	55
3.13.1. Primary Data Sources	Error! Bookmark not defined.
3.14. Demographic Characteristics of Respondents.....	56
3.15. Data Processing and Analysis	57
3.16. Reliability of data	59
3.17. Data quality assurance.....	60
3.18 Plan for dissemination.....	60
CHAPTER FOUR.....	61
RESALTS AND DISCUSSIONS.....	61
4.1. Introduction	61
4.2. Questionnaires Finding and Discussion	61
4.3. The average years of experience of the respondent	62
4.4. Position of respondent in the organization.....	63
4.5. Relative Importance Index Analysis and Ranking different reasons of disputes.....	64
4.6. Causes of Construction Dispute which are identified by the respondents in South West District of ERA Projects.....	63
4.7. Level of Factors considered finding out remedial measure to minimize construction Dispute in South West District of ERA Projects.....	67
4.7.1. Reasons of dispute development on road construction related to client.....	69
4.7.2. Reasons of contract dispute evolvment on road construction related to Contract document.	70
4.7.3. Reasons of dispute development on road construction related to Contractor	70
4.7.4. Reasons of disputes development on road construction related to Consultant	72
4.8 Effects of Construction Dispute.....	73
4.9. Methods to manage/administer Construction Dispute	72
4.10 Positioning of all Dispute cause from overall respondents	74

4.11. Test for agreement in ranking performance factors among respondents	79
CHAPTER FIVE:	81
CONCLUSION AND R ECOMMENDATION.....	81
5.1 CONCLUSIONS.....	81
5.2 RECOMMENDATION	82
REFERENCES	84
APPENDIX: I.....	94

LIST OF TABLES

Table 1	Identified causes of price escalation variables for use in the survey	19
Table 2	Causes of construction Disputes	23
Table 3	Effects construction disputes	25
Table 4	Different factors of construction disputes.....	27
Table 5	Methods to manage/administer of Construction Dispute and its adjustment	43
Table 6	Rating scale for factors causing construction Dispute.....	51
Table 7	Rating scale for effects of construction disputes	53
Table 8	Rating scale for problems of Construction Dispute and its adjustment administration.....	56
Table 9	Rating scale to find out remedial measure to minimize construction Dispute	51
Table 10	Likert's scale.....	53
Table 11	Summary of questionnaires administration	56
Table 12	Questionnaire distribution.....	64
Table 13	Experience of respondents (years).....	65
Table 14	Respondents position in the organization	68
Table 15	Causes of construction Disputes identified by the respondents.....	69
Table 16	Causes of construction Disputes identified by the respondents founded on RII.....	65
Table 17	Different Factor of Construction Dispute in South Western District of ERA.....	68
Table 18	.Position of causes of contract claim on road construction related to client on RII.	72
Table 19	.Position of causes of dispute on road construction to contractdocument on RII.....	70
Table 20	Position of causes of disputes on road construction related to contractor on RII.....	71
Table 21	. Position of causes of disputes on road construction related to consultant on RII.....	72
Table 22	Effects of Construction Dispute.....	73
Table 23	Effects of Construction Dispute founded on RII.....	74
Table 24	The selection of appropriate methodology to manage Construction Dispute.....	75
Table 25	the selection of appropriate methodology to manage Dispute founded on RII.....	76
Table 26	Position of all contract disputes causes founded on RII	77
Table 27	Spearman Rank correlation Coefficient between Client, Contractor, Consultant.....	81

LIST OF FIGURES

Figure .1 Construction project stage.....	11
Figure 2 the different party involved for negative slippage of the project	23
Figure 3 Map of Gambela to Metu... ..	Error! Bookmark not defined.
Figure 4 Map of Jimma to Agaro.	46
Figure 5 Survey run through the same kinds of cycle and typical phase.....	58
Figure 6 percentages of returned questionnaires.....	62

ACRONYMS

ACAF	Asphalt Contractor's Association of Florida
ADF	African Development Fund
ADR	Alternative dispute resolution
BADEA	Bank of Arab for Economic Development in Africa
CI	Construction industry
CII	Construction Industry Institute
CCE	Consultant's Construction engineers
CPA	Contract Price Adjustment
CPM	Critical Path Method
DPI	Dispute potential index
EBL	Employee Benefit Liability
EJCDC	Engineers Joint Contract Documents Committee
ERA	Ethiopian Road Authority
ERISA	Employment Retirement Income Security Act
ETB	Ethiopian Birr
EU	European Union
FIDIC	Federation International des Ingenious Counsels
GC	General Condition
GOE	Government of Ethiopia

IDA	International Development Association
JU	Jimma University
MDB	Multilateral Development Banks
MoWUD	Ministry of Works and Urban Development
NDF	Netherlands Development Fund
NGO	Non-Governmental Organization
OPEC	Organization of Petroleum Exporting Countries
PER	Prudent Expert Reliance
PM	Project Manager
PMBOK	Project Management Body of Knowledge
PPA	Public Procurement Agency
PPI	Producer Price Index
PPPAA	Public Property Procurement and Administration Agency
RSDP	.Road Sector Development Program
SCC	Special Conditions of Contract
UK	United Kingdom

CHAPTER ONE

INTRODUCTION

1.1 Background

Construction industry (CI) may be defined as the production, alteration, renovation, maintenance, facility management, demolition, and re-cycling of building and civil engineering works, including the supply of resources. It includes those who promote the industry's policies, procedures, practices, and culture, which help the industry to fulfill the tasks required of it and thus satisfy its internal and external stakeholders (Fox, 2003).

Construction Industry plays a considerable role in socio-economic development of any nation, largely for developing countries; poverty alleviation; technological development and politico-legal development (Wubishet, 2004).

The construction industry in Ethiopia is challenged by several problems which tend to confront the sector and thus making efforts at developing the construction industry is very difficult and complex. The underlying problems of the construction sector can be classified into two main categories. The first is related to the consequences of the fact that the sector is not viewed and planned in an integrated manner, but rather, operates with fragmented, unrelated and often conflicting components (Wubishet, 2004). The second problem is related to deficiencies and market price fluctuation of the inputs required for the construction (Gebre-Michael, 2002 in Asteway, 2008). However, construction industry largely contributes to the development of the country; it will be affected by the presence of disputes. This is because construction involves many construction activities, different construction companies or firms and different individuals having different knowledge and skills.

Road construction sector is one of the largest sectors in Ethiopian construction industry. ERA is a federal authority established in 1951 and currently responsible to construct federal road construction projects of the country in collaboration with regional road authorities to achieve the intended objectives of the sector (ERA, 2011).

In the context of Ethiopia's geography, pattern of settlement and economic activity, transport plays a vital role in facilitating economic development. In particular, it is road transport that

provides the means for the movement of people, utilization of land and natural resources, improved agricultural production and marketing, access to social services, and opportunities for sustainable growth ERA, (2011).

Recognizing the importance of the road transport in supporting social and economic growth and its role as a catalyst to meet poverty reduction targets, the government of Ethiopia (GOE) has placed increased emphasis on improvement of the quality and size of road infrastructure in the country. To address constraints in the road sector, mainly low road coverage and poor condition of the road network the government formulate the road sector development program in 1997. The RSDP has been implemented over period of fifteen years and in four separate phases, as follows.

The program was financed and is expected to be financed in parallel by IDA, EU, ADB, NDF, BADEA, OPEC fund, Japan, Germany, Italy, UK, Ireland, Sweden, several other NGO's, GOE , the road fund as well as community. To achieve its objectives, RSDP focused on the rehabilitation and upgrading of main roads, construction of link and regional roads and maintenance activities.

The first phase of this program (RSDP I) was officially launched in September 1997, and completed in June 2002. This phase has focused on the restoration of the road network to an acceptable condition. The second phase of the program (RSDP II: July 2002-June 2007) aims to strengthen the achievements of the first phase, increase the network connectivity and provide a sustainable road infrastructure to rural areas .During the 10 years period, a total of 78,569 km of roads were constructed, upgraded/rehabilitated and maintained; of which 10,282 km are federal roads and 10,523 km are newly constructed/maintained regional roads, while much of the recorded length (57,764 km) are community roads constructed since July 1997. However, many of the projects planned under RSDP I and II were not completed within the prescribed time and budget and did not meet the quality standard. ERA,(2007) and Becker, H. J. and Behailu, D.D. (2006).

The third phase, RSDP III, commenced in July 2007 and ended in June 2010. During the RSDP III 3,067 km of trunk and link roads were rehabilitated and upgraded against the planned 3,868 km; construction of 1,603 km of new gravel link roads were undertaken against the planned

1,980 km and emergency/heavy maintenance of 3,326 km of paved and gravel roads was carried out. This shows that, rehabilitation/upgrading and construction works were 79% and 81% respectively compared to the planned targets. Overall, during the RSDP III, a total of ETB 35.0 billion (USD 2.6 billion) has been disbursed; indicating that the implementation of this program takes lion's share of the government's expenditures during the last 13 years ERA, (2011).

The total disbursement of RSDP III is about 101% against the plan; while the corresponding physical accomplishment is only 93% of the plan. Similar program— RSDP IV has been prepared as part of the Government's overall Growth and Transformation Plan. The programs require not only capacity to execute, but also improvement of drawbacks from past performances.

The review of the implementation of RSDP I, II and part of RSDP III, shows that road projects in Ethiopia encounters a number of challenges. In addition to significant project variation, there are a number of themes contributing to this challenge. The development status of the domestic construction industry and the clarity and comprehensiveness of documents (survey, design, tender and contract documents) used in the process can be considered as the two major factors for the challenges faced by the Ethiopian Roads Authority (ERA) in road construction projects. The immediate consequence of such factors is an increase in project costs than originally budgeted, among others. Zerfu, T. (2009)

A project gets more scientific and systematic when the project gets larger and more complex. This is because the project becomes necessary to integrate and coordinate human inputs and some of physical components within the four fundamental constraints which are scope, cost, time and quality. Cost management in construction industry is less effective compared to time management Ramli Mohamad. (2003).

Probability of loss should be considered in the quantitative analysis. Qualitative variables, such as the possibility of losing the customer, should also be considered. A work breakdown structure is presented to help in the Disputing procedure. Sometimes issues occur in construction project that cannot be resolved among project participants. Such issues from contractors' perspective typical involve requests for additional money or time for work performed beyond that required

by construction contract. The specific cause or causes are generally the alleged action, on-action, or wrong action by one or more participants in the construction project. The participants can include the owner, the architect/engineer, vendors, general contractors, or construction managers and/or subcontractors (Girmay, 2003).

This study mainly focused on the construction Disputes through different approach and also Disputes in construction industry, Disputes gets bigger attention due to the high effect on the main elements of construction management. Field study has conducted to collect data required in dispute concern. This research also would like to establish based on the published studies which were used to identify the root causes of dispute to maximize the potential knowledge in order to develop the system for the effective dispute assessment. Construction projects are complex because they involve many human and non-human factors and variables. They usually have long duration, various uncertainties, and complex relationships among the participants. The need to make changes in a construction project is a matter of practical reality. Even the most thoughtfully planned project may necessitate changes due to various factors (O'Brien, 1998).

Disputes are one of the problems that construction project may face. Disputes might lead to many consequences such as payment delay, extension of time and work suspension. Construction Disputes require both legal procedures and engineering abilities. It is possible to find professionals with these abilities; however, this is not enough to win a dispute. A good execution control system that permits the registration of all deviations from the original plans must be implemented. Construction disputes should be made when there is an amount of money that has not been paid through the common, accepted procedures (LIU, 2009).

There are several factors that are contributing to construction dispute. This research attempts to identify the major factors, problems, effects and remedial measure and its adjustment in order to make the construction operation smoothly in selected ERA Project. It is anticipated that the findings of this thesis will contribute towards the assessment of the causes of construction dispute, their impact on the construction industry as well as increasing the awareness of construction managers on construction dispute in and South Western district of ERA projects.

J.G Richard (2006) noted that disputes in the construction industry are inevitable. Thus, it is essential that all participants in construction industry must consider and establish a proper and effective mechanism to resolve Disputes.

1.2 Statement of the Problem

Completion alone does not constitute success for the project owner. For the owner, much of the success of a project depends on many factors, the most important of which is project completion within specified cost parameters (i.e. within a specified budget). The second most important factor affecting success is on time completion as delays in completion of facilities often directly equate to financial losses due to lack of revenue from facility operation IOSR-JMCE,(2014)].

Most projects administered by ERA face delay on completion period, cost overrun and quality problem. The major influencing factors in road construction projects in Ethiopia are cost overruns and delay which occurs frequently and severe .Without a proper and accurate method for selecting the most appropriate contractor, the performance of the project will be affected thereby denying the client value for money (S. O., Suen Henry C.H. and Cheung Kevin K.W. (2004).and Amare Assefa Asres,(2006).

Ethiopian federal road construction projects are going to construct under different phases of RSDP. The status of each phases were assessed at different times and the assessment report showed that the programs are achieving satisfactory progress against its objectives and benchmarks (ERA, 2011).

Most of construction projects in the country end up of claims, but these claims are not treated properly. An improper treatment of claims may lead to dispute which cause both direct and indirect impacts to the client, contractor and consultant. The direct impact was extra overhead cost, material cost and labor cost to the contractor while indirect impacts are loss of trust and affect the disruption of economic activities, social, educational, delay in regional development. (Yates & Epstein, 2006)

The study area in the construction project problems would be investigated the causes of delay which are passed through dispute proceeding claims. In order to handle such dispute there must

be properly rectification of dispute analysis used by concerned parties. This dispute analysis will not be briefed yet in the concerned body of the construction project a delay dispute involves construction that was not completed as scheduled. When dealing with a delay dispute, one must first determine if it is excusable, compensable, a force majeure, or a concurrent delay (Matt DeVries, 2010).

Project objectives are most often related to time, cost, and quality. Construction is a risk-prone industry, with a poor track record of coping with risks, as a result of which clients have been enduring the agonizing outcomes of failure in the form of unnecessary delays in project completion, poor cost estimation and poor cost monitoring and sometimes failing to meet quality standards and operational requirements Shehu.Z and Sommerville, J. (2006).

However, the progress of individual projects in their own report showed that most of the time projects are not completed within the planned time, budget and also sometimes within specified quality. Dispute is also considered as a big problem, which hinders project's progress, since it decreases the contractor's profit leading to huge losses leaving the project in a big trouble. This problem is a result of weak economy, lack of managerial skills, bad planning, increasing the prices of materials and others. For that it is of a key importance to exert the utmost effort to accomplish such study, to detect the previously mentioned factors and to treat all the weakness points and from all sides and so giving specific priorities in order to avoid price increase at construction projects. Therefore, the aim of this study was to assess the Causes of Construction Dispute in South Western District of ERA Projects.

1.3. Research questions

1. What are the problems of construction Dispute in the study area?
2. What are the effects of the identified construction Dispute in the study area?
3. What are the remedial measures to minimize the Construction Dispute in the study area?

1.4. Objectives

1.4.1. General objective

The general objective of the study is to assess the causes of construction dispute in South Western District of ERA Projects.

1.4.2. Specific Objective

The aim of this study was achieved with the following specific objectives:

- ✚ To identify the problems contributory to the Construction Dispute.
- ✚ To determine the effects of construction dispute that affects the construction operation.
- ✚ To find out remedial measure and its adjustment in order to make the construction operation smoothly

1.5. Scope and limitation of the study

The study was conducted on the Assessment of Causes of construction Dispute in South Western District of ERA Projects through identification of causes of construction Dispute using questionnaire. In terms of location this study is covered only in South Western District of ERA Projects which include Metu Gambela, Jimma to Agaro, Nejo (Maka Nejo) and Bonga-Ameya Chida, road construction projects. Clients, Contractors and Consultants who work in this country were participated in the survey. None of the questionnaires would be conducted in other locations. Among the sectors this study focuses on road construction sector particularly ERA road construction projects.

However, the thesis work is limited by several factors: due shortage of allocated budget for the research work, it has not been possible to address all project that are found in this District. Most of the relevant documents for these projects are found at Districts and project offices requiring visiting the actual site of the project. Hence, some of the findings of the study are based on seven sample projects. The other limitation is that some of the open ended questions intended for assessing the current estimating practices have been discarded during analysis due to lack of adequate responses from the respondents.

1.6. Significance of the study

The aim of this study was expressed in the following ways.

1. It may benefit the different stakeholders involving in construction projects in general and particularly road construction projects.

2. It helps owners, contractors and consultants to know about construction Dispute problems mainly occur in road construction projects and to take remedial measures to reduce its impacts once the problems occurs.
3. It identifies the factors which lead to the occurrence of construction Dispute problems and the methods to manage in road construction projects.

CHAPTER TWO

LITERATURE REVIEW

2.1. Construction Industry

The construction industry is the total through which physical development is achieved, and that is truly the locomotive of the national economy. The more resources, engineering, labor, materials, equipment, capital, and market exchange are provided from within the national economy. The increasing complexity of infrastructure projects and the environment within which they are constructed place greater demand on construction managers to deliver projects on time, within the planned budget and with high quality (Enshassi et al., 2003).

According to Abebe (2003) construction industry employs about 20% of the workforce and covers about 30% of the capital budget of the governments in developing countries. Wubishet (2004) cited in Turkey (2011) in his work, however, indicated that the construction industry accounts even for more than 50% of the capital budget in developing countries. According to him, for instance, in Ethiopia (1997/98 to 2001/02), the industry accounted for 58.2% of the capital budget. It should be noted, in both cases, that the industry covers a fairly large portion of the government's capital expenditure and so it needs to be developed.

