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SCHOOL OF CIVIL AND ENVIRONMENTAL
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MSc Thesis

ON

**STUDY ON COST RELATED CLAIM PRACTICE IN FEDERAL ROAD
PROJECTS; FOCUSED ON LOCAL CONTRACTORS**

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DECLARATION

I declare that this thesis entitled “STUDY ON COST RELATED CLAIM PRACTICE IN FEDERAL ROAD PROJECTS; FOCUSED ON LOCAL CONTRACTORS” is my original work. This thesis has not been presented for any other university and is not concurrently submitted in candidature of any other degree, and that all sources of material used for the thesis have been duly acknowledged.

Candidate:

Name: _____

Signature: _____

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TABLE OF CONTENTS

DECLARATION	I
ACKNOWLEDGEMENTS	II
CONTENTS	III
LISTS OF TABLES	V
LISTS OF AND FIGURES	VI
ABBREVIATIONS AND NOTE	VII
ABSTRACT	VIII
CHAPTER 1 - INTRODUCTION	
1.1 Background of the Research	9
1.2 Statement of the Problem	10
1.3 Objective of the research	11
1.4 Significance of the study	11
1.4 Research Methodology	12
1.7 Scope and Limitations of the Study	12
1.8 Thesis organization	13
CHAPTER 2 - LITERATURE REVIEW	
2.1 General	14
2.1.1 Contract	14
2.1.2 Claim	15
2.1.3 General Causes of Claims	16
2.1.4 Claim procedure	17
2.2 Roles and Obligations of Parties	18
2.2.1 obligations of the Employer	18
2.2.2 Roles and obligations of the Engineer	18
2.3 Cost Claims under FIDIC 4 Conditions of the Contract	20
2.3.1 Direct Monetary Compensation under the FIDIC 4 Contract provision	20
2.3.2 Indirect Cost Claim Elements	23
2.3.2.1 Acceleration Claim	23
2.3.2.2 Prolongation Cost claim	28
2.3.2.3 Payment Claims	33
2.3.2.4 Termination Claim	34
2.3.2.5 Change in Scope Claim	37
2.3.2.6 Disruption Claim	40
2.4 Contractors Claim Preparation and Determination Mechanisms	
2.4.1 General	44

2.4.2 Claim Identification	44
2.4.3 Claim documentation	45
2.4.4 Claim Presentation	45
2.4.5 Claim Determination	47
2.4.6 Dispute	48
2.4.7 Settlement of Dispute	48
2.5 Cost Claims Practice in Ethiopian Construction Industry	
2.5.1 General	49
2.5.2 Participation of Local Contractors in RSDP	50
2.5.3 Claim Causes in Local Construction Industry	51
2.5.4 Local Contractors practice in demanding cost claim	52
2.5.5 Dispute practice in local construction industry	53
2.6 Literature Summary	54

CHAPTER 3 RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction	58
3.2 Research Design	58
3.3 Data Collection	60
3.3.1 Primary data	60
3.3.2 Secondary data	60
3.3.3 Sampling	60
3.3.4 Method of Analysis	61

CHAPTER 4 ANALYSIS OF FINDINGS AND DISCUSSIONS

4.1. Introduction	63
4.2. Questionnaires Response Rate	63
4.3. Analysis and Discussion of Results	64
4.3.1. Respondents general experience on Road Projects	64
4.3.2. Respondents experience on FIDIC and Status of Dispute Resolution Mechanism	65
4.3.3 Ranking	65
4.3.4. Causes of Cost claims	66
4.3.5. Impact of Causes of Cost claims	68
4. 4. Local Contractors Claim Request Practice	69
4.4.1. Cost Claim Submission Practice	71
4.4.2. Comparison of Event Encounter and Cost Claim Submission Practice	72
4. 5. Factors affecting Local Contractors Claim success	72
4.5.1. Contractors View for Factors affecting local contractors cost claim success	73

4.5.2. Consultant's View for Factors affecting local contractors cost claim success	74
4.5.3. Client's View for Factors affecting local contractors cost claim success	75
4.5.3. Summary of Factors affecting local contractors cost claim success	76
4.5.4. Local contractors cost claim success	77
4. 6. Responsible Party for non-compensation of Local Contractors Cost claims	78
4.7. Comparison of Local Contractors and International contractors Practice on Cost claim	80
4.8. Methodologies to Calculate Prolongation and Acceleration Claims	80
4.9. Agreement Analysis	81

CHAPTER 5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction	84
5.2. Conclusions	84
5.3. Recommendations	86
5.4. Recommendation for Future Research	88

REFERENCES	89
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APPENDIXES

Appendix-1: Contractors Response for Encounter of Cost Claim Causations (Frequency)	92
Appendix-2: Consultants Response for Encounter of Cost Claim Causations (Frequency)	93
Appendix-3: Employers Response for Encounter of Cost Claim Causations (Frequency)	94
Appendix-4: Contractors Response for Encounter of Cost Claim Causations (Impact)	95
Appendix-5: Consultant Response for Encounter of Cost Claim Causations (Impact)	96
Appendix-6: Employers Response for Encounter of Cost Claim Causations (Impact)	97
Appendix-7: Contractors Response for Local Contractors practice for Submission of Cost Claims	98
Appendix-8: Consultants Response for Local Contractors practice for Submission of Cost Claims	99
Appendix-9: Employers Response for Local Contractors practice for Submission of Cost Claims	100
Appendix-10 Agreement Test	101
Appendix-11: Sample Questionnaires	105

LIST OF TABLES

Table 2.1	RSDP assessment report 2013
Table 4.1	Overall survey response level
Table 4.2	Respondents' experience in the road construction industry
Table 4.3	Respondents' experience in the road construction industry
Table 4.4	Responses to the causes of cost claims
Table 4.5	Responses to the impact of cost claims factors
Table 4.6	Responses to the local Contractors' cost claim submission practice
Table 4.7	Contractor's responses to the factors affecting local Contractors claim success
Table 4.8	Consultant's responses to the factors affecting local Contractors claim success
Table 4.9	Client's responses to the factors affecting local Contractors claim success
Table 4.10	Summary of responses to the factors affecting local Contractors claim success
Table 4.11	Formal Contract administration system practice
Table 4.12	Contractor's responses to the party that affects cost claim success
Table 4.13	Consultant's responses to the party that affects cost claim success
Table 4.14	Client's responses to the party that affects cost claim success
Table 4.15	Responses of Parties on comparison of local vs international contractors practice and Impact on local Contractors
Table 4.16	Responses of Parties on Methodologies to Calculate Prolongation and Acceleration Claims
Table 4.17	Summary of correlation test on the ranking of causes of cost claim
Table 4.18	Summary of correlation test on the ranking of local contractors cost claim submission practice
Table 4.19	Summary of correlation test on the ranking of factors affecting cost claim success

LIST OF FIGURES

Fig. 4.1 Local contractors cost claim submission practice

Fig. 4.2 Summarized data for local contractors practice with encounter of cost claim events

Fig. 4.3 Summarized data for party most affecting cost claim success

ABSTRACTS

The Government of Ethiopia formulated the Road Sector Development Program (RSDP) in 1997, and till the end of 2013, local Contractors participation was 46% with amount of ETB 48,416.79 million, contracted for 278 projects, which is 75% of the floated bid. In a competitive atmosphere of tendering, little or no margins are left for future unknowns in a long and complex period of construction wherein the rates and prices shall be based on certain assumptions and any change between what was assumed and what actually happens may form a seed for a claim, and contracts have provision for monetary compensation to mitigate its effect.

In relation, this research aims to study the causes of the cost claim events, conduct an assessment of local contractors cost claim management and to assess mitigation measures to minimize the impacts on local contractors capacity participated in the Ethiopian federal road projects.

The research revealed that local contractors have poor contract management practice, especially in cost claim submission despite there are events that entitle them monetary compensation under the FIDIC 1987 conditions of contract. The study also indicated that all parties involved in the construction of the road projects have role for the poor achievement of monetary compensation to local contractors; however, a large portion of the contribution is the negative attitude to cost claim determination in the construction industry, poor contract management skills, unfair determination by the consultants and DRE and Employer's interference in the determination of claims as identified in the research.

Thus, it is very important that all parties involved in road projects improve their contract management practices, especially local contractors need to enhance their awareness of contract/claim management to protect their company from cumulative and catastrophe effect of the poor claim management. The Employer shall also play his role for creating positive awareness towards claim management as poor capacity of contractors and industry will be reflected in the success if the road sector development programmes.

Keywords: *Claim, Client, Contract, Consultant, Contractor, Cost Claim, Dispute, Dispute Review Expert*

ABBREVIATIONS AND NOTE

BOQ	Bill of Quantity
CPM	Critical Path Method
DRE	Dispute Review Expert
DAB	Dispute Adjudication Board
ERA	Ethiopian Road Authority
FIDIC	Fédération Internationale des ingénieurs conseils
FDRE	Federal Democratic Republic of Ethiopia
ROW	Right of Way
RSDP	Road Sector Development Program
SMEC	SMEC - Engineering and Development Consultant

CHAPTER ONE

INTRODUCTION

1.1 Background to the Research

Under Road Sector Development Programmes (RSDP), the Government of the Federal Democratic Republic of Ethiopia (FDRE) has awarded many road projects to local and international contractors. From the beginning of the RSDP programme, many local contractors and professionals have been participated in the road construction industry. The Government of Ethiopia formulated the RSDP in 1997 and till the end of 2013, the Programme intends to construct 26,218km and it accomplishment until such period reported as 26,273km. From the allocated budget, local contractors' participation was 46% amounting of ETB 48,416.79 million, involving in 278 projects, which is 75% of the floated bid comparing with the foreign contractors participation. [ERA, 2013]

In a competitive bidding, Brook (2004) states that during preparation of bid, a contractor assumes certain things to be inherently correct. For instance, the contractor assumes that the scope of work has been appropriately defined and the contract specifications, designs, and contract drawings have been drafted correctly and the owner shall fulfill the conditions stipulated in a contract; and if the assumptions are not valid, then disagreements can arise regarding contractual obligations or expectations. In relation to the contractual obligations and expectation, ERA-SMEC [2008] highlights that as and when one party feels that the contractual obligations or expectations have not been met, and the other party feels that it deserve monetary and/or time compensation, then claim issues be raised.

In relation to uncertainties, Nadeem [2010] states that the construction industry is overwhelmed by risks. If these risks are not dealt with satisfactorily, there is a maximum likelihood of cost overruns, time delays and low quality, resulting in dissatisfaction of clients and the public at large.

Bunni [2003] generally highlights that managing various risks in construction projects has been recognized as a very important management process in order to achieve the project objectives in terms of time, cost, and quality. In line with the allocation and sharing of risks during the bid time, some of the risks are allocated to the employer and if such events lead to the financial losses to the contractor during the execution of the project; such events can be managed and compensated in a way of claim submissions, as to the provisions of the conditions of contract.

During preparation of this thesis, previous theses are reviewed and it is noted that claim management is done in a broader aspect, for which, this thesis aims to focus only on specific nature of cost claim elements, under FIDIC 1987 Conditions of Contract and its impact on local contractors' capacity.

Thus, in this research, it is planned to assess causes of cost claim events and practice of local contractors under Ethiopian federal road projects, and will address the question related to cost claim types and management in road projects, and assessment of local and international contractors practice in this regard. The study also highlights the owner (ERA), contractors, and consultants' role to mitigate the impacts of events that lead to financial loss in road construction projects.

1.2 Statement of the Problem

Many of the road projects encounter unexpected ground conditions and also events for which the contractors are not aware of the situation and/or do not consider the same in their rates during bid time. Since a contract is a binding document between the contractor and employer for the specific obligations and rights, if the occurrences of events that lead to financial losses are the result of the obligations outside the provision of the contract, compensation as a remedy is sought in a form of claim determination.

To this effect, contractors need to be compensated for what they deserve, and the employer need to have positive attitude to compensate the effects of such damages. In addition, the consultants should have detail knowledge on the causes and mitigation of the cost claims together with the

methodology of calculation of each type of cost claims; and fair, professional and impartial determination of contractors' claims.

Thus, this thesis will answer the management of the cost claim by local contractors and attitude and awareness of the construction industry, particularly: contractors, consultants and the employer in this regard. This study will attempt to answer the following key questions;

- What are the causes of cost claim under road construction projects?
- How is local contractors' practice in submission of cost claims for events that entitle them monetary compensation?
- How is consultants' and DRE's role in determining the contractors' cost claim?
- What improvements and intervention actions are required from contractors, employer and consultants' side to mitigate/avoid the effect of events that lead to cost claim?

1.3 Objectives of the Research

The main objectives of the study are:

- To identify the main causes of cost claims
- To assess local contractors cost claim practice
- To formulate recommendations for intervention measures to mitigate the effect of cost claim on local contractors.

1.4 Significance of the Research

The Ethiopian Roads Authority under its three Road Sector Development Programme [RSDP] administering various road project; while its implementation is not free from challenges. The review of the implementation of the Road Sector Development Program (RSDP) shows that road projects in Ethiopia encounters a number of challenges [Zerfu, 2009]. In general, as the

construction industry is considered to be some level of uncertainties and could not exhaustively know the ground conditions of the site during design phase, it is most probable to encounter problems that may cause cost claims.

Thus, this research will have positive impact on identifying the causes of cost claims and reviewing methodologies to calculate some of the cost claims events, so that the construction industry will get the benefit out of this research as a means of creating awareness to the industry on the causes of cost claim. In addition, remedial measures will be highlighted that will be helpful to the industry that have impact in minimizing the effects of cost claim and its impact on local contractors capacity.

1.5 Research Methodology

The study was carried out using a three phase approach. The first was to review the relevant literature on the subject of cost claim, in particular based on FIDIC 1987 conditions of contract. In the second phase, a pilot study which took the form of structured questionnaire was conducted with selected contractors, client and consultant professionals in the Ethiopian road construction industry. In the third phase, conclusions and recommendations are drawn from the outcome of the analysis.

The structured questionnaires survey was prepared in three main parts:

- a. Background information – collecting the personal data of respondents and their organization, their experience in the Ethiopian road construction industry.
- b. General perception of cost claim types – gathering the respondents' familiarity with the concept of cost claim types and practices in the Ethiopian road construction industry. This part of the questionnaire explored the respondents' level of knowledge of cost claim.
- c. The final phase of the research was used to analyze the data collected using qualitative method of data analysis to meet the aforementioned research objectives.

1.6 Scope and Limitations of the Study

All professionals selected for the collection of data were personnel that are involved in road projects implemented in Ethiopia. In this research, the emphasis is to enlighten the cause of cost claim and minimize its impact to local contractors, constructing federal road project under FIDIC 1987 conditions of contract.

1.7 Thesis Organization

The research is organized into five chapters which are summarized as follows;

- i)** The first chapter introduces the research problem and the aim of the study followed by the objectives of the research in achieving the depicted aim.
- ii)** Chapter two is a literature review from professional journals, books, internet searches and discussions with professionals with road contract administration experts.
- iii)** Chapter three discusses the research methodology followed in order to achieve the objectives of the study.
- iv)** In Chapter four the results of the data obtained from the questionnaire survey were presented and discussed accordingly.
- v)** Finally, in Chapter five, conclusions and recommendations were forwarded based on the major findings of the study and discussed how the research objectives align with the findings.

CHAPTER TWO

LITERATURE REVIEW

2.1. General

This chapter reviews the literatures in order to develop a better understanding of the research objective, focusing on the provisions of FIDIC 1987 Conditions of the Contract, claim description, types of cost claim and related issues. However, before discussing the concepts related to cost claim types and management issues, hereunder, points related to contract and general causes of claims are stated as introduction to the main parts of the literature, which is focused on cost claim.

2.1.1. Contract

From the various definitions that attempt to encapsulate the essential nature of a contract; two of them are stated here below:

- Contract is ‘An agreement between two or more parties in which each party binds himself to do or forbear to do some act and each acquires the right to what the other promises [Bunni, 2005].
- Contract as an agreement whereby two or more persons as between themselves create, vary or extinguish obligations of a proprietary nature. [Civil Code, 1960]

The Civil Code of Ethiopia, under its Article no. 1678, stipulates the following conditions to be fulfilled in order to have a legally binding contract:

- A clear intent to create a legal relationship and to be bound by the contents of the contract;
- An agreement between the parties based on an offer by one party and an unconditional acceptance of that offer by the other party;

- An exchange of an act or promise of an act (consideration), such as a promise to perform works or services in exchange for the provision of a benefit (payment);
- A legal capacity to contract by each party where this legal capacity is not exceeded by either party; and a legal objective.

Among various types of Contract, construction contract is the type of Contract that this paper is focused on and usually, in local road projects, for the unit Price Contract type, FIDIC 1987 Conditions of the Contract is commonly used as a General Conditions of the Contract.

FIDIC was founded in 1913 by the national associations of three European countries, wherein the membership are from over 60 countries during 2005. Among various FIDIC published documents, FIDIC 87 (FIDIC IV), also called FIDIC Red book, is the most commonly used type of Conditions of the Contract for construction of building and engineering works [Corbett, 1991].

The general conditions of FIDIC contract (Fourth Edition 1987, Reprinted 1992 with further amendments) consist of 25 groups or articles, these articles include 72 sub articles or clauses. In this thesis, in order to specifically mention FIDIC General Conditions of the Contract (Fourth Edition 1987, Reprinted 1992) either FIDIC 1987 or FIDIC IV is used, which both represent the same conditions of the contract.

2.1.2. Claim

No express definition appears in the typical standard form of construction contract. However, the following definitions are considered relevant, as extracted from literatures:

- The Oxford Advanced Learners Dictionary [2010] defines a claim as a general term for “the assertion of a right to money, property, or to a remedy.
- A claim is defined as a request, demand, application for payment or notification of presumed entitlement to which the contractor, rightly or wrongly at this stage, considers

himself entitled and in respect of which an agreement has not yet been reached [Hughes, 1992].

- Bunni [2005] also defined a claim as an assertion to right, by the Contractor for time and/or financial remedies.

Though all the above three definitions are related, the third definitions by Bunni [2005] is more related to the concept of this thesis objectives and is been used the same as a formal definition.

2.1.3 General Causes of Claims

In road construction projects, Levin [1998] lists the following situations as the warning signs of claims occurrence; wherein occurrence of the same will lead to imbalances of contract:

- Additional work not specified in the contract documents
- Work different from that specified in the contract document
- Work in a particular manner or method, which varies from that originally expected
- Work resulting from contract drawings or specifications which have been changed, amended revised, amplified or clarified.
- Unanticipated work, which results from insufficient details in the plans and specification.
- Work required to be performed in one particular method when specifications allow two or more methods.
- Work out of sequence.
- Stop, disrupt, or interrupt work; wholly or partially; directly or indirectly.
- Owner furnishes equipment late, in poor condition, or not suitable for the intended use.
- Accelerate performance in any way, to regain schedule, to add men or materials, or to work overtime or extra shifts.
- Differing site condition
- Differences in contract interpretation
- Defective specifications

- Delay from the owner's act or failure act.
- Unwarranted work rejection.
- Strikes;
- Forces of nature, and others.

