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KIST
TOWARDS A BRIGHTER FUTURE

FINAL YEAR PROJECT

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PROJECT TITTLE:

Analysing the causes and Impacts of disputes in the Rwanda Road Construction Sector and determining ways of Reducing or addressing such disputes

SUBMITTED BY:

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SUPERVISOR: Prof. Charles EGBU

ACADEMIC YEAR 2012

Declaration

I hereby declare that the thesis entitled "To analyse the causes and impacts of disputes in the Rwandan road construction sector and determine ways of reducing or addressing such disputes" submitted for the Degree of Master of Science is my original work and the thesis has formed the basis for the award of any Degree, Diploma, Association, Fellowship of similar other titles. It has not been submitted to any other University or Institute for the award of any Degree or Diploma.

Date ……./ ……/ 2013

Signature ……

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CERTIFICATE

This is to certify that the thesis work entitled **"**Analysing the causes and impacts of disputes in the Rwanda road construction sector and determining ways of reducing or addressing such disputes**"** is a record of the original bonafide work done by **SAFARI Elly (PG 2011576)**, in partial fulfilment of the requirement for the award of Master of Science Degree in Transportation Engineering and Economics of Kigali Institute of Science and Technology (KIST) during the academic year 2011 - 2012.

Supervisor

Signature: **.....**

Prof. Charles EGBU

Head of Department

Signature: **.....**

Dr. KUMARAN SENTHIL

Dedication

To my family

More especially my beloved wife and my lovely kids

Muhoza Maureen

Muhozi Mike

Uwase Doreen

“Pursue education when there is still time”

Acknowledgement

I wish to extend my sincere gratitude to my supervisor Prof. Charles EGBU for his effort and professional concern; for it was through his continued advice and support that I managed to accomplish my task and compile this report.

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Date:…… / **…....** /2013

Signature: .....

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Abstract

Civil works, worldwide, have the tendency to create strong differences in opinion between even the best intentioned parties, which can quickly degenerate into acrimonious disputes and become difficult to resolve. Like all other developing countries, Rwanda is rapidly increasing its capital spending effectively. Construction disputes are one of the obstacles to successful project execution usually leading to increase in project cost; and in worst cases suspension of the project may occur.

This may be devastating and stressing to parties involved, especially if it is a major infrastructural project like a road project. The ability, therefore, to resolve contract disputes quickly and effectively is the difference between projects that is completed on time and a failed capital investment that is completed only after many years of delay.

These instigated me, to research and analyze the causes and impacts of construction disputes in Rwanda road construction sector and ways of addressing /resolving them.

The research approach and techniques used in this study was descriptive as it involved developing research questions covering then the existing state of the subject. As suggested a descriptive research determines and reports the way things are [8, 9]. A survey was done and questionnaires were used to collect both quantitative and qualitative data from the respondents, these were analysed using SPSS and spread sheets, then ranked, and a sample t-test was made from the overall view in order to draw conclusions and recommendations. Basic description of a mixed methodology is simply that methodology with methods that have comparisons between quantitative and qualitative data. Qualitative data is data in numerical form, often derived from questionnaires or structured interviews. Quantitative data is descriptive data from observation or unstructured interviews. As epistemology type of research methodology gives a room to allow for the integration of a variety of methods, the researcher's choice was to use mixed methods, including quantitative and qualitative approaches. In this particular research, the researcher takes a direction of mixed methodology so as to have a robust

grounding in theory. This research involved thirty (30) interviews with practitioners and hundred (100) useable questionnaires sent to respondents of which 66 filled questionnaires returned.

Based on the research findings, this report represents a comprehensive analysis of the occurrence of construction disputes, especially in the Rwanda road construction sector. In order to determine the sample population, cluster sampling was used. Cluster sampling was performed on contractors, consultants, and clients' organisation in the Rwandan Construction industry**.**

Conclusion

Negotiation was identified as the most preferred method of dispute resolution.

Recommendation

The construction industry operates in an open environment therefore these results will be applicable to other sectors of the construction industry especially infrastructural project since most parties to these project are similar with those of the road project.

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List of Symbols and Abbreviations

GDP: Gross Domestic Product

Rwf: Rwandan Francs

ADR: Alternative Dispute Resolution

USA: United States of America

U.K: United Kingdom

FIDIC: Federation international Des Ingenieurs Counseils

RTDA: Rwanda transport development authority

MININFRA: Ministry of infrastructure

RPPA: Rwanda public procurement authority

MRT: Mass rapid transit

KIAC: Kigali international arbitration centre

NTB: National Tender Board

PSF: Private sector federation

DRB: Dispute Resolution Boards

CADR: Centre for Arbitration and Dispute Resolution

CHAPTER I: INTRODUCTION

1.0 BACKGROUND

Civil works, worldwide, have the tendency to create strong differences in opinion between even the best intentioned parties, which can quickly degenerate into acrimonious disputes and become difficult to resolve. Road construction disputes have become a major concern to all parties involved in road construction processes. The construction industry thrives on building lasting relationships, it is absolutely critical that disputes are handled appropriately and expediently. Showcasing the causes and impacts of disputes will enable concerned parties to road construction contracts stringent measures during project execution to ensure project success.

Rwanda is a developing country with interest to catch up with the market trends of other developing economies such as Malaysia, Singapore and the neighbouring Kenya. The country's GDP stands at US$ 13.46 Billion, the real GDP growth rate is at about7.6%. Construction takes 20.2 % of the GDP, an indication of a growing economy. The Rwanda construction industry accounts for reasonable percentage, other than agriculture sector of the labour population**.** According to the Rwanda National budget report of 2011 the budget allocation to road construction sector by government in 2011/2012 was estimated at Rwf 210.81 Billion.

Like all other developing countries, this is an indication that Rwanda is increasing its capital spending, the efficiency of which will be determined by the Government's ability to manage infrastructure spending effectively. The ability, therefore, to resolve contract disputes quickly and effectively may be the difference between a project that is completed on time and failed capital investment that is completed only after many years of delay. In 2012 Rwanda government projected to working on 430km of road repair, which when no serious attention to all stages of the project preparation and execution, disputes may rise, leading to failing the projects or causing big losses on citizens taxes. Therefore much should be done to combat the arising disputes on any road project so as to be cost effective and reduce losses that may arise from that negligence. The existing method in Rwanda used to handle commercial disputes is by litigation method that involves courts of law; this method is expensive, time wasting and enemy creator. To improve that, more other efficient dispute resolution mechanism should be in place to iron out arising disputes in road construction projects and whose implementation would require identifying

factors which bring about disputes. The key factors leading to delays that should be taken into consideration may include; causes impacts and prevention as suggested [17].

Dispute is defined as a class of kind of conflict, which manifests itself in distinct, justifiable issues. It involves disagreement over issues capable of resolution by negotiation, mediation or third party adjudication. The definition given in the Law and Practice of Compromise: "An 'actual' dispute will not exist until a claim is asserted by one party which is 'dispute' by the other." This implies that a dispute will most certainly occur only if a claim is disregarded by one party to the contract. In similar vein suggested that "Conflict exist where there is an incompatibility of interest [11]. When a conflict become irreconcilable and the mechanisms for avoiding it are exhausted or inadequate techniques for resolving the dispute are required." The key elements of the report are the causes and impacts. Causes are the circumstances (actions) that lead to the occurrence of disputes. Impacts are the negative effects experienced by the parties to the contract in case a dispute is not resolved at the earliest.

As a result of the risks and complexities that are naturally inherent with construction projects as well as the diverging interests of the parties involved, disputes could be considered unavoidable consequences of the construction processes especially road construction process [22]. Construction disputes when not resolved in a timely manner become expensive in terms of finance, personnel, opportunity costs and time. The other less visible may include, company resources assigned to the dispute, and lost business opportunities, which are disturbing. Traditionally all disputes were referred to litigation in commercial courts both in construction and other sectors, but due to improved research and development, ADR methods are being used in countries like; South Africa, USA and the U.K among others as amicable, fast and less costly ways of resolving disputes.

Disputes in the road construction works appear to have increased globally, especially during the construction stage of projects and also because of many challenges beyond both parties to contract. There has been a general observation that most contracts are designed in such a way to favour the client in the worst situation. Construction disputes are time and cost consuming elements of any construction contract. The process is lengthy, lacks precedence in interpretation and decision making [1].

Construction projects are unique covering a myriad of products and skills conducted on a profit oriented, commercial awareness environment.

These projects are executed by organisations with potentially opposing objectives, by individuals with different experiences and backgrounds, carrying out complex operation in difficult environments. Decisions are generally made on forecasts of future expectations, usually when the information needed to make those decisions is complete. The scope for uncertainty and change is high and risk of conflict and dispute is always present.

In Rwanda, there are no authentic dispute resolution guidelines, particularly formulated for the Rwandan construction industry. Traditionally FIDIC's conditions of contract have been used as a guideline by professionals while drafting procedures to include in contract documentations. In addition, there is a laxity by professionals to realize that; the difference is legal, social and cultural traditions and practices different countries make the construction industry to be unique. Every country has her specific legal limitations jurisdictions. Due to the increase in technological advances, generalisation of disputes with the traditional legal systems has become completely obsolete. Consultants, implementers/clients/governments who normally favour and aim at protecting client's own rights and interests only give a biased ruling. Disputes have been a common phenomenon in the Rwandan construction industry and with the surge in numbers of construction projects, the numbers of contractual disputes are expected to increase.

Road projects being major infrastructure developments are adversely affected by slowdowns mainly caused by conflicts and disputes. For instance all major road projects in Rwanda were under the MININFRA. These include; national roads and truck roads, while of national roads, the government instituted a national transport authority RTDA, the main function of RTDA is to develop Rwanda's national road network and implement the national development plan by developing infrastructure as life line for economic development. However key issues like dispute resolution have not been given much attention if any, yet on average it is one of the major causes of construction failures globally contends.

1.1 PROBLEM STATEMENT

Due to the unique nature of the road construction industry, disputes are inevitable and major infrastructural developments can be adversely affected if plunged into unending disputes at any stage. This is likely to result into costs and time overruns, not to mention the stresses and social unrests caused to the users and parties involved.

The uniqueness of this industry is defined by the scope of work, where different technical professions are all involved and also being one of the industries that requires big funding, which requires a project manager with excellent project management skills that can prevent disputes or address those that have risen within the project before becoming very costly. Not only that, but also it is a sector that is cross cutting ,because it affects the social , financial and political life of the country, Especially when it fails to yield positive results to the end users and government at large.

There has been no in depth analysis of the causes of disputes and methods of resolving disputes in Rwanda. There is paucity of research on the ways of preventing disputes and minimising the costs associated with them. According to Rwanda public procurement authority report (2010), a significant number of road constructions related disputes have been filed with the various judicial courts, especially by contractors in the past years. This is a majors concern as it affects the overall performance of the construction industry, particularly the roads construction sector.

1.2 AIMS AND OBJECTIVES

The main aim is to analyze the causes and impacts of disputes in the Rwanda road construction sector and determine ways of reducing or addressing such disputes.

1.2.1 Aims of the research study.

To critically review the literature in the general areas of causes of disputes in road construction and dispute resolution strategies, with particular emphasis on Rwanda road construction sector;

a) To examine the different causes of disputes in road construction and with particular reference to Rwanda road construction sector.

b) To identify and document the impacts of road construction disputes in Rwanda.
c) To explore the current practices in place which are employed in the Rwanda road construction sector, in addressing/resolving disputes and to gauge the level of efficacy of these practices.
d) To develop a set of guidance based on literature review and best practices in the road construction sector, on effective ways of managing disputes in the Rwanda road construction sector.

1.3 RESEARCH QUESTIONS

a) What are the major causes of construction disputes in Rwanda?
b) What are the impacts of disputes on the road construction sector?
c) What are the common methods used to settle disputes in Rwanda?
d) How can disputes in the road construction sector be prevented?

How can costs associated with road construction disputes be minimized?

1.4 SIGNIFICANCE OF THE RESEARCH

The prevalence of construction disputes indicates that the current approach to dispute resolution is not effective enough. If disputes are resolved under a lower level, for example by participants only, or by third-party, the relations between contractors and clients could be maintained. Reduction in the conflicts and disputes in road construction project improves Government spending on litigation and other failed dispute cases on infrastructural projects adopted by parties involved in the project implementation.

The reduction in disputes and adoption of ADR will lead to;

- Reduction in construction costs
- Less hostility within the construction industry
- Reduction in the time taken to resolve construction disputes
- Better quality and management of resources.

1.5 DELIMITATION

The research aimed at analysing the causes and impacts of dispute in the Rwandan road construction sector, roads projects were considered, other civil engineering projects were not considered. Contractors and consultants used in the survey were obtained from a list of RTDA, RPPA and institution of engineers Rwanda as, targeted group.

Since road project are diverse in terms of geographical coverage, the survey did not cover specific locations. The researcher got information from different field station depending where respondents worked.

1.6 SCOPE OF STUDY

In general the research aimed at analysing the dispute occurrence in the Rwanda construction industry. In particular the road sector was given special attention because it is a backbone of infrastructure development. The geographical coverage was diverse as the survey data was obtained from contractors, consultants and client organisation who have worked on different road projects scattered around the country in the timeframe of 1 to 30 years. The research study took three month to complete; this also included the field surveys meant for data collection

1.7 STRUCTURE OF REPORT

The report is divided into five chapters; the first chapter is the introduction and presents the back ground, problem statement, justifications for the study, aims and objectives, the conceptual framework of the research and delimitation. The second chapter has literature review on disputes and includes different school of thought on causes of construction disputes, methods of dispute resolution, impact of construction dispute, operation of dispute resolution mechanism and dispute resolution systems in developing and embarked on developed countries that have targetable experience in dispute management. The third chapter presents the research methodology. The fourth chapter gives a summary of results and discussion, while the fifth chapter contains the conclusions, recommendations and area of further research.

CHAPTER II: LITERATURE REVIEW

2.0 INTRODUCTION

This chapter presents literature and definitions of disputes, causes of road construction disputes,

Methods of dispute resolution, impacts of road constructions disputes, operation of dispute mechanisms and dispute resolution systems worldwide.

In the study of South African construction industry, worldwide attention and growing awareness of disputes resulted in the evolution of various approaches, adapted in attempts to avoid or least minimise their disruptive and costly impacts. The standard forms of contract produced by the institutions in the construction industry usually incorporate provisions to vary the work. If such are provided, then it is more prudent to insert provisions to be followed in the resolving disputes as it is impossible to complete all aspects of the contract before commencement. It should be added that most of the contracts are biased, especially in some clauses that favour the client and expose the contractor to losses. Citing an example in Rwanda, were most of the contracts bear a clause of penults of delay in completion of works vis-à-vis the scheduled time and does not consider delay in payment to the contractor as par agreed period. This will impact the contractor, sometimes resulting into abandoning the works and even closing doors for business due to an expected loss that may result into disputes that are time consuming on both parties from my (personal view).

In dispute resolutions, stress that it is virtually impossible to complete a large construction project without having any dispute developing between parties, therefore it is advisable to have dispute review boards Alternative Dispute Resolution that can provide the process and mechanisms to not only help to settle these disputes but also can provide a method to prevent the dispute from ever happening. It is seen that Dispute Resolution Boards have been utilized by the construction industry for many years; they have been primarily utilized by horizontal construction industry on projects such as roads, railways, bridges and tunnels

Rwanda being a developing country that faced a lot of difficulties due to the Tutsi genocide period it under went, which affected the country in all aspects of life, there was a need for infrastructure development required to make life affordable.

The transport sector in Rwanda, especially Public transport is not well structured, yet it is crucial to the welfare of the people and crucial element in any country's development strategy to eradicate poverty. However in many developing countries public transportation is declining or failing to provide the necessary services, this is caused by lack of appropriate planning, in institutional and financial frame work for public transport. These factors can cause disputes between government transport agencies, operators and end users by failing to deliver the right quality of service, hence causing delay time and transport fare losses.

In developing countries like Rwanda, MRT with a spectrum of modes that can be used in urban areas, can serve as a solution to public transport in both addressing high transport fare and delay time as some of the causes of disputes in transport sector.

It is noted that MRT when properly planned, can in principle contribute to the achievement of all the main objectives of the urban development policy, by improving the efficiency of the city economy, by reducing travel costs and by maintaining a higher level of city centre activity and associated economies of agglomeration. The impact of the poverty can be reduced directly where MRT is the major carrier of the poor and indirectly through the benefit to the poor by getting from economic prosperity.

Like in any other sector, transport sector has many causes of disputes:

- Monopolies by the government.
- Design of contract agreements.
- Government policies.
- Labour.
- Poor management.
- Environmental damage.
- Transport models.
- Favoured investors.

Due to lack of expertise in project setting and management, more especially in road construction sector and transportation sector, a lot of conflicts/disputes develops and the ADR methods to resolve the disputes was not in place, but only using local way of reaching amicable solution, that could involve local authorities and when it comes to the worst cases, judicial courts would be involved. This is not professional way of handling such disputes because it involves a lot of delays and sometimes, influence is used in such cases resulting into project losses. It is by all means that Rwanda has to have streamlined process and procedures to cater for arising disputes in existing and developing road construction projects that consume a lot of tax payers' money.

Some of the highlighted disputes/conflicts observed by the NTB by then and KIAC established at the end of the year 2011 was/is as a result of poor design stage, contract preparation, signing and implementation stage of the project. In Rwanda more than often disputes in road construction sector emanate from:

2.0.1 The contract problem:

Whether written on gentleman's agreement, contract is the guidance of both parties as to payment and performance of a project. This is why the contract between both players must clearly identify the rights and obligations of each player in the process, from developer, design, contractor, sub contractor and supplier. More problems occur because of an incomplete, vague or ambiguous scope of work in the agreement.

In Rwanda such issue is dominating as the cause of project disputes, and the first step of preventing the incident is to have a well –written contract that properly analyzes and allocates the risk on the project which may often save heartache at the time of completion.

2.0.2 Stake holders' problem:

It is no secret that successful companies are driven by successful people, especially in developing countries where you find wrong practices like corruption, which might influence actions to take place regardless the losses incurred on any player in the project. but the opposite is true as well. A bigger percentage of disputes in road construction in Rwanda arise from people's understanding and the attitude towards their responsibilities.

2.0.3 Unknown problems:

This is sometimes called "catch –all" categories, as disputes often arise from events beyond one or more of the parties 'control. This would include anything from unusually severe weather, to labour strikes, to differing site conditions. These causes often involve requests by the contractor for more time and/or money, which develop into conflicts between concerned parties.

Because disputes in projects especially road construction project is mostly affecting social economic development of the country, RTDA as a concerned body in national infrastructure development is advised to reduce road construction projects risks by putting in place an advisory body to advise the contractors on the way of handling disputes before joining juridical courts, also a thorough risk register, identifying possible risks to achieving required time, cost and functionality, and strategies to mitigate those risks, is to be in place and shared with all stake holders in road construction sector and responsibility of managing each risk is clearly allocated to the specific organisation or person, that best able to manage it. This will help in reducing or minimising losses incurred on time and money.