Although construction is principally defined by the concept of assembling materials and products, it is in fact multi-tasked. Just as divergent materials come together to form a structure, so too does a diverse group of people come together to make the project possible. To bring together numerous independent businesses and corporate personalities in to one goal oriented process is the particular challenge of the construction industry (Frederick and Nancy, 2009).

According to Chitkara (2004) cited in Fetene (2008) construction project is a mission, undertaken to create a unique facility, product or service within the specified scope, quality, time, and cost.

The guide to the PMI (2004) defines project as a temporary endeavor undertaken to provide a unique product or service. In developed and developing countries, the construction industry plays a major role in the economy by contributing significantly to the gross domestic product, employing a sizable portion of the working population, accounting for about half of the capital

formation, and interacting strongly with other sectors of the economy (Hillebrandt, 1985 in Salleh, 2009).

Wubishet (2004) cited in Getaneh (2011) noted that the construction industry in Ethiopia has been in the process of transformation. This transformation is based on improving the competitiveness of the construction industry and enhancing its ability to fulfill the national development demands. To reveal such transformation is vital to understand the contextual realities and the development trends of the Ethiopian construction industry.

The construction industry is vital for the development of any nation. In many ways, the pace of the economic growth of any nation can be measured by the development of physical infrastructures, such as buildings, roads and bridges. Construction project development involves numerous parties, various processes, different phases and stages of work and a great deal of input from both the public and private sectors, with the major aim being to bring the project to a successful conclusion. The level of success in carrying out construction project development activities will depend heavily on the quality of the managerial, financial, technical and organizational performance of the respective parties, while taking into consideration the associated risk management, the business environment, and economic and political stability. According to Wang (1994), as construction is becoming more complex, a more sophisticated approach is necessary to deal with initiating, planning, financing, designing, approving, implementing and completing a project.

2.2. Classification of Construction Industry

The major division of construction industry consists of Building Construction also called (“vertical construction”) and Heavy Construction (also called “horizontal construction”). The building construction category sub divided into public and private, residential and non-residential building construction. Heavy construction includes roads, railways, bridges, canals, harbor, dams and other major public works (Nunnally, 2001). The ISIC (Rev. 4, 2008) categorizes construction activity as General Construction and Specialized Construction activities for buildings and civil engineering works. Ricketts (1999) classified into Specializations as: Housing, Non-residential building, Engineering construction (roads, bridges, tunnels, railroad, waterways constructions), and Industrial construction. (bekele,2015).

Many authors and researchers follow different approaches in classifying the construction industry. Halpin 2006 (cited by Assefa (2007)) construction projects can be broadly classified as:

- a. Building construction (includes facilities for residential, institutional, educational, light industrial (e.g. warehouses), commercial, social and recreational purposes),
- b. Engineered construction (includes highway and heavy (e.g. dams, sewage plant) construction and
- c. Industrial construction.

Ethiopian construction practice lacks experienced skill manpower and modern technology that helps to maximize the performance of the construction project to accomplish within the contract period. At present condition it is not possible to immediately stop the construction delay. However, it is possible to reduce the rate of percentage dalliance within reasonable limit by practicing proper management administration and by strictly following the CPM.

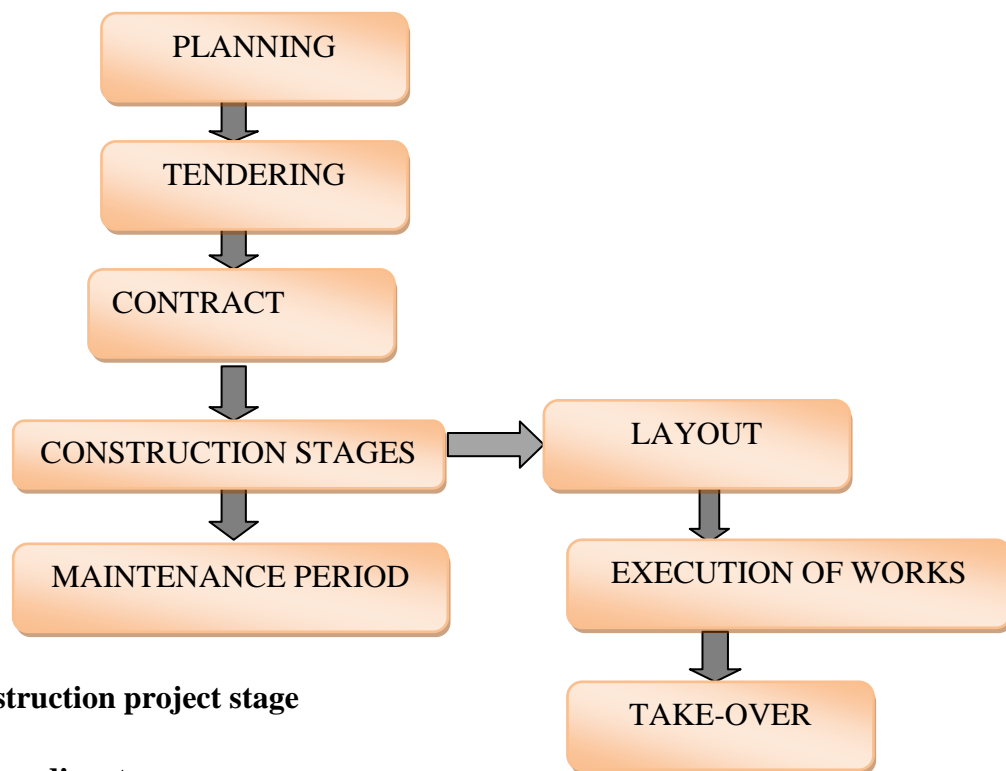


Figure .1, Construction project stage

2.3. Construction disputes

Disputes are common in the construction industry which results in cost overrun, delay in execution of work, loss of profit and quality degradation if they are not resolved in a proper manner. Construction disputes are fairly common, and they vary in their nature, size, and complexity. Disputes for additional costs or for time extensions occur during the course of construction. To enhance the chances of success, contractors must understand the main causes of

disputes and, when submitting disputes, provide enough information and present sufficient documentation. Project owners need also to follow an overall comprehensive step-by-step procedure for tracking and managing the disputes submitted by contractors (Abdul-Malak et al. 2002, Singh and Sakamoto 2001).

A dispute in the construction industry may be caused by one or a combination of several reasons. Most of the typical disputes are caused by causes like differing site conditions, change orders, delays, impact and ripple effects of delays, inspection problems, owner furnished items, the difference in the interpretation of plans and specifications, unfulfilled duties, acceleration, inefficiency and disruption, unrealistic contract duration and cost (Callahan, 1998).

A dispute also happens when a party to a construction contract thinks that, in some way, by act or omission, the other party has not fulfilled its part of the deal. In other words, a dispute arises when one party to the contract has suffered a damage for which that party needs to be compensated by the other party (Kartam, 1999).

Disputes take place as a result of numerous factors including improperly drafted contract documents, inaccurately prepared bids and owners failing in their responsibility to provide site access or to take other required action in a timely manner, and inadequate contract administration on the part of owners, contractors, architect/engineers, and other participants in the construction process (Yates, 2006).

Disputes can be made by contractors against owners and by owners against contractors and can also involve subcontractors, suppliers, and bonding companies. Construction disputes are found in nearly every construction project (Bakhary 213).

Disputes for additional costs or for time extensions occur during the course of construction. To enhance the chances of success, contractors must understand the main causes of disputes and, when submitting a dispute, provide enough information and present sufficient documentation. Project owners need also to follow an overall comprehensive step-by-step procedure for tracking

and managing the disputes submitted by contractors (Abdul-Malak et al. 2002, Singh and Sakamoto 2001, and Scott, 1997).

Once a dispute has been presented, the owner and contractor can come to an agreement concerning the disputes and, thereby, create a change order or a modification, or they may disagree and create a construction contract dispute. Resolving and settling disputes can take place through negotiation, mediation, arbitration, or litigation (Renet *al.*2003). However, analyzing the various causes that contribute to a project's delay is an important task to resolving it (Janneyet *al.*1996). Determining the impact, timing, and the contributing effect of each of those causes to the overall delay should assist in helping the parties settle the delay without litigation (Vidogah and Ndekugri, 1997).

Generally, litigation required a long period of time and significantly higher legal costs, as compared to the other techniques. The analysis must consider the impact of all concurrent delays. It is the analysis of the combination of delays that will result in a defensible evaluation of additional time due to the contractor.

2.4 Different types of disputes were

There are different types effects induced due to disputes developed on the construction industry some of them were:-

2.4.1. Price Escalation disputes

Escalation in the construction market in recent years has been extremely volatile, and this trend is expected to continue in the near future due to competition for resources and skilled workers. This situation has created a great deal of uncertainty and nervousness among construction field. The financial success of a construction project can be uncertain and at risk due to changes in escalation rates during construction (Bates, 1996).

The success of a construction project is mainly influenced by to what extent of cost escalation identified and allocated to the construction project. Budgeting for cost escalation is a major problem in the planning phase of projects (Dawood and Bates, 1998).

Wide varieties of risk factors influence construction costs and result in substantial increase of project costs than originally budgeted. Expressed as a percentage of estimated cost, this is often

termed cost escalation, cost overrun or cost growth, and occurs as a result of many factors some of which are related to each other, but all are associated with some forms of risks (Avots, 1983 and Garry, 2006 in Turkey 2011).

2.4.1.1 Price Increase: Definitions

Different scholars defined project price escalation in construction industry in their works and some of them are outlined as follow:

- Price Increase is an increase in the cost of any construction elements of the original contract and base cost of a project due to passage of time (Williams et. al., 1999).
- Price Increase is the increase in any element of project costs when the cost of that element is compared between two different periods (Lock, 2003).
- Price Increase is the provision in a cost estimate for increases in the cost of equipment, material, labor, etc., due to continuing price changes over time (Jaeger, 1996).
- Price Increase, which mainly include the increase in the amount of resources in actual or estimated, direct costs of labor and material (Stewart, 1982), are usually treated with provisions and some form of compensation that considers price level changes over time.

2.4.1.2. Factors Causing Price Escalation

Price escalation is a major problem in both developed and developing countries. Several studies of major projects show that Price escalation is common. The causes of price escalation in construction projects are varied, some are not only hard to predict but also difficult to manage (Morris, 1991). Price escalation does not only occur during the planning and design phases of a project. Project cost growth often manifests itself during construction. Focusing early on internal factors will reduce cost growth at bid time or during construction (Anderson et al., 2006).

Mansfielld, Ugwu and Doran, 1994 (in Fetene, 2008) suggested that in developing countries the lack of proper phasing of construction projects can contribute to the economy to become “overheated”. This leads to shortage of construction materials as the demand will exceed the supply, this in turn leads to a climb in the cost of construction materials; this inevitably gives rise to project cost overruns, with consequential effects on inflation and a decline on efficient activity in the construction industry. A better understanding of the price escalation factors is achieved through understanding the forces driving each factor or where the factor originates. With this

understanding it is possible to design strategies for dealing with these price escalation factors. In general, the price escalation factors can be classified based on two broad classification methods. These are internal and external factors (Warsame, 2006). In the following section of this research, factors which affect the price escalation on construction project will be dealt in detail.

A. Internal Factors Causing Price Escalation

According to Warsame (2006) internal factors are cost escalation factors that can be directly controlled by the project's sponsoring agency/owner. While numerous internal factors can lead to underestimation of project costs during the planning and design stages of development. The following primary internal factors are well documented (Anderson et al. 2006). Some of the factors are presented below.

I. Delivery/Procurement Approach

According to Harbuck (2004) delivery/procurement approach effects the division of risk between the agency/owner and the constructors, and when risk is shifted to a party who is unable to control a specific risk, project cost will likely increase. The decision regarding which project delivery approach, e.g., design bid-build, design-build, or build operate-transfer and procurement methodology e.g., low bid, best value, or qualifications based selection affects the transfer of project risks (NJDoT, 1999). In addition to the question of risk allocation, lack of experience with a delivery method or procurement approach can also lead to underestimation of project costs (Parsons, 2002).

II. Project Schedule Changes

Project schedule changes particularly extensions, caused by budget constraints or design challenges can cause unanticipated increases in inflation cost effects even when the rate of inflation is accurately predicted (Touran et al., 2004).

Agencies/owners must think in terms of the time value of money and recognize that there are two components to the issue: the inflation rate and the timing of the expenditures (BICE, 2003 and Allen et al., 1995). Many agencies and owners have fixed annual or biannual budgets and project schedules must often be adjusted to ensure that project funding is available for all projects as needed. Estimators frequently do not know what expenditure timing adjustments will be made (Callahan, 1998).

III. Engineering and Construction Complexities

Callahan (1998) notes that Engineering and construction complexities caused by the project's location or purpose can make early design work very challenging and lead to internal coordination problems and project component errors. Internal coordination problems can include conflicts or problems between the various disciplines involved in the planning and design of a project (Touran et al., 1994). Constructability problems that need to be addressed may also be encountered as the project develops. If these issues are not addressed appropriately, cost increases are likely to occur (Allen et al., 1995 and Federal-Aid, 2003).

IV. Poor Estimation

Poor estimating can lead to project cost underestimation. Estimate documentation must be in a form that can be understood, checked, verified, and corrected. The foundation of a good estimate is the formats, procedures, and processes used to arrive at the cost (Arditi et al., 1985). Poor estimation includes general errors and omissions from plans and quantities as well as general inadequacies and poor performance in planning and estimating procedures and techniques (Merrow, 1988). Errors can be made not only in the volume of material and services needed for project completion but also in the costs of acquiring such resources (Harbuck, 2004 and Carr, 1989). A study by Hester et al. (1991) indicates that the estimating method and the accuracy of project cost estimates could be a major reason for having cost changes (cited in Turkey, 2011).

Estimating problems are not limited to a particular owner or project type. Research has shown that project costs are consistently under estimated. In one study by Flyvbjerg et al. (2002) it was found that this underestimation occurs in 9 out of 10 transportation infrastructure projects around the world.

V .Improper Planning and/or Improper Implementation of Proper Planning

This is fact that most of the planning is made by the higher authorities with their mind set-up. Planning made without knowing the ground realities is said to be improper. As the implementation part is going to be performed by the persons in the practical situations.

Sometimes the planners make good plans but it fails due to the executing people. The construction cost, if it is estimated in the planning level will get escalated due to a number of reasons (Dainty et al., 2001).

Flyvbjerg et al. (2002) and Molenaar (2005) cited in Turkey (2011) discussed in developing countries lack of proper planning can contribute to the discrepancy of supply and demand. This

leads to shortage of construction materials as the demand will exceed the supply, which in turn leads to a climb in the cost of construction materials; this inevitably gives rise to project cost escalation, with consequential effects on inflation and a decline on efficient activity in the construction industry.

B. External Factors Causing Price Escalation

External cost escalation factors are those factors over which the agency/owner has little or no direct control over their impact. However, the agency/owner needs to consider them when estimating project costs. During the planning and design phase of project development external factors can lead to underestimation of project costs (Warsame, 2006). These factors dealt with as follows.

I. Local Concerns and Requirements

According to Schroeder (2000) local concerns and requirements can affect project costs during the execution phase. Similar to the effects during the planning and design phases, mitigation actions imposed by the local government, neighborhoods, and businesses as well as local and national environmental groups during the construction of a project can extend the project duration affecting inflation allowances or add direct cost. By not anticipating these changes, agencies/ owners can be plagued by project cost increases (Daniels, 1998, Mackie and Preston, 1998).

II. Inflation

In simple terms, inflation is caused by an increase in the stock of money that is available for spending while the quantity of goods available for purchase does not increase by a proportionate amount (Pickrell, 1992).

The longer the expected construction period, the more account will need to be taken of expected inflationary price increases over time. Initial cost estimates will need to allow for the value that will need to be paid at the time the project actually goes ahead. Inflation can act to increase the original estimates of construction costs. Inflation may have been taken into account in the original estimates, but if the rate of inflation increases above the predicted level during the construction period, then the original cost estimate will be exceeded.

Obviously any other factor that delays a project will expose the project to the risk of further inflationary cost increases (Hufschmidt and Gerin, 1999).

Effects of inflation add cost to a project. The time value of money can adversely affect projects when:

- Project estimates are not communicated in year-of -construction costs;
- The project completion is delayed and therefore the cost is subject to inflation over a longer duration than anticipated; and/or
- The rate of inflation is greater than anticipated in estimate.

III. Market Conditions

Market conditions can affect the costs of a project, particularly large projects. An unstable construction market would make it difficult for contractors to decide on the optimal level of overhead costs that enables contractors to win and efficiently administer projects (Drew and Skitmore, 2001). Inaccurate assessment of the market conditions can lead to incorrect project cost estimating. Market conditions affect the project costs during the execution phase similar to the effects during the planning phase (Woodrow, 2002). Changing market conditions during the construction of a project that reduces the number of bidders, affects the labor force, and other related elements can disrupt the project schedule and budget (chang, 2002).

IV. Force Majeure

This term covers a range of events which are also commonly referred to as “Acts of God”. They include revolution, war, riot, extreme weather, earthquake, landslip, and fire, political and economic instability (Akinci and Fischer, 1998). Usually, the contractor is required to insure against such events happening. Where they do occur, they will normally lead to significant delays occurring and, consequently, cost increases (Chang, 2002).