Reviewing previous thesis on the subject of claims, some of the above listed events are also identified as causes of claims in the local road construction industry; wherein the findings of the previous thesis be reviewed at the end of this chapter.

2.1.4. Claim Submission Procedure

In line with FIDIC IV Forms of Contract, Bunni [2005] highlights the requirements of claim submission procedures, as listed below:

- give a notice of intention to claim within 28 days of the event giving rise to the claim, without including the details of the claim itself;
- keep contemporary records (by the contractor);
- inspect the records (by the engineer);
- provide authority to instruct the contractor to keep further contemporary records (by the engineer);
- within 28 days of the notice or an agreed period, submit particulars of the claim in respect of amount and grounds upon which it is based (by the contractor);
- interim and accumulated accounts to be submitted for continuing effects (by the contractor);
- final accounts to be submitted at end (by the contractor); and
- a copy of accounts to be sent to the employer, by the contractor, if so required by the engineer.

Though such procedures are being required in local road projects' contracts, the applicability of the same, particularly notice requirement within 28 days is not followed seriously. Dereje [2003] clarifies the notice requirement relating with non-rejection of claims due to failure of notice

submission. It is worth to mention that failing to issue notice may not reject contractors' entitlement under FIDIC 1987 conditions of the contract considering the Prevention Principle; as such Principle do not allow a one party to get benefit from his own default [Lal, 2002].

2.2. Role and Obligation of Employer and Engineer

From the definition of claim stated above, it is noted that a claim is a contractor's demand for a right owed him by the other party under the terms of the contract; and thus, understanding the roles and obligations of the parties involved in the contract is necessary.

With such intension, thus, before stating the contract provisions of the contract and other details related to claim, it is essential to review literatures related to the obligations of the employer and his representative on site, which is the engineer, as the research focuses only on the contractors' claim.

2.2.1 Obligation of the Employer

The employer's obligations under the Fourth Edition of the FIDIC conditions of the contract are listed below [Bunni, 2005]:

- Identification of specific elements of the project
- Appointment of Engineer
- Granting possession of site
- To provide instructions as and when they are required
- To refrain from taking any action which would impede or interfere with the progress of the works
- To nominate specialist sub-contractors and suppliers as and when is required
- To permit the contractor to carry out the whole of the works
- To make payments and to make them on time

Accordingly, failure by the Employer to fulfill his obligations as stipulated in the contract is a reason for contractor's claim; for which the details of the same will be discussed in the upcoming sections of the literature review.

2.2.2 Role and Obligation of the Engineer

The engineer's rights and obligations under the Fourth Edition of the FIDIC General Conditions of the Contract, FIDIC 1987, are listed below; for which the same requires him to must act impartially in exercising his discretion: [ERA-SMEC, 2008]

The rights stipulated in the FIDIC 1987 conditions of contract are:

- To exercise the authority to be implied from the Contract – Sub-clause 2.1
- To delegate powers to the Engineer's Representative – Sub-clause 2.3
- To issue instructions to the Contractor as necessary – Various Sub-clauses
- To request a revised programme – Sub-clause 14.2
- To withdraw approval of the Contractor's representative if necessary – Sub-clause 15.1
- To require replacement of any member of the Contractor's staff if necessary– Sub-clause 16.2
- To instruct tests on materials – Sub-clause 36.1
- To instruct a suspension of the Works – Sub-clause 40.1
- To notify the Contractor to expedite progress – Sub-clause 46.1
- To make variations he considers appropriate – Sub-clause 51.1
- To value claims in the absence of details from the Contractor – Sub-clause 53.4
- To correct or modify Interim Payment Certificates – Sub-clause 60.4
- To certify if the Contractor is in default – Sub-clause 63.1

The obligations of the engineer stipulated under the FIDIC 1987 conditions of the contract are:

- To obtain the Employer's specific approval when required – Sub-clause 2.1

- To appoint the Engineer's Representative – Sub-clause 2.2
- To determine additional costs and/or extensions of time when appropriate – Various Sub-clauses
- To issue the Taking-Over Certificate or instruct the contractor to complete outstanding works – Sub-clause 48.1
- To make variations he considers necessary – Sub-clause 51.1
- To value variations – Sub-clause 52.1
- To determine the value of the Works by measurement – Sub-clause 56.1
- To prepare Interim Payment Certificates – Sub-clause 60.2
- To issue the Defects Liability Certificate – Sub-clause 62.1
- To give an Engineer's Decision within 84 days – Sub-clause 67.1

In a competitive bidding, roles and obligations are stated clearly, and contractors assumes fulfillment of obligation and responsibilities by the employer and his representative while fixing their rates, and if the employer and his representative on site, which is the engineer, do not fulfill the obligations and responsibilities, then it is expected the issues of claims to be raised; wherein the following sections will review the literatures related to claim, particularly, cost claim, in detail.

2.3. Cost Claims under FIDIC 1987 Conditions of the Contract

This section reviews literature in relation to the types and methodologies of calculating cost related claims. As discussed in the previous sections, in the context of construction industry, claim means a demand by a contractor for extension of time or for an extra payment of an item of work carried out by him on behalf of the employer for which a readily identifiable amount cannot be ascertained under the term of contract [Davison & Mullen, 2009].

Thus, under the following sections, details regarding the cost claims types, method of analysis and relevant contract extractions are explained. For ease of reference, cost claim entitlements to the contractor are categorized in this thesis into two; direct and indirect, wherein the former

focuses on those events that entitle the contractor from the clause provisions of the FIDIC 1987 versions, while the later covers events not directly but embodied in the provisions of the contract.

2.3.1 Direct Monetary Compensation under the Contract Provision

Bunni [2005] lists the following provisions of the contract, under FIDIC 1987 Conditions of the Contract that allow financial compensation as and when the event occurs:

- (a) Sub-clause 6.4: cost compensation if the Contractor is delayed or incurs additional costs as a result of late issue of drawings or instructions in respect of which he has given notice in accordance with sub-clause 6.3.
- (b) Clause 12.2: as and when Unforeseeable physical obstructions or conditions happen, the Contractor is to be compensated for the additional costs incurred in relation to the same.
- (c) Clause 17: Where an error in setting out of the works is based on incorrect data supplied in writing by the Engineer, the Contractor is entitled to be paid an amount determined by the engineer in accordance with clause 52.
- (d) Clause 18: Where the engineer requires the contractor to make boreholes or to carry out exploratory excavation, such requirement shall be instructed in accordance with clause 51 and accordingly valued and paid for in accordance with clause 52.
- (e) Clause 27: Where fossils, coins, articles of value or antiquity and structures and other remains or things of geological or archaeological interest are discovered on the site, the engineer may issue an instruction for dealing with such articles. Should the contractor incur any costs (or delays) as a result of such an instruction, the engineer is required to determine, the amount of such costs incurred which are then added to the contract price.
- (f) Sub-clause 31.2: If the engineer requests in writing and the contractor provides facilities for other contractors pursuant to sub-clause 31.1 (opportunities for other contractors), the

engineer is required to determine an addition to the contract price in accordance with clause 52.

- (g) Clause 36: Where the cost of samples and tests are clearly intended by or provided for in the contract, the cost is to be borne by the contractor. However, where tests are neither intended by nor provided for under the contract, then sub-clause 36.5 requires the engineer to determine an amount to be added to the contract price.
- (h) Sub-clause 38.2: The engineer may require, as a consequence of some subsequent discovery that work already covered up should be uncovered, inspected and tested. If such work is found to be in accordance with the contract, the engineer is required to determine the amount of the contractor's costs which should then be added to the contract price.
- (i) Clause 40 regulates the consequences of a suspension of the progress of the works or any part thereof when instructed by the engineer for a number of reasons specified in sub-clause 40.1.
- (j) Sub-clause 42.1 provides for the requirement of the possession of the site from time to time, in a certain order and in such portions as may be necessary and subject to the requirements of the contract. Failure by the employer to give possession of the site or portions of it which causes the contractor to suffer delay and to incur costs is governed by the provisions of Sub-clause 42.2.
- (k) Clause 69 deals with the provisions which apply in the case of default by the employer. Sub-clause 69.1 defines the events which render the employer in default and entitle the contractor to terminate his employment under the contract. The contractor may do so by giving notice of termination to the employer, 14 days after which the termination automatically takes effect. Sub-clause 69.3 provides the terms of payment on termination which are the same as those under clause 65.

(l) Sub-clause 70.1 deals with fluctuations in the costs of labour and materials or any other matters affecting the cost of construction. It is particularly important in projects of long duration and at times of inflation where the risk of increase in such costs is high.

(m) Sub-clause 70.2 provides for cost fluctuation as a result of changes in legislation in the country where the project is to be constructed, which occur after the date 28 days prior to the latest date for submission of tenders for the contract. Such fluctuation is easily calculated, and the engineer is required to determine any additional or reduced cost.

As noted above, the contract under FIDIC 1987 conditions of the contract provides clear provisions for the cost compensation of events as and when the events occur on a specific project.

2.3.2 Indirect Monetary Compensation Claims

Under this section, some of the cost claims types are reviewed including the scope and analysis of the specific types of cost claims; for those it requires detail analysis in during claim submission. The Cost claim types discussed under this section are:

- Acceleration Claim
- Prolongation Claim
- Disruption Claim
- Change in Scope Claim
- Payment Related Claim, and
- Termination Claim

2.3.2.1 Acceleration Claim

A. Definition and Scope

Acceleration is the process by which work is speeded up in an attempt to complete performance earlier than was anticipated. This may be earlier than either the originally contracted for completion date or the completion date as extended under the contract provisions [Davison et.al, 2009].

Davison et. al [2003] also identifies the cause of acceleration under two categories. First, actual acceleration/direct acceleration occurs when an owner orders a contractor to finish the project in advance of the specified contract completion date. Constructive acceleration, on the other hand, occurs when a contractor has a justified claim for an extension of time and the owner refuses to adjust the completion date for performance and instead, requires the contractor to finish the project by the original contract completion date.

In relation to the effects of acceleration order to the contract, Cushman et. al [2001] lists the variety of techniques used by the contractor to attempt to meet accelerated schedule; such as:

- Re-sequencing work activities
- Increasing the labor force by:
 - Increasing the number of crews or crew size
 - Working overtime
 - Adding new shifts
 - Combinations of the three, such as increasing two eight-hour shifts working five days per week to two ten-hour shifts working six days per week
- Adding extra equipment
- Expediting material and equipment deliveries.

Cushman et. al. [2001] also states that the additional expenses by the contractor associated with the acceleration effort either be compensable or not; depending on the acceleration types whether it was voluntary or involuntary. Acceleration types, therefore, are categorized as voluntary and involuntary; wherein the later also has two types: directed and constructive acceleration. The three types of acceleration are discussed below

i) Voluntary acceleration

Voluntary acceleration occurs when a party to a construction contract, usually a contractor, performs ahead of schedule for its own purposes or motives, not because of the directives of another party. In this situation, the accelerating contractor does not have a claim for acceleration damages against any other party to the construction contract [Zack, 2011].

ii) Directed/Actual acceleration

Actual acceleration occurs when one party to a construction contract is ordered by another party to complete its performance in advance of the original completion date contemplated by the contract. An owner who actually accelerates a contractor is liable to the contractor for the contractor's acceleration costs [Davison et al, 2003]

iii) Constructive Acceleration

As per Davison et. al. [2003], a Constructive acceleration is used to describe measures taken by the Contractor to overcome delay for which he has not been granted an extension of time. It may also apply in situations where the contractor receives an extension to the contract completion date but argues that the decision to award the extension came too late to prevent him instituting measures to overcome delay for which the employer is responsible.

Likewise, Cushman et. al. [2001] specifies Constructive acceleration to be occurred when the contractor has a justified claim for an extension of time and the owner refuses to adjust the completion date of performance and, instead, requires the contractor to complete the project by the original completion date. Cushman et. al. [2001] also highlights that when an appropriate change order is lacking, a contractor may establish an implicit change resulting in a constructive acceleration by proving the following elements:

- a) The contractor experienced an excusable delay; wherein the cause is not contractor's default

- b) The owner had knowledge of the excusable delay as demonstrated by timely notice of the delay and a proper request for a time extension
- c) The time extension request was either postponed or refused
- d) An order to accelerate, as manifested by some order or direction from the owner or its agent, can reasonably be construed as an order to complete the project within the unextended performance period, or an order demanding a larger effort than would be necessary to complete the work within a properly adjusted schedule or completion date
- e) Actual acceleration by the contractor, resulting in additional costs.

B. Contractor's Entitlement for Acceleration Claims

Zack [2011] stipulates that acceleration costs as those costs encountered as a result of a contractor's performing work faster than anticipated. The contractor who has been forced to operate in an accelerated environment should be compensated for the following, but not limited to as different project has its own specific damages, as stated by Cushman et. al. [2001]:

- **Labor inefficiencies:** A loss of productivity can be caused by more or larger crews, re-sequencing of the work, overtime or loss of planning time.
- **Increased material costs:** Expedited material shipments can increase costs
- **Excess equipment costs:** More equipment may be needed when work is accelerated. The same piece of equipment may have been planned to service two separate activities that now have to take place concurrently.
- **Supervision:** When work is accelerated, supervisory needs are increased. This is often a nonlinear or disproportionate increase in costs to properly manage the project.
- **Subcontract costs:** Some work may be subcontracted at a higher cost than that of the contractor's own labor force. The difference in the costs is damages.
- **Overhead:** Greater home office time is typically spent on the accelerated project as its timely completion becomes critical.

Having stated the general descriptions of costs that could be included in the acceleration costs, Cushman et. al. [2001] describes various types of acceleration claim calculation, wherein, this thesis reviews two of these in consideration of widely used and simple methods and believed to be suitable for the local construction industry: total cost approach and modified total cost approach; and hereunder the same are described.

i) Total Cost Approach

The total cost approach to measuring damages calculates all project costs incurred on the project by the contractor and subtracts from that an estimate of the costs or a benchmark cost for the project; wherein such typical benchmark would be the contractor's originally planned costs for the project. Any amount in excess of the estimate or benchmark is considered the amount by which the contractor was damaged, and this approach has the following assumptions [Cushman et. al., 2001]:

- The contractor did not contribute to the excess costs in any way
- The contractor's costs are accurate
- The estimate is reasonable or a benchmark of planned costs for the project costs can be determined
- There is no other method available.

ii) Modified Total Cost Approach

Using this approach, Cushman et. al. [2001] highlights that the contractor calculates damages using the total cost approach but then subtracts from the damages the excess costs caused by the contractor's own actions. The amount of damages caused by the contractor can be calculated by pricing the time spent on the particular task at hourly rates. This approach is often used and allows the claims advocate to stress that the claimant is being fair in accepting any fault attributable to the claimant's own actions or inaction

2.3.2.2. Prolongation Cost Claims

A. Definition and scope

As cited by Davison et. al. [2003], a prolongation claim is defined as claims for additional time-related costs associated with delays caused by the employer.

Likewise, Cushman et. al. [2001] defines prolongation cost claim as costs associated with staying on site that the originally planned wherein the contractor incurs additional cost that he is unable to recover from the cost of the work carried out.

Bunni [2005] also defined a prolongation claim as a claim that a contractor would make when the time necessary to complete a critical activity becomes longer than that originally planned owing to the event giving rise to the critical delay.

Cushman et. al. [2001] further stipulates that the claims that may arise from a delay classified as follows:

- (a) Increased site running costs or site overheads: this is typically the cost of site based staff accommodation and some plant being retained on the site for a longer period.
- (b) Increased costs to complete the works that would not have been incurred, had no delay occurred.
- (c) Additional work or re-work: This can arise where work done (such as road painting) has to be repeated after a period of delay.
- (d) Recovery of additional management costs, typically costs of staff based at a regional or head office whose time has been charged to the project due to specific issues.
- (e) Lost contribution to head office overheads, where key staff or plant is retained on a delayed project and thus cannot be released to carry out new projects that could earn overhead contributions as part of the contract price.
- (f) Acceleration costs or other reprogramming measures taken to reduce or limit the period of delay.

B. Contractor's Entitlement for Prolongation Cost Claims

As cited by Thomas [2001], three typical heads of claim arising out of prolongation of the contract period are stated; which are:

i) Site overheads or preliminaries

Thomas [2001] states that if the contractor can show that it was reasonable and necessary to employ more weekly resources than those allowed in the tender he may be able to claim on the basis of the increased resources. Under this head, Gibson [2008] describes the site establishment costs actually spent on the project for the specific delay period or periods be considered.

ii) Prolongation of individual activities

Thomas [2001] specifies that some delays may not be on the critical path, in which case there will be no general prolongation costs. However, some time-related costs may be solely attributable to a particular activity. If a delay is in respect of an activity that requires scaffolding for its total duration, then the cost of the scaffolding for the period of the qualifying delay of two weeks would be recoverable. Supervision and other plant and equipment utilized solely for the activity may also be recoverable. This is particularly valid where the activity is for work carried out by a subcontractor.

iii) Head office overheads in the event of prolongation

Gibson [2008] highlights that if a project is delayed and extended in time, then the support provided by the head office must also be extended for the same duration.

Jack [2002] mentions that various potential formulae are considered for calculation of the overhead elements arising from prolongation. Davison et. al. [2003], however, states that the formulae most commonly encountered in Britain are the Hudson and Emden's formula. A further candidate, the Eichleay formula, is an American formula that takes its name from an American court case and is often quoted or adopted by claimants.

Here below, the recognized formulae are defined and explained; as cited by Davison et. al. [2003]:

a) *The Hudson formula*

This formula uses the percentage allowance made by the contractor in his original contract sum for head office overheads and profit as the basis for the loss of contribution to overheads.

$$\text{Head office overheads \%} \times \frac{\text{Contract Sum}}{\text{Contract Period}} \times \text{Period of Delay} \quad [\text{Eq. 2.1}]$$

b) *The Emden's formula*

Emden's formula is identical to the Hudson formula, save that the head office overheads percentage (and profit) used in the formula is the actual percentage based on the contractor's accounts and is arrived at as follows:

$$\text{Head office overheads (profit) \%} = \frac{\text{Total overhead cost (Profit)}}{\text{Total turnover}} \quad [\text{Eq. 2.2}]$$

c) *The Eichleay formula*

This formula originated in the United States, and seeks to establish the proportion of a contractor's head office overhead attributable to the project in question. It uses this proportion to compute an amount of overhead cost per week or per month and applies this to the period of delay.

The Eichleay formula is a three-stage calculation as shown below:

Stage 1

$$\frac{\text{Total value of project (incl. variation)}}{\text{Company revenue for contract period}} \times \text{Company overhead cost/profit} = [\text{Eq. 2.3a}]$$

$$\frac{\text{Company revenue for contract period}}{\text{Allocable overhead for the project}}$$

Stage 2

$$\frac{\text{The allocable overhead of the project}}{\text{Actual project period, incl. delay (weeks)}} = \text{Weekly rate recoverable} \quad [\text{Eq. 2.3b}]$$

Stage 3

$$\text{Weekly rate recoverable} \times \text{period of delay (weeks)} = \text{Head office's overhead costs} \quad [\text{Eq. 2.3c}]$$

The above listed formulae will only produce an average overhead figure based on a number of assumptions that may or may not be realistic in any particular circumstances [Gibson, 2008]. It must be preferable wherever possible to establish the actual overhead costs from records and accounting data but if the adoption of a formula is considered appropriate to a particular project then the matter should be raised, if at all possible, before the contract is agreed between the parties.