A proposed a structural equation model for construction contract dispute potential whose purpose was to explain how and why contract, related construction, problems occur, it is suggested that theories and technologies for generations of legal arguments can only be based on rules of precedent and basing on this, a multi-agent system for construction dispute resolution can used. The system automates the dispute development process, from which it provides predetermined solutions to remedy a particular dispute. The system was operational only after a series of simulation trials in the UK and USA construction industry [8].

However, it is argued that a key cause of disputes in the construction industry is borne of the contractor and suggests early intervention in order to control dispute prolongation. Furthermore, in the analysis of claims and disputes in the construction industry concluded that the terms claims and disputes are a result of players in the construction industry that is; the contractors, consultants, builders, engineers, Sub-contractors and suppliers seeking higher profits and increasingly asserting their rights thus creating an adversarial environment in the industry. It is evident that in Rwanda most the disputes arise from the client side, in either poor contract

preparation that does not incorporate all necessary articles that can protect both parties or poor project management (supervision) on the side of the client [25].

These arguments revolve around finding a fast track system to dispute resolution in the road construction Industry. This is evident of the various construction models development; developed a dispute management model for the Japan industry which proved effective. The model looks at how the present dispute occurrences relate with the past revolution methods, by setting revolution factors basing on rules of precedence [27].

In Rwanda a local court called GACACA was introduced to solve disputes arising from suspect ted genocides and genocide survives that worked efficiently and most of the conflicts/disputes were addressed and now victims live together normally. The Rwanda government should endeavour to export this system to other developing countries to act as ADR (Personal view).

2.1 DEFINITIONS

A review of the literature on conflict and disputes in construction were to be variably used. In many instances, they are used separately or in pairs and frequently without clear indications of the precise meaning of each use. He sees conflicts as the prime driver of disputes [6].

Conflict emanating from opposing interest due to scarce resources, goal divergence, frustration and mixed motive relationships, it exists wherever there is incompatibility of interests among the disputants. It is suggested that conflict can be managed to the point before it leads to disputes [11]. It is observed that disputes occur when a claim is rejected and the rejection is not accepted by the other party [20].

It is commonly agreed that dispute is the manifestation when it occurs; it requires resolution and usually involve third party intervention. The underlying conflict and is linked to difference in perspective, interests and agenda of human beings [24]. It is stressed that dispute is not something that magically appears during the project construction stage. The seeds of a dispute are usually planted during the design and documentation stage by emerge during construction. It adds that disputes can be analysed from lessons learned, experiences and precedence knowledge [12]. Associates conflicts and disputes mostly in construction contracts terms and proposed conflict cannot be avoided but can be managed.

Basing on the information from different writers, there all converges on almost similar causes of disputes and even the proposed solution in different countries appear the same. But due to the losses caused by project disputes /conflicts, both to the client or contractor, more strictness in identifying the causes of the disputes should be emphasised and strict measures taken to protect other stages of the project implementation.

2.2 DISPUTES OCCURRENCE

Unlike other construction projects, road projects are executed in a more diverse environment with a lot of shifting and many changing conditions. This creates tendency to affliction of dispute occurrences. The study on the purpose by which a conflict or grievance, becomes a dispute, called the process transformation. The step which they identified in a transformation, namely that of saying to oneself that a particular experience has been injurious, the second step of 'attributing an injury to the fault of another individual or social entity, they call 'blaming'. The third step, that of voicing the grievance to the person or entity is believed to be responsible and asking for a remedy, they called 'claiming'. In this transformation process, a claim is only finally formed into a dispute when party to whom it is directed rejects the claims, [16, 17].

In simple terms a long last conflict amongst different parties without a solution becomes a dispute.

2.2.0 Design Phase

Design and specification oversight, errors or omissions resulting from uncoordinated civil, structural, architectural, mechanical and electrical design can result in unexpected change orders, wholesale scope changes and project delays [23]. The design profession failure to remain within an owners project budget and design objectives, while not as frequent and occurrence as ill-coordinated documents, nonetheless can result in a project ''growing its own legs" when the designer follows his own vision of what perceived the owner's. The liabilities of the engineer will be questioned and the client may engage the third party.

2.2.1Contract Phase

Project problems will be undoubtedly arise if there is lack of understanding and agreement between the owner and the contractor as to whether the contract is lump sum, cost-reimbursable, (time and materials), cost plus fixed fee or guaranteed maximum price contract arrangement. Other issues that arise during contract formation include;

a) The basis for the contractor's fee
b) Defining what is included in the budget breakdown, particularly when predictable items based upon the design intent remain "un-scoped" and result in a contractor providing the owner an "allowance".

c) Defining what costs are allowed and reimbursable.
d) The budget breakdown and schedule of values for pay items that are essential in controlling billed costs, progress and earned revenue.

The allocation of change orders to budget or pay items relative to billing practices and progress measurement.

In Canadian study, a positive correlation between project cost/time overrun and frequency of claims and disputes on the one hand, and the procurement strategy chosen, on the other.

The study in the UK of 5 procurement types and almost 500 dispute events have similar correlation between "type of procurement method adopted and the types and frequencies of disputes occurring". Generally, claims may be identified as falling into one of the following main groups:

- Conditions are different from the ones represented in contract documents, or known at the time of the bidding of the work; such as different soil conditions, unknown obstruction and others.
- Disputes over the pricing and timing of additional work required, or even whether a piece of identified work is in the contract or not.
- Delays strictly beyond the contractor's control, they may be caused by the owner or by his representative.

- Disputes over a contractor's request for extension on account of changed conditions, required changes to the contract, or owner caused delays.

The construction industry world over is facing a dilemma of improving the contract conditions during execution. The open environment in which the industry operates is one major obstacle, making the industry susceptible to conflicts and disputes. This is illustrated in study of disputes in the United Kingdom's construction industry, where dispute occurrence can adversely affect productivity in the construction industry it is evident that conflicts are barriers to construction industry productivity improvement. These conflicts can be brought by unresolved disputes.

2.2.2 Construction Phase

Construction projects are complex because of the division of tasks and responsibilities between, engineers, and contractors. Road projects require the presence of different, specialists at the construction sites. Failure by the project team leader to coordinate them will cause communication difficulties, which will affect the work productivity and quality.

Construction disputes due to lack of access to utilities, unanticipated site conditions and/or inclement weather impacts on working conditions can result in claims for inefficiency and delay-related costs. The contractor's failure to coordinate subcontractors' work through effective and timely exchange of shop drawings, failure to provide timely responses to revised drawing and engineer's instruction, and purchasing the schedule mismanagement that may impact the work of others, are all factors that also result in delays, inefficiency, rework, defects and cost overruns that lead to claims and disputes.

Contractor over-billings often are the result of a fundamental misunderstanding of what is allowable under the terms of the contract. This includes unsupported costs, disallowed costs under the construction contract, or costs for non-compensable delays, inefficiency, rework and mismanagement. Cost overruns often lead to disputes because of an owner's unwillingness or inability to pay, even when they are the result of legitimate scope changes and/or project upgrades. The owner's contribution to these cost overruns also typically causes contractor delays, acceleration and inefficiency.

Road Construction projects are interdisciplinary by nature, and the lack of communication between specialists may lead to failures. Road Construction failure may create disputes between the participants in Road construction sites [13, 14]. Errors during the construction phase may include:

- Overloading.
- Improper temporary supports.
- Inadequate planning and execution of construction process.
- Lack of inspection.
- Insufficient safety factors.
- In adequate training of construction workers.

Failures also have many other causes such as material defects, poor workmanship, lack of maintenance and so forth. Construction failures often occur because of lack of attention to the construction phase. Failures during the construction disputes regarding the time, cost and quality factor.

2.3 SOME DISPUTED ROAD PROJECTS REGISTERED RECENTLY IN RTDA

2.3.0 First Dispute

CONTRACT:	MAINTANANCE OF PINDURA BWEYEYEYE EARTH ROAD
CLIENT:	RTDA
CONTRACTOR:	MUBILIGI PAUL
CONFLCT/ DISPUTE:	contractor abandoned the works
SCOPE:	32KM
AMOUNT CONTRACTED:	1,993,025,950 FRW
MAJOR CAUSE:	Poor study and excessive rain
IMPACT CAUSED:	The road was not rehabilitated and as a result the Government had to use other means of rehabilitation temporarily because the users this time had already abandoned the road and were using another way through the neighbouring country

WAYS USED OR BEING USED:	Arbitration

2.3.1 Second Dispute

CONTRACT:	MAINTENANCE OF MBA SHYIRA EARTH ROAD
CLIENT:	RTDA/EWSA
CONTRACTOR:	ECOTIBAT
CONFLCT/ DISPUTE:	Works delayed for almost a period of a year because there was misunderstanding on where the funds would come from.
SCOPE:	15.3km
AMOUNT CONTRACTED:	3,212,000,000 FRW
MAJOR CAUSE:	Funds were not released timely
IMPACT CAUSED:	The works have delayed the major goal of accessibility to the newly constructed micro power plant
WAYS USED OR BEING USED:	Amicable means. (Negotiation)

2.3.2 Third Dispute

CONTRACT:	KAZABE RUTSIRO ROAD
CLIENT:	RTDA
CONTRACTOR:	USENGIMANA RICHARD
CONFLCT/ DISPUTE:	Contractor is failing to deliver as the contract stipulates
SCOPE:	53km
AMOUNT CONTRACTED:	3,400,000,000 FRW
MAJOR CAUSE:	Capacity of the contractor (financial capability), Heavy rains
IMPACT CAUSED:	The road, up to now is impassable.

WAYS USED OR BEING USED:	Amicable means (Negotiation)

2.3.3 Fourth Dispute

CONTRACT:	Rehabilitation and periodic road works on nyakinama-vunga-satinsyi road.
CLIENT:	RTDA
CONTRACTOR:	ERGECO SARL
CONFLICT/DISPUTE:	Delays and losses
SCOPE:	24km of un paved road
AMOUNT CONTRACTED:	1,740,583,720FRW
MAJOR CAUSE:	Poor evaluation of bid document.
IMPACT CAUSED:	Delays in starting the works due to appeal made by another bidder.
	Delays and losses caused to the contractor
	` End users still in isolation
WAYS USED:	Adjudication

2.4 CAUSES OF ROAD CONSTRUCTION DISPUTES

Road construction projects are unique among construction projects because usually the geographical coverage is large. The contract documents may not exhaustively cover all aspects of project and hence issues arising may end up causing disputes. Many researchers have studied the reasons for construction claims and disputes. A survey reported that the most common causes of claims are scope changes, weather and restricted site access. Other researchers have also added additional factors such as unclear documents, late supply of material and equipment, and the low profit margins in the industry [16, 17]. Earlier, identified three root causes of conflict: (1) behavioural problems; (2) Contractual; and (3) Technical problems due to uncertainty and low experience. In addition, it was found that the largest contributors to claims

were post contributors to claims were post contract changes by clients, different site conditions, and unfilled duties of the engineers.

A developed causal model for disputes with diverse applications identified a plethora of causes of disputes and suggested that disputes arise as a result of pathogens within a project system. Such pathogens contribute to unworkable relationships, procedures and design and construction deficiencies as illustrated in figure 2.3. Pathogens are latent conditions and lay dormant within a system until a dispute comes to light**.**

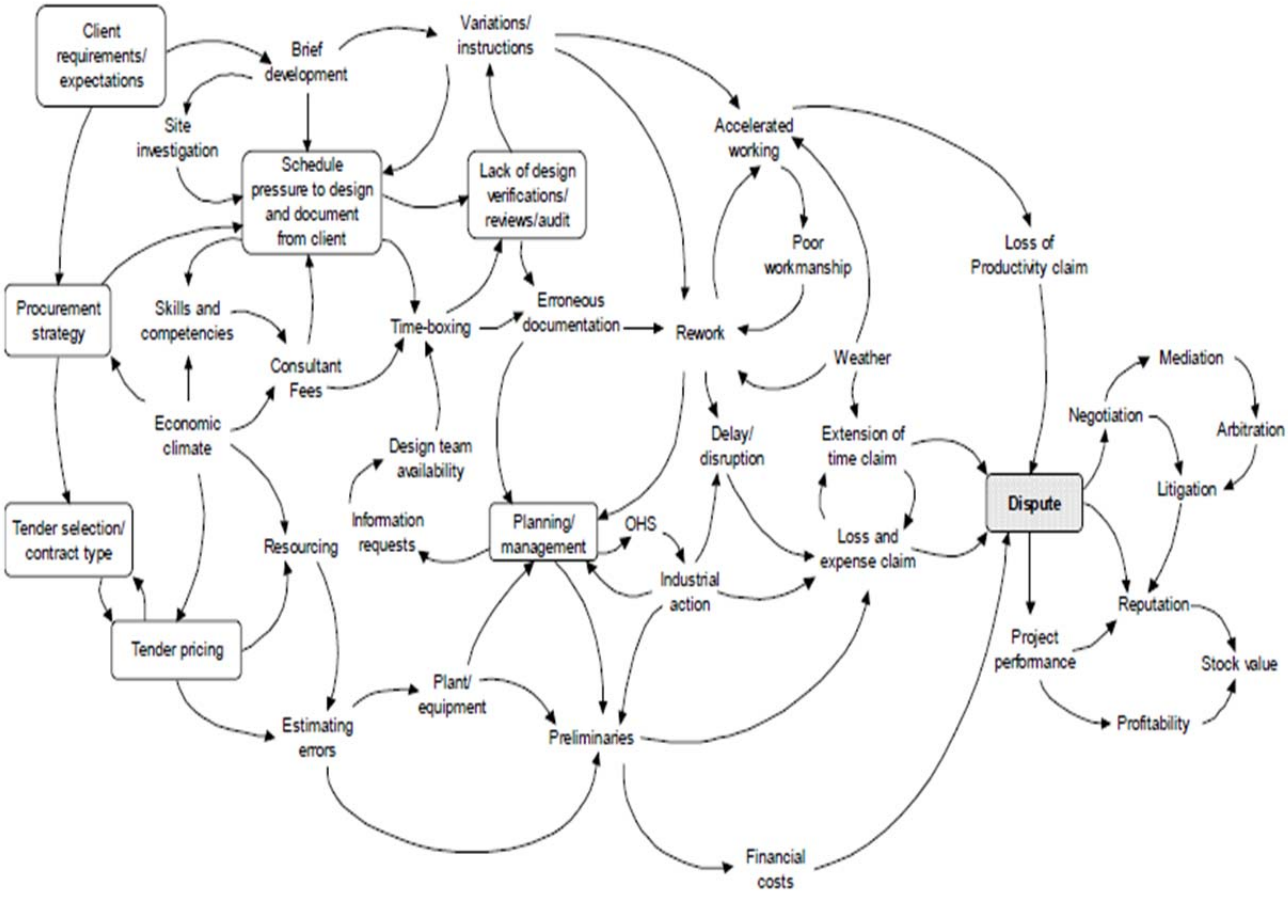

Figure 1: Casual Model for disputes (love et al., 2009)

It was suggested that the key constructs influencing disputes are people, process, and product [21]. An alternative view is that the project management practices and the behaviour of people are the constructs that will influence disputes as illustrated in figure 4. The status of the

economic climate within which the construction industry operates will influence the form of project management strategy adapted and the organization management practices implemented.

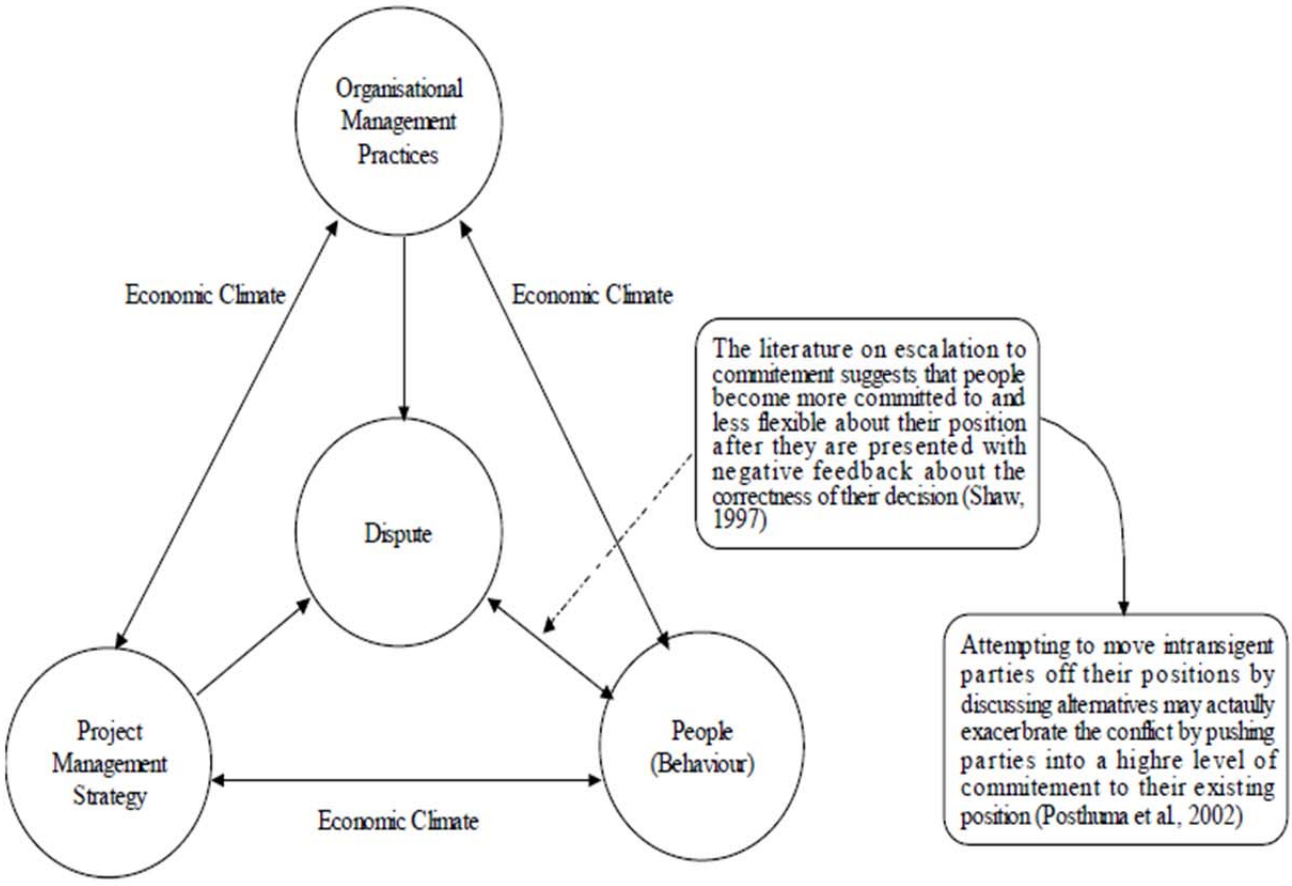

Figure 2: Constructs influencing disputes (Love et al., 2009)

Although it is best practice if all projects are fully planned, changes in circumstances demand that flexibility must be maintained. Measures sure ideally be those that can function in either expected or changed conditions, striking a balance between precision and flexibility.