V. Increase in Global Demand for Construction Materials

One of the most fundamental factors determining the prices of any products or services including construction is the relationship between demand and supply in which the market prices are determined by the equilibrium conditions. However, this equilibrium is not static. It is determined by dynamic forces of the market and evolves over time as some sectors become more attractive than the others (Sanderson, 2006).

In the last decade, the capability of material sources has not increased as much as demand has increased. This gap in the supply-demand equilibrium has resulted in increases in material prices. Steel, asphalt, cement, and aggregates are some of the most strongly affected commodities (Ajibade, 2009).

VI. Limited Capacity of Material Producers

The availability of material sources is falling short of the market demand. Some of the materials which are affected by this gap in demand and supply are cement, asphalt, and steel, among others. Material producers design the capability of their production facilities based on a prediction of future demand. If there is a large uncertainty in future demand, material producers typically design their production facilities short of expected demand (Damnjanovic, 2008).

VII. Local or Municipal Regulations

Local municipality regulations can affect project schedule. Local regulations restrict working hours. The disposal of waste, borrow-pits, and use of certain class of machinery is governed by local regulations, which are often stringent (Wimsatt, 2008).

VIII. Increase in Material Cost

Costs of materials and oil-based fuels significantly impact the overall price of bid items. With demand for construction in both domestic and international markets increasing in past several years, the prices of construction materials have also increased. This can be attributed to a number of factors including limited capacity to produce materials, lack of competition, and price of energy. In fact, the prices of some materials are in direct correspondence to the prices of oil-based fuels (e.g., asphalt) and energy in general (ACAF, 2008).

IX. Shortage of labors / skilled workers

The current high volume of construction is creating a high demand for skilled construction workers. Labor shortages can have severe consequences especially sectors like construction, given the inter-relatedness of the production process and the backward and forward linkages that are involved (Henson and Newton, 1995). The shortages of skilled labor increase the contractor's risk, by increasing the likelihood of delay. The most obvious and direct consequence is that the construction job does not get started or completed in a timely fashion.

Table 1 Identified causes of price escalation variables for use in the survey

No.	Internal Factors	External Factors
1	Delivery/procurement approach	Local concerns and requirements
2	Project schedule changes	Inflation

3	Engineering and construction complexities	Market Conditions
4	Poor estimating	Force Majeure
5	Improper planning and/or improper implementation of proper planning	Increase in global demand for construction materials
6	-	Limited capacity of material producers
	-	Local or municipal regulations
8	-	Increase in material cost
9	-	Shortage of labours / skilled workers

2.4.2. Contractual disputes:

Due to poorly written contracts

2.4.3. Extra work disputes:

Misunderstanding between the client and contractor, the contractor believes that he is performing extra work, while the owner believes the work was part of original contract; Different measurement pricing disputes; the different measurements in final stages affect the plan of the time and price in the project.

2.4.4. Delay disputes:

These delays represent problems in the contractor's organization such as lack of management or financial capability, sub-contractor caused delays etc. Delays caused by the client such as late submission of drawings and specifications, frequent change orders, and incorrect/inadequate site information generates disputes from both the main contractors and subcontractors which many times entail lengthy court battles with huge financial repercussions. Delays caused by contractors can generally be attributed to poor managerial skills. Lack of planning and a poor understanding of accounting and financial principles have led to many a contractor's downfall. Types of delay:-

I. Compensable delays:

Those are caused by the owner alone. These are deviations between the original contract and the final work performed for which the contractor was not compensated. It is only when these changes impact activities on the critical path that a compensable delay occurs. For example, if the owner wants additional work accomplished, and this work is on the critical path, then the owner is responsible for a schedule delay. If the work is not on the critical path then the contractor may be less likely to receive additional time on the project. In addition to the direct impact of compensable delays on critical path activities, here are some other considerations with regard to compensable delays (Akiyama *et al*, 2008).

- ✚ **Acceleration disputes:** Owner directs contractor to perform more work within the same time, to make up for alleged contractor delay, or directs changes activity sequence optimized for contractor workflow. Contractors should have very clear records from the owner given the direction of the additional work and the direction of when the work is to be completed (Harris, 2004.).
- ✚ **Inefficient disputes:** This broad category of disputes often stems from widespread delays resulting from job site access, limitations to material staging areas, or approvals to start major phases of work. In many cases, owners will specifically identify these delays in the bidding documents. Since such impacts are clearly stated in the contract, contractor bid documents should take these factors into account prior to bidding the job (And not during the claims phase) If such impacts are not in the contract, the Contractor must have very clear records of the number of non-work hours caused by such delays.(Amr A.G. Hassanein, 2008).
- ✚ **Differing site condition disputes:** This broad category of disputes stems from one of two types of problems, either the owner has made assumptions about the existing conditions that turn out not to be true, or that the contractor's assumption about how they could perform the work turned out not to be possible (James E. Diekmann, 1985).
- ✚ **Project impact disputes:** The all-inclusive "get well" dispute is often the result of accountant's review of the project rather than an analysis of specific instances of delays on the project. Such disputes, since they simply state a fixed Result from one of the above

disputes or be a separate claim based on interference with contractors' personnel, productivity delays due to excessive changes, design errors (Edward R. Fisk, 2000).

II. Non-compensable delays

A key idea in construction contracts is that full set of all problems that could arise on a project cannot be known ahead of time. Thus different risks of problems are apportioned to the contracting party best able to manage that risk. There are many types of problems that could arise on a construction project that are the responsibility of the construction contractor. For example, delays in purchasing or delivery of materials, differences in labor markets between the time of bidding and time of construction award, or availability of key equipment. As the name implies, non-compensable delays are delays encountered by the contractor for which the owner is not responsible (Z. Ren C. J., 2001).

III. Excusable delays

Some risks were allocated in contracts to the owner and some to the contractor. Other risks cannot be apportioned to either party. Delays associated with this type of risk are called “excusable delays.” An important factor in evaluating such excusable delays is that both parties are required to consider “normally expected” delay as part of their plans. Excusable delays for out-of-the-expected conditions result in contract time extensions without compensation for costs (Akiyama *et al*, 2008). In general delays were caused by some fundamentals and things which go wrong during the construction.

A sign of delay in work is when contractor do not takes care of the schedule. Delay in completion of project is also caused by equipment breakdowns and labor disputes. The major factors due to which delay occur are client problem, service provider problem, sources problem and universal problem (al A. B., September-2011)

2.5. Occurrence of Causes for disputes

This event is mainly affected by two things: recognition of the possible categories of dispute causes, and direct actions on site that initiate the dispute. That is, awareness on the part of the contractor of work aspects that are susceptible to dispute shall first exist, while the dispute is

only initiated when it is perceived by the contractor that a triggering action on the part of the owner or engineer has taken place (Abdul-Malak, 2002).

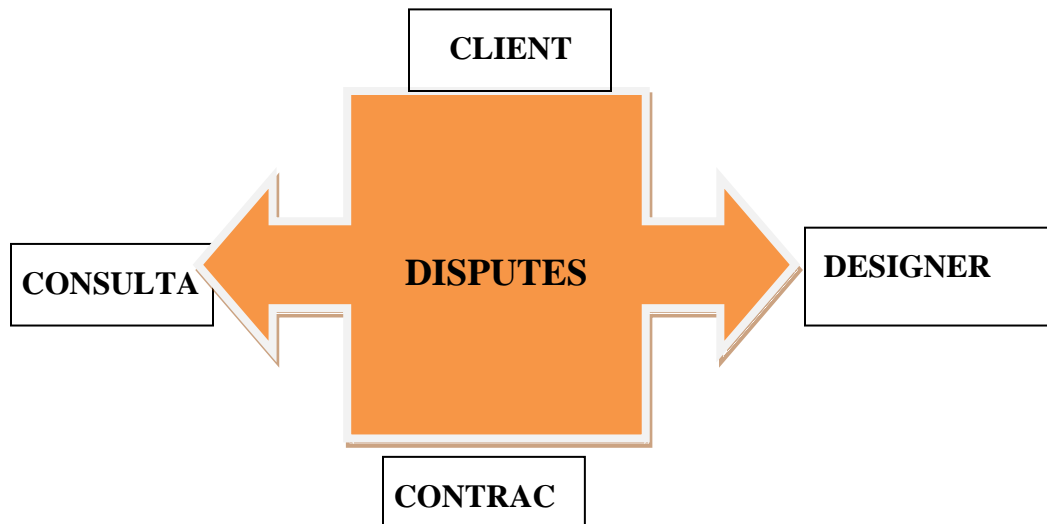


Figure 2 the different party involved for negative slippage of the project

Table 2 Causes of construction Disputes

No	Causes of construction Disputes		
1	Lack, in many occasions, of specialized workforce	9	Suspension of works, unreasonable rejection of work
2	Technical failure due to poor construction	10	Negligence in the implementation of preventive measures
3	Inadequate storages of construction materials.	11	Incorrect consultant report.
4	Poor work plan	12	Force majeure, act of God
5	Delay in decision processing	13	Errors in calculation or design and employment of defective or inadequate materials.
6	In adequate maintenance of traffic plan.	14	Budget based on incomplete data
7	Performance of the contractors	15	Use of poor construction materials
8	Insurance problems;	16	Insufficient time for testing

2.6 Effects of disputes

The impact on the construction industry of the recent, unprecedented disputes has been multi-fold. Certainly, cries have come from the contractor and subcontractor community of eroded or eliminated profit margins, as well as significant project losses. In addition to lost fees, and damaged or destroyed construction businesses, the ripple effect of these dramatic disputes has included numerous other impacts (ENR, 2004 and 2005). Disputes fluctuation can have effect on contractors, clients/owners and the project itself. The major effects of disputes on contractors, if not well compensated is cash flow (project financing) problem of the projects (Stukhart, 1982 and Abdo, 2006 in Asteway, 2008).

A. Delayed and Cancelled Projects

In the world of private development, a dispute has been significant enough to cause many developers to rethink the “numbers” necessary to make a private development worthwhile.

Delayed projects, reduced-in-scope projects, or cancelled projects have been the result. The same impact is being felt in the public construction sector. For public projects that must be funded by bond issues, significant project price increases disputes.

In a number of projects, between the time a bond was approved by the voters and the time bids were received for construction projects, material prices increased significantly and bids came in at prices much beyond the approved contract amounts. Public bodies are then faced with the alternatives of putting projects on hold while supplemental funding is sought, canceling the project if additional money is not available, or attempting to scale-down the project scope (Van der Schans, 2005).

B. Reduced Numbers of Bidders

In part because of the current level of activity in the construction industry, but also in part because of escalation fears, owners are finding fewer bidders for their projects. States where asphalt supplies have been impacted are seeing fewer bidders for highway and paving projects. Owners are seeing more “one bidder” projects and an overall reduction in the number of bidders for projects (ENR, 2006).

C. Higher Project Costs

Those projects that have not been scrapped or significantly delayed as a result of dispute difficulties have frequently experienced. Contractor and supplier fears regarding, disputes in most construction contracts, often leads to higher contract prices and larger project costs (Pearl, 1994).

D. Conflict among Parties

Disputes are insidious often resulting in time overrun, cost escalation, litigation, and complete abandonment of projects (Sambasivan and Soon, 2007). Many construction disputes are arising out of disagreement and delay of hardship and expense during the construction project. Disputes in construction may be caused by one or a combination of several reasons. Most of the typical disputes are caused by factors such as unrealistic contract duration and costs, impact and ripple effects of delays, evaluation of the quality and quantity of works, differences in the interpretation of plans and specifications, unfulfilled duties, inefficiency and disruption (Groton, 1997).

Table 3 Effects of Construction Dispute

S.N	Effects of Construction Dispute
1	Delay in execution of work,
2	Cancelled Projects
3	Reduced Numbers of Bidders or loss of profit
4	Higher Project Costs or (Cost overrun))
5	Quality degradation
6	Cash flow (project financing) problem of the Projects
7	Conflict among parties,

2.7. Factors considered in the selection of appropriate methodology for the dispute analysis.

Delay is quite common in construction projects. Delay can be caused by the Employer, the Contractor, and the third party or the force majeure that the parties to a contract cannot control. Delay to completion of a project could bring significant losses on society as well as the project cost. The damage caused by a project delay is compensated by the Contractor in principle in the

form of 'liquidated damage. However, the Contractor shall dispute the extension of time or the recovery of financial burden if the Employer is liable for the cause of delay. In fact, a variety of factors contribute to the delay of project completion in complex interdependencies of a number of tasks. Hence determining the contractual responsibility of delay is the most likely source of dispute in construction projects for transportation infrastructure. Methods used for forensic investigation of delay are called as 'delay analysis methods (Alena Vasilyeva-Lyulina e. a., 2015).

Delay analysis methods are applied to prepare the logical basis to persuade their dispute concerning the extension of time and financial burden. More precisely, delay analysis refers to a forensic investigation into the issue of what has caused a project to run late, for the purpose of 1) establishing lines of investigation, 2) Demonstrating entitlement and 3) presenting the case one is seeking to prove. Delay analysis methods must provide logic of 'cause and effect' relationship, identifying what events contributed to delay and what is the effect of each event (Alena Vasilyeva-Lyulina e. a., 2015).

It is important for the owner, when analyzing a dispute presented by the contractor, to ask the following questions (Bubbers and Christian 1992; FIDIC 1992):

- Were the contract requirements met (Thomas et al. 1988)?
- Did the contractor refer to the proper clauses in the contract?
- Does the owner or consultant bear part of the responsibility?
- Was the situation predictable at the time the contract was signed?
- Were the specifications defective?
- Was the contract misinterpreted? And, if so
- Which competing interpretation will rule?

Table 4 Different factors of Construction Dispute in South Western District of ERA Projects

No-	Related factors		Identified problems
	Client related factor	1	Lack of expertise
		2	In adequate construction details.
		3	Sequence of work directed by owner
		4	Payment delay for contractor
		5	Funding limitation
	Contract Documents	1	Inadequate scheduling clauses.
		2	Drawings not indicating work interfaces
		3	Coordination inadequately specified
		4	Power of individual party vaguely specified
	Contractor related factor	1	Noncompliance with specifications.
		2	Poor communication with supplier and sub-contractor.
		3	Poor management of the project.
		4	Project coordination problems
		5	Noncompliance to permit requirements
		1	Lack of expertise in schedule management
		2	Quality control

	Consultant related factor	3	Inadequate record keeping
		4	Job progress meetings
		5	On-site coordination
			Types of delays
			Project complexity
			Conditions of the contract
			Types of contract agreement
			Law

2.7.1. The Contract Documents

According to the New South Wales Government (NSW) (2005) have developed a very detailed and comprehensive Contract document, which comprises of ten stages:

- Identify and quantify a service demand for a genuine delivery need in an outcomes strategy.
- Identify service delivery options for meeting the need with stakeholder and preliminary risk analysis with their responsibility.
- Justify proposed option with option evaluation, some financial/economic appraisal and strategy report.
- Define preferred project with brief, risk/benefits analysis, business case and authority to proceed.
- Define/select project procurement strategy with brief, risk/benefits analysis and risk management plan, initial methodology report and later strategy report.
- Define project specification with tender documents, estimate and tender evaluation plan for each contract.
- Call/close evaluate tenders for each contract and recommend/approve/engage best project suppliers.
- Project implementation with supplier(s) carrying out contract work and asset delivery
- Asset operation/maintenance and then disposal after supplier(s) completes asset delivery.

- Project evaluation during/after delivery comparing outcomes sought and achieved, and using lessons learnt. However, selection of the procurement method must integrate with a procurement methodology (al P. D., June 2008).

2.7.2. Contractor related factor

A Contractor is a self-employed independent businessperson who agrees (contracts) to do work for another party usually for a fixed price. It is usually an 'arm's length' transaction. The individual hiring the contractor defines the desired results and the schedule.

The contractor may supply labor only or labor and supplies. Contractors in Ethiopia grouped into different categories according to the type of works they undertake. These are (i) Roads, Airports, and Related Structures ;(ii) Bridges, Culverts and other Structures; (iii) Labor based road works; (iv) Steel bridges and structures: construction rehabilitation and maintenance ;(v) General building works; (vi) Electrical works ;(Vii) Dam and related work and other construction work (Dadzie, November 2012).

In order to clearly establish the issues surrounding a construction dispute, it is first necessary to gain an understanding of what a general building contractor ordinarily does and is subsequently responsible for when performing work under a contract for a building owner (West Hollywood).

The contractor uses established methods of analysis in substantiating

- Cost
- Labor
- Equipment
- Materials
- Productivity loss
- Time (CPM techniques)

2.7.2.1 Some of contractor related factors that cause disputes were:

- I. **Project coordination problems:** Contractors have to frequently communicate externally and internally with the other project participants. Construction participants could come from different countries; misunderstanding among them often happens because of the different cultural backgrounds (O, 2002). A failure on the contractor's part to properly

plan its procurement work, even if a plan was not required by the Contract as a deliverable, would be an indication of deficient procurement management. Any resulting claim and extra costs would be the contractor's responsibility (PMBOK, 2015).

- II. **Noncompliance with specifications.** The purpose of this procedure is to define a systematic approach for Peru LNG ("company") qualified personnel to identify, document, evaluate, and request contractor to rectify and close-out non-compliances in the areas of Environment, Health and Safety (EHS) that might occur during Project construction. Although persons beyond company organization (e.g., Community members or contractors) may and are encouraged to identify what might potentially be deemed an EHS non-compliant condition, it is only when they have reported the condition to a company qualified EHS person that the deficiency can be formally classified as a Project non-compliant EHS condition. In that case, the non-compliant condition is recorded in the Project's Action. Tracking Database and immediately activates the formal resolution procedure described herein (PERU-LNG, PR/003/A02).