Davison et.al., [2003] concludes that if, as a final resort it is decided in particular circumstances that a formula is the only practical way to address the matter, then the Eichleay formula should be preferred as it avoids reliance on the contract tender, has a relationship to the actual levels of cost incurred in the contractor's business and does not require amendment to avoid the double counting problem with the Hudson formula.

In the researcher view, actual method of calculating prolongation cost is common in local construction industry, as learnt from the discussions made with professionals, and it is more

reasonable as it is reflecting the actual expense of the contractor and also possible to prove the same.

2.3.2.3. Payment Claims

To every contractor, the expected cash flow under the payment terms of the contract is very critical. When payment is not made or is made in an untimely fashion, not only are bottom-line profits affected, but also the contractor's capital, its financing, its ability to perform other projects, its bonding capacity, and its obligations to employees, subcontractors, and material suppliers are all negatively impacted [Twort & Rees, 2004].

FIDIC (1987) conditions of contract has introduced provisions to enable the contractor to suspend work or slow down his progress subject to the contractor giving twenty-eight days' notice of his intention to suspend or slow down the progress of the works, if the employer fails to pay by the expiry of the notice period. Let alone suspension, the Contractor may terminate the contract, as and when the payment is delayed unreasonably. Following such suspension or slowing down, the contractor is entitled to an extension of time and additional costs.

Here below, the relevant Clauses of FIDIC (1987) Conditions of Contract related to the effect of payment delay are stated:

- Sub-clause 60.1 : The Contractor shall submit to the Engineer after the end of each month six copies, of a statement, showing the amounts to which the Contractor considers himself to be entitled up to the end of the month.
- Sub-clause 60.2: The Engineer shall, within 28 days of receiving such statement, certify to the Employer the amount of payment to the Contractor which he considers due and payable in respect thereof.
- Sub-clause 60.10 : The amount due to the Contractor under any interim certificate issued by the Engineer pursuant to this Clause, shall subject to Clause 47, be paid by the

Employer to the Contractor within 28 days after such interim certificate has been delivered to the Employer.

- Sub-clause 69.1 : In the event of the Employer:
 - (a) failing to pay to the Contractor the amount due under any certificate of the Engineer within 28 days after the expiry of the time stated in Sub-Clause 60.10 within which payment is to be made, subject to any deduction that the Employer is entitled to make under the Contract;. the Contractor shall be entitled to terminate his employment under the Contract by giving notice to the Employer, with a copy to the Engineer. Such termination shall take effect 14 days after the giving of the notice.
- Sub-clause 69.4: Without prejudice to the Contractor's entitlement to interest under Sub-Clause 60.10 and to terminate under Sub-Clause 69.1, the Contractor may, if the Employer fails to pay the Contractor the amount due under any certificate of the Engineer within 28 days after the expiry of the time stated in Sub-Clause 60.10 within which payment is to be made, subject to any deduction that the Employer is entitled to make under the Contract, after giving 28 days' prior notice to the Employer, with a copy to the Engineer, suspend work or reduce the rate of work.

2.3.2.4 Termination Claims

A. Definition and Scope

A party may terminate a contract but only if the breach is material and occurs prior to substantial completion and due to that the Contractor may be compensated for the loss of profit and other expenses stated under the specific contract [Bunni, 2005].

To determine whether a breach is material, the following factors are considered [Cushman et.al., 2001]:

- The extent to which the injured party will be deprived of the benefit it reasonably expected
- The extent to which the injured party can be adequately compensated
- The extent to which the party failing to perform will suffer because of the forfeiture
- The extent to which the contract has been performed at the time of the alleged breach, and others.

B. Contractor's Entitlement for Termination Claims

Cushman et. al. [2001] cites that in the case of termination for default, the Contractor is entitled to damages if it rightfully terminates the contract or if the owner wrongfully terminates it. Under either scenario, the damages that the Contractor is entitled to recover are the same. However, damages recoverable under a termination for default claim vary depending on the stage of the project at the time of the termination.

FIDIC (1987), under its clause 65.3, states “... If the Contract is terminated as aforesaid, the Contractor shall be paid by the Employer, insofar as such amounts or items have not already been covered by payments on account made to the Contractor, for all work executed prior to the date of termination at the rates and prices provided in the Contract and in addition:

- a) The amounts payable in respect of any preliminary items referred to in the Bill of Quantities, so far as the work or service comprised therein has been carried out or performed, and a proper proportion of any such items which have been partially carried out or performed.
- b) The cost of materials, Plant or goods reasonably ordered for the Works which have been delivered to the Contractor or of which the Contractor is legally liable to accept delivery, such materials, Plant or goods becoming the property of the Employer upon such payments being made by him.

- c) A sum being the amount of any expenditure reasonably incurred by the Contractor in the expectation of completing the whole of the Works insofar as such expenditure has not been covered by any other payments referred to in this Sub-Clause.
- d) Such proportion of the cost as may be reasonable, taking into account payments made or to be made for work executed, of removal of Contractor's Equipment under Sub-Clause 65.7 and, if required by the Contractor, return thereof to the Contractor's main plant yard in his country of registration or to other destination, at no greater cost.
- e) The reasonable cost of repatriation of all the Contractor's staff and workmen employed on or in connection with the Works at the time of such termination.

Provided that against any payment due from the Employer under this Sub-Clause, the Employer shall be entitled to be credited with any outstanding balances due from the Contractor for advances in respect of Contractor's Equipment, materials and Plant and any other sums which, at the date of termination, were recoverable by the Employer from the Contractor under the terms of the Contract. Any sums payable under this Sub Clause shall, after due consultation with the Employer and the Contractor, be determined by the Engineer who shall notify the Contractor accordingly, with a copy to the Employer...”

2.3.2.5. Change in Scope Claim

A. Definition and Scope

Variation is used interchangeably with the word change, and it is defined as any deviation from an agreed well-defined scope and schedule [O'Brien, 1998]. Tadesse [2009] reported that variation is a major effect in local construction industry in bringing cost overrun.

Variations to the works are almost inevitable. Therefore, all standard forms of contract contain provisions to deal with them. Some variations can be made without affecting the progress of the work and with no change in the method, sequence and cost of the work to be done in the variation [Thomas, 2001].

B. Contractor's Entitlement for Variation Claims

Claims for additional payment will usually involve either a request for an adjustment of the contract rates and prices, or the reimbursement of a cost based amount as a consequence of other events, or a combination of the two. The unit rates and prices are often described as the 'direct' cost of the works as each rate or price relates to an individual item or operation included in the works [Davison et al, 2009]

FIDIC (1987) under Sub-clause 52 of the Red Book provides the rules for valuation of Variation; wherein the varied work is valued in one of four different ways.

- The first is where the variation is valued at the rates and prices set out in the contract if, in the opinion of the engineer, these rates and prices are applicable to the items of varied work.
- The second way in which a variation may be valued is where there are no applicable rates and prices in the contract, then the contract rates and prices are to be used as the basis for valuation so far as may be reasonable.
- The third way in which a variation may be valued applies if the contract rates and prices cannot be used as a basis for valuation; then the Engineer is required to agree new suitable rates and prices through the procedure of 'due consultation' with the employer and the contractor.
- The fourth way in which a variation may be valued applies where it is to be found, on the issue of the taking-over certificate for the whole of the works, that the value of varied work together with all adjustments upon measurement of the estimated quantities is in excess of 15 per cent of the effective contract price.

In relation, Bunni [2005] states that there is reference to the purpose of this sub-clause where it is explained that in preparing a tender, a contractor may distribute his on-costs and profit in various ways, and an adjustment of these is necessary where the amount of work under the contract is varied beyond the specified percentage.

2.3.2.6. Disruption Cost Claims

A. Definition and Scope

Disruption is any change in the method of performance or planned work sequence contemplated by the contractor at the time the job was bid that prevents the contractor from actually performing in that manner [Nelson, 2011].

Thomas [2003] cites that the term 'disruption' when used in the context of construction and engineering claims includes any one or a number of the following considerations:

- delays to individual activities, thereby causing manpower to be retained over a longer period to execute the same amount of work;
- changed sequence of working arising out of delays to individual activities, thereby causing the effective use of manpower to be interrupted and disturbed so that no production takes place during such interruption and lower production occurs in the initial stages of the activity to which the manpower has redeployed;
- interruption and disturbance to other secondary activities caused by delay to the affected activities or changed sequence of working so that lower production is achieved in carrying out these secondary activities;
- idle time caused by rescheduling and out-of-sequence working, thereby adversely affecting the progress of the work;
- congestion in sections of the work to which rescheduled manpower is transferred, thereby affecting productivity and progress of the work;
- general loss of productivity due to work being done piecemeal.

Disruption to the contractor's works may arise from a number of sources, including the impact of [Davison et.al, 2003]:

- Ordered variations to the quantity or specification of the original works.
- Ordered additions or omissions to the scope of the works.
- Late information being supplied to the contractor from the design team or specialists.
- Unforeseen physical conditions or obstructions on the site.
- Exceptionally inclement weather.
- Strikes, lockouts, civil disorder or war, etc.
- Difficulties or delays in obtaining the required labour, plant and/or materials.
- Delays by subcontractors, whether nominated, named or domestic.
- The opening up of works for inspection.

B. Contractor's Entitlement for Disruption Damages

Bunni [2005] specifies that a proper evaluation of a claim for disruption requires the following prerequisites:

- a) Identification and an analysis of each of the operations claimed to have been disrupted. It is not sufficient to simply state that the execution of the works has been disrupted.
- b) The cause and the manner in which disruption has occurred should be established.
- c) The figures for the anticipated output, the resources planned and the time required to achieve the completion of the disrupted operations as calculated in the tender have to be shown to be achievable.
- d) The effect of any inefficiency on the part of the disrupted party in carrying out the works should be properly calculated and its effect included in the calculations of disruption suffered.
- e) The number of hours actually logged in the time sheets for the disrupted operation has to be shown to be accurate.

Cushman et. al. [2001] lists the general considerations in pricing the disruption claim, majorly favors the loss of efficiency method. The loss of efficiency, also known as a productivity loss claim relay on the following equation:

$$\begin{aligned} \text{Disruption Damages} &= \\ &= \text{What it cost with the disruption} - \text{What it should have cost without the disruption} \quad [\text{Eq. 2.4}] \end{aligned}$$

Cushman et. al. [2001] further lists the various methods to complete the above equation for a specific claim; wherein all the methods seek to identify the two components of the above equation with differing degree of precision, and these methods are:

- Total cost
- Modified total cost
- Measured mile
- Should cost estimates
- Industry standards and handbooks
- Time and motion studies
- Expert opinion, and
- Jury verdict

In this thesis, only total cost and modified total cost methods are reviewed, which are recommended by Cushman et. al. [2001] and being more practical to the local construction industry:

Total Cost Method: Under this method the claimant entitlement is estimated as the difference between the actual cost and the contractual cost without establishing any causal link between the reason for their entitlement and the quantity of the corresponding loss.

Modified total cost approach: This method is similar to the total cost except that in this approach the contractor's bid estimate is adjusted to account for activities that were underbid or deemed to

be his responsibility. The total cost differential is thus modified to eliminate cost factors that are the responsibility of the contractor and also correct inaccuracies in the original estimate. This makes the approach a more reliable method than the total cost method.

2.4. Contractors Claim Preparation and Determination Mechanisms

2.4.1 General

In the previous sections, descriptions of claim types, methodologies of quantifying the claims, contract provisions together with extractions from FIDIC 87 is reviewed. To have a successful claim; a claim need to be presented as to the required standard, assessed by the engineer in a fairly and impartial attitude, and also as and when there is a different in opinion in the determination of a claim, a dispute resolution mechanism should be sought.

With this attitude, in the following sections, proper presentation of claims including the claim process, consultant's (engineer's) role in determining the claims and dispute resolution mechanism, mainly dispute review expert provisions from reviewed literatures is stated. From the process of claim, only identification, documentation and presentation are reviewed in this paper.

2.4.2 Claim Identification

Claim identification is one of the basic process of claim, wherein the Contractor need to understand the contract provisions as agreed and signed by the parties. The lack of awareness, skills and knowledge of site personnel may cause loss of chances for the rights to declare a claim [Knowles, 1994]

2.5.3 Claim Documentation

Claim documentation focuses on the contractors' record keeping system. An effective documentation will provide proof for the alleged claim and improve the chances of winning a

claim. It is suggested that verbal instruction by owner, some information/instruction is not kept in writing and ineffective record-keeping system contributes to the problems in documenting a claim. Project documentations must be prepared with the intention to build cases and written evidence to support argument. [ERA-SMEC, 2008]

2.4.4 Claim Presentation

Hewitt [2011] explains the need of good presentation of a claim by a claimant as the same task as selling a good by a sells person. In the latter case, the first rule in selling is to get the customer to like them with a principle that people do not want to buy from people that they don't like. Likewise, presenting a claim is also the same since the goal is to sell it to the other party, in this case, it requires promoting the arguments by means of the printed word by making it easier to agree with the claim submission.

In this regard, Gibson [2008] generalize that a poorly prepared or badly presented claim is more likely to be rejected as the claimant's arguments will be unclear, poorly set out and weakly substantiated. The burden of proof lies upon the claimant and as to Hewitt [2011], many claims fail for lack of adequate, corroboratory, documentary evidence.

Bunny [2005], in relation to claim document, specifies that a well prepared and documented claim will save time in dealing with it and will have a better chance of success, and recommends to have the following sections:

- Introduction providing details of the parties, the contract, the project, relevant dates and other pertinent information.
- Brief description of the works as required and specified in the relevant documents.
- Description of the claim events as they occurred and the nature of the resultant problems encountered.
- A section containing a statement of the facts, so that facts can be established.

- An analysis of the facts showing the legal basis upon which the claim is founded, citing the relevant provision and clause of the conditions of contract under which relief is claimed.
- Description of the procedural steps already taken in dealing with the claim event, including notices given, if any.
- Calculation of cost impact and the methods used.
- Calculation of the claimed extensions of time, if any, showing critical and non-critical delays encountered.
- Calculation of disruption experienced, if any, and the method used to calculate its impact.
- Appendices which should include all contemporaneous records and relevant correspondence relied upon.

Hewitt [2011] recommends the contents of a typical claim submission document to be as:

- (i) Front Cover
- (ii) Executive Summary
- (iii) Statement of Claim
- (iv) Definitions, Abbreviations and Clarifications
- (v) The Contract Particulars
- (vi) The method of Analysis and details of the claim for additional payment
- (vii) Appendices
 - Appendix A – Exhibits
 - Appendix B – Base line programme
 - Appendix C - Cost Calculations
 - Appendix D - Supporting information for the cost calculation

2.4.5. Claims Determination

SMEC [2006] and FIDIC (1987) requires that the Engineer should assess the Contractor's cost claim in a fair and impartial manner. For the same, a special provision under Sub-clause 2.6 of

FIDIC 87, that requires the Engineer to exercise his discretion while determining contractors claim, to impartially within the terms of the contract.

SMEC [2008] specifies that the assessor of the claim, who is the engineer under this specific case, must then review the claim critically to determine whether it is acceptable as a whole or in part. This is best done by considering the components of the claim individually and breaking them down into smaller parts if possible. The facts that are presented may have been chosen selectively, omitting contemporary facts that do not support the claim. Therefore, the assessor must check records relating to the claim independently as well as checking that the records presented in support of the claim are correct.

Martoranan et. al. [2013] clarifies the principles in interpretation of the contract provisions during determination of contractor's claim; which is useful to issue fair and reasonable determinations.

2.4.6 Dispute

Most if not all commercial contracts, including construction contracts, contain provision for the resolution through arbitration of disputes which may arise between the parties during the course of the transaction [Gaitskell, 2006].

However, no express definition of 'dispute' appears in the FIDIC [1987] conditions of contract also in most typical standard forms of construction contract. So a dispute was said to come into being when the contractor did not accept the engineer's rejection of his claim [ERA-SMEC, 2008].

2.5.7 Settlement of Disputes

If a dispute of any kind whatsoever arises between the employer and the contractor in connection with, or arising out of, the contract or the execution of the Works, whether during the execution of the Works or after their completion and whether before or after repudiation or other termination of the Contract, including any dispute as to any opinion, instruction, determination,

certificate or valuation of the Engineer, the matter in dispute shall, in the first place, be referred in writing to the Engineer, with a copy to the other party. Such reference shall state that it is made pursuant to Clause 67. No later than the eighty-fourth day after the day on which he received such reference the Engineer shall give notice of his decision to the Employer and the Contractor. Such decision shall state that it is made pursuant to Clause 67 (ERA-SMEC, 2008).

FIDIC (1987) stipulates the procedure for a dispute resolution in the following five steps as follows:

- (i) Step 1: A dispute arises.
- (ii) Step 2: The dispute is referred to the DAB/DRE in writing for its decision
- (iii) Step 3: The DAB/DRE gives notice of its decision within 84 days or it fails to give a decision within that period.
- (iv) Step 4: The Parties react to the decision of the DAB/DRE, which could be one of two possibilities:
 - (a) Both Parties are satisfied with that decision, the dispute is resolved and such decision becomes final and binding; or
 - (b) At least one of the Parties is dissatisfied with the decision of the DAB/DRE, or with its lack of decision, and thus notifies the other Party of its dissatisfaction within 28 days. In this case, the Parties are given 56 days to attempt resolving their dispute by amicable settlement, under Sub-Clause 67.2. If the attempt is successful, the dispute is resolved. If not, step 5 applies.
- (v) Step 5: If the attempt to amicably resolve the dispute fails, such dispute is to be finally settled by arbitration.

2.5. Cost Claims Practice in Ethiopian Construction Industry

2.5.1 General

Recognizing the importance of road transport in supporting social and economic growth and its role as a catalyst to meet poverty reduction targets, the Government of Ethiopia 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 formulated the Road Sector Development Program (RSDP) in 1997 [ERA, 2013].

The RSDP has already been implemented over a period of sixteen years and in four successive phases, as follows:

- RSDP I - Period from July 1997 to June 2002 (5 year plan)
- RSDP II - Period July 2002 to June 2007 (5 year plan)
- RSDP III - Period July 2007 to June 2010 (3 year plan)
- RSDP IV - Period July 2010 to June 2015 (5 year plan)

RSDP assessment report (ERA, 2013) compares the performance of RSDP program (in %), till end of the third year of RSDP IV:

Table 2.1 RSDP assessment report 2013

No.	Program ¹	Plan (km)	Actual (km)	% age
1.	RSDP I	3,777	2,709	72
2.	RSDP II	5,375	7,483	139
3.	RSDP III	8,956	7,996	89
4.	RSDP IV (three years)	8,109	8,085	100
Total RSDP		26,218	26,273	100

2.5.2 Participation of Local Contractors in Road Sector Development Programme

Participation of the local contracting industry has increased, in terms of both the value and number of projects, over the last sixteen years of the RSDP. Some local contractors are now taking relatively bigger contracts, with values amounting to as much as ETB 1.3 billion. The

¹ Only Federal Road projects, without regional and URRAP projects

participation of local contractors, till the end of 2013, is 46% with amount of ETB 48,416.79 million against the foreign contractors' participation of amount ETB 57,510.09 million. In terms of number of projects, local contractors contracted are 278, which is 75% of the floated bid against the foreign contractors. [ERA, 2013]

2.5.3 Claim Causes in Local Construction Industry

Abebe Dinku and Girmay kahsay [2003] studied on Claims in international Construction projects in Ethiopia and concluded that variations due to right of way, design changes, modifications and lack of sufficient data as main causes for the delay claims of sample projects. Likewise, Liu Yi [2009] in his study of claims in international construction contracts of Ethiopia has identified most of the claims arise from right of way problems, design related issues, ambiguities in contract document, inadequate communication, default of the Employer, changed circumstance and unforeseen or uncertain condition during the execution of the contract.