It was noted that as project increase in size and complexity, so does the risk of cost and time overruns, which invariably leads to disputes. He cited others who believe that the failure to act, all incorrect action, to cope with information systems, communication and knowledge are the primary causes of construction disputes. Associated disputes to project uncertainty, contractual problems and opportunistic behaviour [21].

Associates disputes with a combination of issues including time, cost and defects; the contractors' cash flow; and extra difficulty of the private sector and to negotiate for commercial settlement, where as public organisations seek determination of a dispute by a competent tribunal [15]. This finds:

i. Uncertainty causes change beyond the expectation of the parties
ii. Process problems including imperfect contracts and realistic performance expectations and
iii. Peoples issues, problems due to poor communication, poor interpersonal skills and opportunistic behaviour, as the common causes of disputes.

2.5 METHODS OF DISPUTE RESOLUTION

There are several methods available for resolving disputes between parties. The first and most important method is through the courts. When a dispute arises between two parties belonging in the same country, there is an established forum available for the resolution of the same. The parties can get the same dispute resolved through the courts established by the law in that country.

Research has shown that there are various ADR methods, which can be used to resolve disputes before seeking court interventions as shall be discussed.

It is very vital to believe that the future of the success of dispute resolution in road construction lies in the methods that are:-

- Cheap:- Perhaps those that provide value for money.
- Speedy:- In theory and in practice.
- Fair and just.
- That is closed out: - Not left hanging without a binding decision or a mutually agreed settlement agreement.
- Take head of the advice that (Justice delayed is Justice denied).
- Where if there are negative impacts of differences (example confrontational attitudes exist, the impacts should be minimal.

ADR methods involved from the American construction industry, which were later adopted by FIDIC and incorporated in international construction contracts. ADR methods are informal and formal procedures that serve as alternatives to litigation. Also, ADR procedures demonstrate to be a less time consuming and costly option to litigation procedures. Dispute resolution in road construction projects may take the following stages.

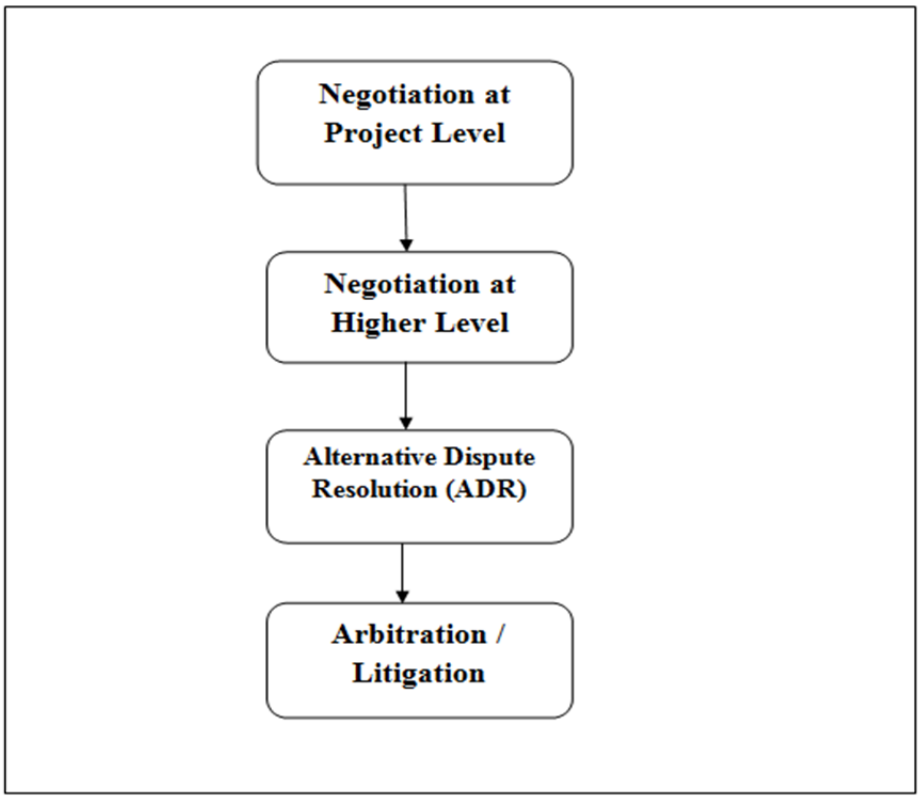

Figure 3: Stages in dispute resolution (Carmichael, 2002)

ADR is a contractual dispute resolution mechanism; therefore it is dependent on the existence of an agreement between parties and is globally defined as a set of methods for resolving disputes without litigation, covering a spectrum of non-litigation method. Therefore two groups of construction ADR techniques are:-

- Formal, binding methodologies. Binding ADR is predominantly arbitration, the most widely used ADR mechanism in construction.
- Non-binding ADR methodologies include mediation, negotiation, third party neutrals and mini trials.

ADR has both; increasingly used alongside, and integrated formally into legal systems internationally , It has the following advantage; Suitability for multi-party disputes, flexibility of procedure- the process is determined and controlled by the parties in the dispute, lower costs, less complexity ("less is more"), Parties choice of neutral third party (and therefore expertise in area of dispute) to direct negotiations/adjudication, likelihood and speed of settlements, practical solutions tailored to parties' interests and needs (not rights and wants, as they may perceive them) durability of agreements, confidentiality, preservation of relationships and the preservation of reputations.

2.5.0 Arbitration

Arbitration is a form in which each party and the party present the position of the party before an impartial third party, who renders a specific award." It is an adversarial private dispute resolution with final and binding resolution. Its advantages include; awards enforceable in the courts worldwide, private and parties can control the rules and procedures. Arbitration may take the following steps;

1. Dispute arises (Start)
2. Request for and submission of dispute to arbitration (This may be to a specific arbitrator or to an institution. Choices may be predicated by a pre-contractual term in an agreement which has given rise to the dispute.
3. Parties agree on the arbitrator or an arbitrator is appointed by an arbitral institution or a court.
4. Arbitrator accepts appointment.
5. Preliminary meeting at arbitrator's request. This may be a joint session with everyone present or maybe conducted by telephone conference.
6. Arrangements of the arbitration including hire of venue and travel arrangements, usually done by the parties with or without the assistance of an arbitral institution.
7. Arbitrator issues directions.
8. Preliminary hearings and interim awards possible in respect of security of costs, scope of arbitration agreement etc.
9. Submission of pleading: claims/counterclaims and response to counterclaim.

10. Discovery and preparation of agreed documents.
11. Preparation of expert report.
12. Hearing (all parties, representatives, witnesses and experts and arbitrator).
13. Award: decision and costs (The End).
14. If non compliance-action for enforcement or challenge of or to award.

2.5.1Mediation

Due to adversarial nature of arbitration, mediation is seen as an alternative to arbitration. Mediation is a means of settlement dispute which involves an independent individual to assist the parties in dispute to reach a settlement. It is a consensual and non-adversarial procedure which produces the final result and encouraged as a precondition process prior to litigation, the use of mediation within contract or as part of dispute escalation clause has also become more popular, not just in the construction industry but in other commercial sectors as well. Pros for mediation include; brings parties together, confidential control, flexibility, cost-effective and reality testing.

Generally there are two types of mediation process: facilitative and evaluative approaches. However, the parties are free to adopt any type of two types of mediation process to suit the nature of disputes and attitudes of disputants.

Facilitative approach requires the mediator to facilitate the process and evaluate or intervention requires the said mediator to evaluate and propose a settlement. Some literature regarded evaluative mediation as conciliation or an extended version of mediation [2].

2.5.2Negotiation

Negotiation is a voluntary pre-hearing or a mandatory pre-trial, It is generally an extension of the parties' earlier negotiation, but is conducted by their newly appointed representatives or attorneys. If unsuccessful, such negotiations may also continue as a "final attempt" pre-trial under the direction of a trial judge. However, any settlement or resolution is only achieved by agreement of the parties.

Although this method can avert a trial, its success depends on the attitudes and expertise of the representatives. If these individuals happen to be opposing attorneys, they must be dedicated to the success of their mission; otherwise, they might as well be in court.

2.5.3Conciliation

Conciliation is that the outcome is a non binding agreement binding in honour only. Conciliation is used extensively for negotiations between large employers and trade unions. Although non adversarial, it may take more time to reach a compromise between disputing when used. This is so because the third parties are usually big association like; PSF and ombudsman's office for Rwanda's case. Unlike commercial mediation which can often be concluded, even in respect of highly complex matters involving large sums of money, within a single one day mediation session, employment conciliation will often involve many sessions conducted over several days or even weeks.

2.5.4Adjudication

Adjudication is a quick and inexpensive method of dispute resolution resulting in an immediately enforceable, non-binding dispute settlement, by a third person, known as the Adjudicator. The Adjudicator is likely to be an expert first and foremost but may also be a qualified lawyer. Most construction adjudicators are qualified builders such as architects, civil engineers and quantity surveyors.

This helps the process because the adjudicator will not need to hear and read large quantities of expert evidence to help him understand how the industry operates. This keeps time down to a minimum and avoids much unnecessary expenses.

Opinion varies as to whether adjudication should be limited to a claim for payment only and not for any dispute arising under the contract**.** Certain legislation, in particular that of New South Wales(Australia), is quite narrow in its application of adjudication to matters only concerning payment. The UK legislation, on the other hand, provides for all matters in dispute to be referred to adjudication. It has been used as many non-payment issues, as it does not prevent disputes regarding matters such as interpretation of contract, quality of work or extension of time being resolved before they become payment disputes.

2.5.5 Dispute review boards

DRB typically consists of three neutral experts, who visit the site periodically in order to monitor progress and potential problems. When requested by the parties, the board conducts an informal hearing of the dispute and issues an advisory opinion that the parties use a basis for further negotiations**.**

Like in the other countries, the nature of disputes in the Rwanda construction industry is fuelled by a prevailing adversarial climate. The construction industry has been unable to reduce the number and magnitude of disputes between contractors and owners. Disputes result in substantial dilution of effort and diversion of capital from what should be the goal of the industry; creation of works and structures to serve the public. Instituting of dispute resolution boards in one bid step to relieve the industry of preconceived dispute resolution constraints, Rwanda requires a CADR to relieve courts with cases that can be solved amicably by the guiding of law. In more support of DRBs, there are some contracts implemented by the World Bank where dispute resolution boards are required to be incorporated in contract documentations before contract award**.**

2.5.6 Expert Determination

Expert determination is defined as a procedure involving a third party, with expertise in the particular subject-matter in issue, to give a determination upon that specific issue:

- Useful for a single issue
- Experts are subject to little court control
- Expert may be reliable for negligence
- Expert not obliged to observe the rules of natural justice and conduct the procedure with fairness

2.6 IMPACT OF CONSTRUCTION DISPUTES

The problems of construction disputes impacts on all stakeholders, which may lead to an inequitable mode of project delivery such as reduced margins, increased costs and even reduced quickly and/or level of service. Most disputes are of minor nature and settled quickly, fairly and amicably by the project team [18, 19].

The consequences of the construction disputes will not benefit the stakeholders in the construction project. An extensive research was carried out on construction dispute resolution and in their findings the following impacts were identified;

a) Additional expense in managerial and administration.
b) Possibility of litigation cases.
c) Loss of company reputation.
d) Loss of profitability and perhaps business viability.
e) Time delays and cost overruns.
f) Diminution of respect between parties-deterioration of relationship and breakdown in cooperation.
g) Higher tender prices.
h) Extended and/or more complex award process.
i) Rework and relocation costs for men, equipment and materials.
j) Loss of professional reputation.

2.7 OPERATION OF THE DISPUTE RESOLUTION MECHANISMS

Most disputes in international construction projects are by establishing mechanisms, models and system. Many researchers have proved this presents four principles to consider when designing an effective dispute resolution system for construction [3, 4];

- Consider the unique nature of the construction process.
- Even when problems turn into disputes, litigation should not be the method used to resolve them.
- If participants commit in advance to use dispute resolution techniques when problems arise, they create an atmosphere conducive to solving problems.

- Many problem-prevention and litigation-avoidance approaches exit; these techniques are most effective when applied early in the project."

The best practices for designing dispute resolution systems include.

a) Flexibility
b) Early intervention, exhaustion of collaborative options before resorting to adjudicatory methods , and
c) Controlled escalation of the dispute by using different ADR methods in a logical progression

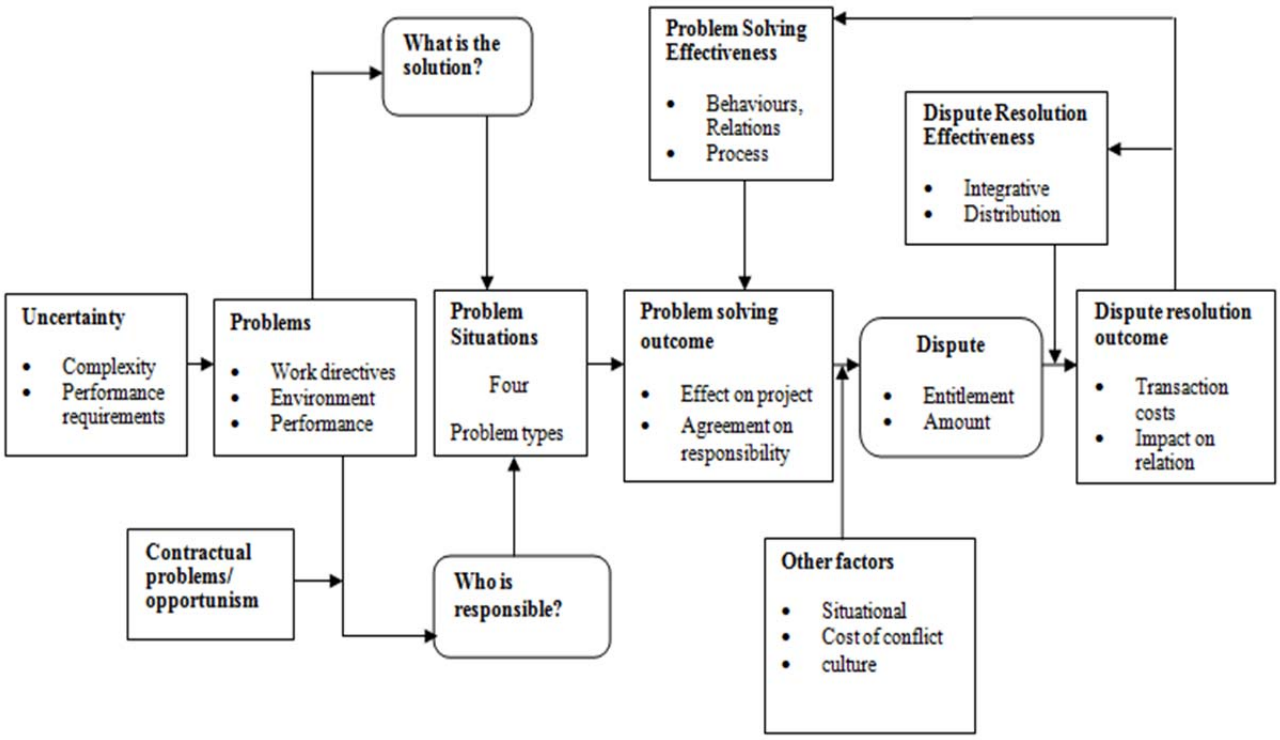

Figure 4: A model of Dispute development and resolution (Groton, 1997)

In addition, it is urged that disputes resolution have got procedural interfaces and therefore no conclusive method can be used entirely alone, to solve a complex of problems in the road construction sector.

In their study of the American Construction industry, it identified intervening factors procedural flow chart was developed and illustrated in Figure 5. The model indicates that always preventive

techniques should be employed first by parties to the project. Planning should be made to allocate and accommodate possible risks when fail to agree, and dispute occurrence becomes inevitable, a step by step approach is applied towards a resolution. At most five stages are suggested before reaching a binding resolution. If an agreement is reached at the stage step the no need to explore other as long as it is binding.

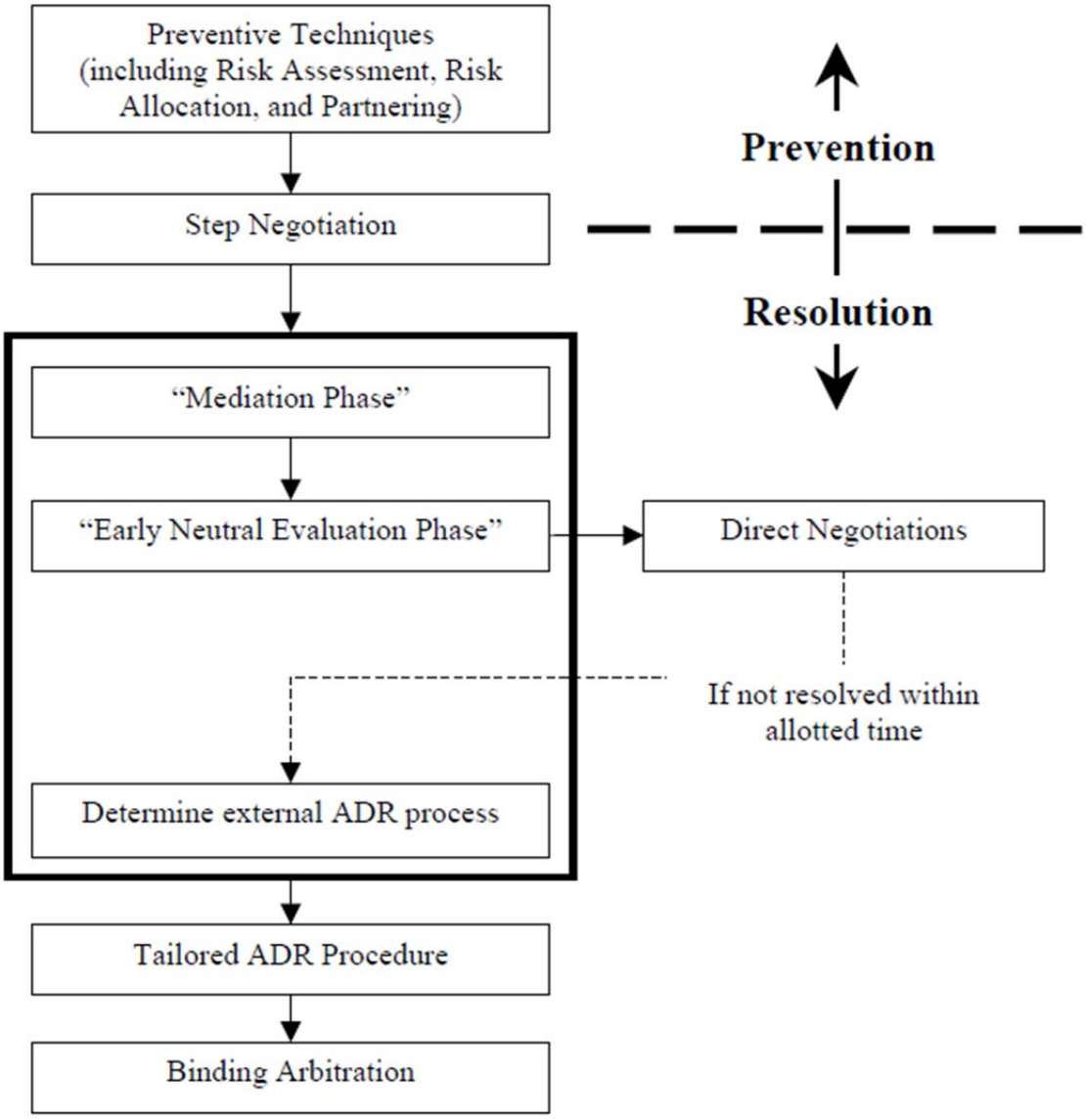

Figure 5: A frame work for Dispute prevention and resolution

Tactual he UK and US construction industry are plagued by a progressive disease of heighten adversity and rising litigious occurrences between parties participating on civil engineering

projects. In a report prepared by the UK National Contractors Group of the Reading University Centre for Strategic Studies in Construction, it is declared that over the past 20 years, loss and expense [due to] contractual claims have attacked the British [and American] industry like a cancer (Another leads on dispute resolution 1991). In the UK, increasing contractual dispute adversarial natures, and poor project management contribute to the current adverse climate in the construction environment.