2.7.3 Consultant related factor

The role of the consultant on a construction project is often not fully understood by the other parties involved on the project, including the consultant's client, the owner. Consequently, the consultant may find itself underutilized. There are also instances where the consultant itself is not fully aware of its duties and obligations to the owner and others, thereby exposing itself to potential liability disputes. During construction, the role of a consultant is to administer the contract as described in the "Contract Documents". However, the Contract Documents do not reference the agreement between the owner and consultant which outlines the professional services to be provided to the project. As noted above, the impact of the services provided by the consultant can be significant. The contractor should make themselves aware of the arrangement in place between the owner and the consultant and understand the scope of that arrangement at the outset of the project (WILSON, 2008).

The Engineer (consultant) is the employer's agent. He ensures that the project is completed to the right quality against:-

- ✚ On time, Technical specifications, Design standards, and within budget, i.e. gives the Employer Value for Money.

Precisely, some of the main duties of the Consultant according to FIDIC IV are: reviewing and updating design details; monitoring contractor's operations to ensure timely commencement of operation; reviewing contractor's programmes; carrying out quality control tests; reviewing contractor's monthly invoices and certifying for payment; evaluating all disputes for additional payment and applications for extension of time; and preparing monthly, quarterly and annual progress reports (J. Dadzie, 2004).

2.8. Construction Contract

A construction contract is a binding agreement, enforceable in law, containing the conditions under which the construction of a facility will take place. According to Ostwald (2001), the element of risk, the willingness of the parties, the competition, complexity of construction, and urgency may influence the general type of contract selected. Construction contract types have direct impact on the cost estimation of construction projects which causes disputes. Similarly, the contract type of a project also has a direct impact on the compensation in case of price fluctuation (Tadesse, 2006 in Asteway, 2008).

A. Types of delays.

Delays caused by the client such as late submission of drawings and specifications, frequent change orders, and incorrect/inadequate site information generates claims from both the main contractors and subcontractors which many times entail lengthy court battles with huge financial repercussions. Delays caused by contractors can generally be attributed to poor managerial skills. Lack of planning and a poor understanding of accounting and financial principles have led to many a contractor's downfall. Empirical studies to determine the causes of delays in construction projects have been carried out in the US.

B. Conditions of the contract:

Understanding the General Provisions of /General Conditions (GC), special condition of contract (SCC):

- General Information, Definitions, and Terms, Definitions are very important, Bidding Requirements and Conditions, Contract Award and Execution, Scope of Work, Controlling Work, Controlling Material, Legal Relations and Responsibility to the Public, Prosecution and Progress, Measurement and Payment

- Understanding the Contract Documents:
- Bid document, Including GCs, and Specs, Including Drawing list and dates ,Including the Estimated Quantities and Prices, Bid Addenda, Notice of Award, Executed Contract, Notice to Proceed, Notice, Submission, and Response times (John Unbewust, 2015),

C. Types of contract agreement:

Key areas to address in contract documents Scope Definition & Realistic Timeline.

- Existing Site conditions; Design Errors and Omissions; Specifications; Drawing; Contract Language ; Bid Documents

The value of good documentation in the contract Agreement:

- Consider as an insurance policy; Contemporaneous analysis, not forensic; Document while issue is fresh, recall is vivid, and staff is present; Facilitates issue resolution; Potential for reduced time and cost impacts after project completion.

2.9. Methods of Price Adjustment in construction dispute resolution

Price adjustment is a method of transferring the risk associated with increasing material prices from the contractor to the contracting agency (Brown, 2011). Price adjustment allows the price of material to fluctuate without imposing additional risk to the agency or the contractor. The construction industry has been challenged with the rise of construction delivery costs which in some cases do not tally with the budgeted ones owing to the continuous and unpredictable change of the macroeconomic environment given such a situation, contractual clauses have been formulated to cater for optimum recovery of price escalations. Subsequently, various increased cost adjustment methods have been developed and reviewed from time to time (Finsen, 2005).

In projects of reasonably long duration (lasting over one year) undertaken in areas which suffer from persistent inflation, Employers consider it reasonable to compensate Contractors for losses which they might suffer as a result of increases in the prices of Labor, Materials, Fuel, Plant etc. There are a number of methods of calculating such CPA. Whichever method is used it usually provides for both increases and decreases in prices and can accordingly result in either an increase or a decrease in the contract price. Unfortunately, the norm is that CPA tends to be an escalation of the contract price (ERA, 2006).

Owing to its complex nature, domestic construction projects are accompanied by frequent price escalation due to rises of prices of materials, labor and equipment.

There are two alternative methods commonly employed in the local context to determine such variations practiced in the construction industry. The first adjustment method is “Basic Prices” or proven cost method and the second are based upon “Price Indices” or adjustment method (ERA, 2006).

2.9.1. Basic Prices/Proven Cost Method

In using base date prices, the difference between the current date prices and base date prices will be established for each items allowed for adjustment. When this method is used the Contractor is required, at tender stage, to list those elements of his costs which he requires to be subject to CPA. In support of this he includes a list of the actual costs and suppliers of the various elements upon which he based his tender. When the Contractor purchases these materials he presents proof of the actual price paid and receives compensation for the difference between the "Basic Cost" and the "Actual" invoiced cost of those same items. It is therefore important to ensure that all purchases are from the suppliers identified at the time of the tender. Any change in suppliers is likely to result in an invalid comparison of prices and accordingly overcompensation (ERA, 2006).It is important, when using this method, that the Employer verifies the authenticity and reliability of the suppliers and prices quoted as the base prices. Any change in supplier is likely to result in different base prices, which will complicate the calculation of CPA.

Although this is the method generally used on European Union funded projects, it is not the preferred method as it has the potential for abuse by:

- Under quoting base prices.
- Over invoicing current prices
- Changing suppliers.

2.9.2. Indices/Formula Method

The amount payable to the contractor shall be adjusted for rises or falls in the cost of labor, goods and other inputs to the Works, by the addition or deduction of the amounts determined by the adjustment formula. With this method the works, to be undertaken, are mathematically described in a formula. The formula contains a number of factors representing the various

elements of the project at the time of tender and a number of similar factors for the various elements of work at the time that the works are undertaken.

By using these factors in the formula a percentage increase in the tendered value of work done is obtained and the amount resulting from this represents the CPA due to the Contractor (ERA, 2006). To address these problems, the MoWUD 1994 (amendment of MoI 2004), FIDIC 1999,

MDB FIDIC 2006, PPA 2006 and PPPAA 2011 form of contracts provide an adjustment formula for price escalation.

PPA 2006 Contract Form

Clause 47: Price Adjustments

Prices shall be adjusted for fluctuations in the cost of inputs only if provided for in the Special Conditions of Contract. If so provided, the amounts certified in each payment certificate, after deducting for Advance Payment, shall be adjusted by applying the respective price adjustment factor to the payment amounts due in each currency. A separate formula of the type indicated below applies to each Contract currency: etc.

$$P_n = \frac{A + bL_n + cM_n + dE_n}{L_o M_o E_o} \dots \dots \dots \text{equation (2.1)}$$

Where:

P_n is a price adjustment factor to be applied to the amount in each specific currency for each payment certificate;

“A” is a constant, specified in the Contractor’s Bid, representing the non-adjustable portion in contractual payments;

b, c, d, etc., are weightings or coefficients representing the estimated proportion of each cost element (labor, materials, equipment usage, etc.) in the Works or sections thereof, net of Provisional Sums, as specified in the Contractor’s Bid; the sum of A, b, c, d, etc., shall be one;

L_n, M_n, E_n, etc., are the current cost indices or reference prices of the cost elements in the specific currency of origin at the date 28 days prior to the deadline for bid submission; and

L_o, M_o, E_o, etc., are the base cost indices or reference prices corresponding to the above cost elements at the date 28 days prior to the last day of the period to which a particular Interim Payment Certificate is related.

If a price adjustment factor is applied to payments made in a currency other than the currency of the source of the index for a particular indexed input, a correction factor Z_o/Z_n will be applied to the respective component factor of P_n for the formula of the relevant currency.

Z_o is the number of units of currency of the country of the index, equivalent to one unit of the currency of payment on the date of the base index, and Z_n is the corresponding number of such currency units on the date of the current index.

The sources of indices shall be those listed in the Contractor's Bid, as approved by the Engineer. Indices shall be appropriate for their purpose and shall relate to the Contractor's proposed source of supply of inputs on the basis of which his Contract Price and expected foreign currency requirements shall have been computed.

Price adjustment is recommended for contracts, which provide for time of completion exceeding 18 months. Bidders are required to propose the weightings for each cost element (labor, materials, equipment, etc.) and the sources of indices.

Current practice in construction dispute resolution generally reflects one of two perspectives: that one size (or resolution method) fits all disputes, and that dispute resolution is a menu of independent stand-alone choices. It is more effective to approach dispute resolution in a manner similar to medical treatment diagnose the problem first, and then select the least invasive procedure that will correct it. Because the cost-effectiveness and timeliness of dispute resolution are critical factors, this paper proposes a flexible framework a strategic approach to dispute prevention and resolution that employs a neutral advisor, early intervention, and the ability to tailor the resolution method to the particular nature of the dispute.

2.10. Current Practice of Dispute Resolution methods

A number of different Alternative Dispute Resolution (ADR) methods are currently used in the construction industry. A few of the more common methods are highlighted briefly:

- A. Step Negotiation** generally requires the individuals directly involved in the dispute to seek resolution through direct negotiation. If a resolution is not reached within a predetermined length of time, the dispute is elevated to the next level in the organizations. This process normally continues to senior levels of each organization. Dispute Review Boards typically consists of three neutral experts, who visit the site

periodically in order to monitor progress and potential problems. When requested by the parties, the board conducts an informal hearing of the dispute and issues an advisory opinion that the parties use as a basis for further negotiations. Except as otherwise credited, information presented on Dispute Review Boards is largely based on the Construction Dispute Review Board Manual (Matyas, et al. 1996).

B. Mediation is “a forum in which an impartial person, the mediator, facilitates communication between parties to promote reconciliation, settlement, or understanding among them.” (7 Texas Civil Practice & Remedies Code 154.023). Mediation is widely used for construction disputes, and provides an excellent forum in which to determine the scope of the dispute, explore the underlying interests of the parties, and discuss the strengths and weaknesses of their positions. It is possible that the parties may reach at least a partial agreement, which would reduce the scope of the remaining dispute and save process time and money. The convener, as mediator, could authorize an appropriate recess for the parties to collect further information, if needed, and reconvene the mediation

C. Arbitration is “a forum in which each party and counsel for the party present the position of the party before an impartial third party that renders a specific award.” (7 Texas Civil Practice & Remedies Code 154.027)

.The Engineers Joint Contract Documents Committee (EJCDC) standard forms require good faith negotiations for 30 days, and allow for more definition of dispute resolution; including options for requiring either mediation or arbitration (EJCDC 1996). The prevalence of construction disputes indicates that the current approach to dispute resolution is not effective enough.

First, as evidenced by standard construction contract forms, dispute resolution tends to be addressed by specifying the resolution method(s) to be used. This “pre-ordaining” of the ADR method obviously cannot consider the nature of the dispute, and may in fact limit the parties’ consideration of possible resolution methods. When the project atmosphere deteriorates, parties frequently stop communicating effectively, become inflexible, and “wrap themselves in the contract.” Therefore, a contract that specifies a particular dispute resolution method, rather than a flexible process, may unintentionally result in the oversight of “less invasive” methods that are available and probably preferable.

Second, dispute resolution methods are too frequently viewed as a menu of stand-alone choices. Dispute resolution methods can be effectively combined into more comprehensive processes, where the benefits of synergy can be exploited to successfully resolve the dispute.

2.10.1 Dispute Resolution Systems Design

Slaikeau and Hasson (1998) present a strategy to develop more cost-effective dispute resolution systems. They describe four summary methods of dealing with conflict: avoidance, collaboration, resorting to higher authority, and power plays.

Slaikeau and Hasson present a comprehensive dispute resolution system template that includes four major components: site-based resolution (between the parties, with an optional appeal to internal higher authority, such as a supervisor), internal support, convening for external ADR, and appealing to an external higher authority (e.g., courts or governmental agencies). The template generally requires collaborative methods prior to resorting to external higher authority. After site-based resolution, the utilization and sequence of subsequent components are completely flexible, including the ability to “loop back” to a more collaborative component at any time. Progressive dispute resolution exists in the construction industry, but most frequently in predefined escalation specified in the contract; for instance, the DBIA standard contract forms specify step negotiation, then mediation, and finally binding arbitration (DBIA 1998a, 1998b).

Groton (1997) presents four principles to consider when designing an effective dispute resolution system for construction:

1. “Consider the unique nature of the construction process.
2. Even when problems turn into disputes, litigation should not be the method used to resolve them.
3. If participants commit in advance to use dispute resolution techniques when problems arise, they create an atmosphere conducive to solving problems.
4. Many problem-prevention and litigation-avoidance approaches exist; these techniques are most effective when applied early in the project.”

The best practices for designing dispute resolution systems include flexibility, early intervention, exhaustion of collaborative options before resorting to adjudicatory methods, and controlled escalation of the dispute by using different ADR methods in a logical progression.

2.10.2. A Flexible Framework for the Prevention and Resolution of Construction Disputes

Due to the number of individuals, organizations, and issues involved in a modern construction project, problems are inevitable. The desire to finish the project and a lack of resources for identifying the root cause of the problem contribute to the danger of delaying the intervention necessary to resolve disputes. Timely intervention can also prevent reoccurrences of the same problem later in the construction process. Too often, contractors submit an all-inclusive dispute at the end of the project, frequently fostering an adversarial atmosphere that threatens potential collaboration between the parties on future projects. A more effective approach is to address the issues quickly, while they are manageable, determine the root causes, and correct them.

In addition to the issue of when to address disputes, there is the matter of how best to address them. Disputes vary in nature, and different disputes are more efficiently resolved through different methods. In the vast majority of construction disputes, some form of ADR is the most appropriate option. There are rare cases in which litigation is the most appropriate recourse – those in which a determination on a legal principle is required, or the establishment of a legal precedent is sought.

Even within the realm of ADR alternatives, a “one size fits all” approach cannot produce optimal results due to the varying characteristics of the disputes and of the ADR methods (Groton 1997, Hinchey and Schor 2000). The question is then, “When is the best time to specify the ADR approach to be used for a particular dispute?”

The 1990 ABA forum concluded that mediations tended to be more successful when parties agreed to mediate after the dispute developed, as opposed to simply enforce as a matter of the contract (Hinchey 1990).

Considering these facts together, the proposed solution is to contractually specify a framework for dispute resolution that combines early intervention with flexibility in the selection of ADR methods, rather than specifying a particular method to be applied to all disputes. The proposed system concentrates heavily on proven techniques to prevent and collaboratively resolve disputes, and includes the ability to tailor the resolution process specifically based on the characteristics of each dispute.

A convener a neutral third-party expert advisor assists the project team in implementing the system, and provides continuity throughout the duration of the project. No single ADR method is effective in all cases; therefore, the proposed system borrows on the military concept of “defense in depth” that is, deploying more than one layer of defense against the enemy – in this case, unresolved disputes.

A. First Layer of Defense: Dispute Prevention

Prevention is the first layer of defense against unresolved disputes, and is an integral part of a comprehensive approach to the problem. The convener adds value by assisting the project team in the development of applicable dispute prevention techniques, which include:

- Risk assessment and allocation, including detailed project scope definition,
- Partnering, including creating a set of common project goals, and
- Contract clauses that outline of a flexible framework for dispute resolution

The success of the project and the prevention of disputes depend heavily on the proper assessment and allocation of risk (CII 1995a). Errors in risk assessment can lead to significant changes and rework, resulting in added costs and delays. Detailed project scope definition is a major component of risk assessment, in that scope changes pose a threat to the success of the project. Changes frequently lead to contractor disputes and while a certain number of changes are inevitable on a complex project, research and experience indicate that thorough project scope definition prior to the start of detailed design avoids a large percentage of changes and their related impacts. A well-defined project scope allows the owner to effectively communicate its desires to the designer, who then has the information needed to design the project to meet the owner’s needs, goals, and expectations (Gibson and Pappas 2003).

The Construction Industry Institute (CII) developed a tool that project teams can use to quantify the degree of project scope definition and create a prioritized action list of those elements that pose the most significant risk to the project. Project teams can also use the Disputes Potential Index (DPI) to assess the likelihood of a dispute by investigating risk factors associated with the parties’ experience with each other and with projects similar to the one in question (CII 1995b).Improper risk allocation frequently leads to disputes; typically this occurs when the

owner uses contract language to unfairly shift risk to the contractor without appropriate compensation.

Jergeas and Hartman (1996) present a collaborative approach whereby Prospective bidders identify risks that would cause them to increase their bid price. The owner and bidders assign a value to each risk during the bidding process. The owner evaluates the bids, decides which risks keeping and which risks to pay the contractor to accept, and awards the contract based on the best combination of cost and risk allocation.

The contract's ADR clause should detail an approach that will reinforce the relationships and the team perspective when problems arise. The clause should include the concepts found in the DBIA documents (DBIA 1998a, DBIA 1998b) – specifically, beginning with a step negotiation process, and specifying binding arbitration with a “loser pays” approach as the last recourse.