Abebe et. al. [2003] found out that the Ethiopian construction industry lacks an appropriate guidance or training on the handling of claims on international contracts, noting that the rights of way/ site handing over problems are major claim events. Claim is unavoidable and in order to minimize this occurrence, the first step needs to be creating an increased awareness on the unavoidability of claims in the management of international projects in Ethiopia. In addition to these, understanding claims in a positive way goes a long way to creating an understanding of their existence and eventually creating a positive atmosphere towards their solution.

Besides, Abebe et. al. [2003] conclude from his research that the main form of contract that is widely used in the Ethiopian construction industry is FIDIC, which may not be widely known or understood in the Ethiopian professional circle. In this aspect the rather in adequate understanding and implication of this form of contract has contributed towards the frequent occurrence of claims. This is very evident in the significant occurrence of site handover related claim issues.

In relation to causes and events that arises claim, Abdissa [2003] in his study lists the following as some of the problems related to claims management in the Ethiopian construction industry:

- Lack of experience in processing claims
- Lack of awareness of claims situation. Most local contractors claim when they encounter shortage of money or time.
- When the owner of the project is government and the contractor is private most decisions made by consultants are in favor of employers. Contractors have less opportunity to be entitled to their intent.
- Lack of knowledge of legal and contractual right
- Poor record keeping for justification of claim
- Most local contractors do not want to issue financial claim to their client. Many of them claim only time extension claim, not its associated cost. The reason is because of fear of their reputation for future relationship with their client.
- The financial constraint of contractors

2.5.4 Local Contractors Practice in Requesting Cost Claim

Abdissa [2003] studied case studies in comparing local and International Contractors practice by studying case studies of projects, the Lalibela to Sekota road project was undertaken by local contractor called SUR construction share company, and the Sodo to Chida road project was also undertaken by international(foreign) contractor called Salini costruttori S.P.A and found out the following remarks:

- When we see the over all of the study, unlike SUR construction CMC and Salini reserve their right to adjust their position as new evidence come to light.
- CMC justified their delay claim by programme comparison between the programmed and actual start and completion time. This helps to know when the delay happened, the reason of the delay and the magnitude of the delay on each activity.
- Claim justification by CMC and Salini was very clear and discrete.

- The contractor, SUR construction, was entitled 239 days of time extension from 827 days of their request i.e.29.89%. But CMC-di-Ravenna succeeded 151days from 181days of their request i.e.83.34%.
- Because of lack of detail claim management, the SUR construction claimed for extension of time when the site was officially closed.
- Throughout their claims SUR construction raised no financial issue.

In general, Abdissa [2003] conclude that the claim management of SUR construction was at very low stage comparing with that of CMC-di-Ravenna and Salini.

In addition, Lui [2009] found out in his study on claim cases in international projects that the common claim reason are arising from design change, default of the employer, unforeseeable condition and other related issues which may bring loss to the contractor or cause delay to the contract implementation; while, the contractor will claim for his entitlement according the contract provision and try to decrease his loss or protect his supposed profit. In Ethiopia, when the project suffers claims, DRE will be very popular to be invited and draw his opinion accordingly due to his professional service. In Ethiopia, we may see most of the engineer prefer to give time extension to the contractor as his request but always try to escape to give his justification or comments on the financial reimbursement request.

2.5.5 Dispute Practice in local Construction Industry

Aberra [2005] points out from his research that many domestic contractors are reluctant to pursue legitimate construction claims for fear of damaging working relationships and their reputation in the industry. There is no conducive atmosphere from the whole state of affairs. There is no clear fertile ground from the construction policy that initiates to pursue and move towards even legitimate claims. Despite the fact that construction industry, involving domestic contractors, is more than 50 years old in Ethiopia, it is still in the infancy age, growing unfortunately, very slowly both in technical and financial terms. Regret the language, these days construction is not viewed as a profession. If there is, any growth to talk about is the increase in number of starter domestic contractors.

Regardless of non- award of legitimate financial claims, contractors should posses, or learn to posses, two qualities in construction industry: always being time-and money-conscious; using project time and money diligently. In both these cases, consultant's aggressive advice and client's assistance to contractors do play a big role.

In addition, Aberra [2005] under his research mention the following points as concluding remarks:

- i) ADR methods in Ethiopian construction projects dispute handling is not developed,
- ii) There is no arbitration clause on Ethiopian construction conditions of contracts,
- iii) Lack of collaboration between the stakeholders,
- iv) Public construction projects clients do not entertain legitimate claims,
- v) Lack of immediate solution for problems encountered on job site, inefficiency of prompt consultants approval,
- vi) Lack of expertise and management of contracts,

2.6. Literature Summary

In order to develop a better understanding of the research objective focusing on the provision of FIDIC 87 Conditions of the Contract, claim description, types of cost claim and related issues are reviewed.

Claim is considered as an assertion to right, by the Contractor for time and/or financial remedies. Majorly, literatures list the common issues which arises claims in the construction industry as: Issues arises normally causes by the client, Issues arises normally by consultant, Issues arises due to material, Issues due to by Labor & Equipment, Issues due to Contractual relationships, Claims that are normally caused by External factors, Issues arises are normally by political and social, and Issues arises normally by economy.

Under local construction industry, various studies have been made to study the causes of the claim. Abebe Dinku and Girmay Kahsay [2003], Abdissa Dessa [2003] and Liu Yi [2009]

studied on issues related to claims in road construction projects. Thus, in my thesis report, consideration has been made on the findings of the papers, which are very relevant to my topic.

2.6.1. Role and Obligation of Employer and Engineer

From the definition of Claim stated above, it is noted that a Claim is a Contractor's demand for a right owed him by the other party under the terms of the Contract; and thus, discussing the role and obligation of the parties involved in the contract is necessary.

For this reason, before stating the contract provisions of the Contract and other details related to Claim, it is essential to review literatures related to the obligations of the Employer and his representative on Site, which is the Engineer, as the paper focuses only on the Contractor's claim. And detail description regarding obligation of the Employer and role and obligation of the Engineer is reviewed.

2.6.2. Cost Claims under FIDIC 4 Conditions of the Contract

Under this section, literatures are reviewed in relation to the types and methodologies of calculating cost related claims, as direct monetary compensation under the FIDIC (1987) provisions of the contract; wherein, the paper is only focuses on this condition of the contract.

Under this section, various types of cost claims are to be reviewed including the scope and analysis of the specific types of cost claims, which are categorized as indirect monetary compensation. The Cost claim types discussed under this section are:

- Acceleration Claim
- Prolongation Claim
- Disruption Claim
- Change in Scope Claim
- Payment Related Claim, and
- Termination Claim

2.6.3. Contractors Claim Management under FIDIC IV Conditions of Contract

Literatures are reviewed regarding the claim process, particularly giving emphasis on presentation of claims and Engineer's determination, with a dispute resolution mechanism.

- a) **Presentation of Claims:** Hewitt [2011] explains the need of good presentation of a claim by a claimant as the same task as selling a good by a sells person A poorly prepared or badly presented claim is more likely to be rejected as the claimant's arguments will be unclear, poorly set out and weakly substantiated. The burden of proof lies upon the claimant. Many claims fail for lack of adequate, corroboratory, documentary evidence (Hewitt 2011).
- b) **Determination of Claims:** SMEC [2008] and FIDIC (1987) requires that the engineer should assess the Contractor's cost claim in a fair and impartial manner. The assessor of the claim, who is the Engineer under this specific case, must then review the claim critically to determine whether it is acceptable as a whole or in part.
- c) **Dispute:** Most if not all commercial contracts, including construction contracts, contain provision for the resolution through arbitration of disputes which may arise between the parties during the course of the transaction.
- d) **Settlement of Disputes:** FIDIC (1987) stipulates the procedure for a dispute resolution following the steps recommended for such. When a dispute arises, the dispute is referred to the DAB/DRE in writing for its decision, then he gives notice of its decision within 84 days or it fails to give a decision within that period. The Parties react to the decision of the DAB/DRE, which could be one of two possibilities, wherein if the attempt to amicably resolve the dispute fails, such dispute is to be finally settled by arbitration.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This section describes all the procedures that were undertaken to achieve the objectives set for this study. The procedures that were adopted including all the information relevant to the collection of the data, where those data were obtained and how they were obtained are discussed. In addition, data and information sources, research instruments, sample size and method of analysis are presented.

The succeeding section provides a general description of the research strategy adopted for this thesis, as well as justification of the methodology.

3.2 Research Design

Majorly, research strategies are categorized in two types, which are: quantitative research and qualitative research. The decision in the choice of the research type is mainly depends on the type of study and availability of the information required for the study (Naoum, 1998).

Quantitative research is an objective measurement of a problem based on a theory composed of variables that can be measured in numbers; while qualitative research emphasizes meanings, experiences and descriptions to subjectively evaluate the opinion, view or perception of respondents towards a particular issue. For this paper qualitative research method is selected for this study, inconsideration of the fact that the research questions are related to the respondent's attitude, opinion and view.

Hence, in order to achieve the aims and objectives of the research, the research was carried out using the following three phase approaches.

- i) The first is to undertake a literature search on previous publications on cost claim, particularly claims based on FIDIC V Conditions of the Contract. The Literature review was carried out throughout the whole research project, this was to compile and discuss information related to the thesis objectives. Many literature sources were used as primary, secondary and references such as academics periodicals, research journals, archival document within the Ethiopian Roads Authority, past dissertations and Internet resources.
- ii) In the second phase, questionnaires were developed basically on the research objectives and the research objectives were translated into specific questions.
- iii) Finally, conclusions and recommendations are drawn based on the outcome of the analysis of the questionnaires.

The questionnaire contains three main parts, as listed below:

- a) The first set of question was to categorize respondents to different parties in the road construction industry. That is to classify them under the role of client, consultants, and contractors. The purpose was to determine the answers they provide based on the role they play in preparation and determination of cost claims.
- b) Background information – collecting the personal data of respondents, their experience in the road construction industry.
- c) General perception of cost claims types and practice – collecting the respondents' familiarity with the concept of cost claim types and practices in the Ethiopian Federal road construction projects. The set of questions under the section is to ask respondents on the following:

- To identify major causes of cost claims in the Ethiopian Federal road construction industry; and
- To identify the role of Engineer, DRE and Employer/client in determination of Contractor's cost claims;

Finally, the results of the questionnaire were analyzed using statistical techniques and the results used to form basis for recommendations as well as areas for further research.

3.3. Data Collection

3.3.1 Primary Data

The source of the primary data will be in a form of questionnaire, designed to gather a large volume of data from client/ERA, consultants, and contractors. The primary function of the survey is to collect information that can be analyzed, and inference made to produce conclusion about causes of cost claims in the road construction industry, and the practice and awareness of the types and methodologies of cost claims in local road construction industry, and impartiality and competency of the Engineer/DRE while determination of Contractor's cost claims.

3.3.2 Secondary Data

Secondary data which involves information from published text such as academics periodicals, research journals, government publications, dictionaries, past dissertations and Internet resources is used to compliment the primary data.

3.3.3 Sampling

The questionnaires were sent to reputable professionals selected from contractors, client/ERA, and consultants that are considered familiar to the road Construction industry in Ethiopia.

3.4. Method of Analysis

In the analysis, the “Mean Score” method is adopted to establish the relative importance of the causes of cost claim in Ethiopia Federal road projects. Scale of ordinal measures of agreement towards each statement (0, 1, 2, 3 and 4) is used to calculate the mean score for each factor that is used to determine the relative ranking.

The mean score (MS) for each variables of cost overrun is computed by using the following Formula:

$$MS = \frac{\sum (f \times S)}{N} \dots\dots\dots \text{Eq. [3.1]}$$

Where:

MS – Mean Score

f – Frequency of responses for each score

S – Scores given to each factor (from 0 to 4)

N – Total number of responses concerning each factor

The Spearman (rho) rank correlation coefficient is used for measuring the differences in ranking between two groups of respondents scoring for various factors (i.e. clients versus consultants, clients versus contractors, and consultants versus contractors). The Spearman (rho) rank correlation coefficient for any two groups of ranking is given by the following formula (Naoum, 1998):

$$\text{Rho } (\rho_{cal}) = 1 - \frac{6 \times (\sum d_i^2)}{N \times (N^2 - 1)} \dots\dots\dots \text{Eq. [3.2]}$$

Where:

Rho (ρ_{cal}) – Spearman rank correlation coefficient

d_i – The difference in ranking between each pair of factors

N – Number of factors (variables)

Procedure for hypothesis testing:

1. Define the null hypothesis (H_0) and the alternative hypothesis (H_A)
2. Choose a value for ρ . (i.e. choose the significance level)
3. Calculate the value of the test statistic, Rho (ρ_{cal}).
4. Compare the calculated value with a table of the critical values of the test statistic.
5. If the calculated value of the test statistic is less than the critical value from the table, accept the null hypothesis (H_0). If the absolute (calculated) value of the test statistic is greater than or equal to the critical value from the table, reject the null hypothesis (H_0) and accept the alternative hypothesis (H_A).

CHAPTER FOUR

ANALYSIS AND DISCUSSION OF RESULTS

4.1. Introduction

This chapter provides explanations to the issues related to distribution of the questionnaire, collection of responses and subsequent analysis of the data acquired through the responses from professionals who are working for the client, consultants and contractors and involved in road construction sector in Ethiopia. The principal purpose is to rank the already identified variables of causes of cost claims and then to find out the critical factors that are required to be given due attention in order to substantially minimize its effects in local contractors involved in federal road construction projects in Ethiopia.

A total of 45 questionnaires were sent to a selected sample of respondents in the Federal road construction industry which comprise the following: 15 client (ERA), 15 consultants, and 15 contractors; wherein the sample of the questionnaires are attached herewith in the Appendix. The questionnaires were sent to key stakeholders in the road construction industry that are considered to have direct relation with the objectives of the research.

4.2. Questionnaires Response Rate

As mentioned above, a total of 45 questionnaires were sent to the three groups of respondents in the road construction industry; out of which, 38 questionnaires were collected that comprises 13 from client (ERA), 12 from consultants, and 13 from contractors. The total response rate is 84.4%; for which and the details of the questionnaire distribution and collected percentages are shown in table 4.1.

Table 4.1: Overall survey response level

No	Respondent	Total Questionnaire Distributed	Total Questionnaire Collected	Response rate (%)
		No	No	
1	Contractor	15	13	86.7
2	Consultant	15	12	80.0
3	Client (ERA)	15	13	86.7
Total		45	38	84.4

4.3. Analysis and Discussion of Results

In this section, analysis of respondents understanding and views on causes of cost claims, problems related to cost claim management, particularly its impact on local contractors have been considered and discussed. The responses of the various contract groups to the questionnaire were analyzed and discussed in subsequent section.

4.3.1. Respondents general experience on Road Projects

Out of the 38 respondents, the data depicted below shows that 18% of the respondents had 5 or less years of working experience, 61% had 6 to 10 years of experience and 21% had more than 10 years of experience.

Table 4.2: Respondents' experience in the road construction industry

No.	Experience	Client	%	Consultants	%	Contractors	%
1	5 years or less	3	23.1	3	25	1	7.7
2	From 6 to 10 years	10	76.9	5	41.67	8	61.5
3	10 years and above	0	0	4	33.33	4	30.8
Total		13	100	12	100	13	100.0

4.3.2. Respondents experience on FIDIC and Status of Dispute Resolution Mechanism

The experience of respondents on FIDIC 1987 Conditions of Contracts and their exposure on the contracts for dispute resolution system, particularly, involvement of Dispute Review experts is shown in the table below; from which it is noticed that all of the respondents have particular experience in working in contracts using FIDIC 1987 Conditions of the Contract as general conditions of contract, with the participation of Dispute Review Expert in resolving disputes encounter in their projects for all the respondents except two.

Table 4.3: Respondents' experience in the road construction industry

No.	Experience	Client		Consultants		Contractors	
		Yes	%	Yes	%	Yes	%
1	Experience in FIDIC 1987 Contracts	13	100	12	100	13	100
2	Contracts have Dispute Resolution system	13	100	11	91.67	12	92.3

4.3.3. Causes of Cost claims

Major causes of cost claims are identified from review of literature and personal experience in the process of contract administration in road construction projects. In the following tables, the frequency of occurrence of each item responded by the respondents from Contractors, Consultant and Employer are shown in the following tables; in a summarized way in Table 4.4.

The survey shows that the three parties ranking “Disruption of Progress (by right of way problem or other reasons)” as the number one causes of cost claim; while the rest of the causes with their ranking is shown in the table 4.4.

Table 4. 4 Responses to the causes of cost claims

I/No	Encounter of Cost Claim Causations due to	Contractor MS	Consultant Ms	Client Ms	Weighted Average Ms	Rank
2.1	Delayed drawings or information (<i>Sub – clause 6.4</i>)	2.846	2.833	3.000	2.893	7
2.2	Unforeseeable physical obstructions or conditions (<i>Sub – clause 12.2</i>)	2.692	2.583	2.846	2.707	8
2.3	Incorrect setting out data (<i>Sub–clause 17.1</i>)	2.538	2.500	2.462	2.500	11
2.4	Damage due to employer’s risks (<i>Sub–clause 20.3</i>)	2.154	2.583	2.692	2.476	12
2.5	Discovery of fossils (<i>Sub–clause 27.1</i>)	1.231	1.667	1.923	1.607	22
2.6	Facilities provided (<i>Sub – clause 31.2</i>)	2.154	1.917	2.000	2.024	16
2.7	Tests not provided for (<i>Sub – clause 36.5</i>)	2.231	2.250	2.077	2.186	15
2.8	Uncovering and making openings (<i>Sub – clause 38.2</i>)	1.769	1.917	1.769	1.818	20
2.9	Suspension on engineer’s instruction (<i>Sub – clause 40.2</i>)	2.462	2.000	2.154	2.205	14
2.1	Late possession of site (<i>Sub – clause 42.2</i>)	3.385	3.333	3.308	3.342	3
2.11	Cost of remedying defects (not contractor’s fault) (<i>Sub – clause 49.3</i>)	2.615	2.250	2.308	2.391	13
2.12	Search of defects (not contractor’s fault) (<i>Sub – clause 50.1</i>)	2.154	1.667	2.000	1.940	17
2.13	Variations – new rate (<i>Sub – clause 52</i>)	3.538	3.167	3.615	3.440	2
2.14	Damage by special risks/force majeure (<i>Sub – clause 65.3& 65.5</i>)	2.308	3.250	2.000	2.519	10
2.15	Interest due to payment delay (<i>Sub–clause 60.8</i>)	2.462	3.417	3.077	2.985	5
2.16	Suspension by Contractor due to payment delay (<i>Sub–clause 69.4</i>)	1.692	1.750	2.077	1.840	19
2.17	Termination Claim (<i>Sub – clause 69.1</i>)	1.500	1.750	1.923	1.724	21
2.18	Fluctuation (<i>Sub – clause 70.1</i>)	3.154	3.500	2.769	3.141	4
2.19	Changes in legislation (<i>Sub –clause 70.2</i>)	2.385	2.500	2.692	2.526	9

I/No	Encounter of Cost Claim Causations due to	Contractor MS	Consultant Ms	Client Ms	Weighted Average Ms	Rank
2.2	Disruption of progress (by right of way problem or other reasons)	3.692	3.917	3.692	3.767	1
2.21	Acceleration (direct or indirect Instruction by the Engineer/Employer)	1.692	2.000	1.923	1.872	18
2.22	Compensation for Prolongation of contract time	2.615	3.250	3.000	2.955	6

4.3.4. Impact of Causes of Cost claims

The respondents were asked to rank the impact of the causes of cost claim events for the listed causes; and the summarized results of Contractor, Consultant and Client are shown in the Table 4.5.