In both, the UK and the US construction industries, the number of claims and the cost of litigation have dramatically risen. In 1991, the Military Engineer reported that in the US, it became apparent that litigation was taking an increase toll in the contract claims area. Claims for additional costs were increasing.

Contract relationships in the United Kingdom (UK) and the United States (US) have become increasingly strained in recent years in the construction industry. This has resulted in a substantial increase in the use of judicial system for the settlement of contractual disagreements. The construction industry has become increasingly adversarial in both the public and private sector contracting. Among the stakeholders, the working relationships, the communication and the commitment to successful job and each other are often not performed in good faith. For all parties involved, these predicaments cause difficulties and additional costs to accomplish the construction activities.

2.8 CONCEPTUAL FRAMEWORK-CASUAL RELATIONSHIPS

As suggested there are major three key constructs that influence dispute resolution processes which are; Casual factors, methods and people. As highlighted in conceptual frame work in figure 6, the status of the economic climate within, which the construction industry operates, will influence the nature of disputes incurred depending on which parties and people involved on the project. On the other hand, in an effort to resolve these disputes, people or parties will react by employing an appropriate dispute resolution method depending on the nature of the dispute. Ideally, the conceptual frame work shows that people or parties in the contract are solely responsible for assessing dispute occurrence, since there are no automatic systems like it would have been in a closed manufacturing setting.

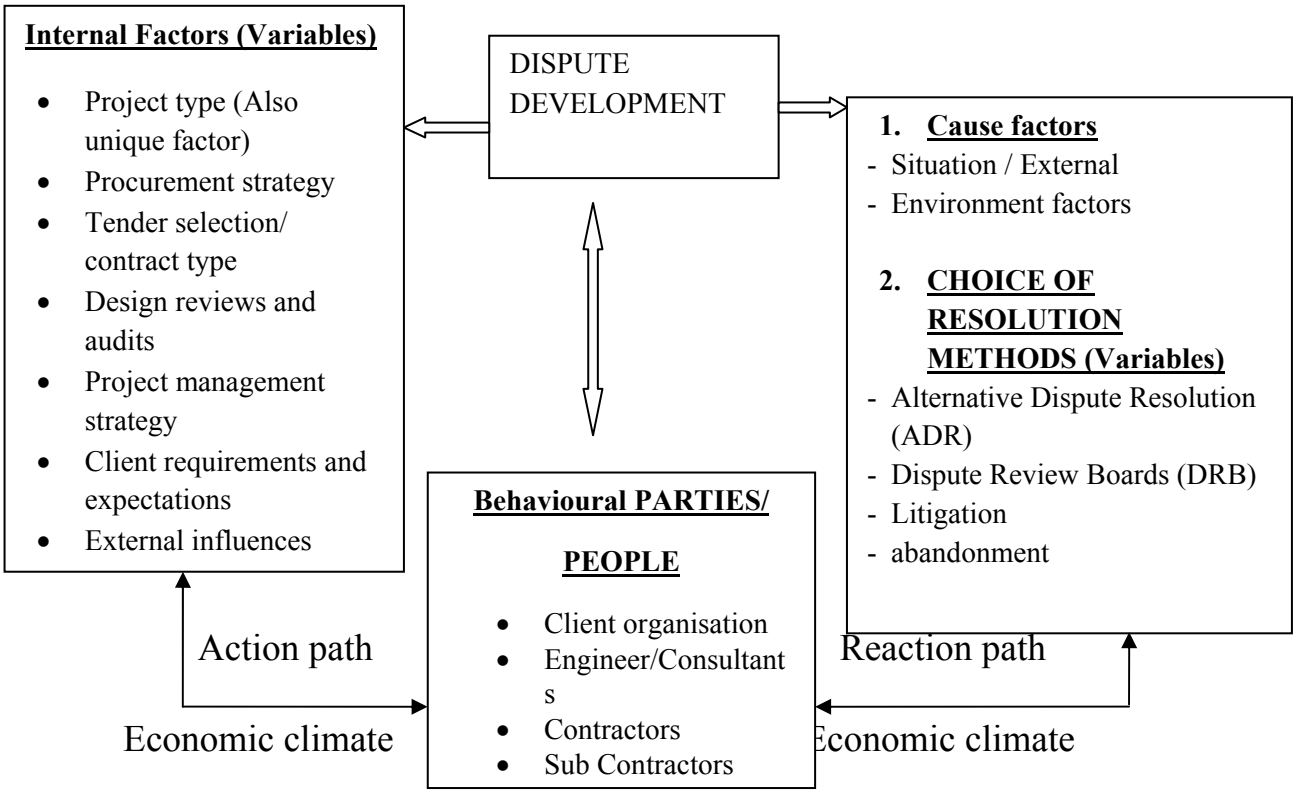

Figure 6: Conceptual framework

2.9 SUMMARY

In this review, the major causes of disputes in construction were identified and categorised. These are the same causes that will be used when collecting survey data in the field. Causes of disputes which are client related:

i. Failure to respond in a timely manner
ii. Inadequate tracing mechanisms for RFI (Request For Information)
iii. Reluctance to check for constructability, clarity and completeness
iv. Discrepancies/ambiguities in construct documents
v. Poor communication between and among the parties involved in the project
vi. Failure to appoint an overall project manager
vii. Lowest price mentality in engagement of contractors and designers
viii. The absence of "team spirit" among the participants

ix. Deficient management, supervision and condition efforts on the part of the project.

Disputes which are contractor related include:

i. Inadequate contactor management, supervision and coordination
ii. Lack of understanding and agreement in contract procurement
iii. Failure to understand and correctly bid or price the works
iv. Reluctance to seek clarification
v. Failure to plan and execute the changes of works
vi. Inadequate CPM scheduling and update requirements
vii. Delay/suspension of works.

Disputes that are designer related include;

i. Failure to understand under design team contract
ii. Over-design and underestimate the costs involved
iii. Inadequate in open and factual communication Late information issued and cumbersome approaches to RFIs
iv. Design and specification oversights and errors or omissions resulting from uncoordinated civil, structural, architectural, mechanical and electrical designs, incompleteness of drawing and specifications. There other related causes of disputes identified by different schools of thought as listed in appendix-1 of this report.

The dispute resolution formulations in Rwanda should adhere and respect the provision of Clause 20 and at the same time think of formulating ADR, as we do not have dispute review boards like in UK and other developed countries. This is mainly because of the construction industry in Rwanda is still growing and therefore most procedures including those concerning disputes are still in formulation. However, improved global interactions and sharing of scholarly ideas has made it easy to improve on dispute clauses especially when it comes to international contracts.

Although considerable research has been on conflicts and disputes in developing countries especially in Asia, the Road construction industry has not been given much attention. Most of the literature has concentrated only on the building sector, yet roads are the infrastructure back

bone of growing economy. The various discussions in the literature if considered by the different players in Rwanda construction industry, particularly the road sector, will considerably reduce the dispute occurrences and their impact. This will work most if the procedures discussed are applied at early stages of dispute occurrence.

Finally, it has been observed that every industry has its own unique conditions and laws un like that construction dispute in Rwanda. There is need to limit the generalisation of factors relating to disputes. Sometimes disputes can become matters or rules and policy especially if they are not resolved in their early stages, that is; if they become adversarial. Therefore more emphasis has to be put on the significance of factors relating to dispute resolution in a particular sector of the country's construction industry, especially impacts and causes of disputes which this research has tried to address.

CHAPTER III: METHODOLOGY

3.0 INTRODUCTION

This chapter provides the research procedures used, Reviews the instruments used in collecting the data, and discusses reasons why particular instruments were used over others. It also shows how the questionnaires were administered and methods used to select the respondents and their justification. Data analysis is also discussed.

Road construction industry is across cutting sector in social, political and economic welfare of the country. This industry has to be protected and managed well to avoid arising disputes that may lead to social, political and economic problems in the country.

The intention of this thesis having the main objectives as to analyse the causes and impacts of disputes in the Rwanda road construction sector and determining ways of reducing or addressing such disputes, methods and methodologies should be identified clearly to make sure that the targeted objectives are achieved.

We can all bring (often implicit?) assumptions and path dependencies to our research (sexton 2002), and different research methodologies can be used to help to understand not only the products of scientific inquiry but also the process itself.

A good research methodology is the one that is appropriate to the study and should be fully justified.
A selected research methodology can influence the formulation of the hypothesis to be tested/procedure by which research questions are to be explored and the choice of sample to be drawn or the variables to be selected for the study.

The following factors determine the choice of research methodology to use:-

- The nature of the problem to be investigated (including aims and objectives).
- The audience for whom the research is intended.
- Need to follow/emulate similar research studies /to make comparison with other similar studies.

- The personal experiences of the researcher (Ontological, Epistemological and Axiological positioning of the researcher and his/her work).

a) Ontology is the study of the conception of reality [5].

Objective ontology: it sees social phenomena and their meanings as existing independently

b) Constructive ontology: this infers that social phenomena are produced through social interaction and are therefore in a constant state of revision [5].

a) Epistemology: this is the study of how we know what we know.
Epistemology is the explanation of how we think. It is required in order to be able to determine the true from the false, by determining a proper method of evaluation. it is needed in order to use and obtain knowledge of the world around use. Without epistemology, we could not think. More especially, we would have no reason to believe our thinking was productive or correct, as opposed to random images flashing before our mind.
Positivism: methods of natural science should be applied to study social phenomena, it only views knowledge as a key goal of scientific approach and that it can only be created through controlled study and the management of facts (which are proven, true pieces of knowledge). Positivists aim at identification of laws of the universe.

One epistemological position is positivism. Positivism suggests that there is a straight forward relationship between the world (objects, events, phenomena) and our perception, and understanding of it.

What is out there and to get it right. Such a position is also referred to as the correspondence theory of truth, because it suggests that phenomena directly determine our perception of them and that there is therefore, a direct correspondence between things and their representation.

Interpretive sees a difference between the objectives of natural science and people in that phenomenon have different subjective meaning for the actors studied.

Axiology: is the study of value, the investigation of its nature, criteria, and metaphysical status

Axiology is usually divided into two main parts:

a) Ethics: the study of values in human behaviour or the study of moral problems: (1) the rightness and wrongness of actions (2) the kinds of things which are good or desirable, and (3) whether actions are blameworthy or praiseworthy.
b) Aesthetics: the study of value in the arts or the inquiry into feelings, judgments, or standards of beauty and related concepts. Philosophy of art is concerned with judgements of sense, taste and emotional.

3.1 DEFINITIONS

Research methodology is a way to systematically solve the research problem by logically adopting various steps; it helps to understand not only the products of scientific inquiry but the process itself.

Research methods are approaches used to gather data to be used as a basis for explanation, inference, prediction or action. These methods are determined by the research methodology adopted.

The choice of research methodology is determined by the nature of the problem to be investigated that includes the aims and objectives of the project (epistemology). Also the personal experiences of the researcher, the audience for whom the research is intended and need to follow /emulate similar research studies /to make comparison with other similar studies are also choices for research methodology (Prof. Charles Egbu).

Epistemology is concerned with the origin, nature, limits, methods, and justification of human knowledge.

The epistemological contribution to research is essentially theoretical and without theory there is nothing to research,

This statement draws attention to the role of theory in the interpretation of data. It is well known that epistemology is inescapable, a reflexive researcher actively adopts a theory of knowledge and a less reflexive researcher implicitly adopts a theory of knowledge, as it is impossible to

engage in knowledge creation without at least tacit assumption about what knowledge is and how it is constructed.

The researcher preferred using positivist epistemology because of the type of research to be investigated, which requires knowledge that can only be gained by gathering facts in a systematic and objective manner, predominantly by testing the hypothesis in order to gradually reach the objective. This is to refine them and achieve applicability on a universal level.

The term positivism was first coined by the founder of positivism, Augustine Comte, positivism maintains that the scientist is the observer of an objective reality. According to the definition positivist position maintains that scientific knowledge consists of facts while its ontology considers the reality as independent of social construction [26].

It is argued that research can choose which stage to begin at, epistemological, ontological, methods or methodology.

The positivist paradigm is also called scientific paradigm and the purpose of using this paradigm is to prove or disprove a hypothesis. Other characteristics of positivist research include an emphasis on scientific methods, statistical analysis and generalised findings. Furthermore, positivist research usually has a control and experimental group and testing method.

The Interpretive paradigm can be called anti-positivist paradigm because it was developed as a reaction to positivism. It is also sometimes referred to as constructivism because it emphasizes the ability of the individual to construct meaning.

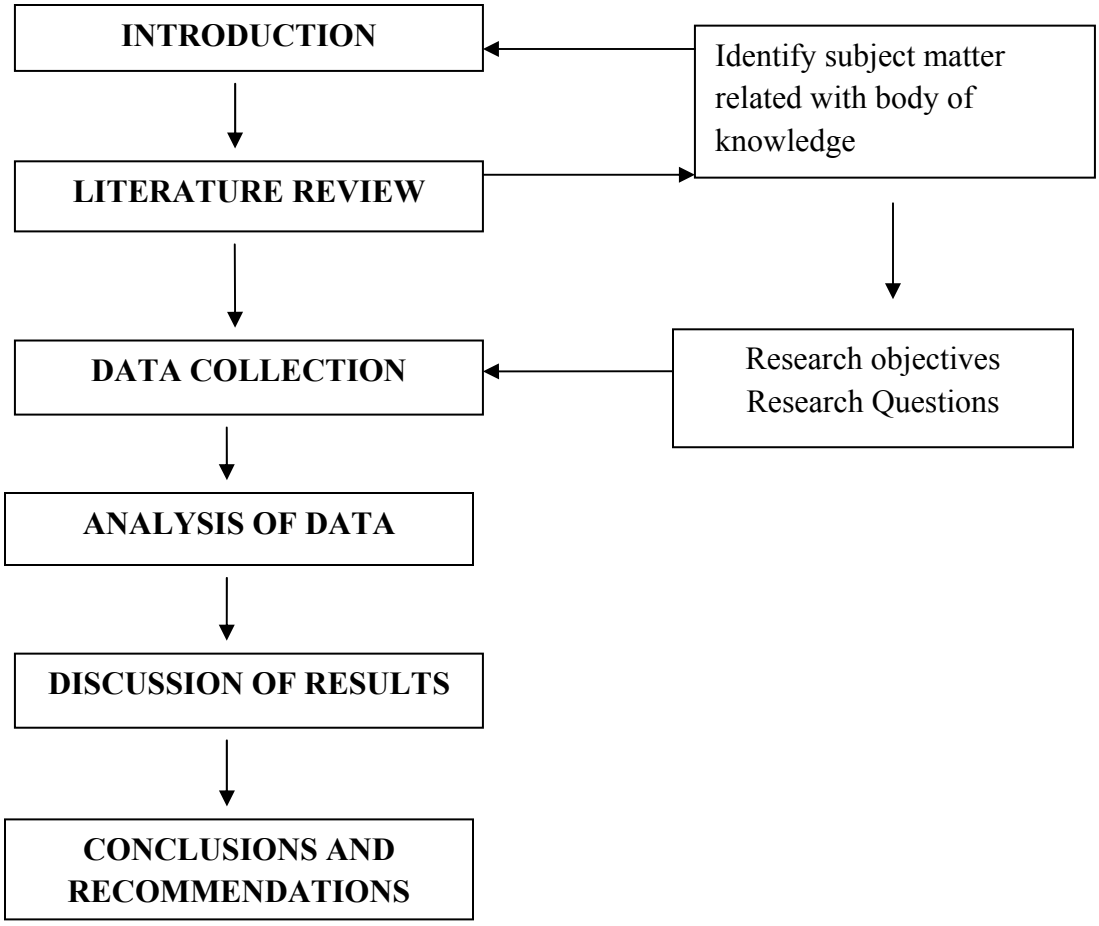

Figure 7: Steps followed in the research

3.2 RESEARCH DESIGN

The process of situating the researcher in the empirical world and connecting research questions to data.

The research method is a strategy enquiry, which moves from the underlying assumptions to research design, and data collection .Although there are other distinctions in the research modes, the most common classification of research methods is into qualitative and quantitative. At one level, qualitative and quantitative refer to distinctions about the nature of knowledge: how one understands the world and the ultimate purpose of the research. Neither of these methods is intrinsically better than the other, the suitability of which needs to be decided by the context,

purpose and nature of the research study in question. In fact one can be alternatives to the other depending on the kind of study.

Data are assumed to be objective facts that already exist in the world, and the role of the research is to discover these data and determine the theories they imply.

Humans should be the primary data collection instrument, since it is difficult to envisage non-human instruments that could interact with participants in a way that would reveal their multiple constructed realities. As every act of observation influences what is seen, the research has to be the primary data gathering instrument to fully understand, respond and describe the complex interactions taking place.

As each research participant has their own point of view the focus of research is on the identification of contextualised meaning of these multiple points of view with the goal of increasing a joint, collaborative reconstruction from the multiple realities that exist

The research approach and techniques used in this study was descriptive as it involved developing research questions covering then the existing state of the subject. As suggested a descriptive research determines and reports the way things are [9, 10].

A survey was done and questionnaires were used to collect both quantitative and qualitative data from the respondents, these were analysed using SPSS and spread sheets, then ranked, and a sample t-test was made from the overall view in order to draw conclusions and recommendations.