The step negotiation requirement should either include time limits, or specify that time limits be established as part of a project partnering workshop. Between step negotiation and binding arbitration, the clause should require the parties, at the point at which step negotiation

B. Second Layer of Defense: Flexible Dispute Resolution

The vast majority of disputes are typically negotiated and resolved by project participants without any external intervention. However, the planning and execution of the most thorough dispute prevention plan and step negotiation process cannot be expected to resolve all disputes on a construction project; therefore, a second layer of defense is needed. In this layer, the convener adds value by conducting one or more informal meetings, as needed, to assist the team in resolving the dispute in a timely and efficient manner before it escalates to the point that it severely impacts the project of goals. CII's method to evaluate design effectiveness (CII 1986) and Shields' (2002) construction success metric can both be customized to reflect the project team's definition of success for a particular project. Undoubtedly there is the mutual goal of resolving the dispute in a cost-effective, timely manner, to the satisfaction of the parties. The optimal solution encourages the selection of an appropriate resolution method based on the individual characteristics of the dispute.

The convening session is an early proactive effort to resolve the dispute. The contemporaneous nature of the session improves the probability of resolution because the events leading to the dispute are fresh in the participants' minds, the individuals involved in the dispute can be made available to participate in the resolution process and the parties may not have had time to become deeply entrenched in their positions, and the relationship is probably not yet seriously damaged. In keeping with Slaikeu and Hasson's work (1998), the convening session first looks to more collaborative resolution methods. This approach enhances the communication and the working relationships developed in the partnering effort and required to successfully complete the current project, not to mention improving the likelihood of the parties working together on future projects.

The convener now has three main objectives: to confirm the scope of the dispute, determine the most appropriate resolution method, and establish the schedule and procedures (including ground rules, the degree of discovery and/or deposition required, the possible use of joint experts, etc.) for the subsequent process. The parties and the convener have the freedom to "loop back" to a more collaborative method at any point for instance, facilitated negotiations or a more formal mediation with an external neutral if that is determined to be appropriate.

Even in cases where the dispute continues beyond the convening session, the proposed flexible dispute resolution system should significantly reduce the time and cost required to reach an agreement. First, this system is based on early intervention. Once the parties notify the convener of failed negotiations, the convening session would be held as soon as arrangements could be made – a reasonable expectation would be within two weeks. The convener would likely complete the mediation and early neutral evaluation (if needed) phases in the same day.

The result is that the dispute would either be resolved, or the parties would have a firm scope, resolution method, schedule, and procedures to be used, within two to three weeks of the original event. Second, there are almost certainly some issues that could be agreed upon in the mediation or early neutral evaluation phases that would require no further analysis. This serves to focus or limit the areas for which legal and expert analyses (e.g., discovery, depositions, expert reports) are required.

Because this framework includes a multiple-meeting format, the convener and the parties should clarify confidentiality issues in advance. For instance, what, if any, information from the convening session would be made available to the external ADR process, or be admissible in the (last resort) binding arbitration?

Finally, the parties retain their rights to continue to binding arbitration as the last resort if the dispute is not resolved through the external ADR process.

C. Qualifications of the Convener

The convener functions in a number of roles in this proposed system – dispute prevention advisor, mediator, early neutral evaluator, and dispute resolution advisor – and therefore must be a well-rounded integrator whom the parties trust to advise them in preventing and effectively resolving disputes.

It is vital that the parties both accept the convener. The ideal situation would be a joint selection and appointment process. It is possible that the convener’s early involvement in some of the dispute prevention techniques may precede the identification of the contractor or another party.

In this case, the owner would appoint the convener, and the contractor, once selected, would either ratify that appointment, or the parties would jointly select a new convener.

To contribute the greatest value to the prevention effort, the convener should have a background in the construction industry with experience in risk assessment and allocation, project scope definition, partnering, contract law, and developing effective project dispute management processes.

To contribute the greatest value to the resolution effort, the convener should be a trained mediator, have experience with construction disputes, and be familiar with various ADR methods. The convener need not be an attorney. In the role of a “mediator plus,” the convener guides the dispute through various ADR methods to resolution. Mediation experience provides certain skills needed to function effectively as an early neutral evaluator and an advisor with respect to any required external dispute resolution processes. Construction expertise provides skills and experience needed to function effectively as a mediator and an early neutral evaluator.

The convener must maintain the proper balance between facilitator, evaluator, and advisor depending upon on his or her current role in the system.

Table: 5 Methods to manage/administer Construction Dispute

Methods to manage/administer Construction Dispute
Good construction management
Using proper work schedules
Practicing on time payment
Develop program-wide contingencies and risk management Protocols
Knowing the strength and Weakness of the projects.

CHAPTER THREE

RESEARCH METHDODOLOGY

3.1. General

Research methodology is a way to systematically solve the research problem and research methodology shall identify the research basis, hypothesis or questions, research design and research analysis (Kothari 2004) quoted in Abraham 2008)).Accordingly this chapter provides a general description of the research strategy adopted for this thesis, as well justification of the methodology.

3.2 Description of the Study Area

ERA is a Federal Road Authority under the Ministry of Transport and Communication for the Development and Management of major highways and links roads (called federal road construction projects) throughout the country. The geographical organization of ERA constitutes five regions (North, South, Central, East and West) which sub divide in to districts. They develop RSDP to expand Ethiopian road network which is divide in to different phases (phase I-IV) beginning from 1997 up to 2015. Until May, 2012, there are total of 471 projects in federal road network of the country, which were completed, under construction, under design, under procurement and feasibility study among those around 282 projects are after June 2006. Currently the country's total road coverage stands at 49,000 kilometers (up to June, 2010) and this figure will be boosted up to 136,044 kilometers, under the new Government's Growth and Transformation Plan, in the upcoming five years (2010-2015). Among those Federal Road network covers 27,850 kilometers from 471 projects (ERA, 2010).

The study was carried out in South Western District which involved a selection ERA Road Project in South Western of Ethiopia which includes Jimma to Agaro(Didesa) ,Metu Gambela,Nejo (Maka Nejo)and Bonga-Ameya-Chida road projects.

Gambela to Metu (169.1 Km)

Gambela is a city and separate woreda in Ethiopia and the capital of the Gambela Region or kilil. Located in Anuak Zone, at the confluence of the Baro River and its tributary the Jajjaba, the city has a latitude and longitude of $8^{\circ}15'N$ $34^{\circ}35'E$ Coordinates: $8^{\circ}15'N$ $34^{\circ}35'E$ and an elevation of 526 meters. It is surrounded by Gambela Zuria



Figure 3 Map of Gambela to Metu

Jimma to Agaro (46.1km)

Agaro (or Haggaro) is a town and separate woreda in south-western Ethiopia. Located in the Jimma Zone of the Oromia Region, it sits at a latitude and longitude of $7^{\circ}51'N$ $36^{\circ}35'E$ Coordinates: $7^{\circ}51'N$ $36^{\circ}35'E$, and an elevation of 1560 meters above sea level. Agaro is one of the most important trading centers of coffee in Ethiopia.



Figure 4 Map of Jimma to Agaro (46.1km)

The Bonga-Ameya-Chida Road

Is located in the South Western Nations and Nationalities Peoples State of Ethiopia and is approximately 109 km long. The project road starts within Bonga town at the intersection with Bonga Mizan road. The project road is divided into two Contracts as follows;

Contract 1: Bonga –Falege Selam (51.80 km)

Contract 2: Falege Selam-Ameya-Chida (57.03 km)

The works under Contract 1 consists of the construction of new 51.80 Km road to DS-5 standard with 7.0 m carriageway width. The works also includes construction of several minor and major drainage structures. The construction of major drainage structures include replacement of existing Sheta Bridge (T-Girder Bridge) with new 32m two span girder bridge located about 3 km ahead from the start point of the project.

The works under Contract2consists of the construction of new 57.03Km road with 7.0 m carriage way with the works also includes construction of several minor and major drainage structures. Furthermore, construction of one single lane type of roundabout located at center of Chida town (station 108+532.5) is included in this contract.

The organizations were assured that the purpose of the study is purely for academic purpose i.e. to conduct comprehensive study on disputes. The interview for in depth discussions were undertaken with selected professionals at top managerial level in their respective organizations.

3.3. Research Process

The strategy followed in this research was first started with problem identification which has been done through unstructured literature review, archival study and informal discussion; and then the research design was formulated.

Then data and information sources were determined based on the formulated research design. On the basis of the data and information sources the research instruments were decided; and available documentary sources relevant to the research were reviewed. The review includes books, journal and articles, internet sources and archival document search such as progress reports, completion reports and contract documents within Ethiopian Roads Authority. The document search was mainly intended to collect disputes and their causes from some upgrading, rehabilitation and new projects which was completed/ substantially completed and ongoing projects through random selection and focusing on projects for further investigation - to identify important disputes variables.

Finally, after an in-depth review of literature, a questionnaire was designed and distributed to contractors, consultants and the employers (ERA) to get their professional opinion based on their experience. Upon obtaining the desired data, checking and sorting of data has been done. The data were then analyzed for cross-checking the validity and conformity of the information obtained through the overall research work. This was followed by thorough discussions in order to draw a conclusion and to forward recommendations based on the findings of the study.

It was attempted to collect data from the relevant population (ERA, consulting firms and contractors) to evaluate the perception of different stakeholders on the issues of disputes in construction projects. The whole research document is classified into five (5) major parts.

3.4 Study Period

The study was conducted in South Western district which includes Jimma to Agaro (Didesa), Metu Gambela, Nejo (Maka Nejo) and Bonga-Ameya-Chidacity, from June 2016 to September 2016.

3.5 Data Collection

3.5.1 Source of Data

Both primary data sources and secondary data sources will be used. The Primary data's will be collected through questionnaire, while secondary data's will be collected through archival documents/literatures (reports, researches, text book and case studies).

3.5.2 Study Population

The study populations for this research were the client (ERA), contractors and consultants who were and still are engaged in road construction projects in South Western District selected road project. The populations for this research were public construction project in Jimma to Agaro (Didesa), Metu Gambela, Nejo (Maka Nejo) and Bonga-Ameya-Chidacity,

3.6 Study Design

During data collection the research design used in this study were descriptive and explanatory survey types and questionnaires were distributed because it dealt with causal relationship between the variables and it has been to describe factors that cause the construction Disputes and the effects. The collected questionnaires were analyzed by using Excel.

Firstly, the research was conducted by identification of the factors influencing construction Disputes through literature review and desk study on selected road projects based on report documents. From these findings, questionnaires were developed and distributed to respondents then attempted to collect data from the relevant population (i.e. Client, consulting firms, contractors) to evaluate the perception of different stakeholders on the issues of Causes of Construction Dispute, problems, effects, remedial measure and its adjustment in order to make the construction operation smoothly in ERA construction projects located in selected road project in South Western District, and existing practice on the Construction Dispute in this District. Upon obtaining the desired data, checking and sorting of data has been done.

The data had been analyzed for cross-checking in order to determine the validity and conformity of the information obtained through the overall research work. This was followed by thorough discussions in order to draw a conclusion and to forward recommendations based on the findings of the study.

The desk study was undertaken by the researcher to obtain actual data from the source documents which included in the contract documents, supplementary agreements, variation orders , progress as well as completion reports to have contextual bases on cost estimation system on selected Road project that are found in South Western District . The other instrument employed was to solicit professional opinion and relevant data through questionnaires. For the questionnaire survey the respondents were randomly selected from the employer's Organization (ERA), contractors, consultant's .who has been involved in the road sector development program. The questionnaire which consists of both open and closed ended question was distributed among these professionals.

3.7 Sample size and sampling procedure

3.7.1 Sample size

Sample size is the number of units in the sample and allocates one to obtain a representative image about the population. The respondents included in the survey comprised of a total of 44 professionals: 10 from owner (Client), 16 from contractors and 18 consulting offices. The numbers were determined on the basis of the time available for conducting the research work, available fund for the study (project), and the reliability of the respondents so that the overall research work would indicate the reality-purposive sampling was used.

3.7.2 Sampling procedures

A stratified random sampling technique was employed to select the relevant sample units deliberately for the problem from the population for questionnaire. The populations are classified in to three strata. The strata is based on physical activities that Rehabilitation (2 projects), Upgrading 3 projects) and New construction (2projects) where. In addition, a sample of available design and contract documents of selected projects believed to face with severe poor cost estimation were taken for desk study based on same technique.

The numbers of contractors and consultants which were and still are engaged in Bonga-Ameya-Chida, Jimma to Agaro (Didesa), Metu Gambela, and Nejo (Maka Nejo) city in ERA road project whose contract period have negative slippage from the original contact period. Respondents were selected based on the criteria from those who are included in the population.

3.7.3. Data Collection Tools/Instruments

3.7.3.1. Questionnaire

In collecting the necessary data from the sampled population through questionnaire, the researcher prepared a total of sixteen questions under four parts. The first part is related to General / Organization Information and answering the questions, the second part sought information from respondent on Factors causing Construction Dispute, the third part addresses the possible effects of Construction Dispute and the fourth part related to Construction Dispute and adjustment Construction disputes. 50 Self-administered questionnaires were distributed and collected among the sampled population. The detail of Questionnaires design is shown in Appendix A.

3.8. Method of Data Analysis

The procedure used in analyzing of data was aimed at establishing the relative importance of the various factors that causing Construction Dispute in South Western District of ERA Projects, identify problems of Construction Dispute, identify the effects of Dispute and to find out remedial measure to minimize construction Dispute in south west District of ERA Projects.

There are three steps in analyzing the data:

- Calculating RII(Relative importance index)
- Ranking of each factors based on RII
- Determining degree of correlations in ranking the variables among Clients, Consultants and Contractors.

In the analysis, the “Relative Importance Index” methods were adopted to determine the ranking relative importance of variables for construction projects of Ethiopia. The method was adopted in this study within various groups of respondents (Clients, Consultants and Contractors). The five point scale (, 1, 2, 3, 4 and 5) was used to calculate the relative importance index for each variable which was then used to determine the relative ranking.

3.8.1. Questionnaire Analysis

The data collected through questionnaire were analyzed through percentage method for question number two in part one, average score method for question number three, four and five in part

one and part two, part three, five, six question was analyzed through relative importance index. The five ordinal measure of agreement Likert scale represent the following rating:

Table 6 Rating scale for factors causing construction disputes

Item	Never	Seldom	Sometimes	Often	Always
Scale	1	2	3	4	5

Ordinal scale used for the measurement of the degree significances for effects of construction disputes on road construction projects:

Table 7 Rating scale for effects of construction disputes

Item	No significance	Minor significance	Average significance	High significance	Extreme significance
Scale	1	2	3	4	5

Ordinal scale used to identify problems of Construction Dispute and its adjustment in South Western District of ERA projects:

Table 8 Rating scale for problems of Construction Dispute and its adjustment

Item	lowest involvement	low involvement Sometimes	medium involvement	high involvement	highest involvement
Scale	1	2	3	4	5

Ordinal scale used to find out remedial measure to minimize construction Dispute in South Western District of ERA projects:

Table 9 Rating scale to find out remedial measure to minimize construction Dispute

Item	Unimportant	Less important	Important	Very important	Extremely important
Scale	1	2	3	4	5

3.9. Relative importance index (RII)

The RII for all disputes factors and group of categories was computed so as to rank the factors. The analysis was aided by the use of Excel where the scores assigned to each factor by the respondents were entered and consequently the responses from the 50 questionnaires were

subjected to statistical analysis for further insight. The contribution of each of the factors to overall Dispute was examined and the ranking of the attributes in terms of their criticality as perceived by the respondents was done by use of Relative Importance Index (RII).

The relative importance index is computed as (Cheung et al, 2004; Iyer and Jha, 2005; Ugwu and Haupt, 2007):

$$\text{Relative importance index (RII)} = \frac{\sum W}{A \cdot N} \dots \dots \dots \text{equation (3.1)}$$

Where:

W is the weight assigned to each factor by respondents (ranging from 1 to 5)

A is the highest weight (i.e. 5 in this case)

N is the total number of respondents (44 in this case)

The value of relative importance index had range from 1 to 2, where 2 is extremely important and 1 is unimportant

Spearman's Rank Correlation Coefficient method, which number varies between -1 and +1, was used to know owners, consultants and contractors perceptions of factors causing price escalation, its effect, price escalation adjustment problems and methods to manage/administer price escalation on federal road construction projects.

As spearman's rank correlation (r_s) is a technique to test the direction and strength of the relationship between two variables, the method was adopted in this study to show the degree of agreement between the respondents. It is calculated using the following formula

$$r_s = 1 - \frac{6 \sum d^2}{n^3(n^2-1)} \dots \dots \dots \text{equation (3.2)}$$

Where:

r_s is Spearman's Rank Correlation Coefficient

d is the difference in factors ranks given by respondents and

n is the number of data pairs.

- A correlation coefficient of +1 means perfect positive correlation (agreement).
- A correlation coefficient close to 0 means no correlation.
- A correlation coefficient of -1 means perfect negative correlation (disagreement).

$$[W = \sum[(f1xn1) + (f2xn2) + (f3xn3)+\dots\dots\dots+(fnxnn)]]\dots\dots\dots\text{equation (3.3)}$$

Where

w =is weighting given to each factor by respondents ranging from 1 to 5.

n1 = number of respondents for very low involvement

n2 = number of respondents for low involvement

n3 = number of respondents for medium involvement

n4 = number of respondents for high involvement

n5 = number of respondents for very high involvement

A= is the highest weight (i.e. 5 in this case), and

f= Likert scale

N =is the total number of respondents. The RII value had a range between $0 < RII \leq 1$. The highest values of RII, is the more important for assessment of Dispute analysis.