In terms of the degree of impact, Contractor's and Client's respondents identify "Late possession of site (*Sub – clause 42.2*)" as the first one while the Consultant's respondent put "Disruption of progress" (by right of way problem or other reasons) as number one as shown in the Annex.

Table 4.5 Responses to the impact of cost claims factors

No	Encounter of Cost Claim Causations due to	Contractor MS	Consultant Ms	Client Ms	Weighted Average Ms	Rank
2.1	Delayed drawings or information (<i>Sub – clause 6.4</i>)	3.538	3.750	3.308	3.532	5
2.2	Unforeseeable physical obstructions or conditions (<i>Sub – clause 12.2</i>)	3.538	3.417	3.385	3.447	7
2.3	Incorrect setting out data (<i>Sub-clause 17.1</i>)	3.385	3.500	2.923	3.269	9

No	Encounter of Cost Claim Causations due to	Contractor Ms	Consultant Ms	Client Ms	Weighted Average Ms	Rank
2.4	Damage due to employer's risks (Sub-clause 20.3)	2.769	3.500	3.077	3.115	13
2.5	Discovery of fossils (Sub-clause 27.1)	1.923	2.500	3.615	2.679	20
2.6	Facilities provided (Sub-clause 31.2)	2.538	2.417	2.385	2.447	22
2.7	Tests not provided for (Sub-clause 36.5)	2.923	2.750	2.769	2.814	18
2.8	Uncovering and making openings (Sub-clause 38.2)	2.385	2.750	3.154	2.763	19
2.9	Suspension on engineer's instruction (Sub-clause 40.2)	3.615	3.333	3.231	3.393	8
2.1	Late possession of site (Sub-clause 42.2)	3.692	3.500	3.923	3.705	1
2.11	Cost of remedying defects (not contractor's fault) (Sub-clause 49.3)	3.154	3.167	2.615	2.979	15
2.12	Search of defects (not contractor's fault) (Sub-clause 50.1)	2.692	2.583	2.462	2.579	21
2.13	Variations – new rate (Sub-clause 52)	3.615	3.583	3.846	3.682	3
2.14	Damage by special risks/force majeure (Sub-clause 65.3& 65.5)	3.154	3.250	3.231	3.212	11
2.15	Interest due to payment delay (Sub-clause 60.8)	3.000	2.917	3.154	3.024	14
2.16	Suspension by Contractor due to payment delay (Sub-clause 69.4)	3.000	2.917	2.846	2.921	16
2.17	Termination Claim (Sub-clause 69.1)	3.000	3.417	3.385	3.267	10
2.18	Fluctuation (Sub-clause 70.1)	3.538	3.500	3.615	3.551	4
2.19	Changes in legislation (Sub-clause 70.2)	3.154	3.083	3.308	3.182	12
2.2	Disruption of progress (by right of way problem or other reasons)	3.538	3.833	3.692	3.688	2
2.21	Acceleration (direct or indirect Instruction by the Engineer/Employer)	2.692	3.333	2.692	2.906	17
2.22	Compensation for Prolongation of contract time	3.231	3.667	3.538	3.479	6

4. 4. Local Contractors Claim Request Practice

The frequency that Local Contractors request compensation for each claim head are summarized by the respondents from Contractors, Consultants and Employer; of which Contractors submit cost claim majorly for “Variation” and least submittal practice for “discovery of fossils”.

Table 4.6 Responses to the local Contractors’ cost claim submission practice

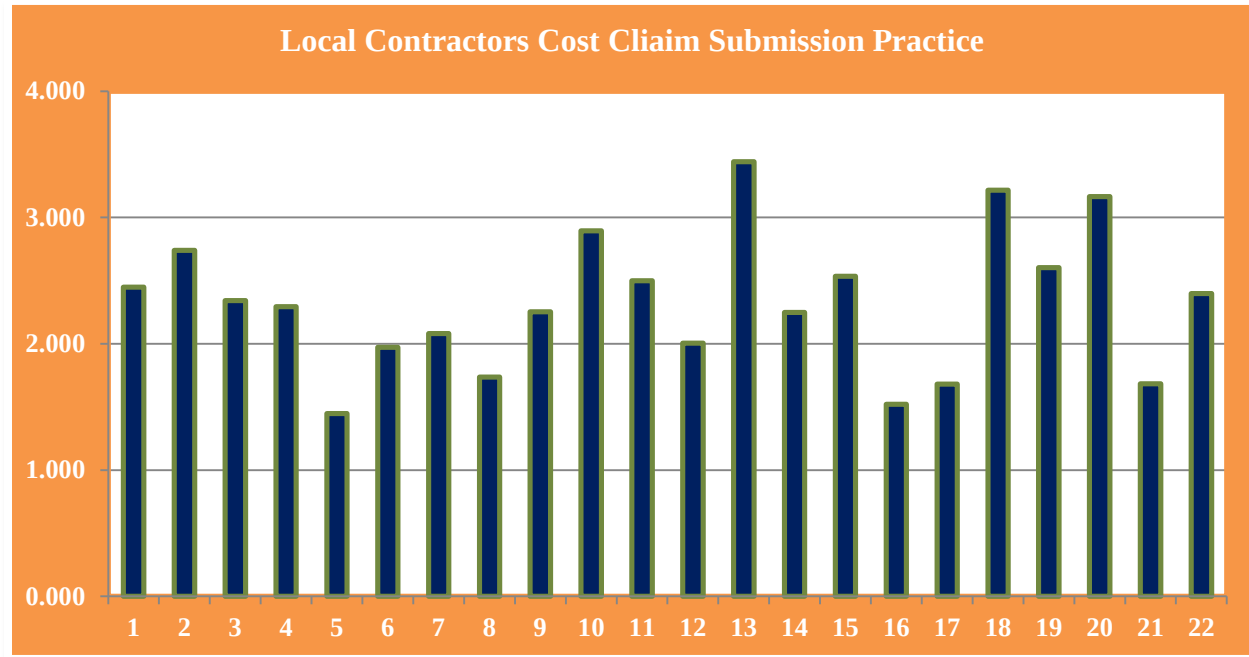
I/No	Local Contractors practice for submission/request of Cost Claims	Contractor MS	Consultant Ms	Client Ms	Weighted Average Ms	Rank
3.1	Delayed drawings or information (<i>Sub – clause 6.4</i>)	2.538	2.500	2.308	2.449	9
3.2	Unforeseeable physical obstructions or conditions (<i>Sub – clause 12.2</i>)	2.769	2.833	2.615	2.739	5
3.3	Incorrect setting out data (<i>Sub–clause 17.1</i>)	2.538	2.333	2.154	2.342	11
3.4	Damage due to employer’s risks (<i>Sub–clause 20.3</i>)	2.538	2.417	1.923	2.293	12
3.5	Discovery of fossils (<i>Sub–clause 27.1</i>)	1.538	1.500	1.308	1.449	22
3.6	Facilities provided (<i>Sub – clause 31.2</i>)	2.154	1.917	1.846	1.972	17
3.7	Testes not provided for (<i>Sub – clause 36.5</i>)	2.154	2.167	1.923	2.081	15
3.8	Uncovering and making openings (<i>Sub – clause 38.2</i>)	1.692	1.750	1.769	1.737	18
3.9	Suspension on engineer’s instruction (<i>Sub – clause 40.2</i>)	2.615	1.917	2.231	2.254	13
3.1	Late possession of site (<i>Sub – clause 42.2</i>)	3.231	2.833	2.615	2.893	4
3.11	Cost of remedying defects (not contractor’s fault) (<i>Sub – clause 49.3</i>)	2.769	2.500	2.231	2.500	8
3.12	Search of defects (not contractor’s fault) (<i>Sub – clause 50.1</i>)	2.154	2.167	1.692	2.004	16
3.13	Variations – New rate (<i>Sub – clause 52</i>)	3.538	3.250	3.538	3.442	1

I/No	Local Contractors practice for submission/request of Cost Claims	Contractor MS	Consultant Ms	Client Ms	Weighted Average Ms	Rank
3.14	Damage by special risks/force majeure (Sub – clause 65.3& 65.5)	2.154	2.667	1.923	2.248	14
3.15	Interest due to payment delay (Sub–clause 69.4)	2.385	2.833	2.385	2.534	7
3.16	Suspension by contractor due to payment delay (Sub–clause 69.4)	1.692	1.333	1.538	1.521	21
3.17	Termination Claim (Sub – clause 69.1)	1.769	1.583	1.692	1.682	20
3.18	Fluctuation (Sub – clause 70.1)	3.154	3.417	3.077	3.216	2
3.19	Changes in legislation (Sub –clause 70.2)	2.615	2.500	2.692	2.603	6
3.2	Disruption of progress (by right of way problem or other reasons)	3.231	3.500	2.769	3.167	3
3.21	Acceleration (direct or indirect Instruction by the Engineer/Employer)	1.846	1.667	1.538	1.684	19
3.22	Compensation for Prolongation of contract time	2.385	2.500	2.308	2.397	10

4.4.1. Cost Claim Submission Practice

Respondents for the questioners from Contractors, Consultants and ERA professionals puts the frequency of submitting cost claim practice on the twenty two events listed as causes of cost claims, under FIDIC 1987 provisions. Setting the “4” for “High” frequent, “3” for “Medium”, 2” for “Low” and “1” for “Never” get 2.32 on average; which is almost near to category of “low”. The summary and average value of respondents’ response is shown in the figure 4.1 below.

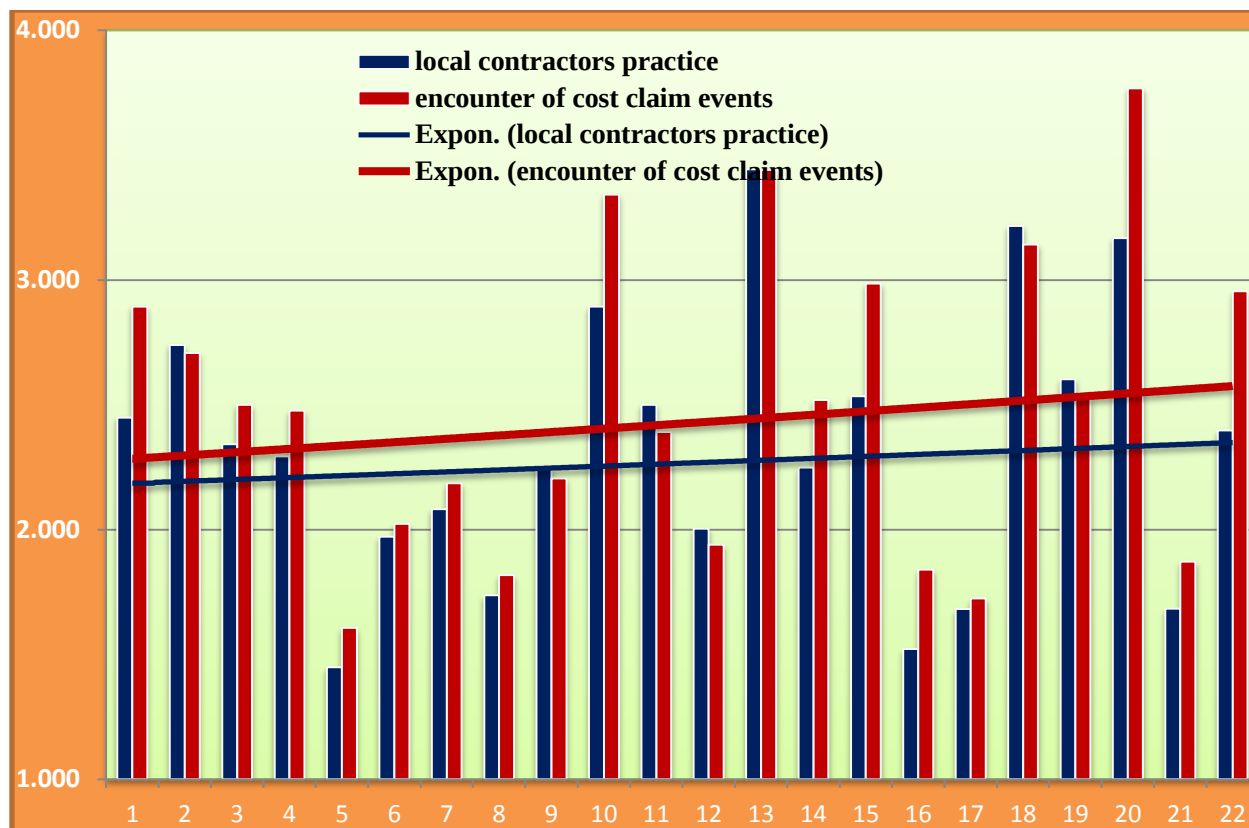
Fig. 4.1 Local contractors cost claim submission practice



4.4.2. Comparison of Event Encounter and Cost Claim Submission Practice

As noted from Table 4.5, in the local construction industry, local contractors do not submit cost claims in a way projects face events entitle them cost compensation under the FIDIC 1987 conditions of the contract clauses. The following chart, tries to compare the event occurrence and local contractors claim submission practice; which noted from the same that the submission practice is less.

Fig. 4.2 Summarized data for local contractors practice with encounter of cost claim events



4. 5. Factors affecting Local Contractors Claim success

The questioner is distributed to reputable three parties representatives; from local Contractors, consultants and Client (ERA), and identified factors are stated in the questioner in order to get the feedback in relation to factors affecting local Contractors cost claim submission and success. Factors influence local Contractors Cost claim award/success under the contract administration process have been requested, in a scale of 1 – 4 (from 1=least to 4=most influence).

4.5.1. Contractors View for Factors affecting local contractors cost claim success

Table 4.7 shows the factors that influence local Contractors Cost claim award/success under the contract administration process, as responded by the Contractor; and list “Contractors failure to keep detail particulars for events that entitle them cost claim” and “Engineer assess and determines the contractor’s cost claim fairly and impartially” and “Employer interfering in Engineer’s determination” are the most influence factors and “DRE recommends the cost claims

impartially and fairly” as least influence.

Table 4.7 Contractor’s responses to the factors affecting local Contractors claim success

No	Factors affecting cost claims Success	RANK				Mean	Rank
		1	2	3	4		
4.1	Contractors’ lack of awareness of the events that entitle them cost compensation	1	3	5	4	2.077	5
4.2	Contractors failure to keep detail particulars for events that entitle them cost claim	0	1	3	9	1.385	10
4.3	Contractors failure to follow the procedures set in the Contract and acceptable practice to submit cost claim	0	2	7	4	1.846	8
4.4	Contractors failure to present their cost claim in acceptable standard form/format, showing causes, effects, entitlements and supporting documents	0	3	7	3	2.000	6
4.5	Engineer involved in road projects have adequate professional background and experience to evaluate the Contractors’ cost claims	1	4	4	4	2.154	4
4.6	Engineer assess and determines the contractor’s cost claim fairly and impartially	1	2	3	7	1.769	9
4.7	Employer interfering in Engineer’s determination	0	3	6	4	1.923	7
4.8	Contractors’ presents their claims to DRE, as dispute when dissatisfied with Engineer’s determination	1	5	6	1	2.462	1
4.9	DRE involved in road projects have adequate professional background and experience to evaluate the Contractors’ cost claims	1	4	6	2	2.308	3
4.10	DRE recommends the cost claims impartially and fairly	0	7	5	1	2.462	1

4.5.2. Consultant’s View for Factors affecting local contractors cost claim success

The respondents of the Consultant also cite “Contractors failure to keep detail particulars for events that entitle them cost claim” as number one factors as a reason to the unsuccessful

Contractor's cost claim practice and "Contractors failure to follow the procedures set in the Contract and acceptable practice to submit cost claim" and Employer interfering in Engineer's determination" as subsequent major factors while point out "Engineer assess and determines the contractor's cost claim fairly and impartial" as least effect. The detail of the consultants' response is shown in the Table 4.8 below.

Table 4.8 Consultant's responses to the factors affecting local Contractors claim success

No	Factors affecting cost claims Success	RANK				Mean	Rank
		1	2	3	4		
4.1	Contractors' lack of awareness of the events that entitle them cost compensation	1	3	2	6	1.917	7
4.2	Contractors failure to keep detail particulars for events that entitle them cost claim	0	1	2	9	1.333	10
4.3	Contractors failure to follow the procedures set in the Contract and acceptable practice to submit cost claim	0	1	3	8	1.417	9
4.4	Contractors failure to present their cost claim in acceptable standard form/format, showing causes, effects, entitlements and supporting documents	1	4	3	4	2.167	6
4.5	Engineer involved in road projects have adequate professional background and experience to evaluate the Contractors' cost claims	1	4	7	0	2.500	2
4.6	Engineer assess and determines the contractor's cost claim fairly and impartially	0	6	6	0	2.500	2
4.7	Employer interfering in Engineer's determination	1	0	6	5	1.750	8
4.8	Contractors' presents their claims to DRE, as dispute when dissatisfied with Engineer's determination	2	7	2	1	2.833	1
4.9	DRE involved in road projects have adequate professional background and experience to evaluate the Contractors' cost claims	2	2	5	3	2.250	5
4.1	DRE recommends the cost claims impartially and fairly	2	3	6	1	2.500	2

4.5.3. Client's View for Factors affecting local contractors cost claim success

Respondent's from Client's also requested to least out and rank the factors that affects cost claim success, like to the Contractors and Consultants' respondents; and accordingly, the Client (ERA) identifies "Contractors failure to keep detail particulars for events that entitle them cost claim" as the most influence while "Employer interfering in Engineer's determination" as least influence.