Basic description of a mixed methodology is simply that methodology with methods that have comparisons between quantitative and qualitative data. Quantitative data is data in numerical form, often derived from questionnaires or structured interviews.

Qualitative data is descriptive data from observation or unstructured interviews. In other wards the researcher believes that triangulation in carrying out research is very important because it can be employed in both quantitative (validation) and qualitative (inquiry) studies and it can became an alternative to traditional criteria like reliability and validity.

Triangulation is the application and combination of several research methodologies in the study of the same phenomenon. It is preferred by combining multiple observers, theories, methods and empirical materials; researcher can hope to overcome the weakness or intrinsic biases and the problems that come from single method, single-observer, and single-theory studies.

Often the purpose of triangulation in specific context is to obtain confirmation of findings through convergence of different perspectives. The point at which the perspectives converges seen to represent reality

Some researchers prefer to use mixed methods approach by taking advantages of the differences between quantitative and qualitative methods, and combine these two methods for use in a single research project depending on the kind of study and its methodological foundation**.**

As epistemology type of research methodology gives a room to allow for the integration of a variety of methods, the researcher's choice was to use mixed methods, including quantitative and qualitative approaches. In this particular research, the researcher takes a direction of mixed methodology so as to have a robust grounding in theory.

The largest assumption that the mixed methods paradigm has is that most comprehensive research has a combination of both quantitative and qualitative methods in their studies. Mixed methods does not subscribe to any one philosophy because it uses the assumptions from both quantitative and qualitative paradigm .Mixed methods researchers ,as much as they feel that both qualitative and quantitative paradigm have limitations, they can be lessened by choosing methods that complement each other .

Mixed methodology's first strength is that it is a workable solution to the seemingly unending debates between qualitative and quantitative purists. Strength lies in its purpose, which is significant.

Mixed methods is both deductive and inductive, it is both objective and subjective, it is entirely practical and applicable to many researchers as it allows a researcher to study what is important to him or her, it allows the researcher to vary the methods used to study that interest, and it allows the researcher to use the results of study to create positive movements in the researcher's own specific area of interest. It also allows the researcher to begin the study with a positive

attitude towards both qualitative and quantitative inquiry, it allows him or her to narrow or expand a focus as needed, where he or she can dive much further into data to understand meaning than they could if a single method was used. Mixed methods research is flexible in other words can be used to add meaning to the quantitative data and numbers can be used to inform or supplement the words, the researcher can explore a broad range of questions because he or she is not restrained by their research methodology's individual paradigm, finally, it provides stronger concluding evidence through convergence and corroboration of the research findings.

Creswell, Fetters and Ivonkova, have constructed an insightful conceptual frame work for making sense of the mixed methods, particularly around issues of quality.

A mixed method has advantages of suggesting, discovering and testing hypothesis. Give new insight on complex phenomenon, they allow the investigator to address practice and policy issues from the point of view of both numbers and narratives.

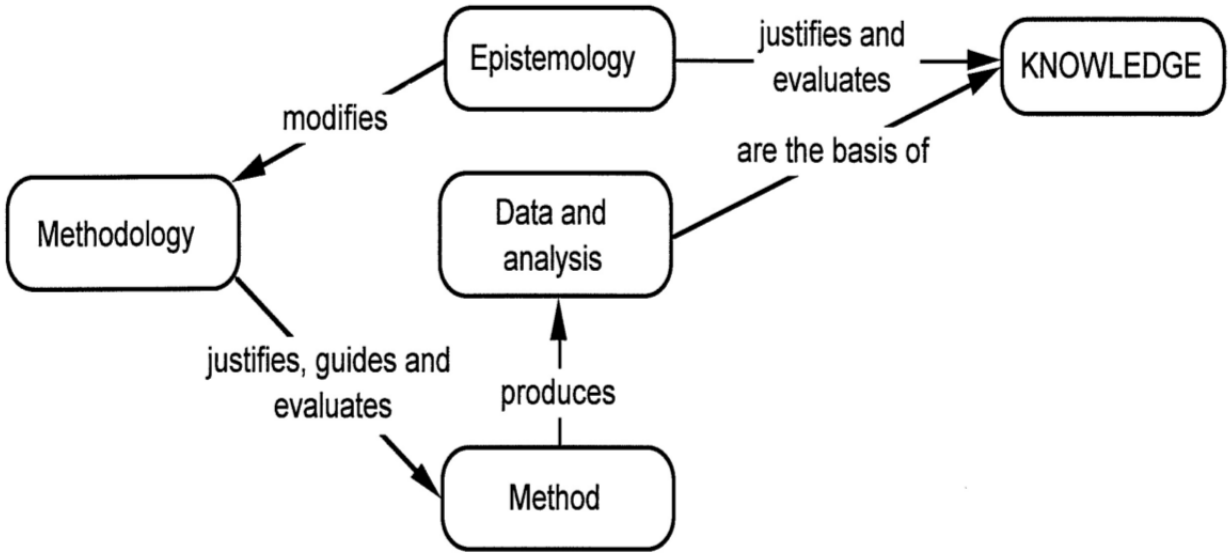

Figure 8: Showing epistemology methodology procedure

3.3 SURVEYS

The population can be represented by choosing a preferred sample using the appropriate method. The opinions and characteristics of the population can be explained through the use of a representative sample; Primary data can be obtained through, questionnaire, interview, observations and case studies [9, 10].

Mixing questionnaire and interview method noted that structured questionnaires and semi-structured interviews are often used in mixed method studies to generate confirmatory results despite differences in methods of data collection, analysis and interpretation [5].

Questionnaires can provide evidence of patterns amongst large populations; qualitative interview data often gather more in-depth insights on participant's attitudes, thoughts, and actions.

3.3.0 Questionnaires

Questionnaires are a formalised set of questions for soliciting information, with concise, pre-planned set of questions designed to yield specific information to meet a particular need for research information about a pertinent topic. It is a means of eliciting, beliefs, experiences or attitudes of some sample of individual.

Using questionnaires is preferred because of its added advantages of being economical, where expenses and time involved is relatively cheaper compared to as tools. It also has uniformity of questions where each respondent receives the same set of questions phrased in exactly the same way.

Positivist approach suggests that closed questions should be used whereas a phenomenological approach suggests open ended questions. Both open ended and closed ended questionnaires were used.

Closed ended questionnaires were preferred in collection of primary data because they were easy to analyse and also provide the respondents with options to choose from. There are two types of close ended questionnaires that is;

i. Multi-choice and

ii. Rating scaling questionnaires.

Open ended questionnaires have a number of desirable features. The respondent is not influenced by pre-tested set of response categories and thus, opinion can be expressed that are quite divergent from what the researcher expected or what others had expressed. They can also provide the researcher expected or what others had expressed. They can also provide the researcher with a basis for judging the actual values and views. These were used in some parts of the questionnaires especially on opinion questions.

The closed ended questionnaires were rated on a likert scale, this was preferred because it has the following advantages; it is easy to construct unlike other scales, more reliable and provides data which is easy to analyse; gives precise information about the respondent's degree of agreement; feasible to give an empirical test to each statement for discriminating ability; easy to use in respondent centred studies and much less time consuming in terms of construction. This provided respondents with values to choose; that is from 1 to 5. It determines the respondent's degree/level of agreement or disagreement and takes the form; very significant (1), insignificant (2), Average (3), Significant (4), Very significant (5). Questionnaires were in three sets, the first was administered to construction companies specifically to project managers or contract managers who have considerable experience in contract administration particularly projects which involved road construction. The second was administered to client organisation; since the research was dealing with disputes in road construction projects then only public organisations were considered. The third set of questions was administered to consultants or project engineers or managers.

3.3.1 Interviews

An interview includes verbal exchange of questions between the respondents and the interviewer, using an interviewer guide. Though it is time consuming, a lot of information can be obtained from this method it was not emphasised on because it is expensive, can be biased and time consuming.

3.3.2 Observations

Observation is a process of careful watching someone or something, especially in order to learn or understand something about him [26]. The research was not about situational behaviour, but focused on historical occurrences to remedy a present shortcoming, therefore observation were not done.

3.4 SAMPLE

The targeted population was divided into sub-groups that is; client organisations, contractors and consultant firms. The researcher obtained a list of contractors and practicing consultants firms from RTDA and RPPA. In case of client organisations, local government District Engineers; MININFRA were considered. Respondents in each category were classified according to the positions or seniority at their place of work; this helped the researcher to easily obtain the required data.

In the survey, cluster sampling techniques was used to determine the number of respondents; questionnaires were administered randomly. This technique was preferred because the area of research is specific that is; respondent were asked if they had experience in road projects. However as suggested in order to avoid small samples; sample size of 50 was targeted in the contractor's category, 40 for project consultants and 30 to clients, representatives [9, 10]. The lists used for the sampling in both the category of contractors and consultant were of 2011.

3.6 DATA ANALYSIS

Data collected from the questionnaire surveys was analysed using both statistical data analysis tools and graphical or pictorial tools with the aid of data analysis software such MS-Word, spreadsheet and SPSS 16, it was then tabulated to obtain relationships and divergences which helped the researcher to draw conclusions. Means for various factors regarding disputes in each category were calculated to give the measures of central tendency, standard deviations as measures of dispersion and coefficient of variance as required satisfy the objectives of the research. A sample t-test was done on the overall view, and the most important factors were identified after ranking all of the factors.

3.7 VALIDITY AND RELIABILITY

Validity is the extent to which a piece of research actually investigates what the research purports to investigate. Internal validity ensured by the intervention of experts who critiqued the questionnaire used to collect the data.

3.8 LIMITATIONS AND ETHICAL ISSUES

The researcher concentrated specifically on disputes in the road construction in Rwanda, it was difficult to identify respondents only on the road experience because both consultants and contractors deal in other projects apart from roads. The other limitation is that; the research was particularly on disputes in the road construction sector. However, it is likely that contractors and consultants may have provided their own views on disputes in other civil engineering projects other than roads. The respondents support was not enough due to time availability and lack of rich information (data).also transport to reach the respondents offices in different parts of Rwanda became a hindrance monetary ways.

Ethical and permission issues were critically considered throughout the study, the researcher and research assistants were given identification documents to seek entry to restricted offices, it is also important to note that privacy and all other procedure to access official information of agencies were fully observed.

3.9SUMMARY

In this chapter, the research methodology has been justified, therefore as part of the efforts to meet the objective of this research, this chapter has fully explained the methodology exhaustively, and its significance in this research. In this summary, questionnaires were sent out to respondents, limitations have been discussed and results and analysis are discussed in the next chapter.

CHAPTER IV: RESULTS AND DISCUSSION

4.0 INTRODUCTION

This chapter presents the data collected from the survey on disputes in the Rwandan road construction sector and provides the analysis of the same. It also discusses the finale-test findings because there was no pre-test due to insufficient time. Responses from the questionnaires are also discussed.

4.1 Testing of questionnaires

The sampling method adopted in this research was cluster sampling, where the population was divided into clusters or sub-groups as listed in the table below

- Client organisation
- Civil engineering contractor
- Engineering consultants, / professionals or project managers

These sub-groups (clusters) where sampled as the population where respondents will be sampled randomly, basing on the involvement/participation in the road construction sector.

Cluster sampling is a probability sampling procedure in which elements of population are randomly selected in naturally occurring groups (clusters).

In the context of cluster sampling a cluster is an aggregate or intact grouping of population elements. It involves the selection of population elements not individually, but in aggregates. Ideally, the clusters would be small but not so small as to be homogenous.

Cluster sampling method has strengths and weakness associated with most probability sampling procedures when compared to non probability procedures. However, it has several special strengths and weakness when compared to other probability sampling procedures such as simple random sampling. Some of the strengths of cluster sampling when compared to simple random sampling are:-

- Cluster sampling requires less time, money and labour than other sampling methods. It is the most effective probability sampling procedure.
- For the same level of costs, cluster sampling with a higher sample size may yield less sampling error than that resulting from simple random sampling with a smaller sample size.
- Cluster sampling permits subsequent sampling because the sampled clusters are aggregates of elements.
- Unlike simple random sampling, cluster sampling permits the estimation characteristics of subsets (clusters) as well as the target population.
- Cluster sampling is much easier to implement than simple random sampling and the rest.

As much as cluster sampling has good strengths that make it to be preferred as a best sampling method, it also has weakness as indicated:-

- In cluster sampling, the sampled cluster may not be as representative of the population as a simple random sample of the same sample size.
- Combining the variances from two separately homogeneous clusters may cause the variance of the entire sample to be higher than that simple random sampling.
- Cluster sampling introduces more complexity in analyzing data. Inferential statistical analysis of data collected via simple random sampling.
- Since elements within a cluster tend to be a like, we receive less new information about the population when we select another element from that cluster. This lack of new information makes a cluster sample less precise than a simple random sample.

Table 4.1: Targeted Client Organisations

Targeted Group	**Targeted Respondents**
Central Government Bodies	***Targeted respondents***
Rwanda transport development authority(RTDA)	Project managers in road construction
Ministry of Local Government	Head of Procurement Department
Ministry of infrastructure	Contracts Department / Principal Engineer
Ministry of Finance planning and Economic Development	Audit Department
At District Level	***Targeted respondents***
RPPA district representatives	Procurement officers
Infrastructure Department	District Engineer
Rwanda local development support fund(RLDSF) department	Project managers.

The research study targeted contractors who are registered and fully paid up of with Rwanda contractors association (RCA) and other reputable contractors as of 2011 as Table below particularly those construction companies which have had experience in various civil works. The targeted respondents were contract managers, project managers and any company officials who have a good knowledge in contract management. The table below summarises the number of contractors their class of expertise and experience;

Table 4.2: Civil engineering contractors (RCA 2011)

Number of Contractors (targeted)	Classification (category)
10	A*(15yrs and above)
20	A(between 10yrs and 15yrs)
25	B(between 7yrs and 10 yrs)
35	C (between 5yrs and 7yrs)
30	D (between1yr and 5yrs)

For engineering consultants or professionals or project managers; respondents were obtained from a list of registered member and fully paid up with the Institution of Engineers Rwanda.

It is very essential to use the obtained list from institution of Engineers Rwanda in this research because this is an established institution enforced by the law and expected to have qualified registered professionals that can give correct/trusted data (information), that is reliable and without bias.

The type of sampling adopted was random sampling technique in accordance to the distribution of questionnaires as in Table 4.3 below

This technique was preferred from other methods of sampling like purposive or judgmental sampling that focus on knowledge of the population, because of its benefits, where each member of the population has an equal chance of being chosen. This means that it guarantees that the sample chosen is representative of the population. It also has un biased statistics, with the ease of assembling the sample. The statistical analysis related to sample distributions, hypothesis testing, and sample size determinations assume that the sample is a simple random sample.

Table 4.3: Detail Breakdown of sampling

Type of Sample	Sent	Returned	% of response
Client Organizations	20	13	43
General Contractors	50	30	60
Consultants	30	23	77
Total	**100**	**66**	**66**

Out of the 100 questionnaires sent, only 66 were received back, which represents 66% response. The compositions: Client organization (43%), General contractors (60%) and consultants (77%).

The low response rate was attributed to the fact that the time sent to respond to the questionnaires was short, and many recipients asked for more time which was not possible due to limit to finalise with the project.

Data summary was a very important step to provide data for analysis. In order to achieve the study objectives, the data collected from questionnaire survey was summarised into three categories, namely;

a) Clients' point of view
b) Consultants' point of view
c) Contractors' point of view

In the responding to the questionnaires, the following concerns were raised in each of the categories.

- More causes of disputes in this category were added
- Additional impacts of disputes were identified

4.1.1 Questionnaire formulation

The questionnaires used in the survey were formulated to compare the collective perceptions of the personnel from clients, consultants and contractors; these were adopted from chapter two similar to the ones used by Bahr in his study of disputes in the Malaysian construction industry. The questionnaires consisted of Section A, which is concerned with the respondent's profile, Section B consisted of the causes of disputes where by the respondents were required to rate them on a Likert scale as discussed in chapter 3. Section C was concerned with the impact of disputes, and finally Section D for dispute prevention. Analysis for the overall response was done using a sample t-test.

4.2 DATA ANALYSIS AND RESULTS

Using cluster sampling 50 questionnaires were sent to contractors, 30 to consultants and 20 to client organisations. The total response was at 66% which is significant and valid consultants had highest response rate at 75% as again detailed in Table below [9, 10]. The responses were analysed using SPSS16, ranks were obtained and a sample t-test was carried out on the overall category.

Table 4.4: Response Rate

RESPONDENT	**Sent**	**Returned**	**% of response**
Client Organisations	**20**	**13**	**43%**
Civil Engineering Contractors	**50**	**30**	**60%**
Consultants (Engineers)	**30**	**23**	**77%**
Total	**100**	**66**	**66%**

The response from the questionnaires were categorised into four groups that is;

- Client's point of views
- Designer's point of views
- Contractor's point of views
- Additional qualitative questions on dispute and risk management by each group

4.2.0 Client's Point of View

The overall questionnaires returned from clients were 13 out of 20 sent representing 43 percent of the response. Responses from various sections of the questionnaires are summarised in table below

a) Question -1 (Experience)

Table 4.5: Response on experience by clients

A.2. Yrs of experience, less than 2yrs=1, 2-5yrs=2, 5-10yrs=3, 10-15yrs=4, over 15yrs=5

Valid	Frequency	Percent	Valid percent	Cumulative percent
2	3	23.1	23.1	23.1
3	4	30.8	30.8	53.8
4	2	15.8	15.4	69.2
5	4	30.8	30.8	100

Most respondents were in the experience range of; 5-10 years and 15 years and above; representing 30.8% each of the response. Having a good experience in road construction help in making better informed decisions by parties involved.

Most of the respondents have experience of 5 years and above, which made the researcher presume that their responses were well thought after.

b) Questions -2 Causes of construction disputes / client's view)

Table 4.6: Ranking of causes by clients according to mean rate

Very insignificant=1, insignificant=2, average=3, significant=4, very insignificant=5)

Rank	Causes of Construction Disputes	Mean (μ)	Standard Deviation (Ơ)	coefficient of variance (Ơ/μ)
1	Discrepancies/ ambiguities in contract documents	**4.46**	**0.66**	**0.15**
2	Poor communication between and among the parties involved in the project	**3.39**	**0.75**	**0.20**
3	Reluctant to check for constructability, clarity and completeness.	**3.77**	**0.83**	**0.22**
4	Failure to respond in timely manner	**4.08**	**0.95**	**0.22**
5	Deficient management, supervision and coordination efforts on the part of the project	**4.00**	**0.91**	**0.23**
6	Lowest Price mentality in engagement of contractors and designers	**3.69**	**0.95**	**0.26**
7	Failure to appoint an overall project manger	**3.54**	**0.97**	**0.27**
8	Inadequate tracing mechanism for RFIs	**3.69**	**1.03**	**0.28**
9	The absence of team spirit among the participants	**2.31**	**0.85**	**0.37**

Basing on the result from Table 4.6, discrepancies / ambiguities in contract document was considered to be the most significant with Coefficient of Variance (COV) of 0.15; this was followed closely by poor communication between and among the parties involved in the project with 0.20.

Respondents considered absence of team spirit among the participants as the least significant with a coefficient of variance of 0.37.

The findings in this category confirms with the findings of Lumu when he cited ambiguities in contract documentation as one of the causes of disputes on the northern by pass project in Uganda. Generally the coefficient of variance of the factors with a high mean score are the smallest; most of the causes have got the mean rating of more than 3 which implies that all the causes except, the absence of team spirit among participants have a significant effect on the road construction industry. Referring to posed questions in chapter one, of the major causes of construction disputes in Rwanda, especially in road construction sector, question (a) was answered.

C) Question -3 Impacts of disputes on the road construction sector

Table 4.7: Ranking impacts of disputes by client according to mean rate

(Very significant=1, significant=2, average=3, significant=4, very significant=5)

Rank	Causes of Construction Disputes	Mean (μ)	Standard Deviation (O)	coefficient of variance (O/μ)
1	Loss of company reputation	**4.38**	**0.51**	**0.116**
2	Loss of profitability and perhaps business viability	**4.23**	**0.60**	**0.142**
3	Time delays and cost	**4.38**	**0.65**	**0.148**
4	Diminution of respect between parties-deterioration of relationship and breakdown in cooperation	**4.31**	**0.63**	**0.148**
5	Loss of professional reputation	**4.28**	**0.65**	**0.152**
6	Additional expenses in managerial and administration	**4.23**	**0.72**	**0.170**
7	Higher tender prices	**2.92**	**0.76**	**0.260**
8	Possibility of Litigation cases	**2.69**	**0.75**	**0.288**
9	Rework and relocation costs for men, equipment and materials	**3.23**	**0.93**	**0.288**
10	Extended and / or more complex award process	**3.31**	**1.06**	**0.320**

Table 4.7 indicates that loss of company reputation and time delays and cost overruns were concurrently considered as very significant by the respondent with a coefficient of variance of 0.116.

This was followed by loss of profitability and perhaps business viability with COV value of 0.142 possibilities of litigation cases was the least significant, with a mean indicator of 2.69 and a standard deviation of 0.75.

d)Question -4 (Type of disputes)

Table 4.8: Types of disputes

Ref:	Types of Disputes	Respondents	Mean	Standard Dev.	Percentage
1	Payment	7	0.54	0.519	53.80
2	Changed	6	0.46	0.519	46.20
3	conditions	11	0.85	0.376	84.60
4	Delays	11	0.85	0.376	84.86
5	Contract time	0	0	0	0
	Others				

Table 4.8 shows that dispute to delays and contract time are the most important types of disputes expected to occur in road construction projects representing 84.60% of the response. Disputes over changed conditions were ranked the lowest representing 46.2%.

c) Question – 5 Methods of Dispute Resolution

According to the client organisations, most respondents preferred mediation as the most effective method for resolving disputes on road projects representing 78% of the response. Litigation and conciliation were the least methods with each representing 30% of the in those categories. There was no response in the other category. The graphical representation of these results is shown in figure 4.2.1 below.

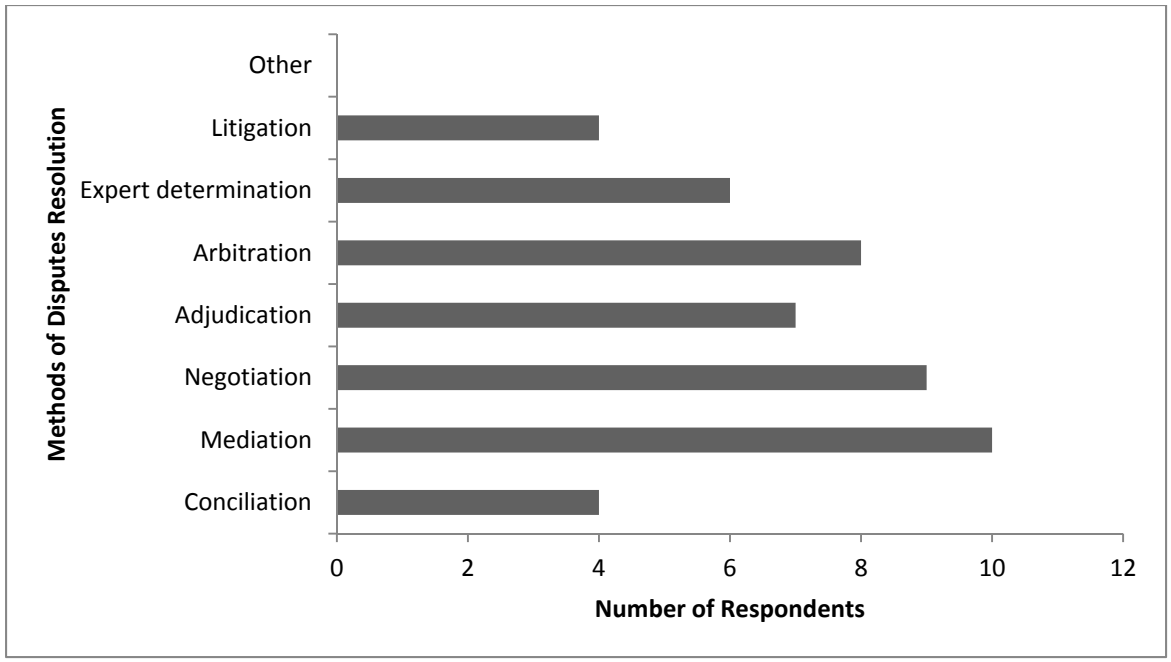

Figure 9: Methods of Dispute Resolution

4.2.1Question one-experience

Table 4.9: Consultants' experience

A.2. Yrs of experience, less than 2 yrs=1, 2-5yrs=2, 5-10yrs=3, yrs=4, over 15yrs=5

Indicator	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1	1	4.3	4.3	4.3
2	1	4.3	4.3	8.7
3	7	30.4	30.4	39.1
4	4	17.4	17.4	56.5
5	10	43.5	43.5	100
Total	23	100	100	

Most respondents were in the experience range of 15 years and above representing 43.5% of the response, this below average in comparison with the number of questionnaires sent out as shown in the table 4.9. Since most respondents have 15 years and above, it is more likely that they have encountered disputes or disagreements as they perform their work.

Question – 2 Causes of Disputes (Consultant view)

Table 4.10: Ranking of dispute causes by consultants according to mean rate

(Very significant =1, insignificant=2, average=3, significant=4, very significant=5)

Rank	Causes of Construction Disputes	N=23		
		Mean (μ)	**Standard Deviation (O')**	**coefficient of variance (O'/μ)**
1	Late information issued and cumbersome approach to RFIs	**3.96**	**0.64**	**0.162**
2	Over – design and factual communication.	**3.13**	**0.63**	**0.218**
3	Inadequate open and factual communication	**4.04**	**0.88**	**0.218**
4	Incompleteness of drawing and specification	**3.04**	**0.71**	**0.234**
5	Failure to understand its responsibilities under design team contract	**2.65**	**0.66**	**0.249**
6	Design and specification oversight and errors or omissions resulting from uncoordinated civil, structural, mechanical and electrical designs.	**3.78**	**0.95**	**0.251**

Table 4.10 shows that late information issued and cumbersome approaches to the RFIs the most important cause of dispute with CoV value of 0.162. This is closely followed by the factor of over-design and under estimate the costs involved with a CoV of 0.201. Design and specification oversights and errors or omissions resulting from uncoordinated civil, structural, architectural, mechanical and electrical designs were the least with a CoV value of 0.251 which is almost insignificant. These results were got from the 23 respondents in this category.

The comparisons mean scores of consultants and other categories are discussed in the section of overall review of this chapter, however as argued [3]. Consultant are the source of technical information regarding the project; issue instructions and make variation orders, this is agreement with the finding, that factors involving dissemination of information score highly when it comes to causes of dispute.

a) Question -3 Impact of disputes on the Road Construction Sector

Table 4.11: Response from consultants on the impact of disputes

(Very insignificant=1, insignificant=2, average=3, significant=4, very Significant=5)

Rank	Causes of Construction Disputes	Mean (μ)	Standard Deviation (Ơ)	coefficient of variance (Ơ/μ)
1	Loss of profitability and perhaps business viability	**4.57**	**0.51**	**0.112**
2	Time delays and cost	**4.57**	**0.59**	**0.129**
3	Additional expenses in managerial and administration	**4.52**	**0.51**	**0.113**
4	Loss of company reputation	**4.43**	**0.59**	**0.113**
5	Loss of professional reputation	**4.39**	**0.65**	**0.148**
6	Rework and relocation of costs for men, equipment and materials	**3.3**	**0.58**	**0.176**
7	Diminution of respect between parties-deterioration of relationship and breakdown in cooperation	**3.43**	**0.73**	**0.213**
8	Possibility of Litigation cases	**2.65**	**0.65**	**0.245**
9	Higher tender services	**2.96**	**0.77**	**0.260**
10	Extended and / or more complex award process	**3.04**	**1.03**	**0.339**

Table 4.11 shows that consultants hold factors; 1) loss of company reputation 2) loss of profitability and perhaps business viability as the most important impacts of construction disputes on road projects with a CoV of 0.112 and 0.129 respectively. Extended and / or more complex award process was ranked the lowest with the highest CoV of 0.339 on the rating. Most impacts are above the average indicating that respondents are concerned with the aftermath effects of disputes occurrence.

Basing on the findings related to impacts resulting from disputes in road construction sector in Rwanda, question (b) in chapter one is fully answered.

a) Question – 4 Types of disputes

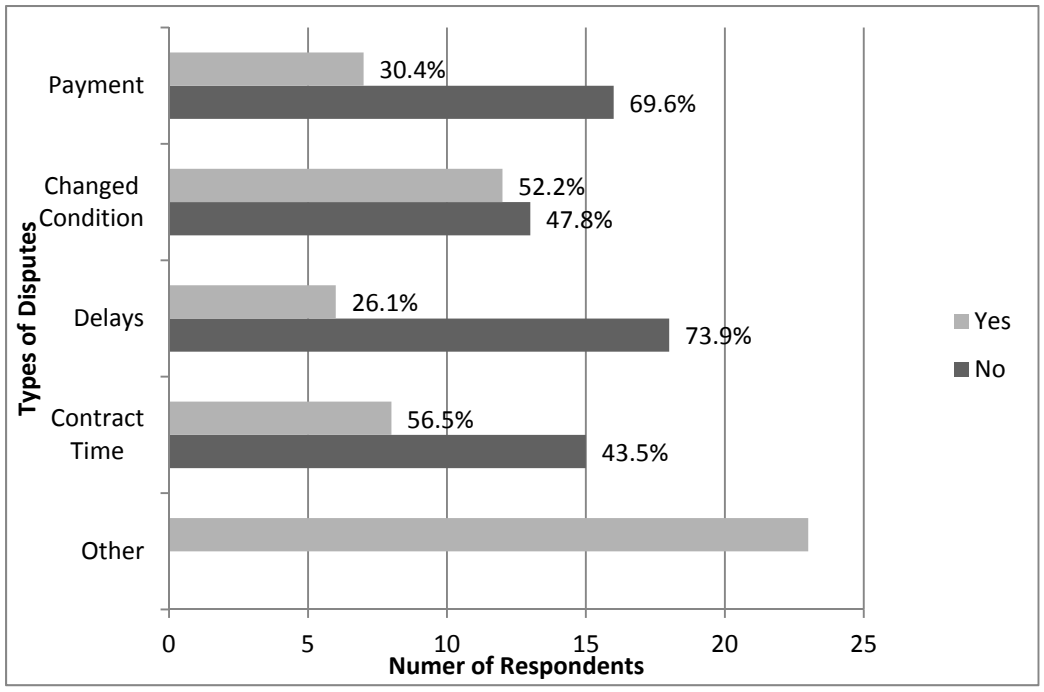

Figure 10: Response on types of disputes

Disputes over delays were the most significant with the response rate of 73.9%, followed by payment with 69.6%. Contract time was regarded as the lowest with 43.5% as in figure above**.** There is contrast in opinion comparison with research carried out in other countries; it is identified changed conditions as the most significant type in his findings on causes of disputes in the Malaysian construction industry. However delays as a key type in UK and USA Construction

industries. In Rwanda as indicted by the graph, disputes are mainly caused by delay in completion of works, payment delays to the contractor and the contracts are prepared.

4.2.2 Methods of Disputes Resolution

According to the findings from consultants in figure negotiation is the most preferred method for dispute resolution; this was closely followed by mediation. Litigation and expert determination did not seem to be favoured as they ranked rock bottom. This is in agreement with findings that the model on dispute resolution they emphasised negotiation as the central and most critical method for dispute resolution, which answers question (c) in chapter one of the project. It is at this stage that parties have to break the behavioural silence or disputes will require adversarial methods that may attract additional costs and stress to parties involved.

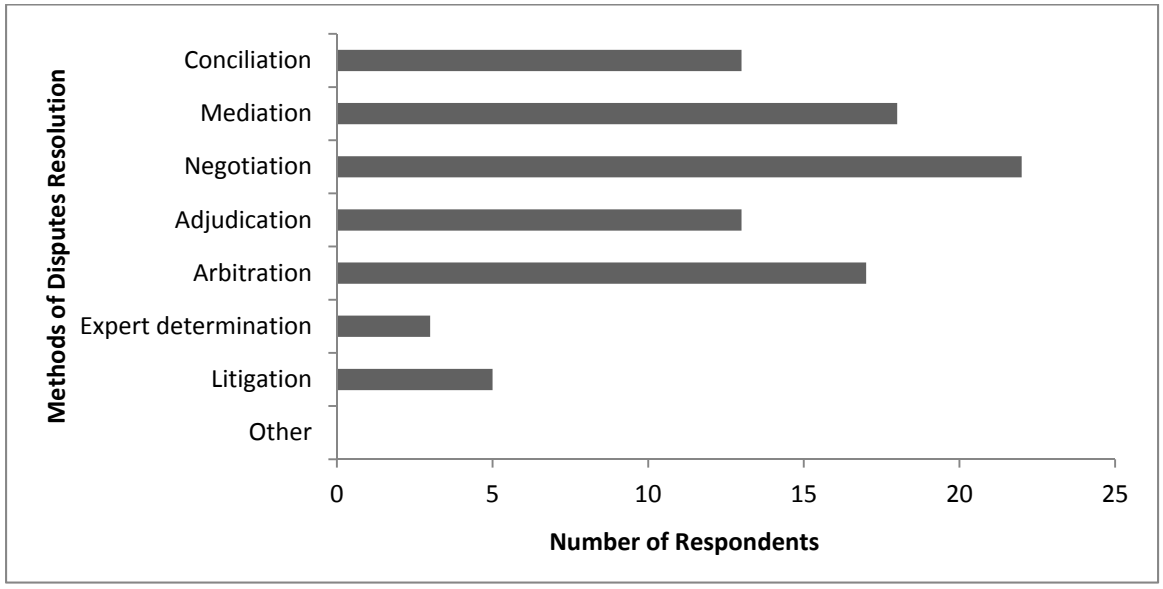

Figure 11: Method of Dispute Resolution (consultants' view)

4.2.3Contractors' Point of View

Contractors were sent 50 questionnaires, of which 30 were returned, representing 60% of the response. The results from the questionnaires survey are detailed in this section

a)Years of experience

Table 4.12: Contractors' experience

A.2. Yrs of experience, less than 2 yrs=1, 2-5 yrs=2, 5-10 yrs=3, 10-15 yrs=4, over 15yrs=5

		Frequency	Percent	Valid percent	Cumulative percent
Valid	1	3	10.1	10.1	10.0
	2	2	6.7	6.7	16.7
	3	5	16.7	16.7	33.3
	4	10	33.3	33.3	66.7
	5	10	33.3	33.3	100.0
	Total	30	100.0	100.0	

The results indicate that most of the contractors who respond have been in this business for 10 years and above representing; 66.6% of the overall response. However under each category of experience, respondents of 10-15 years and those above 15 years, each category represents 33.3%. Those with 5-10 years represent 16.7%, 2-5 years represent 6.7% and contractors with experience below 2 years represent only 10% of the survey results as shown in Table 4.12.

Having well experienced respondents certainly improves on the rating of the validity of information obtained from the questionnaire survey.

b) Question -2 (Causes of road construction disputes)

Contractors were the major contributors in the survey, as they represented the biggest number of respondents. The survey indicates that inadequate contract management, supervision and coordination are the major causes of construction disputes on the contractor's side with CoV of 0.202. This is closely followed by reluctance to seek clarification with CoV of 0.212. This is followed by; i) Lack of understanding and agreement in contract procurement (0.212), ii) Failure to plan and execute the changes of work (0.285), iii) inadequate CPM scheduling and update of requirements (0.281), iv) Delay or suspension of works and v) failure to understand and correctly bid or price the works (0.358) as shown in the table

Table 4.13: Rank of causes of disputes by contractors

(Very insignificant=1, insignificant=2, average=3, significant=4, very significant=5)

Rank	Causes of Construction Disputes	Mean (μ)	Standard Deviation (Ơ)	coefficient of variance (Ơ/μ)
1	Inadequate contract management, supervision and coordination	**4.21**	**0.85**	**0.202**
2	Reluctance to seek clarification	**4.20**	**0.89**	**0.212**
3	Lack of understanding and agreement in contract procurement.	**3.83**	**0.87**	**0.227**
4	Failure to plan and execute the changes of works	**3.87**	**0.94**	**0.243**
5	Inadequate CPM scheduling and update of requirements	**3.67**	**1.03**	**0.281**
6	Delay or suspension of work of works	**3.97**	**1.13**	**0.285**
7	Failure to understand and correctly bid or price the works.	**2.93**	**1.05**	**0.358**

a) Question – 3 Impacts of disputes on the road construction sector

Table 4.14: Response from contractors on impacts of disputes

Very insignificant=1, insignificant=2, average=3, significant=4, very Significant=5

Rank	Causes of Construction Disputes	Mean (μ)	Standard Deviation (Ơ)	coefficient of variance (Ơ/μ)
1	Loss of company reputation	**4.40**	**0.56**	**0.127**
2	Additional expenses in managerial and administration	**4.23**	**0.63**	**0.149**
3	Loss of profitability and perhaps business viability	**4.30**	**0.75**	**0.174**
4	Diminution of respect between parties-deterioration of relationship and breakdown in cooperation	**4.20**	**0.66**	**0.157**
5	Loss of professional reputation	**4.30**	**0.75**	**0.174**
6	Time delays and cost overruns	**4.20**	**0.76**	**0.181**
7	Rework and relocation costs for men, equipment and materials	**3.03**	**0.77**	**0.254**
8	Extended and or more complex award process	**2.80**	**0.76**	**0.271**
9	Higher tender prices	**2.77**	**0.94**	**0.339**
10	Possibility of Litigation cases	**2.67**	**1.16**	**0.434**

According to results from table**,** contractors considered loss of company reputation as a major impact with an indicator of 0.127, this shows that contractors considered their business sustainability as being very important and therefore would consider a resolution which does not damage the company name.

Additional expenses in managerial and administration with a CoV score of 0.149. The factors of higher tender prices (0.339), extended and or more complex award process (0.271) and possibility of Litigation cases (0.434) are scored as almost insignificant by contractors.

Question – 4 Types of construction disputes

Results in Figure below show disputes over delays as the most common with a response of 80%, this is closely followed by disputes over payment with 73.3%; changed conditions take 50%; dispute over contract time taken 60%. There is no response in the category of others. These results indicate similarity of situation in countries like Malaysia and Australia.

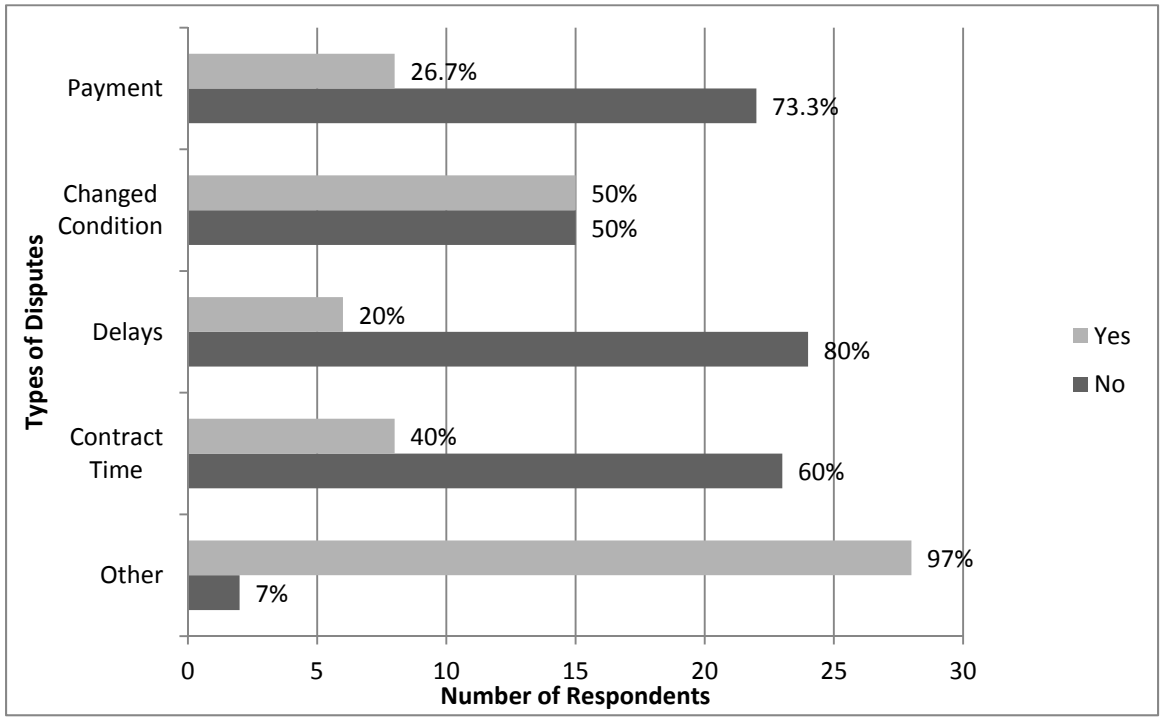

Figure 12: Response on the types of disputes (Contractor's view)

4.2.4 Methods of disputes resolution

According to results in figure below, Negotiation like in consultants' response tops the list of the preferred methods of dispute resolution with manager 73.3% of the response; this was closely followed by adjudication at 70% of the response. Conciliation and mediation tie at 60% each, arbitration the more adversarial method comes in at 63%. Like expert determination, litigation seems complex and costly, justified by 33.3% it presented as the preferred method of dispute resolution.

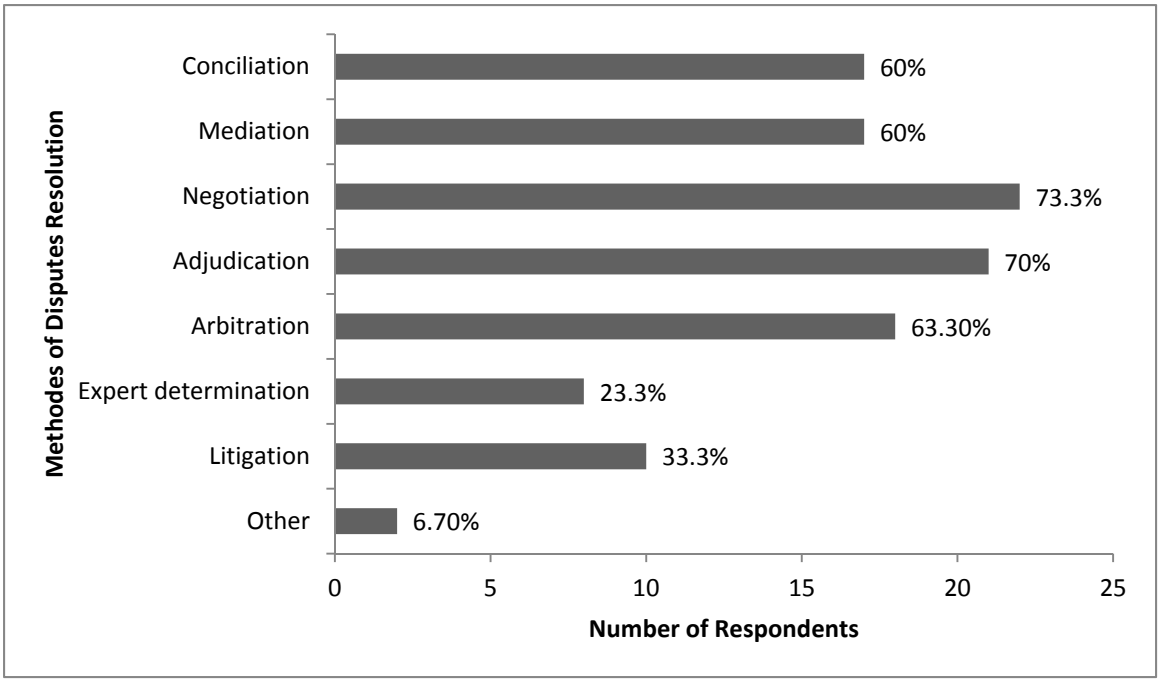

Figure 13: Response on method of Dispute resolution (Contractors' view)

4.3 OVERALL POINT OF VIEW

This section presents the overall ranking from all respondents combined; this gives the most important factor in each category. Responses from clients, consultants and contractors were combined to give a basis for collective analysis. In addition, a one sample t-test was done, the factors analysed and discussed in this section are; impacts of construction disputes, types of disputes and methods of dispute resolution.

A. **)Years of experience (Overall)**

Table 4.15: Experience (Overall)

		Frequency	Percent	Valid percent	Cumulative percent
Valid	1	4	5.0	6.1	6.1
	2	6	7.5	9.1	15.2
	3	15	18.8	22.7	37.9
	4	17	21.2	25.8	63.6
	5	24	30.0	36.4	100.0
	Total	66	82.5	100.0	

As indicated in Table Above 4.15**,** most of the respondents had a considerable experience in road construction projects, with majority of the respondents above 10 years. However, those with 15 years and above were more than others representing; 36.4% of the response. This is again in agreement with assumptions in other categories (clients; contractors and consultants) whereby experience helps in ensuring a valid response. The construction industry will benefit if the mistakes in the past projects are not repeated in the present undertakings and this can only happen if the parties use precedence I resolving disputes.

Table 4.16: A sample t – test for causes and impacts of disputes

	Mean Score	Std Deviation	t	Sig. df(2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
						Upper	Lower
Causes of construction disputes							
Failure to understand responsibility under Design team	2.65	0.647	-2.577	22	.017	-0.348	-0.628 -0.068
Over design and under estimate	3.13	0.626	1.000	22	.328	0.130	-0.140 0.401
Inadequate open and factual Communication	4.014	0.878	5.700	22	.000	1.043	0.664 1.423
Late information issued and cumbersome Approaches to RFI's	3.96	0.638	7.190	22	.000	0.957	0.681 1.232
Design and specification oversights and Errors or omissions resulting from Coordinated civil, structural, architectural, Mechanical and electrical designs	3.78	0.945	3.945	22	.001	0.783	0.371 1.194
Incompleteness of drawings and specification Specification	3.04	0.706	0.295	22	.770	0.043	-0.262 0.349
Failure to respond in timely manner	4.08	0.954	4.505	12	.001	1.143	0.595 1.691
Inadequate tracing mechanism for RFIs	3.69	1.032	2.687	12	.019	0.714	0.140 1.288
Reluctant to check for constructability, Clarity and completeness	3.77	0.832	3.238	12	.006	0.714	0.238 1.191
Discrepancies / ambiguities in contract Documents	4.460	0.660	8.272	12	.000	1.429	1.055 1.802
Poor communications between and Among the parties involved in the project	3.690	0.751	3.667	12	.003	0.786	0.323 1.249

Failure to appoint an overall project Manager	2.310	0.855	-3.238	12	.006	-0.714	-1.191	-0.238
Lowest Price mentality in engagement of Contractors and designers	3.690	0.947	2.104	12	.050	0.571	-0.015	1.158
The absence of team spirit among the Participants	3.540	0.967	2.280	12	.040	0.571	0.030	1.113
Deficient management, supervision and Coordination efforts on the part of the Project	4.000	0.913	3.789	12	.002	0.929	0.399	1.458
Inadequate contractor management, Supervision and coordination	4.210	0.887	7.413	29	.000	1.200	0.869	1.531
Lack of understanding and agreement in Contract procurement	3.830	0.874	5.221	29	.000	0.833	0.507	1.160

	Mean Score	**Std Deviation**	**t**	**Sig. df (2-**	**Mean Difference tailed)**	**95% Confidence Interval of the Difference**	
							Lower Upper
Failure to understand and correctly bid or Price the works.	2.93	1.048	-0.348	29	.730	-0.067	-0.458 0.325
Reluctance to seek clarification	4.20	0.847	7.761	29	.000	1.200	0.884 1.516
Failure to plan and execute the changes Of works	3.870	0.937	5.066	29	0.000	0.867	0.517 1.217
Inadequate CPM scheduling and update Requirements.	3.670	1.028	3.551	29	.001	0.667	0.283 1.051
Delay or suspension of works	3.97	1.129	4.690	29	.000	0.967	0.545 1.388
Impacts of Disputes							
Additional expenses in managerial and Administration	4.320	0.612	17.508	65	0.000	1.1318	1.168 1.469

Possibility of company reputation	2.680	0.931	-2.777	65	0.177	-0.318	-0.547	-0.089
Loss of company reputation	4.410	0.554	20.661	65	0.007	1.409	1.273	1.545
Loss of profitability and perhaps Business viability	4.380	0.554	17.212	65	0.000	1.379	1.219	1.539
Time delays and cost overruns	4.330	0.664	16.311	65	0.000	1.333	1.170	1.497
Diminution of respect between parties- Deterioration of relationship and Breakdown in cooperation	3.920	0.810	9.273	65	.000	0.924	0.725	1.123
Higher tender prices	2.850	0.827	-1.488	65	0.142	-0.152	-0.335	0.052
Extended and or more complex Process	2.950	0.867	-0.426	65	0.762	-0.045	-0.259	0.168
Rework and relocation costs for men, Equipment and materials	3.170	0.904	1.497	65	0.139	0.167	-0.056	0.389
Loss of professional reputation	4.270	0.735	14.072	65	0.000	1.273	1.092	1.453

The results of a t-test can be used to test whether the mean of single variable differs from a specified constant. This can be done by comparing the t- test statistics against the crucial value.

Most t-test statistics have the form, $T = Z \div S$

Where Z and S are functions of the data, Typically, Z is designed to be sensitive to the alternative hypothesis (i.e. its magnitude tends to be larger when the alternative hypothesis is true), whereas S is a scaling parameter that allows the distribution of T to be determined

The assumptions for this t-test are;

- Follows a standard normal distribution under the null hypothesis
- ps2 follows an $\chi 2$ distribution with p degrees of freedom under the null hypothesis, where p is a positive constant
- Z and s are independent

The test value was set at 3 that correspond to the neutral position of average or uncertain on the scale in the questionnaire. In this case variables which have a mean score below 3 are assumed to be null and void with no effect because they are above the significant level of 0.05 as indicated in table 4.16. It can also be observed from the table 4.16 that, variables which have a significant level below 0.05 have a high mean score above the set test value of 3.

Loss of company reputation was considered the most important with a mean of 4.38 and a standard deviation of 0.65, this was also considered by both contractors and client as the most important factor. Consultants indicate both loss of profitability and perhaps business viability and loss of company reputation as the most important factors. Possibility of litigation cases ranks rock bottom with a mean of 2.68 and a standard deviation of 0.93. This confirmed suggestions that; litigation should never be looked at as an alternative in resolving disputes because of its adversarial nature, time and other cost implications.

On causes of disputes, most variables under all the three categories of respondents were considered significant except for; "over design and under estimate (0.328) and incompleteness of drawings and specification (0.770)" under consultants and "failure to understand and correctly bid or price the works" (0.730) all the levels of significant was below the 0.05 required. This confirms with result in mean score ranks obtained in individual categories as the same factors are ranked bottom.

4.4Types of disputes (Overall view)

Generally delays were considered by all respondents as the most important type of dispute, representing 78%; this was followed closely by contract time representing 71.8% as presented in figure below**.** This show a difference in comparison to other developed industries like UK, Australia were changed conditions is the most common type of dispute. However in countries like Malaysia and India parties especially contractors cited disputes over delays as the most common **[7]**

This general finding, both to all respondents from different population sounds quite correct because for delays in completion of works, whether to the clients, contractors and consultants,

the negative impact becomes generation of losses. This impact affects the social economical and political style of the country.

This leaves a lesson to policy makers and other responsible officials in the government to consider time as money and create standards for every work to be implemented ,especially in infrastructure development i.e. roads construction, right from design , contract preparation to implementation .

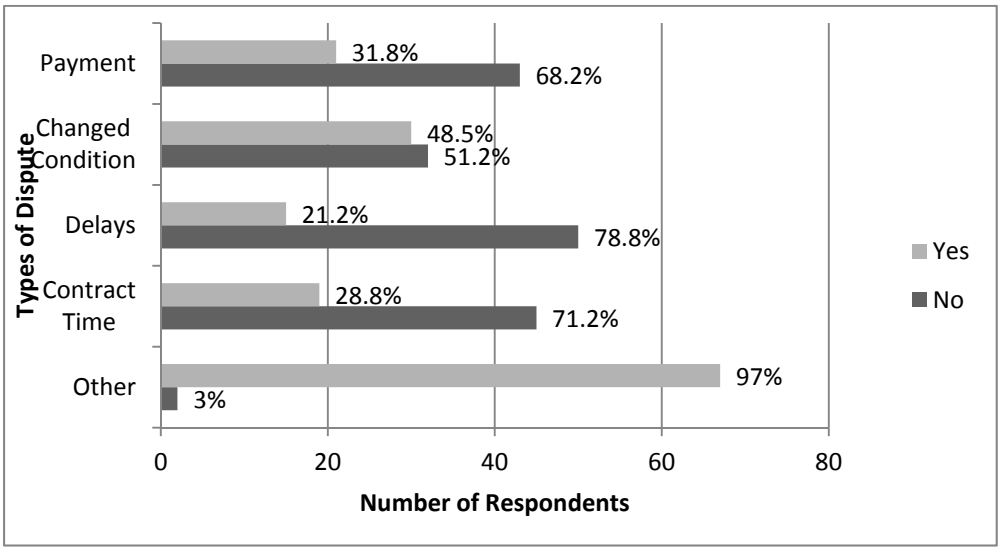

Figure 14: Types of Disputes (Overall response)

4.5 Methods of Dispute Resolution

Negotiation was considered the most significant method of dispute resolution with 51 respondents in its favour representing 77 percent as indicated in Figure below argues how significant negotiation is, especially at the early stages of dispute resolution **[2, 22,]**. This indicates that parties to contract are willing to go as less adversarial as possible in resolving disputes. Negotiation is followed closely by arbitration and adjudication; this implies that alternative dispute resolution methods are still the most preferred methods of dispute resolution in road construction projects.

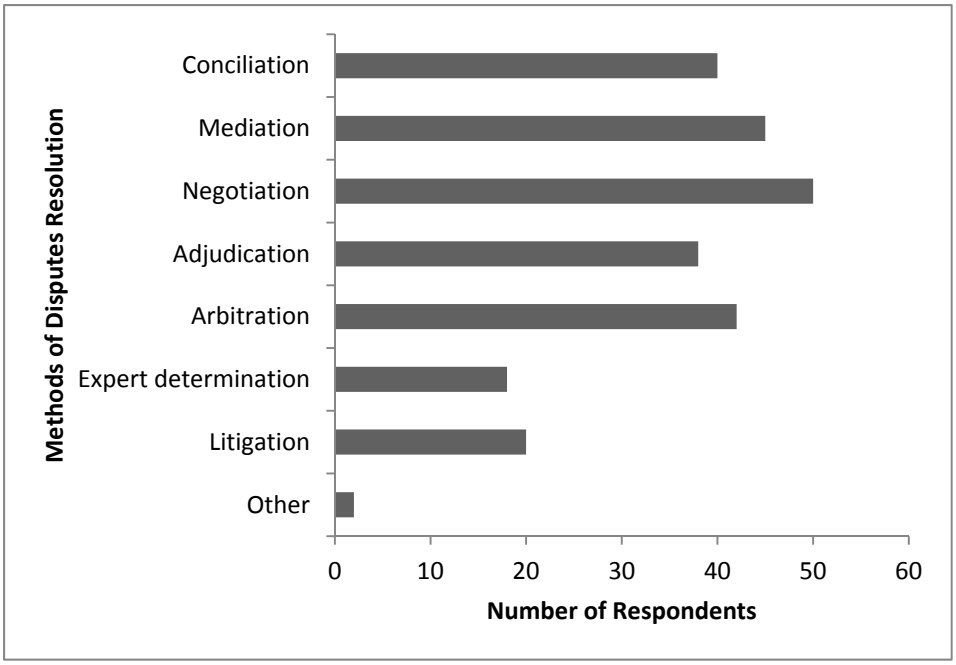

Figure 15: Response methods of dispute resolution (Overall view)

4.6 Qualitative analytical results

There were some open ended questions asked to the respondents, these were analysed by qualitative methods or content analysis techniques. A step by step approach was used until the content was identified and discussed. The procedure of admission was through, a questionnaire survey from which the outcomes are discussed, interpretations are made, descriptions and explanations are done, and the researcher can then draw conclusions depending on perception of the majority of the respondents. In this case, respondents were asked to give their opinion on dispute prevention and the risk management strategies in the road construction sector.

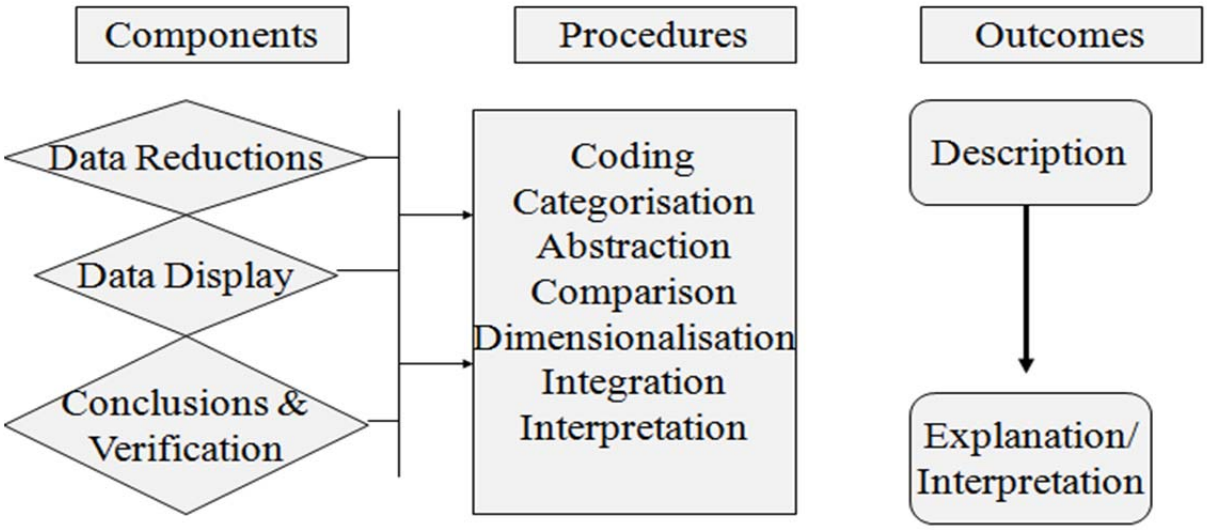

Figure 16: Qualitative analysis process (Adapted from descriptions of Strauss and Corbin, 1990, Spiggle 1994, Miles and Huberman, 1994)

4.7 Procedure

The open ended questions, formed part of the questionnaire administered to the categorised respondents as described in chapter three. Opinions advanced were categorised, the focus of analysis was to find out to what extent the respondents have addressed dispute prevention. The sorting out of responses was done as shown in table below**.** Quasi statistics method was used; this involved carefully observing the number of times a particular factor in context in talked about. Relevancy was of essence in order to avoid divergence and therefore information provided but not in scope as described in chapter three was left out. The number of times a factor is repeated is indicated in brackets at the end of the respondents' paragraph in each category.

Table 4.17: Responses on prevention of disputes

Questions	No of Respondents			% to the overall response
	Clients	Contractors	Consultants	
1. Suggest ways of preventing disputes in the Rwandan road construction sector.	10	20	15	68.18
2. Please provide here any information or comments you deem necessary for this research study	5	11	9	37.88

4.8 Outcomes

The various responses are indicated in each category and the remarks are given in the overall views were the most important factors are identified. From this, the following conclusions and recommendations on dispute prevention were drawn.

4.9Clients

Respondents in this category emphasised early intervention, proper record keeping and use of alternative dispute resolutions methods as a way to prevent the escalation of disputes in the road construction industry.

Parties to contract should be willing to overcome personal differences and put all their efforts towards ensuring that the project does not exceed the intended time and budget, because when either party is not willing to accept additions in time and then there are many chances that disputes may occur.

One remarkable response was on design alterations and one respondent held "designs should be thoroughly checked and if possible, a reasonable cost contingency allocated. Usually when such alterations occur the designer may find it difficult to approve such huge sums that may result from a variation and on the other hand the client's budget may not have forecasted such".

The issue of design has been discussed in Chapter 2 of this report and a significant percentage of dispute occurrences in some developed countries like; Australia and USA have been blamed on design alterations.

Contractors should ensure that they deliver the project within the allotted time, by stressing their resources in order to avoid the liquidated damages that may be a source of disputes. Usually these damages are a percentage on the overall contract and are charged on each extra day of delay of work, depending on the contract conditions.

In addition, most respondents advocated for the establishment of alternative dispute resolution centres to reduce on time taken by other adversarial dispute resolution processes. Suggestions like dispute resolution boards Centre for Arbitration and Dispute Resolution (CADR), private dispute resolution centres and a Construction Commission to regulate the operations of the construction industry in the country.

4.10 Contractors

The following key issues were identified in contractors' category

- Ensuring record keeping, right from the project inception until completion.
- Implementation of a work programme and adherence to it to avoid time related disputes
- Ensure adequate communication between consultants, clients and may other party involved.
- Adherence to specifications during execution of works.
- Ensure that all the contract documents are clear and unambiguous and that the documents are well understood before contract signing and correcting any inconsistencies therein.
- Divergence from traditional business law to improved construction law which requires expert involvement and more tolerance to amicable settlement.

- Establishment of amicable dispute resolution centres, to reduce on the time and costs involved in the adversarial methods like litigation.
- Contractors also complained on government entities who failed to pay the agreed compensation due to them, hence making the resolution more length and costly in the long run, because of the interests accumulated.

4.11Consultants

The key issues identified in this category are;

- Clients should exhaustively identify all possible project requirements during the design phase, in order to avoid huge variations due to design alterations.
- Contractor should follow their work programmes, work methods, and specifications strictly to avoid time and cost overruns.
- Contract conditions and terms must be well interpreted by all parties prior to agreement to avoid ambiguities in documentations.
- Continued communication should be maintained between all parties to contract to encourage problem solving.
- The parties to contract should always exhaust all possible means of amicable settlement before declaration of disputes against each other.
- The clause for reduction in powers or authority of the project engineer should be introduced during contract drafting as in the FIDIC International Contract Conditions Book of 2006.

  This will lead to flexibility in decision making and involvement of all parties hence disputes will be prevented.
- Contractors should allocate contract responsibilities to skilled personnel to avoid errors on site during implementation and also to ensure adherence to instructions.
- During tendering stage, the contractors should ensure that they cover all the possible uncertainties and risks. This will reduce disputes related to changed conditions.
- Efficient risk allocation and management.

- The construction industry in Rwanda should institute regulatory bodies like; dispute resolution boards and alternative dispute resolution centres, this will help to resolve disputes in early stages to reduce on the costs involved.

4.12 Summary and Verifications

After analysing the different responses, the important issues which are common to all categories were identified and according to this research findings; disputes in the Rwandan road construction sector can be prevented by; ensuring proper contract records, adherence to the work programmes, adequate communication between parties to contract and establishment of alternative dispute resolution centres.

For the effectiveness of these findings, policy makers, Government high ranking officials, Stakeholders and funding organs should own the research findings and strive for their implementation.

In answering the research questions in chapter one, all the findings as mentioned in this chapter should be respected and followed critically so as to combat dispute issue in road construction sector in Rwanda.

4.13 Reflection

The answers to the research questions in Chapter 1 have been discussed in the context of the Rwandan road construction sector. The objectives of the study have been met. The finding can also be applicable to other sectors of the Rwandan construction industry and other industries with problems of dispute resolution. The next chapter presents the conclusions from the study and recommendations.

CHAPTER V: CONCLUSION AND RECOMMENDATION

This chapter gives the conclusion, recommendations and areas of further research.

The aim of the study was to analyse the causes and impacts of disputes in the Rwandan road construction Sector and determine ways of reducing or addressing such disputes. This was achieved through the following specific objectives;

a) To critically review the literature in the general areas of causes of disputes in Road construction and dispute resolution strategies, with particular emphasis on Rwanda road construction.
b) To examine the different causes of disputes in road construction and with particular reference to Rwanda road construction sector.
c) To identify and document the impacts of road construction disputes in Rwanda.
d) To explore the current practices in place which are employed in the Rwanda road construction sector, in addressing/resolving disputes and to gauge the level of efficacy of these practices.
e) To develop a set of guidance based on literature review and best practices in the road construction sector, on effective ways of managing disputes in Rwanda road construction sector.

5.0 CONCLUSIONS

- To critically review the literature in the general areas of causes of disputes in road construction and dispute resolution strategies, with particular emphasis on Rwanda road construction.

As the analysis in the chapter four indicated; the major causes of disputes in the road construction sector were indentified and the key are; i) for contractors, inadequate contract management supervision and coordination, ii) for consultants, inadequate open and factual information and iii) for client's discrepancies and ambiguities in contract documents are most significant causes of construction disputes in the road construction sector. Ambiguities in contract documentation can be inform of; lack of explicit contract conditions and terms, incomplete designs, specifications and bills of quantities, failure to identify the key channels of communication regarding the contract, lack of procedure documentations like resolution guidelines health and safety guidelines, environment policies and plans, job description for unskilled and skilled workers,

All these ignored may increase the room for dispute occurrence yet they are inexpensive to abide by. The overall results indicate that discrepancies or ambiguities in contract document as the most significant factor for disputes causation in the Rwandan road construction sector. This can be solved by observing the factors discussed above. In retrospect the result in the U.K held that failure by the contract management team to monitor the implementation of the works, used of inexperience workers for a task which requires speciality, unwillingness to adherence to contract terms and conditions during implementation, poor planning prior to implementation, failure to implement quality management plan, failure by parties to contract use logic rather than emotions during project management. Frequent project meeting should be organised in order to fast truck disturbing issues and solve them at source.

- To identify and document the impacts of road construction disputes in Rwanda.

Of company reputation, loss of profitability and perhaps business viability, additional expenses in management and administration, time delays, cost overruns and loss of professional reputation. Of these were ranked by clients, consultants and contractors as the most important factors. These results indicated a similar situation as a research done in Malaysia, USA and UK.

- To explore the current practices in place which are employed in the Rwanda road construction sector, in addressing/resolving disputes and to gauge the level of efficacy of these practices.

Negotiation was considered the most significant which represented73.3% of the response; this was closely followed by arbitration and adjudication. This sequential choice is in agreement with research from other countries like Malaysia and UK as various authors contend in chapter four. In addition, disputes related to delays, payment and contract time were the most dominant in the industry.

- To develop a set of guidance based on literature review and best practices in the road construction sector, on effective ways of managing disputes in Rwanda road construction sector.

In an effort to identify ways of preventing dispute occurrence, open questionnaires were used and the important issues which are common to all categories were identified and according to the

research findings; disputes in Rwanda road construction sector can be prevented by; ensuring proper contract records keeping, and the following should be adhered to; weather reports, equipments and pants, contractual correspondences, instructions from project managers; this includes clients' and contractors' representatives, cost or project finance records this also include; payment certificates, invoices, expenses, projects budgets, and accountabilities. Project photographs are also important especially before and during implementation, original contract agreements and terms and condition, establishment of a safe lockable office to ensure proper storage of these records and finally ensuring that all correspondences and relevant forms should be referred, dated and signed by the parties responsible.

In addition adherence to the work programme, adequate communication between parties to contract and establishment of alternative dispute resolution centres will remedy the situation.

- To examine the different causes of disputes in road construction and with particular reference to Rwanda road construction sector.

Parties to contract should always use non adversarial methods to resolve disputes, ensure proper record of events that may lead to the disputes and only use litigation as the last resort. The major causes of disputes that have been identified in chapter four should be taken care of by all parties involved in the road construction contracts. This will prevent disputes at source as suggested.

In respect to all the findings by the involved stake holders in this sensitive research, the problem statement highlighted in chapter one can be addressed and solved in road construction sector in Rwanda.

5.1 RECOMMENDATIONS

Negotiation was identified as the most preferred methods of dispute resolution. It is recommended that policy makers should enforce this recommendation with other ADR methods as a law to protect the construction industry in Rwanda especially in road construction sector.

This negotiation recommendation from the findings stands to address the issue of disputes in road construction sector in Rwanda .This is less costly and social in nature, compared with the current method in use, which is Adjudication that results into Judicial courts. This current method is expensive, time wasting and exposes players into risk of losing reputation.

The involved parties in road construction sector should put more emphasis on including these methods as alternative dispute resolution methods. This will reduce the costs involved with litigation and other non adversarial methods.

The construction industry operates in an open environment therefore these results will be applicable to other sectors of the construction industry especially infrastructural project since most parties to these project are similar with those of the road project.

All parties to the construction contracts should ensure that they play their roles effectively in order to prevent professional negligence, which may result into costly disputes. Practitioners should make sure that during contract execution, proper documentation and good record keeping is very crucial in prevention of disputes occurrence at early stages of the contract.

Trainers should expand their training knowledge on causes, impacts and modern methods of addressing dispute related issues to different business entities, especially in road construction sector.

The government legal system should introduce construction arbitration boards and the construction commission as the case in some developing countries like South Africa, where they have instituted the South African Arbitration Commission, in order to overcome the lengthy and costly litigation procedures [22].

To relevant managers concerned with roads and transport infrastructure, project management should be respected followed carefully right from conceptual/design to implementation and site handover. This is to avoid negligence on any stage.

5.2FURTHER STUDIES

There is laxity in record keeping among practitioners in roads construction sector in Rwanda; this can be overcome by conducting more research in knowledge management. In addition, the Rwandan road Construction industry has not appreciated the effectiveness of alternative dispute resolution methods, mainly due to lack of awareness of the advantages they offer. More research is therefore required to justify the extent of applicability of these methods as they seem to be new in dispute resolutions.

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APPENDIX

TABLE SHOWING DISPUTE OCCURENCES

Author(s)	Factors contributing to claims/disputes
Blake Dawson Waldron (2006)	**Key causes in disputes:** 1. Variations to scope 2. Contract interpretation 3. EOT claims 4. Site conditions 5. aLate, incomplete or substandard information 6. Obtaining approvals 7. Site access 8. Quality of design 9. Availability of resources
Cheug and Yui (2006)	**Three root causes of disputes:** 1. Conflict – Task interdependency, differentiations, Communication obstacles, tensions, personality traits 2. Triggering events – Non performance, payment, time 3. Contract Provision
Yiu and Cheung (2004)	**Significant sources:** • Construction related: variation and delay in work progress • Human behaviour parties: expectations and inter parties' problems

Kilian (2003)	**Project management procedure:** Change order, pre-award design review, pre-construction conference proceedings, and quality assurance • Design errors: errors

Msc- IN TRANSPORTATION ENGINEERING AND ECONOMICS.

PROPOSED QUESTIONNAIRES FOR ACADEMIC PURPOSES.

Questionnaire reference 001

Thesis Title: Analyzing the Causes and Impacts of construction disputes in Rwandan road construction sector and ways of addressing /resolving them.

Questionnaire survey

SECTION A

Organization or company and response

1. Profile:

   a) What is the name of your organization?

   ……...……..

   b) What position do you hold in the organization?

   ……...……..

2. How many years has your organization been working in road construction activities, either in execution, consultancy or procurement?

   ……..……

3. How long have you been working in the organization of road construction?

   ……...……....

4. Type of organization (Tick one in the box)

	Client organization (government, parastatals, project firm and NGO)
	Consultants or design team
	Contractors
	Others(specify)

SECTION B

Causes of disputes

1. The following are sets of the causes of disputes in road construction sector.

   In your opinion kindly indicate by ticking in the box the degree to which these causes of disputes occur on the project for which you have undertaken in the past or one for which you are executing.

No	Dispute Causes	Degree of causes				
		Very insignificant	**Insignificant**	**Average**	**Significant**	**Very significant**
1	Failure to respond in timely manner					
2	Inadequate tracing mechanism for RFIs					
3	Reluctant to check for constructability, clarity and competence					
4	Discrepancies or ambiguity in contract documents					
5	Poor communications between and among the parties in the project					
6	Failure to appoint an overall project manager					
7	The absence of team spirit among the participants					
8	Deficient management supervision and coordination efforts on the part of the project					

2. By drawing on your experiences, please indicate the level of impact (on time cost and quality), which these causes of disputes have on projects.

V.F= Very frequent, F= Frequent, F.F= Fairly Frequent, N.F= Not frequent, V.H= Very high, H= High, L= low, N.H= Not high

		Frequency of occurrence				**Level of impacts**			
		V.F	**F**	**F.F**	**N.F**	**V.H**	**H**	**L**	**N.H**
1	Failure to respond to timely manner								
2	Inadequate tracing mechanism RFIs								
3	Reluctant to check for constructability, clarity and competence								
4	Discrepancies or ambiguity in contract documents								
5	Poor communications between and among the parties in the project								
6	Failure to appoint an overall project manager								
7	The absence of team spirit among the participants								
8	Deficient management supervision and coordination efforts on the part of the project								

SECTION C

Impacts of Road Construction Disputes

1. The following are sets of impacts which disputes can have on project variables. In your view and by drawing on your experience. Kindly indicate the level of impact of disputes of the project variable below.

V.H= Very High, H= High, L= low, N.I= No Impact

No	Project Variables	Level of impacts			
		V.H	H	L	No impact
1	Additional expenses in managerial and administration				
2	Possibility of litigation				
3	Loss of profitability and perhaps business viability				
4	Loss of company reputation				
5	Time delays and cost overruns				
6	Diminution of respect between parties deterioration of relationship and breakdown in cooperation				
7	Higher tender prices				
8	Extended and or more complex award process				
9	Rework and relocation costs for men, equipments and materials				
10	Loss of professional reputation				

2. The following are some of the current practices in place in Rwanda for addressing or resolving disputes please kindly indicate:

   a) The frequency of use of these practices
   b) The level of effectiveness of these practices

V.F= Very frequent, F= Frequent, F.F= Fairly Frequent, N.F= Not frequent, V.E= Very Effective, E= Effective, F.E= Fairly Effective, N.E= Not Effective

	Frequency					**Level of effectiveness**			
No	**Current practices of addressing or resolving disputes**	**V.F**	**F**	**F.F**	**N.F**	**V. E**	**E**	**F.E**	**N.E**
1	Negotiation								
2	Mediation								
3	Arbitration								
4	Conciliation								
5	Export determination								
6	Adjudication								
7	Litigation								
8	Others (Please specify)								

3. Please list or document three (3) best practices you believe are currently employed and associated with addressing or resolving disputes.

   I **……**

   II**……**

   III**……**

SECTION D

1. What type(s) of construction disputes that you have encountered (Tick in the right hand box as appropriate).

	Disputes over payment (Variations, insufficient)
	Disputes over poor contracts (preparation) and extension of time
	Disputes over changed conditions (un foreseen ground conditions)
	Disputes over delay (suspension of work site profession)
Others (Please specify) …… …… ……	

NOTE: This information will be protected, confidential and used for academic purposes only.