3.10. Data Measurement

In this research, ordinal scales were used. Ordinal scale as shown in table 10 is a ranking or a rating data that normally uses integers in ascending or descending order. Table 10ordinal scale used for data measurement for the Likert scale.

Table 10: Likert’s scale

Item	Very low involvement	low involvement	Medium involvement	high involvement	Very high involvement
Scale	1	2	3	4	5

The relative importance index method (RII) is used here to determine different Research projects, perceptions of the respondent about the Causes of Construction Dispute in south west District of ERA Projects. The relative importance index is computed as in equation (3.1) above.

3.11. Ethical Consideration

This point of the survey is completely academic and it was clearly described to the organization. so the data was only be collected for the purpose of academic and it was clearly described to the organization by showing ethical clearance that was obtained from JiT - Research, Publication, and Graduate Studies JiT. Before starting data collection the purpose of the study was explained to all respondents and informed consent was obtained to ask questions. The research and data collection was conducted after approval was obtained from Jimma University and ERA to process the work. Before the collection of the data the purpose of the data collection was clearly described to the organizations by the data collectors and the principal investigator. The data was collected based on the willingness of the organizations to give information. The data was kept confidential and used only for the research purpose.

Basic Ethical Principles in Human Research

The Belmont Report (1974) summarizes three basic ethical principles relevant to research involving human subjects.

Respect for person:

- The researcher must ensure that the subject has received a full revelation of the nature of the study, profit and options, with an extended opportunity to ask question Persons with diminished autonomy are entitled to protection.
- Prisoners, students, children, etc.) Should not be coerced to participate in a research.

3.12. Study variables

The aim of this study is to studying the current situation with regard to Assessment on Causes of Construction Dispute in south west District of ERA Projects.

3.12.1 Dependent variable:

Construction Dispute in Road Projects

3.12.2 Independent Variable:

The basis why problems of construction Disputes develop on road projects.

Factors of Construction Dispute considered in Disputes assessment.

Basic Methods in manage/administer Dispute in road Construction projects.

3.13. Data collection process

The collection of data refers to a plan for gathering data, information from field situations. The Adopted data collection process was primary sources include questionnaire; and open discussion while secondary sources includes internet sources were included. The information/data collected by a person directly is known as primary data while records or data collected from offices/institutions is known as secondary data.

3.13.1. Primary Data Sources

A. Questionnaire

Questionnaires were used for collecting information from different construction professionals to reach the final conclusions. Due to this 50 questioners were distributed to different companies and their representatives and 44 questionnaires were returned back. The questionnaire plays a central role in the survey process in which information is transferred the respondents to the users. It is the instrument through which the information needs of the users are expressed in operational terms as well as the main basis of input for the data processing system for the particular survey (Jambwa, Data processing, analysis, and dissemination, 2003).

The questionnaire serves two purposes. First, it translates the objectives of the field work into specific questions which help in the collection of necessary data. The data collected through the responses of the questions forms the basis of understanding the problem or explore the idea set by the objective. In order to achieve these objectives, each question must communicate to the respondent the idea or group of ideas required by the objective and obtain a response which can be analyzed to fulfill the objectives. The second purpose of questionnaire is to assist interviewer in motivating the respondent to communicate the required information. There are many factors which determine the respondent's willingness to engage in an interview. The questionnaire itself does much to determine the nature of interviewer-respondent relationship (MODULE, 1988).

Table 11 Summary of questionnaires administration

Name of Organization	Number sent	Number of questionnaires back	% of returned questionnaires
Client	11	10	84.21
Consultant	20	18	90.00
Contractors	19	16	90.91
Total	50	44	88.00

3.14. Demographic Characteristics of Respondents

This aspect covered activities related to the reason that Dispute develops on road construction, Major exposures to loss on road construction, basic risk in the road construction, & factor considered in the selection of appropriate methodology for Dispute Analysis. It employed the five point type Likert ordinal scale to measure level of usage by responding firms from “Very low involvement” to “Very high involvement” that is, 1= Very low involvement, 2= low involvement,, 3= Medium involvement, 4= high involvement , 5= Very high involvement. All the collected information from the survey were checked and verified for the correctness by principal investigator. The data were subjected to statistical analysis for further checking using Excel.

The data was collected is secondary and primary data. The secondary data was collected through desk study i.e. archival, different materials such as journals, magazines, published and unpublished materials, books, and internet sources. The primary data for this study was collected from respondents work through:-The questionnaires addressed to the managing directors of the selected firms with the permission cover letter, describing the purpose of data collecting and asking that senior staff members with major involvement in disputes assessment be encouraged to complete it and it was designed to produce answers to a number of questions pertinent to the research objectives. In addition to this had been use of interviewing.

3.15. Data Processing and Analysis

The categorized data were then coded and analyzed using Microsoft Excel software program to determine the causes, effects, factors and Methods to manage construction Disputes in the selected road projects in South Western District of Federal Road Project. The Relative Importance Index (RII) was calculated using the formula shown above. The five point Likert scales (1, 2, 3, 4, and 5) are used to calculate the relative importance index for each factor and which was then used to determine the relative ranking among 25 factors. The relative importance index for 16 identified causes of construction Disputes was also ranked on five point scale (1 to 5)

Spearman's-rank correlation coefficient for measuring the agreement/or difference in ranking between two groups of respondents scoring each factor is applied; because of its advantages of not requiring the assumption of normality and or homogeneity of variances. In this research it is used to show the degree of agreement between the different parties involved in the survey: contractors, clients and consultants. John Wiley & Sons (1985)

The ranking correlation coefficient ranges from -1 to +1. A correlation coefficient of 1 indicates a perfect linear correlation i.e. good or strong correlations while -1 indicates negative correlation implying high ranking in one group is associated with low ranking on the other. Correlation coefficient value near to zero indicates little or no correlation. This correlation coefficient is used to measure and compare the association between the rankings of two parties, while ignoring the ranking of the third one.

The Spearman's- rank correlation coefficient (rs) for agreement in ranking between the two parties is given by the following formula. John Wiley & Sons, (1985)

$$rs = 1 - \frac{6\sum d^2}{N(N^2 - 1)} \dots\dots\dots\text{equation-(3.4)}$$

rs=Spearman's rank correlation coefficient.

d =the difference in ranking between the contractors, consultants and clients and

N= is number of variables

The rank correlation coefficient is used for measuring the differences or agreement in ranking between two groups of respondents scoring the various factors (i.e. clients versus consultants, clients versus contractors and consultants versus contractors).

Survey planning: the designers of the survey make decisions about the major purposes, users and uses of the survey, its major outputs and major inputs, procedures for obtaining the inputs (the design and preparation of the questionnaire and related survey instruments) and transforming them into outputs, and the design of the data processing and documentation system.

Survey operations: this consists of the creation of the sampling frame, sampling, data collection (measurement), data preparation (data entry, coding, editing and imputation), and the creation of the observation file, estimation, analysis and presentation and dissemination of results.

Survey evaluation: consisting of checking and evaluating whether the specified end products have been delivered, the output properly published and advertised, the metadata documented.

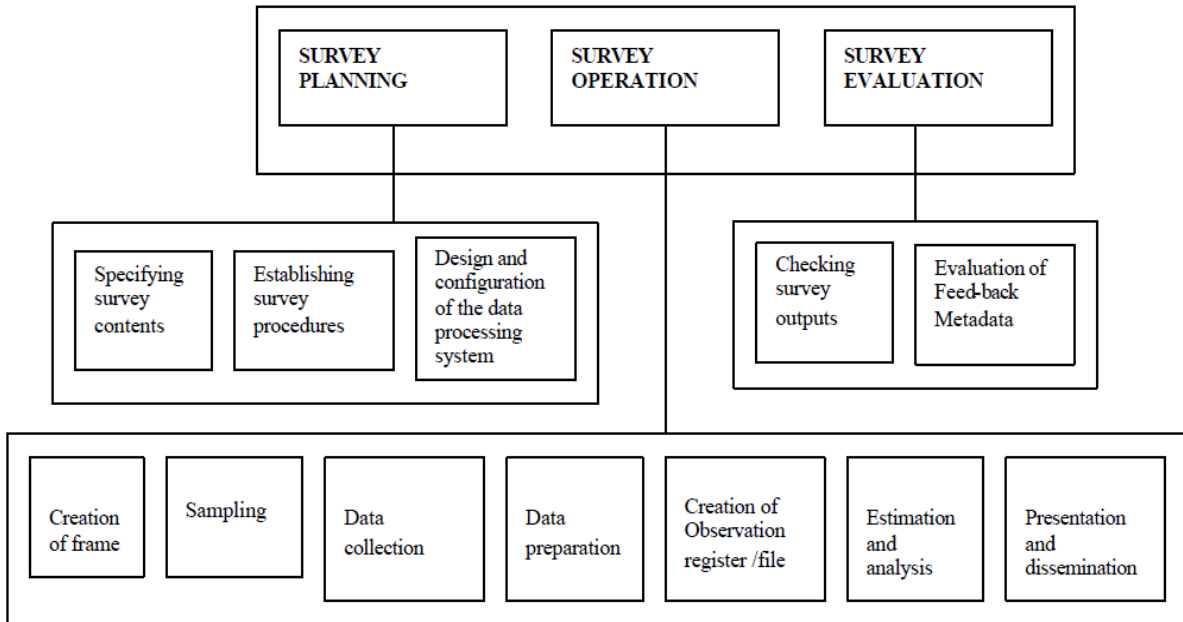


Figure 5 Survey run through the same kinds of cycle and typical phase.

It is important to analyze whether the information recorded on the questionnaire can be processed easily. An identification code should uniquely identify each questionnaire and should always be numerical. The categorized data were then coded and analyzed using Excel program to

determine the severity and frequency occurrence of the Dispute factors influencing performance of road construction projects in Bonga-Ameyya-Chida, Jimma to Agaro (Didesa), Metu Gambela, and Nejo (Maka Nejo) cities.

3.16. Reliability of data

Reliability is, literally, the extent to which we can rely on the source of the data and, therefore, the data itself. Reliable data is dependable, trustworthy, unflinching, sure, authentic, genuine, reputable. Consistency is the main measure of reliability. So in literary accounts, the reputation of the source is critical (Russell, 1951).

Research essentially involves the gathering or collection of data that addresses the research question and enables theory to be tested or developed. So the data from which answers to the research question are to be drawn must be appropriate in terms of its relevance and efficacy – ‘fitness for purpose.

Reliability:

There are different means of estimating the reliability of any measure. According to Crocker and Algina, the test developer has a responsibility to identify the sources of measurement error that would be most detrimental to useful score interpretation and design a reliability study that permits such errors to occur so that their effects can be assessed. Pretesting or pilot testing an instrument allows for the identification of such sources. Refinement of the instrument then focuses on minimizing measurement error (Winterstein, 2008).

The most popular index (and the one reported in Testing & Evaluation’s item analysis) is referred to as Cronbach’s alpha. In this way, Cronbach’s alpha is often considered a measure of item homogeneity; i.e. large alpha values indicate that the items are tapping a common domain (higher degree of internal consistency). The formula for Cronbach’s alpha is as follows

$$a = \frac{Kr}{1+(K-1)r} \dots \dots \dots \text{equation (3.5)}$$

Where:

a = is Cronbach’s Coefficient Alpha

K = is items (variables) in the scale and

r = is the average of the inter-item correlations

For different reasons of contract disputes, Major exposure for loss, Basic risks on road construction projects and the factors considered in the selection of appropriate methodology for the dispute analysis, the value of Cronbach's Coefficient Alpha analyzed using Excel shows the questionnaire is reliable and most are highly reliable.

3.17. Data quality assurance

This research study Data was collected very imperatively to create awareness for the manager of construction project on handling of disputes once it is occurred. The training was given to the manager of the construction company owner as well as the construction project manager because of this the time and money was conserved. In order to achieve the quality of data, the researcher ordered the questionnaires to the relevant respondents in an effort to achieve the necessary information. Moreover, data collectors were trained on the aspects of the questionnaire and how to handle the respondents and the data carefully. During the data analysis, the raw data used in Ms excel were checked repeatedly whether the values were exactly the same as the given value by the respondents to avoid any wrong results.

3.18 Plan for dissemination

The findings of this thesis work was presented for School of Civil Engineering; and the office of Research, Publications, Graduate Studies and Consultancy, Jimma Institute of Technology, Jimma University as part of evaluation for the award of the degree of Master of Science and publically defended in the presence of examiners. The research study area will be conducted for ERA in South Western District in selected Road Projects.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1. Introduction

This part is mainly designed to provide general information about respondents' organization, position, and experience in road construction and the research deals with the assessment and discussion of the data gathered from the desk study and questionnaire survey. It includes on the Assessment of causes of Construction Dispute in South Western District of ERA Projects by: identifying the problems of construction Dispute, effects of Construction Dispute, and remedial measure and its adjustment in order to make the construction operation smoothly in South Western District of ERA Projects. For this study, the sample population composed of professionals from the client (ERA), consulting firms, and constructing organizations which were and still are engaged in road construction projects in the study area. The professional mix includes project managers, site engineers, project coordinators and resident engineers.

The Target of the research was achieved through the following specific objectives:

1. To identify the problems contributory to the Construction Dispute.
2. To determine the effects of construction dispute that affects the construction operation.
3. To find out remedial measure and its adjustment in order to make the construction operation smoothly

4.2. Questionnaires Finding and Discussion

A self-administered fifty (50) questionnaires were distributed to the respondents to investigate Construction Dispute for South Western District of ERA Projects. Among those 44 was answered by respondents. 11 to client (ERA), 20 to consulting firms and 19 to constructing organizations. Out of which, (88%) valid responses were collected. as follows: 10 (90.91%) from client, 18 (90.00%) from consulting firms, 16(84.21%) from constructing organizations.

Table 12 Questionnaire distribution

S.N	Participants	Distributed	No. of response	Percent	Cumulative	Response rate (%)
1	Contractors	19	16	36.36	36.36 %	84.21
2	Consultants	20	18	40.91	77.27 %	90.00
3	Clients	11	10	22.73	100 %	90.91
	Total	50	44	100		88.00

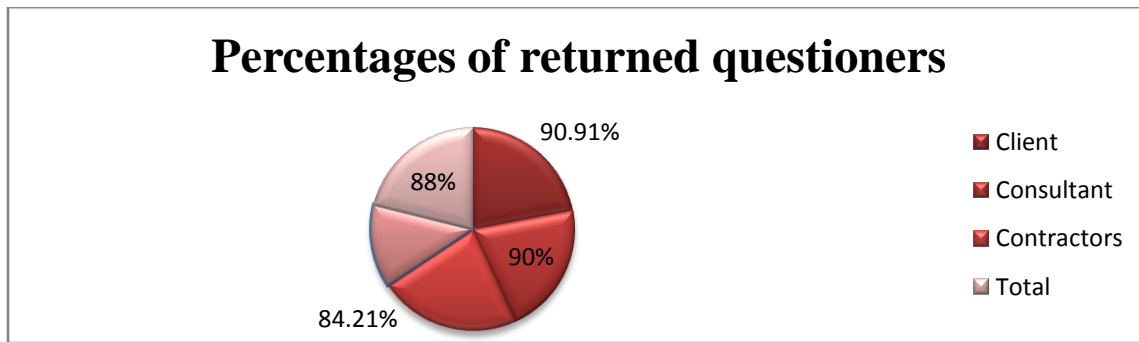


Figure 6 percentages of returned Figure 2 percentages of returned questionnaires

4.3. The average years of experience of the respondents

The level of experience of the organization and respondents was great importance to the reliability of the research as a whole. Table10 shows that 22.73% (10) of the respondents firm have experience less than 3years (0-3) at road construction works, 59.09% (26) of respondents have experience between 4 to 6 years, (4-6)18.18% (8) of respondents have experience from 7 to 10years(7-10).

The majority of respondents fall in the category of 4-6 years of experience. This could indicate that those filling questionnaires had relatively reasonable experience in the industry and their responses could be trusted.

Table 13 Experience of respondents (years)

Number of experience in Years	Number of Respondents	Percentage of experience of the respondent
0-3	10	22.73%
4-6	26	59.09%
7-10	8	18.18%

4.4. Position of respondent in the organization

Knowing the position of Respondents in the organization is very beneficial to have in-depth information of a work that performed during data collection. With such knowledge, it is easy to manage the work and any raised response. Table 14 indicates that the greater percentage of respondents (75 percent) is project manager, the percentage of respondents (18.18 percent) fell within planning head; and the last percentage of respondents (6.82 percent) fell within Project Engineer.

Table 3 Respondents position in the organization

Position in the organization	Number of Respondents	Percentage of respondents against total (%)
Project Managers	33	75
Planning head	8	18.18
Project Engineers/Site Engineers	3	6.82
Total	44	100

4.5. Relative Importance Index Analysis and Ranking different reasons of disputes.

The data received in the questionnaire was analyzed by Relative Importance Index (RII) method to determine the relative importance of: the problems which contributory to the Construction

Dispute, The effects of construction dispute that affects the construction operation and the remedial measure and its adjustment in order to make the construction operation smoothly.

4.6 Causes of Construction Dispute which are identified by the respondents in South Western District of ERA Projects

The main objective of this study was Assessment on Causes of Construction Dispute in South Western District of ERA Projects.