Table 4.9 Client's responses to the factors affecting local Contractors claim success

No	Factors affecting cost claims Success	RANK				Mean	Rank
		1	2	3	4		
4.1	Contractors' lack of awareness of the events that entitle them cost compensation	1	4	4	4	2.154	7
4.2	Contractors failure to keep detail particulars for events that entitle them cost claim	0	1	3	9	1.385	10
4.3	Contractors failure to follow the procedures set in the Contract and acceptable practice to submit cost claim	0	4	4	5	1.923	8
4.4	Contractors failure to present their cost claim in acceptable standard form/format, showing causes, effects, entitlements and supporting documents	0	4	2	7	1.769	9
4.5	Engineer involved in road projects have adequate professional background and experience to evaluate the Contractors' cost claims	3	6	3	1	2.846	2
4.6	Engineer assess and determines the contractor's cost claim fairly and impartially	1	5	7	0	2.538	5
4.7	Employer interfering in Engineer's determination	4	5	4	0	3.000	1
4.8	Contractors' presents their claims to DRE, as dispute when dissatisfied with Engineer's determination	4	3	3	3	2.615	3
4.9	DRE involved in road projects have adequate professional background and experience to evaluate the Contractors' cost claims	3	4	4	2	2.615	3

No	Factors affecting cost claims Success	RANK				Mean	Rank
		1	2	3	4		
4.1	DRE recommends the cost claims impartially and fairly	3	4	2	4	2.462	6

4.5.3. Summary of Factors affecting local contractors cost claim success

Table 4.10 shows the summary of the respondents response for the factors affecting local contractors cost claim success, and the three parties representatives all agree with the most influence factors as “Contractors failure to keep detail particulars for events that entitle them cost claim” while on some of the factors they have different ranking.

Table 4.10 Summary of responses to the factors affecting local Contractors claim success

No	Factors affecting cost claims Success	Contractor Rank	Consultant Rank	Client Rank	Average Rank
4.1	Contractors’ lack of awareness of the events that entitle them cost compensation	5	7	7	7
4.2	Contractors failure to keep detail particulars for events that entitle them cost claim	10	10	10	10
4.3	Contractors failure to follow the procedures set in the Contract and acceptable practice to submit cost claim	8	9	8	9
4.4	Contractors failure to present their cost claim in acceptable standard form/format, showing causes, effects, entitlements and supporting documents	6	6	9	8
4.5	Engineer involved in road projects have adequate professional background and experience to evaluate the Contractors’ cost claims	4	2	2	2
4.6	Engineer assess and determines the contractor’s cost claim fairly and impartially	9	2	5	6
4.7	Employer interfering in Engineer’s determination	7	8	1	6

4.8	Contractors' presents their claims to DRE, as dispute when dissatisfied with Engineer's determination	1	1	3	1
4.9	DRE involved in road projects have adequate professional background and experience to evaluate the Contractors' cost claims	3	5	3	4
4.10	DRE recommends the cost claims impartially and fairly	1	2	6	3

4.5.4. Local contractors cost claim success

Table 4.11 shows that 100 % of the respondents believe that formal contract administration system is not practised in local Contractors' project management system.

Table 4.11 Formal Contract administration system practice

No.	Question	Contract.		Consult.		ERA	
		Yes	%	Yes	%	Yes	%
1	Do you think formal contract administration system is practised in local Contractors' project management system? (yes respondents)	13	100	12	100	13	100

4. 6. Responsible Party for non-compensation of Local Contractors Cost claims

Tables 4.12 to 4.14 shows the respondents view on the party who takes more responsibility in contributing to the non-compensation of the local Contractors cost claims, under contract administration on the scale of 1 – 4 (from 1=least to 4=most influence). Contractors' respondent identify Consultant as most affecting party, while Consultants' and Clients' respondent classify the Contractor as a main reason for failure of their own cost claim achievement/compensation.

Table 4.12 Contractor's responses to the party that affects cost claim success

No	Party Most Affecting Cost claim Success	RANK				N	Mean	Rank
		1	2	3	4			
a	Employer	1	2	5	5	13	3.07	3
b	Consultant	0	1	4	8	13	3.53	1
c	Contractor	0	1	5	7	13	3.46	2
d	Dispute Review Expert	3	4	4	2	13	2.38	4

Table 4.13 Consultant's responses to the party that affects cost claim success

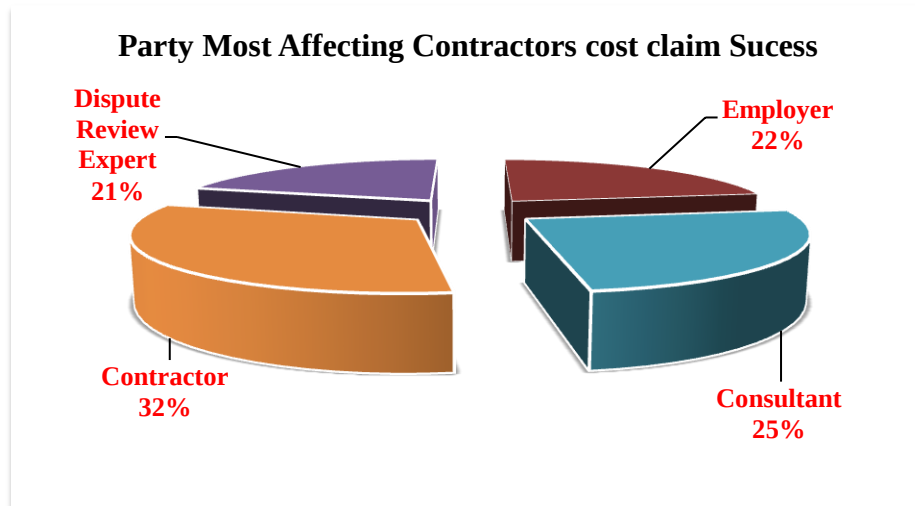
No	Party Most Affecting Cost claim Success	RANK				N	Mean	Rank
		1	2	3	4			
a	Employer	1	2	6	3	12	2.91	2
b	Consultant	1	2	8	1	12	2.75	3
c	Contractor	0	0	2	10	12	3.83	1
d	Dispute Review Expert	6	6	0	0	12	1.50	4

Table 4.14 Client's responses to the party that affects cost claim success

No	Party Most Affecting Cost claim Success	RANK				N	Mean	Rank
		1	2	3	4			
a	Employer	5	5	3	0	13	1.84	4
b	Consultant	1	6	5	1	13	2.46	3
c	Contractor	0	1	2	10	13	3.69	1
d	Dispute Review Expert	0	4	1	8	13	3.30	2

Reviewing the three parties' response, respondents are in a view that the Contractor himself is contributing negatively for his own failure in succeeding cost claim award, mainly reported as poor contract management; while the other parties also have a role despite to a lesser extent. A summary showing the results are presented in the following fig no.4.3

Fig. 4.3 Summarized data for party most affecting cost claim success



4.7. Comparison of Local Contractors and International contractors Practice on Cost claim

Table 4.15 shows the comparison of local and international contractors practice on contract management and also the overall assessment of the respondents in relation to non-compensation of cost claim to local contractors and its effect on them. Accordingly, 100 % of the respondents believes that foreign/international Contractors participated in the country has better contract management practice and requests and being awarded cost related claims better than local Contractors. In addition, 89 % of respondents believe that local Contractors projects and company suffer due to non-compensation of cost claims, while events occur that entitle them cost compensation.

Table 4.15 Responses of Parties on comparison of local vs international contractors practice and Impact on local Contractors

No.	Question	Contractor		Consultant		Employer	
		Yes	%	Yes	%	Yes	%
1.	Do you think foreign/international Contractors participated in the country has better contract management practice and requests and being awarded cost related claims better than local Contractors? (yes respondents)	13	100	12	100	13	100
2.	Do you think local Contractors projects	13	100	12	100	8	67

	and company suffer due to non-compensation of cost claims, while events occur that entitle them cost compensation? (yes respondents)						
--	--	--	--	--	--	--	--

4.8. Methodologies to Calculate Prolongation and Acceleration Claims

In order to understand the awareness level of the Contractors', Consultants' and Employer professional in relation to the preparation and evaluation method of Prolongation and Acceleration Claims; open ended questions were included in the questioner, and table 4.16, shows the summary of the respondents:

Table 4.16 Responses of Parties on Methodologies to Calculate Prolongation and Acceleration Claims

No.	Question	No. of Resp. correctly mentions the standard methodology					
		Contractor		Consultant		Employer	
		No	%	No	%	No	%
1.	What method do you use to request (for Contractors)/assess (for Employer/Engineer) an Acceleration claim, as and when encountered/been requested?	4	31	2	17	1	8
2.	What method do you use to request (for Contractors)/assess (for Employer/Engineer) a prolongation cost claim, as and when encountered/been requested?	5	38	4	33	3	23

4.11. Tests for Agreement (Spearman rank correlation)

This test helps to investigate whether there is agreement or not on the attitudes of stakeholders towards the causes of cost claim, local contractors practice and factors affecting local contractors cost claim success on Federal road projects in Ethiopia, among stakeholders in the Construction Industry. Hence in this section respondents' response will be tested for correlation using Spearman rank correlation coefficients, to see if there is difference in ranking between two groups of respondents; these are Clients versus Contractors; Contractors versus Consultants; and

Clients versus Consultants, on the variables of the causes of cost claim, local contractors practice and factors affecting local contractors cost claim success

The purpose of a hypothesis test is to avoid being deceived by chance occurrences. The tests also helped to evaluate whether consensus of opinions exist among respondents. The spearman correlation coefficient (ρ) is calculated using Equation 3.2. In order to decide whether to accept or reject the null hypothesis, the level of significance 95% ($\rho = 0.05$) is used.

If the calculated value of ρ is greater than the critical value, the hypothesis is rejected, i.e. there is evidence of a statistically significant agreement between the groups. If the calculated value of ρ is less than the critical value, the hypothesis is accepted, i.e. there is no evidence of a statistically significant agreement between the two groups.

Accordingly, in the following three tables summary of correlation test on the ranking of causes of cost claim, local contractor cost claim submission practice and factors affecting the success of the local contractors cost claim shown.

i) Correlation test on the ranking of causes of cost claim

Correlation test is done for the causes of cost claim, and the summary of the results are shown below in Table 4.17.

Table 4.17: Summary of correlation test on the ranking of causes of cost claim

Respondent	$\rho = 1 - \frac{6 \sum d_i^2}{N(N^2-1)}$	Critical value of ρ	Significance for $\rho < 0.05$	Reject/don't reject the Null Hypothesis
Contractor/Consultant	0.814	0.359	Significant	Reject
Consultant/Client	0.829	0.359	Significant	Reject
Contractor/Client	0.884	0.359	Significant	Reject

In this case, with a significance level of 95% , the calculated value of ρ for all the three group cases are greater than the critical values of ρ , so the hypothesis that there is no significant agreement between the respondents is rejected i.e. the null hypothesis is rejected.

From Table 4.6 above, it can be concluded that there is strong correlation between the attitudes of the respondents in all the three groups and hence the null hypothesis should be rejected and the alternative hypothesis shall be accepted. This means that most of the respondents have the same perception about frequency of the causes of cost claim.

ii) Correlation test on the ranking of local contractors cost claim submission practice

In a similar way correlation test is done for local contractors practice in submitting cost claim as shown below; wherein the spearman correlation coefficient (ρ) is calculated using Equation 3.2 and tabulated as shown below in Table 4.18.

Table 4.18: Summary of correlation test on the ranking of local contractors practice

Respondent	$\rho = \frac{1-6 \times (\sum d_i^2)}{N(N^2-1)}$	Critical value of ρ	Significance for $\rho < 0.05$	Reject/don't reject the Null Hypothesis
Contractor/Consultant	0.845	0.359	Significant	Reject
Consultant/Client	0.920	0.359	Significant	Reject
Contractor/Client	0.910	0.359	Significant	Reject

In this case, with a significance level of 95% ($\rho = 0.05$), the calculated value of ρ for all the three group cases are greater than the critical values of ρ , so the hypothesis that there is no significant agreement between the respondents is rejected i.e. the null hypothesis is rejected.

Thus, it can be concluded that there is strong correlation between the attitudes of the respondents in all the three groups and hence the null hypothesis should be rejected and the alternative hypothesis shall be accepted. This means that most of the respondents have the same perception on frequency of the practice of local contractors cost claim submission.

iii) Correlation test on the ranking of factors affecting cost claim success

Correlation test is done for factors affecting cost claim success; wherein the spearman correlation coefficient (ρ) is calculated using Equation 3.2 and tabulated as shown below in Table 4.19.

Table 4.19: Summary of correlation test on the ranking of factors affecting cost claim success

Respondent	$\rho = 1 - \frac{6 \sum d_i^2}{N(N^2 - 1)}$	Critical value of ρ	Significance for $\rho < 0.05$	Reject/don't reject the Null Hypothesis
Contractor/Consultant	0.612	0.564	Significant	Reject
Consultant/Client	0.442	0.564	Not Significant	Not reject
Contractor/Client	0.406	0.564	Not Significant	Not reject

In this case also, with a significance level of 95% ($\rho = 0.05$), the calculated value of ρ for only Contractor/Consultant group case is greater than the critical values of ρ , so the hypothesis that there is no significant agreement between the respondents of Contractor/Consultant is rejected i.e. the null hypothesis is rejected.

However, the critical values of ρ for the groups of Consultant/Client and Contractor/Client is less than the critical values of ρ ; which means that there is significant agreement between the respondents of the groups of Consultant/Client and Contractor/Client is not rejected i.e. the null hypothesis is not rejected.

Thus, it can be concluded that there is no correlation between the attitudes of the respondents with the group of client respondents, and hence the null hypothesis should not be rejected and the alternative hypothesis shall not be accepted. This means that most of the respondents do not have the same perception on factors affecting local contractors cost claim success; in particular the Client has a different attitude with Consultants and Contractors.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are forwarded from the research work.

5.1. Conclusions

In the previous chapter, the results attained in the analysis of the questionnaires survey being discussed, and based on the findings from the same, the following major conclusions have been summarized:

1. Disruption of progress (by right of way problem or other reasons) is categorized as the major causes of cost claim, while variations and late possession of site as second and third under the Ethiopian federal road projects. On the other hand, late possession of site, disruption of progress and variation are categorized as the highest causes of cost claim elements that have high impact on the local contractors, in their order of degree of impact.
2. Respondents from contractors, consultants and ERA professionals sets the frequency of submitting cost claim practice for the events that entitle contractors cost claims stipulated under FIDIC 1987 conditions of contract provisions is very low. In addition, the majority of respondents from the three parties believe that the most influencing factors affecting local contractors cost claim success as “Contractors failure to keep detail particulars for events that entitle them cost claim”.
3. Contractors’ respondent identify consultant as the party who contributes more to the non-compensation of the local contractors cost claims in Ethiopian federal road projects, while the majority of consultants’ and clients’ respondent believes that the contractor as his own reason for failure of his own cost claim achievement/compensation.

4. It is agreed by the three parties that foreign/international Contractors participated in the country have better contract management practice in requesting and being awarded cost related claims than local contractors.
5. The majority of respondents believe that local contractors' projects and company suffer due to non-compensation of cost claims for events occurred and contractually entitle them cost compensation.
6. Respondents believe that in addition to the contractors' lack of awareness of the events that entitle them cost compensation, failure to keep detail particulars and failure to follow the procedures set in the contract and acceptable practice to submit cost claim as potential reasons for inadequate compensation of contractors. In addition to the above, it is learnt that the engineers involved in road projects in some percentage have inadequate professional experience to evaluate the contractors' cost claims, and even to some degree assess and determines the contractor's cost claim not in a fairly and impartial manner.
7. Respondents also believe that employer's interference in engineer's determination to contractors cost claims and also lack of referral of the rejected claims to dispute resolution system, mainly to DRE, also have effect to the failure of compensation of cost claims to local Contractors.
8. Respondents also believe that the DREs' professional background and experience to evaluate the Contractors' cost claims and impartially and fairness in their determination plays a role negatively for the success of the local contractors cost claim.

5.2. Recommendations

Following the detail study of the cost related claim practice in federal road project, focusing on local contractors, review and analysis of the collected data on the same, the under listed recommendations are forwarded:

1. The local contractors are advised to formulate contract management department under their head office and project level to study each events that entitle them cost compensation under the conditions of the contract. Formulation of such system under their organization helps them to understand the rights and obligation of each parties under the contract; and if any events occur that imbalances the contract, proper cost compensation would be claimed. The local contractors are recommended to believe in professional experts involved in claim management, and left the claim job to this specific experts; so that the Contractors will follow the procedures set in the contract and acceptable practice to submit cost claim and present their cost claim in acceptable standard form/format, showing causes, effects, entitlements and supporting documents
2. The local contractors are advised to keep proper record, acceptable to the engineer, employer and dispute review experts, as and when events occur; wherein such events are categorized as cost compensation events under the conditions of the contract.
3. The employer is advised to fulfill his obligation stipulated in the contract, and as and when there is a failure in the same, there should have been fair view on the contractors' loss and positive attitude to the compensation of contractors cost claim.
4. The employer is highly advised not to interfere in engineer's claim assessment, negatively, by having positive attitude to compensation claims, if events allowed them to get compensation, as such attitude helps not only the contractor but also the employer himself, as having capable local contractors definitely help the success of the planned road development programmes and minimize involvement of foreign contractors in locally funded projects, which has ultimately economical advantages.
5. The consultants involved in the Ethiopian federal road projects are recommended to have adequate professional background and experience to evaluate the contractors' cost claims; that will assess and determines the contractor's cost claims fairly and impartially. In addition, such professionals need to advise the employer and contractor in minimizing the impact of the cost claim entitling events; by alerting both parties timely and

contractually.

6. Most projects under FIDIC 1987 conditions of the contract have provisions of dispute resolution mechanisms, and contractors' are advised to present their claims to DRE, as dispute, as and when the contractor dissatisfied with engineer's determination; and also to involve the DRE from the commencement of the project to get the benefit of his assignment within the reasonable time. Besides, the DRE assignment is to protect the contractor from the partial determination of their claims by the Engineer, in consideration of the fact that the employer is the one who chooses the engineer and pay him for his service. To this effect, the DRE, selected by the employer and contractor jointly and paid to him equally for his service should exercise his role professionally and impartially, for disputes referred to him for determination.
7. Contractors are advised to strengthen their association in seeking solutions for the common problems related to negative attitude of compensation of their cost entitlements and properly inclusion of formal adjudication or arbitration system in their contract and also to create awareness in the construction industry.

5.3. Recommendation for Future Research

The researcher would like to suggest for future research that are related with this study are: developing a guideline for preparation of cost claim submission and assessment of such claims to be as reference to local construction industry in road construction projects. It is believed that the same will contribute towards a better understanding of claim management in the local construction industry.

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Appendices

Appendix-1: Contractors Response for Encounter of Cost Claim Causations (Frequency)

I/No	Encounter of Cost Claim Causations due to	Frequency				N	Mean	Rank
		High (4)	Medium (3)	Low (2)	Never (1)			
2.1	Delayed drawings or information (<i>Sub – clause 6.4</i>)	4	3	6	0	13	2.846	5
2.2	Unforeseeable physical obstructions or conditions (<i>Sub – clause 12.2</i>)	3	4	5	1	13	2.692	6
2.3	Incorrect setting out data (<i>Sub–clause 17.1</i>)	3	2	7	1	13	2.538	9
2.4	Damage due to employer’s risks (<i>Sub–clause 20.3</i>)	2	1	7	3	13	2.154	15
2.5	Discovery of fossils (<i>Sub–clause 27.1</i>)	0	0	3	10	13	1.231	22
2.6	Facilities provided (<i>Sub – clause 31.2</i>)	0	4	7	2	13	2.154	15
2.7	Tests not provided for (<i>Sub – clause 36.5</i>)	0	3	10	0	13	2.231	14
2.8	Uncovering and making openings (<i>Sub – clause 38.2</i>)	0	1	8	4	13	1.769	18
2.9	Suspension on engineer’s instruction (<i>Sub – clause 40.2</i>)	1	4	8	0	13	2.462	10
2.1	Late possession of site (<i>Sub – clause 42.2</i>)	6	6	1	0	13	3.385	3
2.11	Cost of remedying defects (not contractor’s fault) (<i>Sub – clause 49.3</i>)	1	6	6	0	13	2.615	7
2.12	Search of defects (not contractor’s fault) (<i>Sub – clause 50.1</i>)	0	4	7	2	13	2.154	15
2.13	Variations – new rate (<i>Sub – clause 52</i>)	8	4	1	0	13	3.538	2
2.14	Damage by special risks/force majeure (<i>Sub – clause 65.3& 65.5</i>)	2	2	7	2	13	2.308	13
2.15	Interest due to payment delay (<i>Sub–clause 60.8</i>)	2	5	3	3	13	2.462	10
2.16	Suspension by Contractor due to payment delay (<i>Sub–clause 69.4</i>)	0	2	5	6	13	1.692	19
2.17	Termination Claim (<i>Sub – clause 69.1</i>)	0	1	5	8	14	1.500	21
2.18	Fluctuation (<i>Sub – clause 70.1</i>)	5	5	3	0	13	3.154	4
2.19	Changes in legislation (<i>Sub –clause 70.2</i>)	1	3	9	0	13	2.385	12
2.2	Disruption of progress (by right of way problem or other reasons)	9	4	0	0	13	3.692	1
2.21	Acceleration (direct or indirect Instruction by the Engineer/Employer)	0	2	5	6	13	1.692	19
2.22	Compensation for Prolongation of contract time	2	5	5	1	13	2.615	7

Appendix-2: Consultants Response for Encounter of Cost Claim Causations (Frequency)

I/No	Encounter of Cost Claim Causations due to	Frequency				N	Mean	Rank
		High (4)	Medium (3)	Low (2)	Never (1)			
2.1	Delayed drawings or information (Sub – clause 6.4)	2	7	2	1	12	2.833	8
2.2	Unforeseeable physical obstructions or conditions (Sub – clause 12.2)	1	6	4	1	12	2.583	9
2.3	Incorrect setting out data (Sub–clause 17.1)	0	7	4	1	12	2.500	11
2.4	Damage due to employer’s risks (Sub–clause 20.3)	3	2	6	1	12	2.583	9
2.5	Discovery of fossils (Sub–clause 27.1)	0	0	8	4	12	1.667	21
2.6	Facilities provided (Sub – clause 31.2)	0	1	9	2	12	1.917	17
2.7	Tests not provided for (Sub – clause 36.5)	0	3	9	0	12	2.250	13
2.8	Uncovering and making openings (Sub – clause 38.2)	0	1	9	2	12	1.917	17
2.9	Suspension on engineer’s instruction (Sub – clause 40.2)	1	1	7	3	12	2.000	15
2.1	Late possession of site (Sub – clause 42.2)	8	1	2	1	12	3.333	4
2.11	Cost of remedying defects (not contractor’s fault) (Sub – clause 49.3)	0	4	7	1	12	2.250	13
2.12	Search of defects (not contractor’s fault) (Sub – clause 50.1)	0	1	6	5	12	1.667	21
2.13	Variations – new rate (Sub – clause 52)	6	2	4	0	12	3.167	7
2.14	Damage by special risks/force majeure (Sub – clause 65.3& 65.5)	4	7	1	0	12	3.250	5
2.15	Interest due to payment delay (Sub–clause 60.8)	7	3	2	0	12	3.417	3
2.16	Suspension by Contractor due to payment delay (Sub–clause 69.4)	0	1	7	4	12	1.750	19
2.17	Termination Claim (Sub – clause 69.1)	0	1	7	4	12	1.750	19
2.18	Fluctuation (Sub – clause 70.1)	8	2	2	0	12	3.500	2
2.19	Changes in legislation (Sub –clause 70.2)	2	3	6	1	12	2.500	11
2.2	Disruption of progress (by right of way problem or other reasons)	11	1	0	0	12	3.917	1
2.21	Acceleration (direct or indirect Instruction by the Engineer/Employer)	0	2	8	2	12	2.000	15
2.22	Compensation for Prolongation of contract time	5	5	2	0	12	3.250	5

Appendix-3: Employers Response for Encounter of Cost Claim Causations (Frequency)

I/No	Encounter of Cost Claim Causations due to	Frequency				N	Mean	Rank
		High (4)	Medium (3)	Low (2)	Never (1)			
2.1	Delayed drawings or information (Sub – clause 6.4)	2	9	2	0	13	3.000	5
2.2	Unforeseeable physical obstructions or conditions (Sub – clause 12.2)	3	5	5	0	13	2.846	7
2.3	Incorrect setting out data (Sub–clause 17.1)	3	1	8	1	13	2.462	11
2.4	Damage due to employer’s risks (Sub–clause 20.3)	2	5	6	0	13	2.692	9
2.5	Discovery of fossils (Sub–clause 27.1)	0	3	6	4	13	1.923	19
2.6	Facilities provided (Sub – clause 31.2)	0	3	7	3	13	2.000	16
2.7	Tests not provided for (Sub – clause 36.5)	0	3	8	2	13	2.077	14
2.8	Uncovering and making openings (Sub – clause 38.2)	0	1	8	4	13	1.769	22
2.9	Suspension on engineer’s instruction (Sub – clause 40.2)	0	4	7	2	13	2.154	13
2.1	Late possession of site (Sub – clause 42.2)	7	3	3	0	13	3.308	3
2.11	Cost of remedying defects (not contractor’s fault) (Sub – clause 49.3)	1	3	8	1	13	2.308	12
2.12	Search of defects (not contractor’s fault) (Sub – clause 50.1)	0	3	7	3	13	2.000	16
2.13	Variations – new rate (Sub – clause 52)	9	3	1	0	13	3.615	2
2.14	Damage by special risks/force majeure (Sub – clause 65.3& 65.5)	0	3	7	3	13	2.000	16
2.15	Interest due to payment delay (Sub–clause 60.8)	6	3	3	1	13	3.077	4
2.16	Suspension by Contractor due to payment delay (Sub–clause 69.4)	0	4	6	3	13	2.077	14
2.17	Termination Claim (Sub – clause 69.1)	0	1	10	2	13	1.923	19
2.18	Fluctuation (Sub – clause 70.1)	0	10	3	0	13	2.769	8
2.19	Changes in legislation (Sub –clause 70.2)	2	6	4	1	13	2.692	9
2.2	Disruption of progress (by right of way problem or other reasons)	10	2	1	0	13	3.692	1
2.21	Acceleration (direct or indirect Instruction by the Engineer/Employer)	0	3	6	4	13	1.923	19
2.22	Compensation for Prolongation of contract time	5	3	5	0	13	3.000	5

Appendix-4: Contractors Response for Encounter of Cost Claim Causations (Impact)

I/No	Encounter of Cost Claim Causations due to	Degree of Impact				N	Mean	Rank
		High (4)	Moderate (3)	Neutral (2)	None (1)			
2.1	Delayed drawings or information (Sub – clause 6.4)	9	2	2	0	13	3.538	4
2.2	Unforeseeable physical obstructions or conditions (Sub – clause 12.2)	9	3	0	1	13	3.538	4
2.3	Incorrect setting out data (Sub–clause 17.1)	7	5	0	1	13	3.385	8
2.4	Damage due to employer’s risks (Sub–clause 20.3)	4	5	1	3	13	2.769	17
2.5	Discovery of fossils (Sub–clause 27.1)	0	5	2	6	13	1.923	22
2.6	Facilities provided (Sub – clause 31.2)	1	7	3	2	13	2.538	20
2.7	Tests not provided for (Sub – clause 36.5)	1	10	2	0	13	2.923	16
2.8	Uncovering and making openings (Sub – clause 38.2)	2	5	2	4	13	2.385	21
2.9	Suspension on engineer’s instruction (Sub – clause 40.2)	8	5	0	0	13	3.615	2
2.1	Late possession of site (Sub – clause 42.2)	9	4	0	0	13	3.692	1
2.11	Cost of remedying defects (not contractor’s fault) (Sub – clause 49.3)	4	7	2	0	13	3.154	10
2.12	Search of defects (not contractor’s fault) (Sub – clause 50.1)	2	7	2	2	13	2.692	18
2.13	Variations – new rate (Sub – clause 52)	8	5	0	0	13	3.615	2
2.14	Damage by special risks/force majeure (Sub – clause 65.3& 65.5)	7	2	3	1	13	3.154	10
2.15	Interest due to payment delay (Sub–clause 60.8)	5	5	1	2	13	3.000	13
2.16	Suspension by Contractor due to payment delay (Sub–clause 69.4)	7	2	1	3	13	3.000	13
2.17	Termination Claim (Sub – clause 69.1)	8	1	0	4	13	3.000	13
2.18	Fluctuation (Sub – clause 70.1)	7	6	0	0	13	3.538	4
2.19	Changes in legislation (Sub –clause 70.2)	4	8	0	1	13	3.154	10
2.2	Disruption of progress (by right of way problem or other reasons)	7	6	0	0	13	3.538	4
2.21	Acceleration (direct or indirect Instruction by the Engineer/Employer)	3	5	3	2	13	2.692	18
2.22	Compensation for Prolongation of contract time	5	6	2	0	13	3.231	9

Appendix-5: Consultant Response for Encounter of Cost Claim Causations (Impact)

I/No	Encounter of Cost Claim Causations due to	Degree of Impact				N	Mean	Rank
		High (4)	Moderate (3)	Neutral (2)	None (1)			
2.1	Delayed drawings or information (Sub – clause 6.4)	9	3			12	3.750	2
2.2	Unforeseeable physical obstructions or conditions (Sub – clause 12.2)	8	2	1	1	12	3.417	9
2.3	Incorrect setting out data (Sub–clause 17.1)	8	3	0	1	12	3.500	5
2.4	Damage due to employer’s risks (Sub–clause 20.3)	8	3	0	1	12	3.500	5
2.5	Discovery of fossils (Sub–clause 27.1)	1	6	3	2	12	2.500	21
2.6	Facilities provided (Sub – clause 31.2)	0	7	3	2	12	2.417	22
2.7	Tests not provided for (Sub – clause 36.5)	1	7	4		12	2.750	18
2.8	Uncovering and making openings (Sub – clause 38.2)	2	6	3	1	12	2.750	18
2.9	Suspension on engineer’s instruction (Sub – clause 40.2)	8	2	0	2	12	3.333	11
2.1	Late possession of site (Sub – clause 42.2)	9	1	1	1	12	3.500	5
2.11	Cost of remedying defects (not contractor’s fault) (Sub – clause 49.3)	5	5	1	1	12	3.167	14
2.12	Search of defects (not contractor’s fault) (Sub – clause 50.1)	1	7	2	2	12	2.583	20
2.13	Variations – new rate (Sub – clause 52)	8	3	1	0	12	3.583	4
2.14	Damage by special risks/force majeure (Sub – clause 65.3& 65.5)	7	2	2	1	12	3.250	13
2.15	Interest due to payment delay (Sub–clause 60.8)	1	10	0	1	12	2.917	16
2.16	Suspension by Contractor due to payment delay (Sub–clause 69.4)	1	10	0	1	12	2.917	16
2.17	Termination Claim (Sub – clause 69.1)	9	1	0	2	12	3.417	9
2.18	Fluctuation (Sub – clause 70.1)	8	3	0	1	12	3.500	5
2.19	Changes in legislation (Sub –clause 70.2)	4	6	1	1	12	3.083	15
2.2	Disruption of progress (by right of way problem or other reasons)	10	2	0	0	12	3.833	1
2.21	Acceleration (direct or indirect Instruction by the Engineer/Employer)	6	5	0	1	12	3.333	11
2.22	Compensation for Prolongation of contract time	8	4	0	0	12	3.667	3

Appendix-6: Employers Response for Encounter of Cost Claim Causations (Impact)

I/No	Encounter of Cost Claim Causations due to	Degree of Impact				N	Mean	Rank
		High (4)	Moderate (3)	Neutral (2)	(1)None			
2.1	Delayed drawings or information (Sub – clause 6.4)	4	9	0	0	13	3.308	9
2.2	Unforeseeable physical obstructions or conditions (Sub – clause 12.2)	6	6	1	0	13	3.385	7
2.3	Incorrect setting out data (Sub–clause 17.1)	4	5	3	1	13	2.923	16
2.4	Damage due to employer’s risks (Sub–clause 20.3)	2	10	1	0	13	3.077	15
2.5	Discovery of fossils (Sub–clause 27.1)	9	3	1	0	13	3.615	4
2.6	Facilities provided (Sub – clause 31.2)	1	5	5	2	13	2.385	22
2.7	Tests not provided for (Sub – clause 36.5)	1	9	2	1	13	2.769	18
2.8	Uncovering and making openings (Sub – clause 38.2)	6	3	4	0	13	3.154	13
2.9	Suspension on engineer’s instruction (Sub – clause 40.2)	3	10	0	0	13	3.231	11
2.1	Late possession of site (Sub – clause 42.2)	12	1	0	0	13	3.923	1
2.11	Cost of remedying defects (not contractor’s fault) (Sub – clause 49.3)	2	7	1	3	13	2.615	20
2.12	Search of defects (not contractor’s fault) (Sub – clause 50.1)	0	9	1	3	13	2.462	21
2.13	Variations – new rate (Sub – clause 52)	11	2	0	0	13	3.846	2
2.14	Damage by special risks/force majeure (Sub – clause 65.3& 65.5)	8	2	1	2	13	3.231	11
2.15	Interest due to payment delay (Sub–clause 60.8)	3	9	1	0	13	3.154	13
2.16	Suspension by Contractor due to payment delay (Sub–clause 69.4)	5	4	1	3	13	2.846	17
2.17	Termination Claim (Sub – clause 69.1)	7	5	0	1	13	3.385	7
2.18	Fluctuation (Sub – clause 70.1)	11	0	1	1	13	3.615	4
2.19	Changes in legislation (Sub –clause 70.2)	6	6	0	1	13	3.308	9
2.2	Disruption of progress (by right of way problem or other reasons)	9	4	0	0	13	3.692	3
2.21	Acceleration (direct or indirect Instruction by the Engineer/Employer)	4	4	2	3	13	2.692	19
2.22	Compensation for Prolongation of contract time	8	4	1	0	13	3.538	6

Appendix-7: Contractors Response for Local Contractors practice for Submission of Cost Claims

I/No	Local Contractors practice for submission/request of Cost Claims	Frequency				N	Mean	Rank
		High (4)	Medium (3)	Low (2)	Never (1)			
3.1	Delayed drawings or information (Sub – clause 6.4)	4	2	4	3	13	2.538	9
3.2	Unforeseeable physical obstructions or conditions (Sub – clause 12.2)	4	3	5	1	13	2.769	5
3.3	Incorrect setting out data (Sub–clause 17.1)	3	4	3	3	13	2.538	9
3.4	Damage due to employer’s risks (Sub–clause 20.3)	3	3	5	2	13	2.538	9
3.5	Discovery of fossils (Sub–clause 27.1)	0	0	7	6	13	1.538	22
3.6	Facilities provided (Sub – clause 31.2)	1	3	6	3	13	2.154	14
3.7	Testes not provided for (Sub – clause 36.5)	0	3	9	1	13	2.154	14
3.8	Uncovering and making openings (Sub – clause 38.2)	0	1	7	5	13	1.692	20
3.9	Suspension on engineer’s instruction (Sub – clause 40.2)	2	4	7	0	13	2.615	7
3.1	Late possession of site (Sub – clause 42.2)	6	4	3	0	13	3.231	2
3.11	Cost of remedying defects (not contractor’s fault) (Sub – clause 49.3)	3	5	4	1	13	2.769	5
3.12	Search of defects (not contractor’s fault) (Sub – clause 50.1)	0	4	7	2	13	2.154	14
3.13	Variations – New rate (Sub – clause 52)	9	2	2	0	13	3.538	1
3.14	Damage by special risks/force majeure (Sub – clause 65.3& 65.5)	2	1	7	3	13	2.154	14
3.15	Interest due to payment delay (Sub–clause 69.4)	3	1	7	2	13	2.385	12
3.16	Suspension by contractor due to payment delay (Sub–clause 69.4)	0	1	7	5	13	1.692	20
3.17	Termination Claim (Sub – clause 69.1)	0	3	4	6	13	1.769	19
3.18	Fluctuation (Sub – clause 70.1)	5	5	3	0	13	3.154	4
3.19	Changes in legislation (Sub –clause 70.2)	0	8	5	0	13	2.615	7
3.2	Disruption of progress (by right of way problem or other reasons)	6	4	3	0	13	3.231	2
3.21	Acceleration (direct or indirect Instruction by the Engineer/Employer)	1	1	6	5	13	1.846	18
3.22	Compensation for Prolongation of contract time	0	6	6	1	13	2.385	12

Appendix-8: Consultants Response for Local Contractors practice for Submission of Cost Claims

I/No	Local Contractors practice for submission/request of Cost Claims	Frequency				N	Mean	Rank
		High (4)	Medium (3)	Low (2)	Never (1)			
3.1	Delayed drawings or information (Sub – clause 6.4)	1	6	3	2	12	2.500	8
3.2	Unforeseeable physical obstructions or conditions (Sub – clause 12.2)	3	5	3	1	12	2.833	4
3.3	Incorrect setting out data (Sub–clause 17.1)	0	5	6	1	12	2.333	13
3.4	Damage due to employer’s risks (Sub–clause 20.3)	2	3	5	2	12	2.417	12
3.5	Discovery of fossils (Sub–clause 27.1)	0	1	4	7	12	1.500	21
3.6	Facilities provided (Sub – clause 31.2)	0	4	3	5	12	1.917	16
3.7	Testes not provided for (Sub – clause 36.5)	0	4	6	2	12	2.167	14
3.8	Uncovering and making openings (Sub – clause 38.2)	0	1	7	4	12	1.750	18
3.9	Suspension on engineer’s instruction (Sub – clause 40.2)	0	3	5	4	12	1.917	16
3.1	Late possession of site (Sub – clause 42.2)	4	3	4	1	12	2.833	4
3.11	Cost of remedying defects (not contractor’s fault) (Sub – clause 49.3)	3	2	5	2	12	2.500	8
3.12	Search of defects (not contractor’s fault) (Sub – clause 50.1)	1	4	3	4	12	2.167	14
3.13	Variations – New rate (Sub – clause 52)	5	5	2	0	12	3.250	3
3.14	Damage by special risks/force majeure (Sub – clause 65.3& 65.5)	3	4	3	2	12	2.667	7
3.15	Interest due to payment delay (Sub–clause 69.4)	3	4	5	0	12	2.833	4
3.16	Suspension by contractor due to payment delay (Sub–clause 69.4)	0	0	4	8	12	1.333	22
3.17	Termination Claim (Sub – clause 69.1)	1	0	4	7	12	1.583	20
3.18	Fluctuation (Sub – clause 70.1)	9	0	2	1	12	3.417	2
3.19	Changes in legislation (Sub –clause 70.2)	2	4	4	2	12	2.500	8
3.2	Disruption of progress (by right of way problem or other reasons)	8	2	2	0	12	3.500	1
3.21	Acceleration (direct or indirect Instruction by the Engineer/Employer)	0	1	6	5	12	1.667	19
3.22	Compensation for Prolongation of contract time	1	4	7	0	12	2.500	8

Appendix-9: Employers Response for Local Contractors practice for Submission of Cost Claims

I/No	Local Contractors practice for submission/request of Cost Claims	Frequency				N	Mean	Rank
		High (4)	Medium (3)	Low (2)	Never (1)			
3.1	Delayed drawings or information (Sub – clause 6.4)	0	4	9	0	13	2.308	8
3.2	Unforeseeable physical obstructions or conditions (Sub – clause 12.2)	2	5	5	1	13	2.615	5
3.3	Incorrect setting out data (Sub–clause 17.1)	1	3	6	3	13	2.154	12
3.4	Damage due to employer’s risks (Sub–clause 20.3)	0	2	8	3	13	1.923	13
3.5	Discovery of fossils (Sub–clause 27.1)	0	0	4	9	13	1.308	22
3.6	Facilities provided (Sub – clause 31.2)	1	2	4	6	13	1.846	16
3.7	Testes not provided for (Sub – clause 36.5)	2	0	6	5	13	1.923	13
3.8	Uncovering and making openings (Sub – clause 38.2)	1	1	5	6	13	1.769	17
3.9	Suspension on engineer’s instruction (Sub – clause 40.2)	1	3	7	2	13	2.231	10
3.1	Late possession of site (Sub – clause 42.2)	4	3	3	3	13	2.615	5
3.11	Cost of remedying defects (not contractor’s fault) (Sub – clause 49.3)	2	2	6	3	13	2.231	10
3.12	Search of defects (not contractor’s fault) (Sub – clause 50.1)	0	2	5	6	13	1.692	18
3.13	Variations – New rate (Sub – clause 52)	7	6	0	0	13	3.538	1
3.14	Damage by special risks/force majeure (Sub – clause 65.3& 65.5)	0	2	8	3	13	1.923	13
3.15	Interest due to payment delay (Sub–clause 69.4)	3	3	3	4	13	2.385	7
3.16	Suspension by contractor due to payment delay (Sub–clause 69.4)	0	2	3	8	13	1.538	20
3.17	Termination Claim (Sub – clause 69.1)	0	1	7	5	13	1.692	18
3.18	Fluctuation (Sub – clause 70.1)	3	8	2	0	13	3.077	2
3.19	Changes in legislation (Sub –clause 70.2)	3	4	5	1	13	2.692	4
3.2	Disruption of progress (by right of way problem or other reasons)	3	4	6	0	13	2.769	3
3.21	Acceleration (direct or indirect Instruction by the Engineer/Employer)	0	2	3	8	13	1.538	20
3.22	Compensation for Prolongation of contract time	1	3	8	1	13	2.308	8

Appendix-10: Spearman rank correlation Test

i) Hypothesis on Causes of Cost Claim

I/No	Encounter of Cost Claim Causations due to	Contractor Rank	Consultant Rank	Client Rank	Contractor/Consultant		Consultant/Client		Contractor/Client	
					d	d2	d	d2	d	d2
2.1	Delayed drawings or information (Sub – clause 6.4)	5	8	5	-3	9	3	9	0	0
2.2	Unforeseeable physical obstructions or conditions (Sub – clause 12.2)	6	9	7	-3	9	2	4	-1	1
2.3	Incorrect setting out data (Sub–clause 17.1)	9	11	11	-2	4	0	0	-2	4
2.4	Damage due to employer's risks (Sub–clause 20.3)	15	9	9	6	36	0	0	6	36
2.5	Discovery of fossils (Sub–clause 27.1)	22	21	19	1	1	2	4	3	9
2.6	Facilities provided (Sub – clause 31.2)	15	17	16	-2	4	1	1	-1	1
2.7	Tests not provided for (Sub – clause 36.5)	14	13	14	1	1	-1	1	0	0
2.8	Uncovering and making openings (Sub – clause 38.2)	18	17	22	1	1	-5	25	-4	16
2.9	Suspension on engineer's instruction (Sub – clause 40.2)	10	15	13	-5	25	2	4	-3	9
2.1	Late possession of site (Sub – clause 42.2)	3	4	3	-1	1	1	1	0	0
2.11	Cost of remedying defects (not contractor's fault) (Sub – clause 49.3)	7	13	12	-6	36	1	1	-5	25
2.12	Search of defects (not contractor's fault) (Sub – clause 50.1)	15	21	16	-6	36	5	25	-1	1
2.13	Variations – new rate (Sub – clause 52)	2	7	2	-5	25	5	25	0	0
2.14	Damage by special risks/force majeure (Sub – clause 65.3& 65.5)	13	5	16	8	64	-11	121	-3	9
2.15	Interest due to payment delay (Sub–clause 60.8)	10	3	4	7	49	-1	1	6	36
2.16	Suspension by Contractor due to payment delay (Sub–clause 69.4)	19	19	14	0	0	5	25	5	25
2.17	Termination Claim (Sub – clause 69.1)	21	19	19	2	4	0	0	2	4
2.18	Fluctuation (Sub – clause 70.1)	4	2	8	2	4	-6	36	-4	16
2.19	Changes in legislation (Sub – clause 70.2)	12	11	9	1	1	2	4	3	9
2.2	Disruption of progress (by right of way problem or other reasons)	1	1	1	0	0	0	0	0	0
2.21	Acceleration (direct or indirect Instruction by the Engineer/Employer)	19	15	19	4	16	-4	16	0	0
2.22	Compensation for Prolongation of contract time	7	5	5	2	4	0	0	2	4
					$\sum di^2$	330		303		205
					ρ	0.814		0.829		0.884
Respondent		$\rho = \square$	Critical value of	Significance for P	Reject/don't					
Contractor/Consultant		0.814	0.359	Significant	Reject					
Consultant/Client		0.829	0.359	Significant	Reject					
Contractor/Client		0.884	0.359	Significant	Reject					

ii) Hypothesis on Local Contractors Cost claim Practice

I/No	Encounter of Cost Claim Causations due to	Contractor Rank	Consultant Rank	Client Rank	Contractor/Consultant		Consultant/Client		Contractor/Client	
					d	d2	d	d2	d	d2
2.1	Delayed drawings or information (Sub – clause 6.4)	9	8	8	1	1	0	0	1	1
2.2	Unforeseeable physical obstructions or conditions (Sub – clause 12.2)	5	4	5	1	1	-1	1	0	0
2.3	Incorrect setting out data (Sub–clause 17.1)	9	13	12	-4	16	1	1	-3	9
2.4	Damage due to employer's risks (Sub–clause 20.3)	9	12	13	-3	9	-1	1	-4	16
2.5	Discovery of fossils (Sub–clause 27.1)	22	21	22	1	1	-1	1	0	0
2.6	Facilities provided (Sub – clause 31.2)	14	16	16	-2	4	0	0	-2	4
2.7	Tests not provided for (Sub – clause 36.5)	14	14	13	0	0	1	1	1	1
2.8	Uncovering and making openings (Sub – clause 38.2)	20	18	17	2	4	1	1	3	9
2.9	Suspension on engineer's instruction (Sub – clause 40.2)	7	16	10	-9	81	6	36	-3	9
2.1	Late possession of site (Sub – clause 42.2)	2	4	5	-2	4	-1	1	-3	9
2.11	Cost of remedying defects (not contractor's fault) (Sub – clause 49.3)	5	8	10	-3	9	-2	4	-5	25
2.12	Search of defects (not contractor's fault) (Sub – clause 50.1)	14	14	18	0	0	-4	16	-4	16
2.13	Variations – new rate (Sub – clause 52)	1	3	1	-2	4	2	4	0	0
2.14	Damage by special risks/force majeure (Sub – clause 65.3&65.5)	14	7	13	7	49	-6	36	1	1
2.15	Interest due to payment delay (Sub–clause 60.8)	12	4	7	8	64	-3	9	5	25
2.16	Suspension by Contractor due to payment delay (Sub–clause 69.4)	20	22	20	-2	4	2	4	0	0
2.17	Termination Claim (Sub – clause 69.1)	19	20	18	-1	1	2	4	1	1
2.18	Fluctuation (Sub – clause 70.1)	4	2	2	2	4	0	0	2	4
2.19	Changes in legislation (Sub –clause 70.2)	7	8	4	-1	1	4	16	3	9
2.2	Disruption of progress (by right of way problem or other reasons)	2	1	3	1	1	-2	4	-1	1
2.21	Acceleration (direct or indirect Instruction by the Engineer/Employer)	18	19	20	-1	1	-1	1	-2	4
2.22	Compensation for Prolongation of contract time	12	8	8	4	16	0	0	4	16
					$\sum di^2$	275		141		160
					ρ	0.845		0.920		0.910
	Respondent	$\rho = \square$	Critical value of ρ	Significance for $P < 0.05$	Reject/don't reject the Null Hypothesis					
	Contractor/Consultant	0.845	0.359	Significant	Reject					
	Consultant/Client	0.920	0.359	Significant	Reject					
	Contractor/Client	0.910	0.359	Significant	Reject					

Table 1

[illegible]

Appendix-11: Sample Questionnaire

Section 1: General Background Information

1. The questions below are related to your organisation and yourself. Please indicate your response by ticking (X or $\sqrt{}$) the appropriate box (es) or by filling the blank spaces provided, as appropriate.

1.1 Name of organization (Optional): _____

1.2 Type of organization:

Employer ☐ Consultant ☐ Contractor ☐

1.3 Years since establishment:

More than 10 years ☐ 5-10 years ☐ Less than 5 years ☐

1.4 The organization's experience in road construction projects in Federal road projects

More than 10 years ☐ 5-10 years ☐ Less than 5 years ☐

1.5 Your experience on road projects:

More than 10 years ☐ 5-10 years ☐ Less than 5 years ☐

1.6 Do you have experience in projects using FIDIC 1987/1992 (Red book) as the Conditions of the Contract?

Yes ☐ No ☐

1.7 Do your Contracts have a dispute resolution system, in particular Dispute Review Expert?

Yes ☐ No ☐

1.8 Your Name, Title and Contact address:

Name (optional): _____

Job Title: _____

Tel (optional): _____ E-mail address: _____

Section 2: Ranking the Degree of Impact and Frequency

2. The following causes of cost claims are identified from review of literature and personal experience in the process of contract administration in road construction projects. Please consider in terms of your organization's experience and/or your knowledge the degree of impact and frequency of occurrence of each item in the project which your organization undertook and respond by ticking in (X or √) the appropriate box or filling the blank space provided, as appropriate. For other factors which require specific elaborations, please reply to the subjective questions in the space provided.

I/No	Encounter of Cost Claim Causations ² due to:	Frequency				Degree of Impact			
		High (4)	Medium (3)	Low (2)	Never (1)	High (4)	Moderate (3)	Neutral (2)	None (1)
2.1	Delayed drawings or information (<i>Sub – clause 6.4</i>)								
2.2	Unforeseeable physical obstructions or conditions (<i>Sub – clause 12.2</i>)								
2.3	Incorrect setting out data (<i>Sub–clause 17.1</i>)								
2.4	Damage due to employer's risks (<i>Sub–clause 20.3</i>)								
2.5	Discovery of fossils (<i>Sub–clause 27.1</i>)								
2.6	Facilities provided (<i>Sub – clause 31.2</i>)								
2.7	Tests not provided for (<i>Sub – clause 36.5</i>)								
2.8	Uncovering and making openings (<i>Sub – clause 38.2</i>)								
2.9	Suspension on engineer's instruction (<i>Sub – clause 40.2</i>)								
2.10	Late possession of site (<i>Sub – clause 42.2</i>)								
2.11	Cost of remedying defects (not contractor's fault) (<i>Sub – clause 49.3</i>)								
2.12	Search of defects (not contractor's fault) (<i>Sub – clause 50.1</i>)								
2.13	Variations – new rate (<i>Sub – clause 52</i>)								

² Extracted from FIDIC 1987

I/No	Encounter of Cost Claim Causations ² due to:	Frequency				Degree of Impact			
		High (4)	Medium (3)	Low (2)	Never (1)	High (4)	Moderate (3)	Neutral (2)	None (1)
2.14	Damage by special risks/force majeure (Sub – clause 65.3& 65.5)								
2.15	Interest due to payment delay (Sub– clause 60.8)								
2.16	Suspension by Contractor due to payment delay (Sub–clause 69.4)								
2.17	Termination Claim (Sub – clause 69.1)								
2.18	Fluctuation (Sub – clause 70.1)								
2.19	Changes in legislation (Sub –clause 70.2)								
2.20	Disruption of progress (by right of way problem or other reasons)								
2.21	Acceleration (direct or indirect Instruction by the Engineer/Employer)								
2.22	Compensation for Prolongation of contract time								

2.23 Is there any other incident in your project/experience which can be categorized / considered as a special circumstance which is not specified herein above in the table but entitles / entitled the Contractor for cost claim?

Yes ☐ No ☐

If your answer is yes, please specify the special event which entitles / entitled the Contractor for additional cost herein below.

Section 3: Ranking the Frequency

3. The following factors are listed as causes of cost claims for compensating contractors as their cost entitlements. Please consider in terms of your organization's experience and/or your knowledge the frequency that **Local Contractors** request compensation for each claim head and respond by ticking in (X or √); the appropriate box representing your selection. For other factors which require specific elaborations, please reply to the subjective questions in the space provided.

I/No	Description	Frequency			
		High (4)	Medium (3)	Low (2)	Never (1)
	Rate the Local Contractors practice for submission/request of Cost Claims for the listed causes				
3.1	Delayed drawings or information (<i>Sub – clause 6.4</i>)				
3.2	Unforeseeable physical obstructions or conditions (<i>Sub – clause 12.2</i>)				
3.3	Incorrect setting out data (<i>Sub–clause 17.1</i>)				
3.4	Damage due to employer's risks (<i>Sub– clause 20.3</i>)				
3.5	Discovery of fossils (<i>Sub–clause 27.1</i>)				
3.6	Facilities provided (<i>Sub – clause 31.2</i>)				
3.7	Testes not provided for (<i>Sub – clause 36.5</i>)				
3.8	Uncovering and making openings (<i>Sub – clause 38.2</i>)				
3.9	Suspension on engineer's instruction (<i>Sub – clause 40.2</i>)				
3.10	Late possession of site (<i>Sub – clause 42.2</i>)				
3.11	Cost of remedying defects (not contractor's fault) (<i>Sub – clause 49.3</i>)				
3.12	Search of defects (not contractor's fault) (<i>Sub – clause 50.1</i>)				
3.13	Variations – New rate (<i>Sub – clause 52</i>)				
3.14	Damage by special risks/force majeure (<i>Sub – clause 65.3& 65.5</i>)				
3.15	Interest due to payment delay (<i>Sub–clause 69.4</i>)				

I/No	Description	Frequency			
		High (4)	Medium (3)	Low (2)	Never (1)
3.16	Suspension by contractor due to payment delay (<i>Sub-clause 69.4</i>)				
3.17	Termination Claim (<i>Sub – clause 69.1</i>)				
3.18	Fluctuation (<i>Sub – clause 70.1</i>)				
3.19	Changes in legislation (<i>Sub – clause 70.2</i>)				
3.20	Disruption of progress (by right of way problem or other reasons)				
3.21	Acceleration (direct or indirect Instruction by the Engineer/Employer)				
3.22	Compensation for Prolongation of contract time				

3.23. Do you think formal contract administration system is practised in local Contractors' project management system? If your answer is no, does this lead the Contractors' to loss their entitlement?

3.24. Do you think foreign/international Contractors participated in the country has better contract management practice and requests and being awarded cost related claims better than local Contractors? If your answer is yes, please provide us with the possible reasons.

3.25. What method do you use to request (for Contractors)/assess (for Employer/Engineer) an Acceleration claim, as and when encountered/been requested?

3.26. What method do you use to request (for Contractors)/assess (for Employer/Engineer) a prolongation cost claim, as and when encountered/been requested?

4. Which of the following factors influence local Contractors Cost claim award/success in your view, under the contract administration process? Rank them on the scale of 1 – 4 (from 1=least to 4=most influence).

No	Factors	RANK			
		1	2	3	4
4.1	Contractors' lack of awareness of the events that entitle them cost compensation				
4.2	Contractors failure to keep detail particulars for events that entitle them cost claim				
4.3	Contractors failure to follow the procedures set in the Contract and acceptable practice to submit cost claim				
4.4	Contractors failure to present their cost claim in acceptable standard form/format, showing causes, effects, entitlements and supporting documents				
4.5	Engineer involved in road projects have adequate professional background and experience to evaluate the Contractors' cost claims				
4.6	Engineer assess and determines the contractor's cost claim fairly and impartially				
4.7	Employer interfering in Engineer's determination				
4.8	Contractors' presents their claims to DRE, as dispute when dissatisfied with Engineer's determination				
4.9	DRE involved in road projects have adequate professional background and experience to evaluate the Contractors' cost claims				
4.10	DRE recommends the cost claims impartially and fairly				

4.11. Others potential factors that influence local Contractors cost claim attainment, under contract administration process (Please specify below):

4.12. Do you think local Contractors projects and company suffer due to non-compensation of cost claims, while events occur that entitle them cost compensation? If yes, how?

4.13. Which party take more responsibility in contributing to the non-compensation of the local Contractors cost claims in view of the factors listed from 4.1 to 4.12? Rank them on the scale of 1 – 4 (from 1=least to 4=most influence).

No	Factors	RANK			
		1	2	3	4
a	Employer (e.g., by interfering in Engineer's and DRE's determination)				
b	Consultant (e.g. Determinations are not impartial and fair)				
c	Contractor (e.g. Poor claim management)				
d	Dispute Review Expert(e.g. Determinations are not impartial and fair)				

Section 5: General Questions

5. The questions below are aimed at to benefit from your ample experience in elaborating some of the critical problems and identification of relevant best practices. Please kindly indicate your opinion on the spaces provided (*you may use additional paper*)

5.1. What do you suggest as measure to be taken to improve situations in compensating local contractors' as and when incidents are encountered that entitle them monetary compensations in federal road projects?

a. Contractor's Contract management practice.

b. Engineer's/Consultant's role

c. Employer's role.

d. Involvement, Assignment and Selection of DREs.

e. Conditions of Contract clauses modification, addition and/or deduction from FIDIC 87

f. others

5.2. Do you have any suggestion/recommendation that the local contractors shares from the experience of foreign contractors in getting compensation as cost claim, as and when their projects encounter events that has provision for cost compensation?

5.3. Do you have any further suggestion and comments related to improving local contractors cost claim entitlement, as and when they encounter events that entitle them cost compensation?

Please kindly check that no points are escaped.

Thank you very much for your time!!!