There were different causes of Dispute on road construction. Questioners were distributed to the respondents was conducted in this District which includes Jimma to Agaro (Didesa), Metu Gambela, Nejo (Maka Nejo) and Bonga-Ameya-Chida. The following causes of Dispute on road construction were identified through the questionnaires. The respondents were gave Likert's scale five (Very high involvement) for the whole types of Causes of Dispute on road construction. A total of 16 Causes has been identified through literature review were from literature review and presented in table 15 below

Table 4 Causes of construction Disputes identified by the respondents

No	Causes of construction Disputes		
1	Lack, in many occasions, of specialized workforce	9	Suspension of works, unreasonable rejection of work
2	Technical failure due to poor construction	10	Negligence in the implementation of preventive measures
3	Inadequate storages of construction materials.	11	Incorrect consultant report.
4	Poor work plan	12	Force majeure, act of God
5	Delay in decision processing	13	Errors in calculation or design and employment of defective or inadequate materials.
6	In adequate maintenance of traffic plan.	14	Budget based on incomplete data
7	Performance of the contractors	15	Use of poor construction materials

8	Insurance problems;	16	Insufficient time for testing
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The data received in the questionnaire was analyzed by Relative Importance Index (RII) method. The view of respondents were ranked by their relative importance index as below on table 16

By Using excel the result of the analysis was as shown in the table 13. The rank of the causes based on its RII was: Technical failure due to poor construction. (RII=0.623) was the first; Delay in decision processing (RII=0.592); Inadequate storages of construction materials. (RII=0.592) and Budget based on incomplete data (RII=0.592); was the second; Negligence in the implementation of preventive measures (RII=0.587) was the third from over the other major

Table 16 Causes of construction Disputes identified by the respondents founded on RII.

Causes of construction Disputes	Mean	RII	Rank
Technical failure due to poor construction	3.117	0.623	1
Delay in dissections	2.958	0.592	3
Inadequate storages of construction materials.	2.958	0.592	3
Budget based on incomplete data	2.958	0.592	3
Negligence in the implementation of preventive measures	2.933	0.587	5
In adequate maintenance of traffic plan.	2.86	0.572	7
Performance of the contractors	2.86	0.572	7
Insufficient time for testing	2.836	0.567	9
Suspension of works, unreasonable rejection of work	2.835	0.567	9
Lack, in many occasions, of specialized workforce	2.811	0.562	10
Incorrect consultant report.	2.701	0.540	11
Force majeure, act of God	2.677	0.535	12
Errors in calculation or design and employment of defective or inadequate materials.	2.493	0.499	13
Poor work plan	1.809	0.362	14
Use of poor construction materials	1.626	0.325	15
Insurance problems	1.357	0.271	16

1. Technical failure due to poor construction

Technical causes are actual physical proximity causes. For example, improper compaction of soil could lead to excessive settlement of foundation. Procedural causes are related to human errors and include things such as communication problems, short comings in the design and construction process that cause physical failures to occur. One example of this were when a contractor place a top reinforcing steel too low in a slab. Another example of a procedural error would be when a testing laboratory fails to check the compaction of the soil (Janet k Yates, 2002).

The all-inclusive “get well” dispute is often the result of accountant’s review of the project rather than an analysis of specific instances of delays on the project performing defective work; owners may need to withhold progress payment from contractors that have performed defective work by poor construction and poor workman ship. The delay to the project completion caused by the time required to correct these defects may also justify the owner's liquidate damage disputes. (Edward R. Fisk, 2000).

1. Delays in decisions

Delays in decisions had very high involvement for major exposure on road construction. Late decision that delays the performance of the contractor's work is invitations for disputes. Examples of these problems are decisions on pending change orders that drag on well beyond the contractor's ability to complete the work efficiently and without delaying the project, and decisions to approve a time extension or require the contractor to accelerate the work.

2. Inadequate storages of construction materials

HamzahA. (1994) the main reasons of cost variance in materials management are : overstocked materials, damaged materials, loss of materials, waiting of the materials to arrive in location, frequent moving of materials, inflation, material, changes in buying/purchasing situation starting from the prepared estimation, bulk material, the shortages and changes of materials quantity required, materials inefficiency, stealing and loss, material shipment, work repairing, delay in updating/posting storage system, inaccurate measurement of work location, material off-take, inaccurate estimation of shipment quantity, uneconomic order quantity, poor shipping time, inadequate tools/equipment needed, increasing transportation cost, material over usage in

location, choosing the wrong materials, the increasing storage cost, the poor buying ability, delay of payment, and the poor policy in purchasing (Alin VERONIKA, 2006)

Owners typically want to procure and furnish their own equipment for unique projects. Because of favorable purchasing agreements with vendors or the special needs associated with such projects. Most owners fail to understand that contractors have specific materials management plans for the project. A plan for when the material will be installed and where it's going to be stored once it arrives on the site, the contractor can efficiently store or install the materials, but if the storage place of the material is poor the quality of the material was decreased, so wastage of material was occurs.

3. Budget based on incomplete data

Those projects that have not been scrapped or significantly delayed as a result of disputes difficulties have frequently experienced. Contractor and supplier fears regarding, disputes in most construction contracts, often leads to higher contract prices and larger project costs (Pearl, 1994).

4. Negligence in the implementation of preventive measures

It is for the victim to prove that the defendant owed them a "duty of care", that duty was breached, and that they have sustained either foreseeable harm or economic loss as a consequence of the negligence alleged. If successful, the victim will be awarded damages assessed on the basis of the harm caused or loss sustained.

4.7. Level of Factors considered finding out remedial measure to minimize construction Dispute in South Western District of ERA Projects.

Table 5 Different Factor of Construction Dispute in South Western District of ERA Projects

Related Factors		Identified problem
Client related factor	1	Funding limitation
	2	In adequate construction details.
	3	Payment delays for contractor.
	4	Sequence of work directed by owner
	5	Lack of expertise
Contract Documents related factor.	1	Inadequate scheduling clauses.
	2	Drawings not indicating work interfaces
	3	Power of individual party vaguely specified
	4	Coordination inadequately specified
Contractor related factor.	1	Noncompliance with specifications.
	2	Poor communication with Suppliers and Sub-contractor
	3	Poor managements of the project
	4	Noncompliance to permit requirements
	5	Project coordination problems
Consultant related factor.	1	Lack of expertise in schedule management
	2	Quality control
	3	Inadequate record keeping
	4	Job progress meetings
	5	On-site coordination

4.7.1. Problems of dispute development on road construction related to client.

A typical construction project involves different parties; the employer (Client), the architect, the civil engineer, the quantity surveyor, and sub-contractors. The different parties usually sign different contracts with one another. The major contract, the one that deals with the project as a whole, is mostly signed between the employer (Client) and the engineer, being a prime contractor. George Otim, (2006)

According to the data table 15 the rank of the factor based on its RII was: Payment delays for contractor (RII=0.594) was the first; Inadequate construction details (RII=0.572) was the second; and Sequence of work directed by owner (RII=0.469) was the third ranks. Payment delays for contractor leads to very high involvement for reasons of dispute development on road construction.

In general the client of the project should have an obligation to pay to the contractor for the work carried out and also in connection with his representative he should submit/prepare/ the detail of the project drawings and its' sequence of work with the interest of the owner in order to minimize project delay.

Table 6 Positions of causes of contract dispute evolvement on road construction related to client founded on RII.

Contract dispute causes related to Client	Mean	RII	Rank
Payment Delays for contractor	2.970	0.594	1
Inadequate construction details.	2.860	0.572	2
Sequence of work directed by owner	2.350	0.469	3
Funding limitation	2.273	0.455	4
Lack of expertise	2.053	0.410	5

1. Payment Delays for contractor

This is done by the consultant or client for the effectiveness of progress payment to the contractor on time schedule. Delaying of this shortage of finance for the delivery of material on time (Thomas, 1988)

4.7.2. Problems of contract dispute involvement on road construction related to Contract document.

Article 2610 of the Civil Code of Ethiopia defines a construction contract as "a contract of work and labor is a contract whereby one a party, the contractor, undertakes to produce a given result, under his own responsibility, in consideration of a remuneration that the other party, the client, undertakes to pay him.

There are different variables which are under the category of Contract document related dispute cause. These are Leverage for enforcement of schedule specification ; Power of individual party vaguely specified; Permitting responsibilities vague; Coordination inadequately specified; Drawings not indicating work interfaces; Milestone dates and interface clauses unreasonable and . Inadequate scheduling clauses (Mohsin, 2012)

By using Excel the data was analyzed and the result of the analysis was as shown in the table 19 the factor based on its RII was: Power of individual party vaguely specified (RII= 0.577) was the first, Coordination inadequately specified (RII=0.538) was the second and Drawings not indicating work interfaces (RII=0.533) was the third ranks.

Table 19 Position of causes of contract dispute involvement on road construction related to contract document founded on RII.

Contract dispute involvement causes related to contract document	Mean	RII	Rank
Power of individual party vaguely specified	2.884	0.577	1
Coordination inadequately specified	2.689	0.538	2
Drawings not indicating work interfaces	2.664	0.533	3
Inadequate scheduling clauses.	2.347	0.469	4

4.7.3. Reasons of dispute development on road construction related to Contractor

. Every contractor has the option of submitting an application for registration as a contractor in any one of the following categories:

According to the data from table 20 the rank of the factor based on its RII was: RII of the variables were, Project coordination problems (RII=0.582) was the first; Noncompliance with

specifications (RII=0.572) was the second and Poor communication with suppliers and subcontractors (RII=0.567) was the third ranks over the other reasons of contract disputes involvement on road construction project.

Table 7 Position of causes of contract disputes involvement on road construction related to contractor founded on RII.

Contract claim involvement causes related to Contractor	Mean	RII	Rank
Project coordination problems	2.909	0.582	1
Noncompliance with specifications.	2.860	0.572	2
Poor communication with suppliers and subcontractors	2.836	0.567	3
Poor Management of the project	2.762	0.552	4
Noncompliance to permit requirements	2.567	0.513	5

1. **Project coordination problems:** Contractors have to frequently communicate externally and internally with the other project participants. Construction participants could come from different countries; misunderstanding among them often happen because of the different cultural backgrounds (O, 2002). A failure on the contractor’s part to properly plan its procurement work, even if a plan was not required by the Contract as a deliverable, would be an indication of deficient procurement management. Any resulting claim and extra costs would be the contractor’s responsibility (PMBOK, 2015).
2. **Noncompliance with specifications.** The purpose of this procedure is to define a systematic approach for Peru LNG (“company”) qualified personnel to identify, document, evaluate, and request contractor to rectify and close-out non-compliances in the areas of Environment, Health and Safety (EHS) that might occur during Project construction. Although persons beyond company organization (e.g., Community members or contractors) may and are encouraged to identify what might potentially be deemed an EHS non-compliant condition, it is only when they have reported the condition to a company qualified EHS person that the deficiency can be formally

classified as a Project non-compliant EHS condition. In that case, the non-compliant condition is recorded in the Project's Action. Tracking Database and immediately activates the formal resolution procedure described herein (PERU-LNG, PR/003/A02).

4.7.4. Problems of disputes development on road construction related to Consultant

All applicants wishing to register in any of the consulting offices have to submit satisfactory evidence that the owner or manager at the consulting office being applied for is a registered practicing architect or engineer along with satisfactory evidence. Consultants registering in office for consulting architects and engineers may participate in the preparation of total design documents for building and civil projects befitting their categories.

Analyzing reports is the main part of their job description. They must analyze maps, drawings, blueprints, aerial photography and other topographical information. It is the Consultant's construction engineer job to make sure that everything is conducted correctly. Accordingly, they have to see the safety of all the workers undertaking the construction works.

There are different variables which are under the category of Consultant related cause. These are inadequate schedule updates and progress monitoring; inadequate record keeping; Job progress meetings; Quality control; and Lack of expertise in schedule management.

According to the data from table 18 the rank of the factor based on its RII was: Inadequate record keeping (RII=0.642) was the first; On-site coordination (RII=0.578) were the second and Quality control (RII=0.568) were the third ranks.

Table 21 Position of causes of contract Dispute evolvement on road construction (BC) related to consultant founded on RII.

Contract dispute evolvement causes related to consultant	Mean	RII	Rank
Inadequate record keeping	3.195	0.642	1
Job progress meetings	2.980	0.596	2
On-site coordination	2.888	0.578	3
Quality control	2.842	0.568	4
Lack of expertise in schedule management	2.705	0.541	5

1. On-site coordination

It affects the cost estimation of project. It should be mentioned that there were many projects in the South Western Region finished with poor cost estimation because of inadequate site investigation/unexpected ground condition. Unexpected Ground Conditions: unforeseen ground conditions are frequently reported to cause construction project cost growth.

2. Inadequate record keeping

No Disputes was performed with proper recording of data. (Mohsin, 2012)

3. Job progress meetings

This factor is important for all respondents because in the job progress meeting the idea that hinder the construction progress would be raised and it solved by common consensus. This is valuable for the performance of the project. This result is on the side of (Semple, 1994).

4.8 Effects of Construction Dispute

Disputes fluctuation can have effect on contractors, clients/owners and the project itself. The major effects of disputes on contractors, if not well compensated is cash flow (project financing) problem of the projects (Stukhart, 1982 and Abdo, 2006 in Asteway, 2008).

Table 22 Effects of Construction Dispute

S.N	Effects of Construction Dispute
1	Delay in execution of work,
2	Cancelled Projects
3	Reduced Numbers of Bidders or loss of profit
4	Higher Project Costs or (Cost overrun))
5	Quality degradation
6	Cash flow (project financing) problem of the Projects
7	Conflict among parties,

Delay in execution of work, (RII=0.623) was taken the first position; Higher Project Costs or (Cost overrun)) (RII=0.592) was the second position and Conflict among parties, (RII=0.589) was taken the third position.

Table 23 Effects of Construction Dispute founded on RII

Effects of Construction Dispute	Mean	RII	Rank
Delay in execution of work,	3.117	0.623	1
Higher Project Costs or (Cost overrun))	2.958	0.592	2
Conflict among parties,	2.958	0.589	3
Quality degradation	2.958	0.588	4
Cancelled Projects	2.933	0.587	5
Reduced Numbers of Bidders or loss of profit	2.86	0.572	6
Cash flow (project financing) problem of the Projects	2.86	0.572	7

A. Delayed in execution of work

Delayed projects, reduced-in-scope projects, or cancelled projects have been the result. The same impact is being felt in the public construction sector. For public projects that must be funded by bond issues, significant project price increases disputes. In a number of projects, between the time a bond was approved by the voters and the time bids were received for construction projects, material prices increased significantly and bids came in at prices much beyond the approved contract amounts. (Van der Schans, 2005).

B. Higher Project Costs

Those projects that have not been scrapped or significantly delayed as a result of disputes difficulties have frequently experienced. Contractor and supplier fears regarding, disputes in most construction contracts, often leads to higher contract prices and larger project costs (Pearl, 1994).

C. Conflict among Parties

Many construction disputes are arising out of disagreement and delay of hardship and expense during the construction project. Disputes in construction may be caused by one or a combination of several reasons. Most of the typical disputes are caused by factors such as unrealistic contract duration and costs, impact and ripple effects of delays, evaluation of the quality and quantity of works, differences in the interpretation of plans and specifications, unfulfilled duties, inefficiency and disruption (Groton, 1997).

4.9 Methods to manage/administer Construction Dispute

Methods to manage/administer Construction Disputes were one of the objectives of this study.

Table 24 the selection of appropriate methodology to manage/administer Construction Dispute

No	Methods to manage/administer Construction Dispute
1	Good construction management
2	Using proper work schedules
3	Practicing on time payment
4	Develop program-wide contingencies and risk management Protocols
5	Knowing the strength and Weakness of the projects.

Good construction management (RII=0.648) was taken the first position; Using proper work schedules (RII=0.628) was the second position and Practicing on time payment Use (RII=0.621) was taken the third position over the other factors that considered in the selection of appropriate methodology for the disputes on road construction project .It is observed that Consider fluctuation/ Dispute clauses are the most important methodology to manage/administer Construction Dispute

Table 25 the selection of appropriate methodology to manage/administer Construction Dispute founded on RII

Methods to manage/administer	Mean	RII	Rank
Good construction management	3.239	0.648	1
Using proper work schedules	3.141	0.628	2
Practicing on time payment	3.104	0.621	3
Develop program-wide contingencies and risk management Protocols	2.86	0.572	4
Knowing the strength and Weakness of the projects.	2.799	0.560	5

4.10 Positioning of all Dispute cause from overall respondents

From literature review we had 38 variables that cause construction disputes was identified. By taking this data from all respondents the analysis was performed by means of Excel and the result was as shown in the table 24 below.

As a rule of thumb, some teams decide to consider only the top 10 or the top 15 factors. Others might use other criteria. One such criterion is the Pareto's Law: i.e., 20% of risk items are responsible for 80% of Dispute cause, so those are the problems that need to be considered" (Touran, 2006) as cited on (Kassahun, 2015).

the ranking order of the variables for the top 10 was: Types of delays (RII=0.648) ; Inadequate record keeping (RII =0.643) ; Knowing the strength and Weakness of the project (RII= 0.628); Delay in decision processing (RII=0.623); Conditions of the contract (RII=0.621); Payment Delays for contractor (RII=0.594); Technical failure due to poor construction (RII=0.592); Budget based on incomplete data (RII=0.591); Negligence in the implementation of preventive measures (RII=0.587); Project coordination problems (RII=0.584); were the top Ten main contract dispute causes were identified.

Table 26 Position of all contract disputes causes founded on RII

Contract dispute cause variables	Over all respondent ,on all variables							
	Client		Contractor		Consultant		Overall	
	RII	Rank	RII	Rank	RII	Rank	RII	Rank
Delay in dissections	0.660	2	0.631	2	0.651	2	0.648	1
Inadequate record keeping	0.645	4	0.640	1	0.642	2	0.643	2
Knowing the strength and Weakness of the project	0.645	4	0.606	4	0.633	3	0.628	3
Delay in decision processing	0.704	1	0.562	14	0.623	4	0.623	4
Conditions of the contract	0.675	2	0.592	7	0.623	4	0.621	5
Payment Delays for contractor	0.601	8	0.592	7	0.605	6	0.594	6
Technical failure due to poor construction	0.469	29	0.533	21	0.596	8	0.592	7
Budget based on incomplete data	0.572	15	0.416	34	0.596	8	0.591	8
Negligence in the implementation of preventive measures	0.601	8	0.406	35	0.587	10	0.587	9
Project coordination problems	0.587	11	0.582	9	0.596	8	0.584	10
Power of individual party vaguely specified	0.572	15	0.577	10	0.578	12	0.572	13
Lack, in many occasions, of specialized workforce	0.601	8	0.479	26	0.578	12	0.572	13
Quality control	0.572	15	0.572	12	0.568	15	0.572	13
On-site coordination	0.572	15	0.582	9	0.578	15	0.572	13
Types of contract	0.675	2	0.533	21	0.578	12	0.572	13

agreement								
Inadequate construction details.	0.571	18	0.567	13	0.568	15	0.570	16
Poor communication with suppliers and subcontractors	0.557	19	0.567	13	0.560	18	0.562	17
Inadequate storages of construction materials.	0.601	8	0.567	7	0.568	18	0.562	17
Law	0.587	11	0.552	16	0.560	18	0.560	19
Poor Management of the project	0.543	21	0.552	17	0.550	20	0.550	20
Incorrect consultant report.	0.540	21	0.543	19	0.541	21	0.540	21
Force majeure, act of God	0.535	21	0.538	20	0.688	1	0.540	21
Coordination inadequately specified	0.528	24	0.538	20	0.532	23	0.535	23
Lack of expertise in schedule management	0.528	24	0.528	22	0.541	21	0.535	23
Suspension of works, unreasonable rejection of work	0.567	24	0.523	23	0.523	25	0.523	24
Noncompliance to permit requirements	0.513	26	0.513	24	0.523	25	0.523	24
Performance of the contractors	0.572	15	0.606	4	0.513	25	0.513	26
In adequate maintenance of traffic plan.	0.572	15	0.484	25	0.501	26	0.506	27
Insufficient time for testing	0.567	24	0.548	10	0.505	26	0.499	28
Sequence of work directed	0.469	29	0.469	27	0.477	28	0.474	29

by owner								
Inadequate scheduling clauses.	0.469	26	0.450	30	0.477	28	0.469	30
Inadequate scheduling clauses.	0.469	29	0.469	27	0.468	30	0.467	31
Errors in calculation or design and employment of defective or inadequate materials.	0.499	29	0.469	27	0.468	30	0.467	31
Job progress meetings	0.513	26	0.464	28	0.468	30	0.464	33
Project complexity	0.455	31	0.460	28	0.450	31	0.457	34
Funding limitation	0.455	31	0.455	29	0.450	31	0.455	35
Insurance problems	0.352	37	0.445	31	0.358	37	0.362	36
Poor work plan	0.362	37	0.367	37	0.33	37	0.323	37
Use of poor construction materials	0.325	38	0.504	38	0.275	38	0.271	38

1. Delay in diction (RII =0.648)

Delay diction has been ranked in the first position. This shows that road construction project in South Western District of ERA Projects were affected by delays. It is one of the causes of disputes development on road construction so it is the one which consider for assessing causes of disputes. Delay can lead to many negative effects such as increased costs, loss of productivity and revenue, and contract termination. This result is in line with (K. L. Ravisankar, 2014) because based on the type of delay the analysis of claim also varies.

These delays represent problems in the contractor's organization such as lack of management or financial capability, sub-contractor caused delays etc. Delays caused by the client such as late submission of drawings and specifications, frequent change orders, and incorrect/inadequate site information generates disputes from both the main contractors and subcontractors which many times entail lengthy court battles with huge financial repercussions. Delays caused by contractors can generally be attributed to poor managerial skills. Lack of planning and a poor understanding of accounting and financial principles have led to many a contractor's downfall.

2. Inadequate record keeping (RII 0.643)

Has been ranked in the Second position from over all respondents No Disputes was performed with proper recording of data. (Mohsin, 2012)

3. Knowing the strength and Weakness of the project (RII 0.628)

Has been ranked in the Third position from over all respondents, Callahan (1998) notes that Engineering and construction complexities caused by the project's location or purpose can make early design work very challenging and lead to internal coordination problems and project component errors. Internal coordination problems can include conflicts or problems between the various disciplines involved in the planning and design of a project (Touran et al., 1994). Constructability problems that need to be addressed may also be encountered as the project develops. If these issues are not addressed appropriately, cost increases are likely to occur (Allen et al., 1995 and Federal-Aid, 2003). Then Complexity of the project affects the project

4. Conditions of the contract (RII 0.621)

Has been ranked in the forth (4th) position from over all respondents. Contract is a legally binding agreement between two or more parties obligating parties to do or not to do a particular thing. Conditions of the contract have the ruling power for all party that take part contract agreement. So condition of contract is important for proper contract claim analysis. This result is in line with (CIDB, 2008).

Bid document, Including GCs, and Specs, Including Drawing list and dates ,Including the Estimated Quantities and Prices, Bid Addenda, Notice of Award, Executed Contract, Notice to Proceed, Notice, Submission, and Response times (John Unbewust, 2015),

5. Payment Delays for contractor (RII 0.594)

Has been ranked in the 5th position from over all respondents, this factor is important for contractor this is done by the consultant or client for the effectiveness of progress payment to the contractor on time schedule. Delaying of this results shortage of finance for the delivery of material on time, this result is agreed with (Thomas, 1988).

4.11. Test for agreement in ranking performance factors among respondents

To appraise the most important factors that cause disputes by each party autonomously the client, contractors and consultants their data were analyzed separately in order to determine the degree

of agreement between each party by using Spearman Rank Correlation Coefficient along with ranks of the respondents In a sample it is denoted by and is by design constrained as follow

$$-1 < r_s < 1$$

Where r_s is Spearman's correlation coefficient

Correlation is an effect size and so we can verbally describe the strength of the correlation using the following guide for the absolute value. The closer is to the stronger the monotonic relationship.

Table 27 ranking performance factors

No	Range	Description
1	0.00- 0.14	Very weak
2	0.01 - 0.29	Weak
3	0.29 - 0.43	Moderate
4	0.44 - 0.58	Strong
5	0.59 - 1.0	Very strong

By Using Excel the result Spearman Rank Correlation Coefficient client, contractor, consultant and other was as shown.

Table 28 Spearman Rank correlation Coefficient between Client, Contractor and Consultant

			Client	Contractor	Consultant
Spearman's rho	Client	Correlation Coefficient	1.000	.309**	.477**
		Sig. (1-tailed)		.000	.000
		N	38	38	38
	Contractor	Correlation	.309**	1.000	.314**

		Coefficient			
		Sig. (1-tailed)	.000		.000
		N	38	38	38
	Consultant	Correlation Coefficient	.477**	.314**	1.000
		Sig. (1-tailed)	.000	.000	
		N	38	38	38

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1 CONCLUSIONS

The causes of construction Disputes can be measured and evaluated using a large number of construction phase related factors such as Payment Delays for contractor and Inadequate construction details, Power of individual party vaguely specified and Coordination inadequately specified, Project coordination problems and Noncompliance with specifications, Inadequate record keeping and Job progress meetings. The first set is related to construction Clients, the second set is related to contract document, the third set is related to Contractor and the fourth set is related to the consultants (site supervisors and the site operatives Based on the data gathered from the desk study and the analysis obtained from questionnaire survey, 88% of the respondents express their agreement towards the issue that there are Causes of Construction Dispute in South Western District of ERA Projects.

From the results of analysis, it was concluded that the group of most important factors contributing to construction Disputes on road projects in South West District of ERA. The identified problems and causes of construction Disputes on South West District of ERA projects are

From the results it can be concluded that the most factors that causing construction Disputes in road projects are Delay in dissections (0.648) , Inadequate record keeping (0.643), Knowing the strength and Weakness of the project (0.628) ,design and documentation (0.69), Conditions of the contract (0.621) and Payment Delays for contractor (0.594) using relative important index respectively.

As Table 17 shows highest causes of construction Disputes in case of client, contract document, contractor and consultants related factors are due to Payment Delays for contractor (0.594), Power of individual party vaguely specified (0.577), Project coordination problems (0.582) and Inadequate record keeping (0.642) those are the most significant factors. On the other hands the least contributor were due to t Poor work plan

(0.32) and Use of poor construction materials (0.27) using relative important index respectively.

While considering documentation the results from the survey revealed on the second ranks that the respondents consider all the nineteen factors as causes of construction Disputes in the documentation activities on road construction. As Table 19 shows the highest factor of construction Disputes in case of documentation are Power of individual party vaguely specified (0.58), Coordination inadequately specified (0.54) Drawings not indicating work interfaces (0.53) and Inadequate scheduling clauses (0.47) were the most significant factors using relative important index respectively.

. 5.2 RECOMMENDATION

In respect to this research finding, the following basic recommendations are expected to be exercised by key role players of the construction industry, i.e., Clients, Consultants and Contractors, utility companies in order to minimize or avoid challenges on Dispute in south west District of ERA Projects.

Recommendations for owners:

Owners have to evaluate their ability to manage construction projects in order to understand and manage construction details. The client of the project should submit/prepare/ the detail of the project drawings and its' sequence of work with the interest of him in order to minimize project delay and Choosing the best delivery plan of project to fulfill their objectives.

Recommendations for Contractors

For site management and supervision i.e. administrative and technical staff should be assigned as soon as project is awarded to make arrangements to achieve completion within specified time with the required quality, and estimated cost. During execution of a project contractors should focus on planning (work breakdown structure, scheduling, resource allocating, etc.) effort and project managers leading ability which improves effective site management in utilizing and coordinating man power, equipment and materials towards the success of a project.

Contractors have to create effective coordination between owners and consultants in order to create smooth working atmosphere and to manage variation work. Any oral instruction given by

the client should be written on site diary in order to minimize communication gap between the consultant and client

Recommendations for Consultant

Consultants are one of the key role players in construction industry, translating the clients' needs and ideas in to plans and drawings and supervise the translation of these plans and drawings into viable physical structures. The following are recommendation given to consultants based on the research findings. It is also advised for consultant to have high qualification to give suitable instruction in a suitable time and to be able to answer any question stated by contractor to avoid price escalation. Study the likely occurrence of price escalation and device mitigation plan before the project suffers. The consultant should continue their regular progress meeting but focus on the effectiveness of each meeting. The consultant should start from pre-contract preparatory works that need to be undertaken.

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APPENDIX: I

Questionnaire

JimmaUniversity

Jimma institute of technology

School of civil and environmental engineering

Msc. Program in Construction engineering and management

(Questionnaire)

Assessment on Causes of Construction Dispute in South West District of ERA Projects

Dear Sir/Madam,

The aim of this questionnaire is to obtain professional opinion on issues of Construction Dispute in South West District of ERA projects. This is to identify factors that cause Construction Dispute and their consequential effects on ERA Projects in South West District and recommend possible remedial measures that minimize the problem (Construction Dispute). This questionnaire is required to be filled with exact and relevant facts as much as possible. All data included in this questionnaire will be used only for academic research purpose and will be strictly confidential. For unclear questions (if there is) or any questions related to the questionnaire use my addresses.

Sincerely

Submitted by:KebeeneAdeba

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May, 2016

This Questionnaire is to collect information from client, consultant & contractor, on issues of Construction Dispute in South West District o ERA projects.

Note

- You are kindly requested to complete the questionnaires as soon as possible.
- You are not obliged to answer questions, which you do not want to.
- Tick yes or no whichever is appropriate and write the required information in the open space provided.

Part I: General / Organization Information and answering the questions what you know,

1. Company Name (optional): _____

2. Type or origin of your organization (Please indicate with “√” when appropriate)

Project Owner/Client Consultant Contractor

(If any other please specify) _____

3. Years of experience of the respondent:

< 3yea 4- 6 years 7-10 years > 10 years

4. How many road projects you have been involved in?

Less than 2 projects 3- 5 projects More than 5 projects

5. Job title in the organization/company:

Project Manager planning head

Project Engineers/Site Engineers

Other, Please specify: _____

6. How many employees do you have?

7. Do you have specialized staff member who is responsible for Construction Dispute cases in your Organization?

(Please write his/her duty and responsibility)

8. Do you have professional indemnity insurance coverage?

If your answer is yes, please list them.

If your answer is no, please list your reason for not being insured

Part II: Factors causing Construction Dispute

The following tables consist of lists of possible Factors of Dispute in South Western District of ERA projects identified from literatures. Based on your experience what is the likely contribution of these factors to Construction Dispute in south west District of ERA Projects that you have involved in? Please express your opinion on rate of occurrence (frequency of occurrence) based on the representative numbers listed below by marking (√) under each preference.

Their levels of involvement were also assessed on a scale of 0-5 (1 for lowest involvement” and “5 for highest involvement”) Please put (✓) and/or fill in the blanks as appropriate

1= lowest involvement 2 = low involvement 3 = medium involvement
 4= high involvement 5 = highest involvement

No-	Related Factors		Identified problems	1	2	3	4	5
1	Client related factor	1	Lack of expertise					
		2	In adequate construction details.					
		3	Sequence of work directed by owner					
		4	Payment delays for contractor.					
		5	Funding limitation					
	Contract Documents	1	Inadequate scheduling clauses.					
		2	Drawings not indicating work interfaces					
		3	Coordination inadequately specified					
		4	Power of individual party vaguely specified					
		1	Noncompliance with specifications.					
		2	Poor communication with Suppliers and					

	Contractor		Sub-contractor						
		3	Poor managements of the project						
		4	Project coordination problems						
		5	Noncompliance to permit requirements						
	Consultant	1	Lack of expertise in schedule management						
		2	Quality control						
		3	On-site coordination						
		4	Inadequate record keeping						
		5	Job progress meetings						
	if there are others ,please specify								

Part III: Effects of Construction Dispute

The following table consists of list of the possible effects of Construction Dispute in construction projects identified from literatures. Based on your experience, among the following lists of potential effects of Construction Dispute, please indicate the most recurrent effects in south west District of ERA Projects based on the representative numbers listed below by marking (√) under each preference.

1- No significance

3-Average significance

2- Minor significance

4- High significance

5-Extreme significance

S.N	Effects of Construction Dispute	1	2	3	4	5
1	Delay					
2	Cancelled Projects					
3	Reduced Numbers of Bidders					
4	Higher Project Costs					
5	Cash flow (project financing) problem of the Projects					

6	Conflict among parties					
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Part III: Construction Dispute and adjustment

5.2. What do you think on current Construction Dispute administration system (practice) on south west District of ERA Projects?

Excellent Very good Satisfactory Poor

Part IV: managing/administering Construction Dispute

The following table consists of numbers of methods to manage/administer Construction Dispute on south western District of ERA Projects. From your experience, please express your opinion on the degree of importance based on the representative numbers listed below. (Please tick the appropriate box).

1-Unimportant, 3± Important
 2-Less important 4± Very important 5± extremely important

No	Methods to manage/administer Construction Dispute	Degree of importance				
		1	2	3	4	5
1	Good construction management					
2	Using proper work schedules					
3	Practicing on time payment					
4	Develop program-wide contingencies and risk management Protocols					
5	Knowing the strength and Weakness of the projects.					

If others, please specify in the following table

Summary Data for all variables from all respondent perspectives.

Total reviewed contract Dispute cause variables	Likert scale					MEAN	RII	Total No of respondents
	1	2	3	4	5			
Lack of expertise	7	10	17	4	6	2.817	0.303	44
Inadequate construction details.	5	3	6	8	22	3.883	0.418	44
Sequence of work directed by owner	5	15	6	7	11	3.233	0.348	44
Payment Delays for contractor	1	2	7	18	16	4.050	0.436	44
Funding limitation	10	8	7	5	14	3.100	0.455	44
Inadequate scheduling clauses.	7	9	6	15	7	3.183	0.467	44
Drawings not indicating work interfaces	2	6	10	11	15	3.650	0.535	44
Coordination inadequately specified	0	3	10	23	8	3.650	0.535	44
Noncompliance with specifications.	3	6	19	12	4	3.900	0.572	44
Poor communication with suppliers and subcontractors	2	10	7	15	10	3.833	0.562	44
Poor Management of the project	4	6	4	10	20	3.750	0.550	44
Project coordination problems	3	7	9	10	15	3.983	0.584	44
Lack of expertise in schedule management	1	1	7	4	31	3.650	0.535	44
Quality control	0	6	6	20	12	3.900	0.572	44
On-site coordination	0	7	3	18	16	3.900	0.572	44
Conditions of the contract	1	6	18	15	4	4.233	0.621	44
Knowing the strength and(complexity of the project)	3	1	3	28	9	4.283	0.628	44
Types of delays;	1	3	2	17	21	4.417	0.648	44

Thank you so much for your time taking to answer the questions: