

**CAUSES OF CONTRACTORS' FAILURE IN
CONSTRUCTION INDUSTRY IN RWANDA**

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Rwanda

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DECLARATION

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

Signature..... Date.....

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This thesis has been submitted for examination with our approval as the university supervisors

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DEDICATION

To the Almighty God, my parents, late father, my Mother and sisters. My beloved wife Annet Dusabe and children Bright Kwizera, Peace Mbabazi, Kendra Itesi and KendrickJoshua Kalamagye for their continued sacrifice in expense of my study.

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LIST OF ABBREVIATIONS

ANOVA:	Analysis of Variance	BNR:	National Bank of Rwanda
CoK:	City of Kigali		
JKUAT:	Jomo Kenyatta University of Agriculture and Technology		
MININFRA:	Ministry of Infrastructure		
RDB:	Rwanda Development Board		
RTDA:	Rwanda Transport Development Authority		
SPSS:	Statistical Packages for Social Science		

ABSTRACT

Even though the construction industry in Rwanda is growing at an increasing rate due to the enabling political environment that promotes doing business and a booming private sector driven economy, most construction contractors companies in the country remain at same level of survival and growth in business for quite a long period of time due to a number of hindering factors. This situation is not good for it implies low and/or under developing contracting capacity in the country. The aim of this study is to find out the challenges which cause failure experienced by the contractors in the execution of roads and bridges construction contracts and to develop a strategy to mitigate the failure. In order to achieve the objectives and aim of the study, an online questionnaire survey of 80 construction contractors, 58 consultancy firms and 32 clients was conducted. The researcher surveyed 30 causes of contractor's failure that had been categorized, from review of the related literature, into four groups: (i) managerial causes; (ii) financial causes; (iii) expansion causes; and (iv) external causes. The respondents rated the factors on a 5 point scale, indicating the relative level of impact on the contracting firm to cause failure. In the data analysis, the causes were ranked according to their severity index as had been assessed by the respondents. Thereafter, the researcher evaluated differences in perceptions of different parties regarding the challenges which cause failure of construction contractors during the execution of construction contracts, using Analysis of Variance combined with multiple comparisons using the Scheffe and Bonferroni methods. The data analysis results showed that out of the thirty identified causes of contractor's failure, the top five causes as ranked by consultants are: (1) lack of capital; (2) lack of using project management techniques; (3) adopting unsuitable procurement practices; (4) fraud; and (5) award contracts to lower price. Additionally, the top five causes as ranked by clients are: (1) lack of using project management techniques; (2) lack of capital; (3) adopting unsuitable procurement practices; (4) fraud; and (5) award contracts to lowest price. Also, ranking by the contractors themselves revealed the top five causes of their failure to be: (1) adopting unsuitable procurement practices; (2) lack of capital; (3) inefficient deployment of resources; (4) award contracts to lower price, and lack of controlling equipment cost usage. Finally, it was observed that there is a statistically significant difference between perceptions of different party's consultants, clients and contractors regarding the managerial, financial, expansion and external causes of contractor's failure in implementation of their construction projects and also their businesses at the corporate level. From these findings, it was concluded that strategic measures should be taken in order to mitigate the contractor's failures during execution of construction contracts. From the study findings, it is recommended that the contractors should: (i) adopt the more suitable procurement practices; (ii) find ways to increase their working capital; (iii) be aware of risks involved in contracting to the lowest price and endeavor to contract to the suitable price; (iv) adopt skillful construction project management techniques in their construction projects. Further research in this area should investigate more causes of failure of the contractors in general.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Construction is a labor intensive activity with capacity to provide extensive employment with limited investment. The industry provides a point of entry into the labor market to some of the least educated and most disadvantaged section of the society. And in that way it provide the physical infrastructure, which is essential to the development of the economy (RDB, 2012).

However, the contribution of construction industry in economic development of a country notwithstanding, the construction industry worldwide is still faced with the challenges of sustainability in the business. There exist a multitude of challenges facing the construction industry today. Increasingly, difficult social, environmental, health and economic challenges continue to hamper growth of the construction industry (Kwaku, Lamia & Paul, 2014).

A number of contractors run bankrupt and many others end up in litigation that eventually lead to the collapse of the construction companies (Peters, 2004). Different researchers have attended to the industry's problems in the developing countries suggesting and arguing for various ways to lessen such problems (Ofori, 1994; Wells, 1986). Nevertheless, there is including lack of improvement in addressing the problems, resulting from numerous reasons: inappropriateness of some of the recommendations and the initiatives adopted, poor executive capacity of the implementing agencies, lack of resources for initiation and implementation, neglect of the construction industry by governments and their lack of commitment to solve its problems, and the lack of progress in construction industry development due to absence of measurable targets in programs for improving the industry's overall performance (Ofori, 1994).

It was revealed that the industry's problems in developing economies can be categorized into three areas: problems of shortages or inadequacies in industry infrastructure, problems caused by clients and consultants, and problems caused by

contractor's incompetence or inadequacies. Moreover, it was observed that the major problems faced by contractors in developing countries have been classified as problems imposed by the industry's infrastructure, problems of inaccurate information and frequent changes in instructions and failure to meet obligations on the part of clients and consultants, and problems imposed by their own shortcomings and this might lead to the financial failure of contractors (Enshassi, Al-Hallaq, & Mohamed, 2006). This gloomy outlook of contracting activity in the developing world generally applies to Rwanda too.

Rwanda has registered high achievements in all sectors of the economy since 1994. The construction industry is a distinct sector, which makes a significant contribution of 144 billion of Rwandan francs to Rwanda's GDP, since it plays a significant role in the socio-economic development and it offers direct employment (BNR, 2020). Transport infrastructure provides easy access to markets and inputs, stimulating agricultural production and leading to improved welfare of the population. The economic success of Rwanda has been achieved through deliberate reforms implemented by the government with the support of international financing institutions and donor agencies. This performance has resulted in the expansion of the country's infrastructure in all sectors, including: transport, communications, housing and buildings, water and sanitation, energy, health, education and agriculture. However, the nation's construction industry is still facing different problems, which include poor management, low technical capacity, limited or non-access to credit facilities and minimal work opportunities (MININFRA, 2009).

The construction industry in Rwanda has been classified according to the International Standards of Industrial Classification (ISIC Rev 4) into three categories: (1) Construction of buildings; (2) Civil engineering (including construction of roads and bridges, railways, construction of utility projects, and construction of other civil engineering projects); and (3) Specialized construction activities (Demolition and site preparation, electrical, plumbing and other construction installation activities, building completion and finishing, and other specialized construction activities). As stated before, this industry is crucial to the development of Rwanda's economy, since it

comprises the building, transport and civil engineering sub-sectors, so providing the physical infrastructure, which is vital to the development of the country's economy. It also improves the peoples 'lives and ways of doing business. The industry generates business for suppliers and manufacturers and offer employment to professionals, semi-skilled and unskilled labor. More than 50% of the employment so created in the construction industry is in the unskilled labor market, (RDB, 2012), which is the larger position of the workforce in the country. Consequently, adversity and inefficiency in the construction industry causes considerable disruption to livelihood workers and the society in general.

Construction process is undertaken by two main groups namely, consultants and contractors, both working on behalf of a client. The consultants include architects, engineers (structural/civil building services consultants) and quantity surveyors; and they charge professional fees for their services. The contractors and resource suppliers are commercial companies who carry out the construction production for profit (Kwakye, 1997). Construction contractors are the foremost players in any construction project for they are the ones who take up the responsibility to carry out the whole construction activities and related tasks necessary for erection of the structure. Their main responsibilities comprise procurement of materials, deployment of all the necessary machinery, equipment and human resource, managing the financial resources and converting all resources into the intended project outputs. Hence, in the course of their business they are the ones to first face the problems and challenges encountered within the construction industry.

1.2 Statement of the problem

Although the construction industry in Rwanda is growing at an increasing rate, most construction companies remain at same level of growth for quite a long period of time. Frequently, contractors fail to perform well in the delivery of projects in the business as profit making organizations. It has been observed that most financial losses incurred by contractors have hindered their survival and growth. Failure results from inefficiencies in the elements of construction, contract administration and management and other issues such as inflation, corruption, and accidents on sites.

Failure is one of the hindrances that adversely affect growth of construction companies. These failures include lack of success in projects delivery and lack of success in business performance, both of which are actually related. A number of studies on the challenges causing failure to contractors in construction industry worldwide have so far been done in the discipline of construction project management. For example Asteway (2008) investigated the Ethiopian construction industry, and noted that the industry was faced by several and complex problems which tend to make efforts aimed at developing the construction industry rather futile. In the study, the underlying problems of the construction sector were classified into two main categories. The first was related to the consequences of the fact that the sector was not viewed and planned in an integrated manner, but rather, operates with fragmented, unrelated and often conflicting components. The second problem was related to deficiencies and market price fluctuation of the inputs required for the construction, and with this unpredictably occurring, sharp price increases led contractors into failure to complete their projects within the acceptable margin of time and quality for the client, and into failure to complete within the planned cost margin for themselves. This hindered their growth in all aspects.

In addition, as reported in Levy (2007), the most critical reasons for misunderstandings leading to failure of contractors in construction projects in the USA were: (i) inadequate administration of responsibilities by the client, contractual team, contractors or suppliers; (ii) an unwillingness or inability to comply with the intent of the contract or to adhere to industry standards in the performance of work; (iii) site conditions which differ materially from those described in the contract documents; (iv) Wanyona, Dianga, & Gwaya (2014) pointed that in the construction industry of developing countries, productivity loss is one of the greatest and severe problems arising from lack of documented data for estimating, scheduling and control of the project.

1.3 Objective of the study

1.3.1 Main objective

This research aims at analyzing the challenges which cause failure by contractors in the execution of contracts and seeks to develop a strategy to mitigate the contractors' failure in construction industry in Rwanda.

1.3.2 Specific objectives

The specific objectives of the study are:

- 1 To assess and rank the challenges which cause failure encountered by contractors during implementation of contracts.
- 2 To evaluate the difference in perceptions of contractors, consultants and clients regarding the challenges which cause failure of contractors during the execution of contracts.
- 3 To develop a strategy to mitigate contractors' failure in construction industry in Rwanda.

1.4 Research questions

In order to achieve the above objectives, the following research questions were formulated to guide the investigation:

- 1 What are the challenges which cause failure encountered by construction contractors during implementation of contracts?
- 2 What are the perceptions of contractors, consultants and clients regarding the challenges which cause failure of construction contractors during the execution of contracts?
- 3 What is the strategy to mitigate contractors' failure in construction industry in Rwanda?

1.5 Research Hypotheses

Null hypothesis: There is no statistically significant difference in perceptions of contractors, consultants and clients regarding the challenges causing failure of contractors during the execution of contracts.

Alternative hypothesis: There is a statistically significant difference in perceptions of contractors, consultants and clients regarding the challenges causing failure of contractors during the execution of contracts.

1.6 Justification of the study

This research project intends to assess the challenges which cause failure experienced by contractors during the execution of construction contracts. This is mainly due to the prevailing challenges facing the construction industry today including entrenched social, environmental, economic and management challenges which continue to hamper the growth of Rwandan construction industry. And as a result failure and losses, the contractors face difficulties in building their capacity. From the literature reviewed in the course of this study no research work has been conducted in the country, on analysis of the challenges causing failure to construction contractors particular for the industry in Rwanda. For these reasons this research is justified. Time and money spent in doing the research work are resources well spent.

1.7 Significance of the study

In this study, it was observed that the contractors, especially local contractors in Rwanda are experiencing failures that affect construction projects, and as result the contractors' achievement of quality standards, acceptable workmanship, timely completion, and business survival and/ or growth in construction contracting are hindered. Moreover, due to that failure of growth, the local contractors are unable to compete favorably with foreign contractors operating in construction industry in Rwanda. Therefore, the results of this study are useful to all parts (clients, local contractors, and consultants) of industry and for researchers interested in field of this research, in the following ways:

The results will help the local contractors to enhance efficiency their organizational understanding on the areas where they need to improve in construction projects administration and management so they can be more competitive in course of construction.

The results will be a guide to the clients in implementing construction projects efficiently on the strength of proper project administration and its management.

The findings are expected to contribute to existing knowledge of technical consultants (Architects, Engineers, Quantity Surveyors etc..), in construction project administration and its management resulting in higher proficiency in project supervision and measurements.

And the findings are useful source of literature for future researchers in this area.

1.8 Scope of the study

This research was carried out on a sample of construction firms operating in Rwanda in the year 2019 who were available to participate in the study, in the period of 3 months (February to April 2019) dedicated to the data collection. Additionally, the study was only concerned with roads and bridges construction companies which are registered in the Rwandan Public Procurement Authority (RPPA), and a sample of clients, and of engineering consultancy firms registered with the Institution of Engineers of Rwanda. Furthermore, the implementation stage was only focused.

1.9 Outline of the study

The thesis is composed of five chapters, aligned as follows:

Chapter one introduces the study and includes background of the study, statement of the problem, justification, objectives, research questions, research hypotheses, significance, scope and outline of the study.

Chapter two presents the review of the literature related to the failure of contractors, empirical studies, research gaps, theoretical framework and conceptual framework for the study.

Chapter three is the research methodology, and it includes the research design, target population, sample size and sampling techniques, data gathering instruments and procedures, data processing and analysis, variables and ethical considerations.

Chapter four is the data analysis results and their discussion. It includes presentations of data using tables as per responses of the respondents, presentation of the findings related to each objective of the study and finally the interpretations and discussion are made to enable the reader to understand the main results of the study.

Chapter five is summary conclusions and recommendation of the study. In this chapter the main findings of the study were summarized, and conclusions from the findings stated, and recommendations for reducing the number of companies that are experiencing failure during execution of the contracts given. Finally, areas for further study following this work are given.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the existing literature and empirical studies related to the study. It summarizes the causes of failure of construction contractors during the execution of their contracts, as found in the existing literature and research works. The managerial, financial, expansion, and external contractors' failures are examined. Finally, the theoretical framework and conceptual framework for the study are presented at end of the chapter.

2.2 Causes of failure

In construction, there are three principal parties involved, namely, owner, consultants and contractors. The relationship between these parties is adversarial because each party has goals which often conflicts with those of the other parties in the projects. The relation among the parties could be a major source of a contractors' failure. There is no exact definition of a contractor's failure. However, it could be defined as when a business ceases operation following assignments, due to the inability to continue construction, and the business goes into bankruptcy due to failure to collect money from customers, and voluntarily withdraws because of dissatisfaction with business or profit. The construction industry has very high risks which could lead to contractors' failure, arising from the sensitivity of the business to economic cycles, and competition. Because there are large numbers of contractors, it is easy to establish a new firm. Since entry into the construction business is easy, implementation could easily be poor and unorganized, which increases the probability of a contractor's failure (Bader, 2004; Memba, & Nyanumba, 2013).

According to Storey (1994), business failure was defined as the business that should never have been started in the first place, or that the person was not competent to do, or that the businessman (or businessmen) left behind significant unpaid debt causes of business failure are very many. Watson & Everett (1993) attributed business failure to four different situations: discontinuance for any reason;

ceasing to trade and creditor loss; sale to prevent further losses; and failure to make a go of it. In the following sections, the challenges faced by contractors which can lead them to business failure are highlighted.

2.2.1 Challenges related to construction costs

Construction cost consists of the direct construction cost, indirect construction cost and risk allowances. The cost components have been categorized as follows:

The Direct construction costs are all costs that can be specifically recorded with an activity in a project. The direct cost cover the largest portion of the total project cost and these costs can be budgeted, monitored and controlled far more effectively than the indirect costs. And they mainly include material, labor, equipment, and subcontract costs. On the other hand indirect construction costs are all costs, which cannot be directly booked under a specific activity in a construction project but required to keep the whole project operational. These costs are also called overhead costs, which mainly include the head office and site overhead costs (Yamane, 2006).

It is very crucial to integrate risk allowances in the pricing for a construction project. This helps to recompense the negative impacts of different risks such as contractual, technical, political and economic risks. Whereas, contractual risks are usually stemming from the contract agreements with the project owner, subcontractors and suppliers, technical risks are usually associated with the clarification of the technical specifications, working drawings, construction technology and difficulties in understanding new method of constructions. Political and economic risks reflect the impact of political situations, stability of economic policies, inflation and price fluctuation of the inputs (material, labor, equipment and other related costs) on the execution of the intended construction project (Yamane, 2006).

2.2.2 Material related challenges

Abdul-Rahman and Alidrisyi (1994) it was observed that in material management practices in a fast developing country, in Malaysia for example, there were great challenges related to theft of materials on construction sites, vandalism of materials

and construction equipment, waste of construction materials, and misuse of materials by labor on site. Thieves can directly impact on the success of a project and diminish the potential profitability of the project being constructed (McDowall, 2002).

Banks (1990) stated that many contractors feel that the best way to help control jobsite theft is to develop a thorough job site anti-theft plan before the start of construction work. The first step is to decide on a sensible, written security plan during the preconstruction period. Money should be set aside when preparing the estimate for proper lighting, alarm systems, fencing, watchdogs, and security guard services if applicable (Banks, 1990). Therefore, security responsibilities should be assigned to the project manager, project engineer, superintendent, or any other employee who is in a position of responsibility. One of these individuals should be made responsible for the accountability of materials and equipment on site. This will ensure that everything is properly recorded when it is stored on site. Police and fire departments should also be contacted and a good line of communication established.

Research has shown that the majority of theft incidents are not done by strangers, but rather by individuals familiar with the job site (Gardner 2003). Vandalism is generally a nuisance crime on construction sites and does not present serious losses to most contractors. Since, any loss affects the profits; the threat of vandalism cannot be ignored. Like theft, the magnitude of the vandalism problem is difficult to estimate with accuracy a numerous contractors consider the act of vandalism to be part of the job. Unless it is excessive. There has been no systematic method of estimating the magnitude of the problem of vandalism among the many contractors (McDowall, 2002).

Construction waste means the waste materials generated by construction activities, such as scrap, damaged or spoiled materials, temporary and expendable construction materials, and waste generated by the workforce. Material waste and spoilage have been recognized as a major problem in the construction industry. Hence, although some residual level of construction waste seems unavoidable the potential reduction by preventing the generation of construction waste on sites is substantial. Much of this

waste is due to poor storage and handling on sites, leading to spillage and spoilage (McDowall, 2002).

Reducing waste in construction operations starts with people from the construction operatives upwards to the project managers and specialists. The operatives need to be aware of the need to manage waste as well as to be provided with opportunities to contribute to the waste management. Project Managers need to facilitate waste reduction activities on the construction sites whilst the specialists will be spotting opportunities to reduce, reuse and recycle much of the waste as well as coach the construction site team on waste management operations (McDowall, 2002).

There is a variety of ways through which construction contractors can reduce construction waste or demolition debris at the job site. The following general practices are common: Proper storage and control including proper handling; Avoiding unnecessary setting by looking for a suitable available length; Protection of installed items as necessary and avoiding working to inaccurate dimensions which, for example, can cause overexcavation; Purchasing materials in bulk where possible and avoiding individual packing for volume purchases; Using returnable containers and packing materials; Reusing non-returnable containers on the site to the maximum extent possible; Collecting and storing scraps at cutting and fabricating locations, for materials that are heated, mixed, exposed to environmental conditions, or otherwise subject to spoilage, limiting preparation of these materials to quantities which can be installed within their expiration times. Working in smaller batches will reduce the necessity to throw out expired or spoiled or surplus materials; and salvaging and/or recycling damaged components, products, and materials (Banks, 1900).

2.2.3 Equipment and plant related challenges

Proverbs (2000) investigated that the best practice supply chain implications for reducing construction costs. He observed that most of the loss identified with plant came from idle plant on construction site, breakdown of plant and depreciation and misuse of plant by the operators. Contractor's plant implies the machinery, tools

(other than craftsman's personal tools) and other equipment used in the contractor's yard workshop and on site (Foster & Harington, 1976).

Idle plant is mainly due to lack of proper planning and management of the plant. It is also due to adverse weather interruptions. Breakdown of plant is either due to inadequate maintenance regime or use of old and obsolete plant and equipment. Many contractors grapple with managing such old and obsolete equipment (Proverbs, 2000).

According to Harris and McCaffer (2001), a contractor has two options in acquiring plant: he may own machinery, lease or hire it. Many contractors prefer to hire only those items of plant which are required to meet peak demand or specialized duties. The alternative decision to purchase involves considerable capital sums which can be locked up in the plant. The plant must be operated economically in order to produce a profitable rate of return on the investment. Most often, acquiring plant leads to owner related costs. In order to effectively manage plant, a plant manager has been developed to manage all likely scenarios on site, including plant that is damaged on delivery, plant replacement in the event of breakdown, and replacement of the accessories (e.g. protective equipment) associated with certain items of plant. The plant manager enables more efficient management of plant on sites with significant reduction in costs, by providing a full attention to each item of the plant in addition to running costs control (Harris & McCaffer, 2001).

2.2.4 Labor related challenges

Alinaitwe et al . (2007) investigated the factors that affect the productivity of workers on construction sites. The researchers found out that great loss was due to inefficient labor and staff, accidents, strikes/Industrial action, poor quality work leading to rework, poor quality labor that is not well trained and the majority of whom learn on the job, and misuse of labor by poor deployment due to inadequate supervision (Alinaitwe, Mwakali, & Hansson, 2007).

Lack of training also leads to loss. Training is a job-oriented process to provide employees with the skills and knowledge required to carry out their duties efficiently and effectively. Training can take many forms; it may be done formally or informally, it may be on the job or off-the-job (Storey & Sisson, 2000).

Many organizations have reduced the number of full-time employees, or are planning to do so. This is not simply due to increased efficiency, although that is a factor, but is a conscious effort to become more flexible. An increasing number of firms is combining a relatively small nucleus of full-time employee with fluctuating numbers of part-time staff or service providers. In this way firms gain flexibility to deal with rapidly changing conditions. Lucey (1994) states that manpower planning seeks to make sure that the organization will have sufficient staff of the right caliber and expertise in order to achieve the organization corporate objectives which involve minimization of financial loss on projects. In general the part-time workers tend to be paid less and have little or no job security and many are women especially in retailing. The tendency for there to be a core of full-time employees supported by part-timers called up as required can be seen in many industries including construction, retailing, local government, security, industrial cleaning and many others (Lucey, 1994). Many employers like temporary workers because of the benefits of not having to pay sickness or holidays. The temporary worker can also be given extra work without the employer paying any extra wage (Garry, 2011). However, temporary workers are a source of loss in terms of lack of attendance and thefts (Lucey, 1994).

The other major causes of loss to companies are strikes. In a strike, a group of workers agree to stop working to protest against something they think is unfair where they work. Workers withhold their services in order to pressurize their employment or government to meet their demands. Demands made by strikes can range from asking for higher wages or better benefits to seeking changes in the workplace environment. Strikes sometimes occur so that employers listen more carefully to the workers and address their problems. Strikes can occur because of the following reasons: dissatisfaction with company policy; salary and incentive problems; increment not up

to the mark; wrongful discharge or dismissal of workmen; withdrawal of any concession or privilege; hours of work and rest intervals; leaves with wages and holidays; bonus, profit sharing, provident fund and gratuity; retrenchment of workmen and closure of establishment; and dispute connected with minimum wages (Grants, 1990).

Accidents on construction sites are a source of loss to the contractor in respect of finance, time and reputation (Grants, 1990). Therefore, the contractor should take steps to minimize accidents by: displaying health and safety guidelines where they can be seen by all employees; providing protective clothing (e.g. hard hat and safety goggles); and providing appropriate training. According to Shrivastas (2008), an accident can be costly to the injured employee as well as to the employer. There are two types of accident cost, namely direct cost and indirect cost. The direct cost involves: compensation, medical and legal payments made directly by the organization or through their insurance schemes. Indirect cost involves; lost time of the injured employee, lost time by other employees who stop work because of an accident, damage to equipment, plant or other properties, spoilage of materials cost of paying wages to the injured employee during the period of injury, delay in production due to an accident, reduction in efficiency of the injured worker at work after recovery and lost production as a result of slowing down of other employees because of influence of accident on their morale (Shrivastas, 2008).

2.2.5 Financial challenges due to mark up

The high competition among construction contractors has contributed to increased financial failures of the emerging market, making the market unsustainable. Lack of access to finance both during pre-construction which disqualifies construction contractors from meeting guarantee and performance bond requirements and during construction which leads to cash-flow problems, incomplete work and even liquidation are financial challenges faced construction contractors (Nissanke, 2001).

Shou et al . (2004) investigated the risks associated with construction projects in developing countries. In particular, they came up with a risk management

framework. The researchers concluded that the major risks that lead to financial failure of construction contractors are inflation and price fluctuation, delays, corruption, and underestimation of the site of the contractors (Shou, Zhijun, Taihe, & Brian, 2004).

Inflation has become a chronic problem whose effects permeate the entire construction industry. Contractors are faced with severe uncertainty in bidding and financing work on projects. Owners are not only paying for the increased costs of facilities and capital but also for premiums on construction prices because of the uncertainties of inflation and its side effects. Productivity is affected because contractors cannot accurately forecast long-term returns on their investments and are required to divert necessary capital to meet resource costs. In particular, the proper assignment of economic risks in contracting should reduce costs in the long term, although this would entail considerable change in construction industry operations. Inflation will lead to increase of prices of goods and services and as a result the currency will become weaker and exports will be uncompetitive. This will result in reduction in volume of exports. The businesses will close as they fail to sell and yet have to pay high charges for inputs including labor. Here, there are policies that contractor can apply to avoid the adverse effects of inflation: Purchasing most of materials and goods in bulk at the beginning of the project; Agreeing and signing the contract fluctuation clause. This means that, in case of increased costs of materials and labor during the contract period, contractors and sub-contractors receive financial reimbursement; and Speeding up the execution of the contract by avoiding delays on the project, as much as possible (Asteway, 2008).

Price fluctuation can have effect on contractors, clients/owners and the project itself. The major effects of price fluctuation on contractors, if not well compensated for can be: profit loss of contractors, cash flow (project financing) problem of the projects, delay in project completion, and Poor quality of project outputs (Abdo, 2006). Although, price fluctuation has serious adverse effects on construction contractors, there are several ways of minimizing the effects. One way is through risk

management. In addition to risk management, literature suggests the following methods (Asteway, 2008)

Improved financial utilization of contractors: The contractor must identify and purchase items likely to delay the schedule or be in short supply. In addition to this, proper planning and constant review of cash flows provides the best defense against surprises. Companies should also constantly evaluate their profitability against objectives.

Improved contract procedures: The following are improvements on contract procedures are also believed to reduce the impact of price fluctuation on construction contractors, especially the increase in prices.

Maintaining current information: update control information continually with current prices, indices, and trends.

Payment: Contractors can suffer severely under inflation and high interest rates if payments are delayed. Therefore payments to be made to contractors must not take long time (Hatmanu, Căuțișanu, & Ifrim, 2020).

Innovative contracting: use contracting procedures that shorten the overall design award construction time.

Subdivide contracts: by subdividing a large risky venture into several smaller ones at prices more manageable and foreseeable, the total risk will be reduced

Delays

Usually clients seek to have their projects completed on time so as to achieve the first in the markets advantage over competitors. In practice, the complexity of the project, the consultant's experience, project leaders experience and the contractors' competency, influence the outcome with respect to project timely completion, cost and the desired quality (Harris & McCaffer, 2001). The main targets on the project which the contractor should aim at are completion on the specified time, cost quality and safety, because these targets can be used to assess their efficiency. In (Chitkara,

1995) it was observed that all projects are time bound and hence all project activities are directed towards the achievement of timely completion. Many construction projects experience delays which result into cost and time overruns giving ground for costly disputes and claims.

Assaf and Al-Hejji (2006) identified the contractor related delay factors as; difficulties in financing project by contractor, conflicts in sub-contractors schedule in execution of project, rework due to errors during construction, conflicts between contractor and other parties (consultant and owner), poor site management and supervision by contractor, poor communication and coordination by contractor with other parties, ineffective planning and scheduling of project by contractor, improper construction methods implemented by contractor, delays in sub-contractors work, inadequate contractor's work, frequent change of sub-contractors because of their inefficient work, poor qualification of the contractor's technical staff, and delay in site mobilization.

Ayudhya (2011) evaluated the common delay causes of construction projects in Singapore and found out that the major causes of project delay were: delay in progress payment by owner; adverse weather conditions; main contractor financial problems; evaluation of completed works.

Based on a study done on assessment of delays and cost overruns during construction projects in Pakistan, it was observed that due to technical, financial and market behavior, construction projects were seriously facing delay and cost overruns in Pakistan. Also, it was observed that these delay and cost overruns would be controlled by effective management tools. Proper management tools and techniques can successfully improve the performance of a project. In the study project management task was further subdivided into the following groups: management of material, financial, mechanical resources, and human resources. It was noted that negligence of management in any of these above mentioned zones may cause failure, delay or cost overruns during construction (Ejaz, Ali, & Tahir, 2011). These observations and arguments point to the possible solutions for addressing the problem of contractor's failures in the construction industry in Rwanda.

2.2.6 Previous Research Works on Contracting Business Failures

Many researchers had studied the challenges which cause contracting business failure. Osama (1997) presented a study of the factors that contribute to the failure of construction contractors in Saudi Arabia and found that the most important factors are: difficulty in acquiring work, bad judgment, and lack of experience in the firm's line of work, difficulty with cash flow, lack of managerial experience, and low profit margins (Osama, 1997). In addition, Bader (2004) and Ibrahim Mahamid (2011) also presented the causes of contractor's failure in Saudi Arabia, and in Palestine respectively and the main causes were grouped into the following categories: (Bader, 2004 & Mahamid, 2011).

Managerial causes: The more important causes that have a strong influence on contractor's failures were: Lack of experience, replacement key personnel, not assigning project leader in the site, labor productivity and improvement, bad decisions in regulating company policy, none use of project management techniques, inefficient company organization, bad procurement practices, excessive claims, internal company problems, recruitment from one country, recruitment from many countries, owner's absence from the company, frauds, neglect, lack of experience in contracts, competent consultation, and control systems.

Financial causes: The financial stand of the contractor is very important for running the business. Work improvement sometimes needs money because improvement needs buying new equipment or developing new techniques. All the important managerial causes would not keep the contractor save without good financial stand. The financial causes were related to: Low profit margin due to competition, cash flow mismanagement, bill and collecting effectively, poor estimation practices, evaluate project profit in one fiscal year, employee benefits and compensations, controlling equipment cost and usage, fluctuation in construction material cost, depending on banks and paying high interest, award contracts to lower price, fluctuation in money exchange rate, lack of capital, controlling equipment cost and

usage, evaluation of profit yearly, dealing with variation orders, monopoly, and material wastage.

Expansion causes: The expansion is the normal growth in any business. If the company does not develop, the companies, which are the same size, will develop and become stronger than the solid company. However, the expansion should be done under very good researching, planning, and controlling. The size of the company should be reasonable for the business to avoid failure. The expansion causes were: expanding into new geographic locations, opening a regional office, increased number of projects, increased size of projects, change in the type of work, lack of managerial maturity as the company grows, and change from private to public or vice versa.

External Causes: The external causes were related to: national slump in the economy, construction industry regulation, owner involvement in construction phase, bad weather, natural disaster, banks policy, project environment, politics, and limitation on importing.

2.3 General theory related to business failures

Arditi et al . (2000) found budgetary and macroeconomic issues as the main reasons for construction company failure in the USA. Over 80% of the failures were caused by five factors, namely insufficient profits (27%), industry weakness (23%), heavy operating expenses (18%), insufficient capital (8%) and burdensome institutional debt (6%).

Enshassi et al . (2006) concluded that the main causes of contractors failure are: delay in collecting dibs from clients (donors), closure, depending on banks and paying high profits, lack of capital, cash flow management, lack of experience in the line of work, absence of construction regulations, low margins of profit due to competition, award contract to lowest price, and lack of experience in contracts (Enshassi, Al-Hallaq, & Mohamed, 2006).

Kivrak and Arslan (2008) examined the critical factors causing the failure of construction companies through a survey conducted among 40 small to medium-

sized Turkish construction companies. A lack of business experience and the country's economic conditions were found to be the most influential factors to company's failure.

According to Ramus and Birchall (2005) the causes of financial failure to contractors may arise from any one or more of the following: Inefficient deployment of resources (labor, plant, and materials), excessive wastage or theft of materials, plant being allowed to stand idle or under-utilized, adverse weather or working conditions, and underpricing of tender documents by assumptions in regard to labor times, types and sizes of plant which do not equate with the realities of the construction work (Ramus & Birchall, 2005).

2.4 Research gap

The foregoing literature review has demonstrated that the development of construction contractors in many countries faces many challenges which need to be addressed in order for them to attain sustainable growth. However most of the previous studies do not demonstrate how the problem can be solved effectively. Also various studies have largely identified several challenges that may be categorized as: managerial, financial and expansion causes to contractor's failures in the construction industry elsewhere. However in the case of Rwanda no coverage of this problem was found in the literature reviewed. Although observations and conclusions made from studying construction industries of the other countries might find some reference in the construction industry in Rwanda, every country has unique challenges from political, social, and economic environment. Therefore, this study attempts to fill this gap by assessing and ranking the causes, and developing a strategy to mitigate contractor's failures in Rwanda.

2.5 Theoretical framework

A number of researchers have studied the causes of financial failure of construction companies. It has been observed that lack of a strong financial director, inadequate cashflow plan, poor budgetary control system, defective bidding system, and lack of

engineering skills led to company failure (Abidali & Harris, 1995). Also, lack of capital, under costing, lack of control, lack of advice, government regulation, trade fluctuation and fraud were listed as main causes of business failure. Clearly, failure is the outcome of a complex process and is rarely dependent on a single factor (Argenti, 1976).

Moreover, there are many definitions of financial failure that leads to contractor's failure. For instance, financial failure was defined from an economic perspective as follows: a company is said to have failed if the realized rate of return on invested capital, with allowances for risk considerations, is significantly and continually lower than prevailing rates on similar investments. Another criterion from financial failure is insufficient revenues to cover costs and situations where the average return on an investment is below the firm's cost of capital (Altman, 1968).

According to Frederikslust, (1978) failure of company is the incapacity of a company to pay its debt as effect of a quick decline in sales, as a result of recession, the loss of an important client, shortage of new materials and deficiencies of management. Simply, it is a situation in which a company stops operations for the reason that it is unable to generate sufficient revenue to pay its expenses.

Thus, there is no exact definition of a contractor's failure. However, it could be defined as when a business: ceases operation following assignments due to the inability to continue construction, goes into bankruptcy due to failure of collecting money from customers, and voluntarily withdraws because of dissatisfaction with business or profit (Bader, 2004). Therefore, to analyze the causes of contractors' failure in construction industry in Rwanda the above definitions proposed by Frederikslust, (1978) and Bader,(2004) were adopted.

2.6 Conceptual framework

The conceptual framework for this study was developed based on the literature reviewed on contractors' failure causes in this industry. As shown in Figure 2.1 the

independent variables are considered to be internal and external challenges of the company that can lead to failure of contractors.

According to Karels and Plakash, (1987) internal problems of the company were assigned to poor management. Potential forms of the appearance of bad management are the absence of a sense of a need for change, inadequate communication over expansion, and mismanagement of projects or fraud. The external problems were ascribed to negative fluctuation negatively of exchange rates, political instability, and industrial production, changes in the interest rates, economy weakness, budget shortages and expected or unexpected inflation among others. In addition, the causes of contractor's business failure were observed as due to different causes including, managerial, financial, business growth, business environmental, and political causes (Enshassi, AlHallaq, & Mohamed, 2006). The same approach classification was suggested in the study done on causes of contractor's failure in Saudi Arabia (Bader, 2004). Hence, this study on causes of contractors' failure in construction industry in Rwanda, the internal and external challenges of the company are addressed, whereby the internal challenges include the managerial, financial, and expansion causes, and external challenges include the political and the environmental causes of failure.

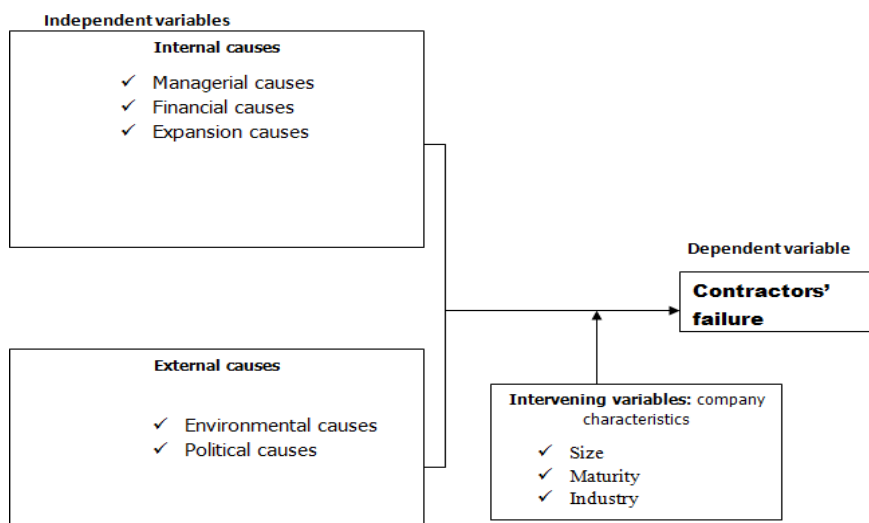


Figure 2.1: Conceptual framework

Source: Researcher, 2020

THREE CHAPTER

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

The research methodology chapter describes the data to be used and the research methods and techniques that were employed in this study. It includes the research design, targeted population, sampling techniques and illustrations, data collection instruments, validity and reliability of data, and methods of data analysis.

3.2 Research design

It is viable to make categorization of different research approaches into two broad categories depending on how they are conducted: quantitative research methods and qualitative research methods. Qualitative research is an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. The process of research involves emerging questions and procedures, data typically collected in the participant's setting, data analysis inductively building from particulars to general themes, and the researcher making interpretations of the meaning of the data. The final written report has a flexible structure. Those who engage in this form of inquiry support a way of looking at research that honors an inductive style, a focus on individual meaning, and the importance of rendering the complexity of a situation. On the other hand, quantitative research is an approach for testing objective theories by examining the relationship among variables. These variables, in turn, can be measured, typically on instruments, so that numerical data can be analyzed using statistical procedures. The final written report has a set structure consisting of introduction, literature and theory, methods, results, and discussion. Like qualitative researchers, those who engage in this form of inquiry have assumptions about testing theories deductively, building in protections against bias, controlling for alternative explanations, and being able to generalize and replicate the findings (Creswell, 2014). Thus, this study employed the survey research design, where qualitative and quantitative research methods were used in the data collection and analysis procedures.

3.3 Target population

A population consists of the totality of the observation with which we are concerned. The target population are 100 construction contractors of roads and bridges of the first five categories namely A, B, C, D, and E that have valid registration with the Rwanda Public Procurement Authority (RPPA), where categories A, B subdivided into 2 subcategories each one as indicated on Table 3.1 below; and the last column of the Table

3.1 below represent the related number of construction contractors which will be taken as sample, its computation are summarized in next section. The population was distributed amongst the five categories as given on Table 3.1.

Table 3.1: Categorization of companies involved in roads and bridges

Category	number of companies (Population)	Criteria	Number of companies (Sample)
	13	Allowed to bid whose value is greater than 2 million Rwandan Francs(All road projects)	11
A1	3	Allowed to bid whose value is greater than 2 billion Rwandan Francs(All road except Asphalt roads)	2
B1	0	No company has fulfilled this category	0
B2	4	Allowed to bid whose value is between 1.5-2 billion Rwandan Francs(All road projects)	3
C	16	Allowed to bid whose value is between 800 million -1.5 billion 2 million Rwandan Francs	13
D	40	Allowed to bid whose value is between 300-800 million Rwandan Francs	32
E	24	Allowed to bid whose value is between 100-300 million Rwandan Francs	19
Total	100		80

Source: (RPPA, 2016)

In addition 68 consultancy companies were considered as consultancy population of this study. Finally; all 30 districts, City of Kigali, Rwanda Transport Development Agency(RTDA) were taken as main clients of construction contractors.

3.4 Sample size and sampling techniques

A sample can be defined as a subset of some of the units in the population. Sampling defines the process of making the selections; sample defines the selected items (Ritchie, Lewis, Nicholls & Ormston, 2013). Sampling is defined as the process of selecting representative units of a population for the study in a research investigation. Scientists obtain knowledge from samples; many problems in scientific research cannot be solved without employing sampling procedures (Christensen, 2003; Barrett, Bliss-Moreau, Lebo & Kaschub, 2003). Unfortunately, without a survey of the population, the representativeness of any sample is uncertain, but statistical theory can be used to indicate representativeness (Fellows & Liu, 2015). Thus, the well-researched formulas in equation (3.1) will be used to determine the sample size n (Ayoub & Mc Cuen, 2000).

$$n = \frac{z^2 p(1-p)}{c^2} \dots \dots \dots (3.1)$$

Where

- n is sample size for an infinite population (of size exceeding 1000 units),
- z^2 is z value,
- p is probability of picking a choice expressed as percentage, and
- c^2 is confidence level.

Thus, for our case we use $z = 1.96$, $p = 50\%$, and $c = 5\%$.

Therefore, for this case

$$n = \frac{1.96^2 \cdot 0.5(1-0.5)}{0.05^2} = 384.16 \approx 385 .$$

Thus, the confidence level in study is 95%. Furthermore, to ensure the representativeness, the correction for the finite population was used, where the new sample size (n^*) is calculated by using this following formula given in equation (3.2).

$$n^* = \frac{n}{1 + \frac{n-1}{N}} \dots\dots\dots 3.2$$

Then, the representative sample of construction contractors is given by

$$n_1^* = \frac{385}{1 + \frac{384}{100}} = 79.50989 \approx 80$$

And the representative sample of consultancy companies is given by

$$n_2^* = \frac{385}{1 + \frac{384}{100}} = 57.92035 \approx 58$$

Those 80 construction contractors have been chosen from all those mentioned categories where each one was considered as stratum, and the simple random sampling method was used to select the selected companies from each stratum. Moreover, simple random sampling method was used to sample 58 consultancy companies.

3.5 Data gathering and processing

The research instrument that have been used in this research is online structured questionnaire, where the open and closed questions were addressed to the respondents in order to collect the primary data. The questionnaire is shown in Appendix 1.

\bar{c} is average covariance between pair of items, and

\bar{v} is the average variance.

Moreover, the draft instrument was given to the experts in construction industry of Rwanda and supervisors to scrutinize and critique. The comments that were provided and the research was included into the final instrument. Furthermore, the validity of the instrument was tested through a pilot study, and then the instrument improved further before being used in the actual data collection.

3.8 Treatment of missing data

Missing data occurs in research for a variety of reasons and are a cause of concern for analysis. Many researchers have described the sources of missing data and suggest the ways of handling them depending on the type of missing data; in addition some methods for handling missing data are available and easy to be implemented in statistical software such as SPSS version 20.

In Brick and Kalton, (1996) missing data was classified as arising from four main sources. The most commonly recognized source is total or unit non response, which occurs when no survey data are collected for an element selected for the sample. Total non-response results from refusals to participate in the survey. Compensation for total non-response is generally made by means of weighting adjustments in which respondents are assigned greater weight in the analysis in order to represent the non-respondents. A second source of missing survey data is non coverage, which occurs when some elements in the population of inference for the survey are not included in the survey's sampling frame. Its compensation is usually made by means of weighting adjustments. A third source of missing data is item non response, which occurs when a sampled element participates in the survey but fails to provide acceptable responses to one or more of the survey items. It is usually handled by using imputation method which involves assigning a value for missing response. The

fourth one is partial non response which falls between total and item non response. It can be handled either by weighting or imputation.

The other classifications of type of missing data are either random or non-random. Random missing values are said to be missing completely at random (MCAR) to describe data where the observed values in data set are just a random sample from data set, when it would have been complete. And also missing values are said to be missing at random to describe data that are missing for reasons related to completely observed variables in the data set in other words the data is said to be missing at random when the probability that a value for certain variable is missing is related to observed values on other variable. Finally, missing values are said to be missing not at random when the probability that a value for certain variable is missing is related to the scores on that variable itself (Rubin, 1976). Therefore, based on this classification a well-researched imputation method have been suggested for handling missing completely at random and missing at random, moreover this method can be implemented in SPSS (Rubin, 1996). Thus, in this research the more emphasis has been taken in data collection and data entry phase in order to minimize the probability of missing data.

3.9 Method of data analysis

To address the first and second specific objectives of the study the Relative Impact Index (RII) and the Analysis of Variance as explained in Richard & Gouri, (2010) were used to assess whether there is a statistically significant difference in means of Relative Impact Index (RII) between each two parties (clients and consultants, client and contractors, consultants and contractors). This enabled the researcher conclude whether there is or no statistical significant difference in perceptions of contractors, consultants and clients regarding the challenges causing failure of contractors during the execution of contracts. Therefore, Relative Impact Index (RII) was used to rank the causes of financial loss encountered by construction firms during implementation of construction contracts from the perspective of clients, consultants, and contractors. Relative Impact Index (RII) is given by this equation (3.4)

$$RII = \frac{\sum_{i=1}^4 W_i X_i}{\sum_{i=1}^4 X_i} \dots\dots\dots (3.4)$$

where i is response category index for 4 is strongly agree, 3 is agree, 2 is disagree , and 1 is strongly disagree, W_i is the weight assigned to the i^{th} response = 4,3, 2 and 1 respectively, and X_i is the frequency of the i^{th} response given as a percentage of the total responses for each cause.

3.10 Ethical considerations

Before starting of the study different ethical issues were addressed. The concerned people from construction industry in Rwanda were contacted and then the purpose of the study, procedure and benefits were explained to them. The respondents were assured that participation was voluntary and they were free to choose to participate in the study. To ensure confidentiality and privacy no names of their companies were used in the questionnaire and the information collected was only used for the purpose explained by the researcher. Finally, the approval from other relevant authorities was also gotten.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter summarizes the results and findings from research, where the tables and graphs have been used and some interpretations have been made to the findings from this research. From the research findings, a strategy for mitigation of contractors' failure in Rwanda is synthesized.

4.2 Background of the respondents

In this part, the classifications of respondents based on their job position and high level of study, their business type and working experience are presented.

4.3 Position and qualification

In the Table 4.1 below we can see that among all 170 respondents, the total of 63 of respondents were engineers, where 50.8% have Bachelor's degree and 42.9% of them are masters holders, and only 4.8%, and 1.6% of them are respectively PhD and diplomaholders. The total 26 of respondents were technicians where 65.4% of them their highest level of education is diploma, and only 7.7% of them have bachelor's degree. Moreover, among all 170 respondents, the total of 20 were directors, 55.0% of them have masters' degree and only 4.8% of them were PhD holders.

Table 4.1: Distribution of respondent’s position and level of education

Position of the respondents	Qualification of the respondents					Total
	PhD	Masters	Bachelor	Diploma	Certificate	
Director	5 25.0%	11 55.0%	4 20.0%	0 0.0%	0 0.0%	20 100.0%
Engineer	3 4.8%	27 42.9%	32 50.8%	1 1.6%	0 0.0%	63 100.0%
Architect	0 0.0%	6 30.0%	13 65.0%	1 5.0%	0 0.0%	20 100.0%
Quantity surveyor	0 0.0%	5 25.0%	7 35.0%	8 40.0%	0 0.0%	20 100.0%
Administrator	2 9.5%	6 28.6%	7 33.3%	6 28.6%	0 0.0%	21 100.0%
Technician	0 0.0%	0 0.0%	2 7.7%	17 65.4%	7 26.9%	26 100.0%
Total	10 5.9%	55 32.4%	65 38.4%	33 19.4%	7 4.1%	170 100.0%

Source: Researcher, 2020

4.4 Experience and business type

The results summarized in the Table 4.2 below indicate that among all 170 respondents 42 of them have less than three years of working experience, and 50%, 33.3% and 16.7% of them are from consultancy firm, client and contractor companies respectively. In addition, the majority of 68, 31 and 29 of respondents have working experience of 3 – 6 years, 6 – 9 years and over 9 years respectively. Moreover, 55.2% of respondents that are experienced over 9 years are from contractors companies.

Table 4.2: Distribution of respondent’s experience and their business

Experience of respondents	Business type			Total
	Consultancy	Client	Contractor	
0-3 years	21 50.0%	14 33.3%	7 16.7%	42 100.0%
3-6 years	17 25.0%	15 22.1%	36 52.9%	68 100.0%
6-9 years	10 32.3%	0 0.0%	21 67.7%	31 100.0%
Over 9 years	10 34.5%	3 10.3%	16 55.2%	29 100.0%
Total	58 34.1%	32 18.8%	80 47.1%	170 100.0%

Source: Researcher, 2020

4.5 Categories of contractor’s companies

The Figure 4.1 below illustrates the distribution of all 80 respondents from contractors companies that have been participated in this study as shown in Table 3.1; it is clear that the majority of 41.25%, 23.75% , 16.25%, 12.50%, 3.75% and 2.5% of all 80 companies are registered in category D, E, C, A1, B2, and A2 respectively as ranked by RPPA .

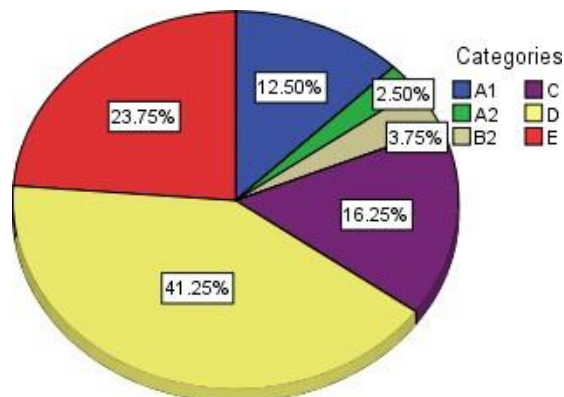


Figure 4.1: Distribution of the contractors companies in RPPA categories

4.5.1 Contractor's failure causes

In this section, 30 causes including 10 managerial causes, 10 financial causes, 5 expansion causes, and 5 external causes that lead to contractors' failure in execution of their contracts are presented, also the perceptions of respondents on each cause was recorded using likert scales. Moreover, the relative impact of each cause was calculated and finally, the ranks for all causes were calculated in each one indicated category as follows.

4.5.2 Managerial causes

To assess the perceptions of all parties about the managerial challenges that cause the failure of contractors firms during the execution of construction contracts, the following managerial causes were obtained from the literature reviewed: adopting unsuitable procurement practices, assigning unqualified personnel, bad decisions in formulating company policy, company organization, frauds, lack of experience in contracts, lack of labor productivity and improvement, lack of using computers applications, lack of using project management techniques, and poor accounting and control systems. In the data collection, it was these factors that the respondents were questioned about.

The respondents were asked to show their perceptions about the managerial challenges that causing the failure of contractors firms during the execution of their construction contracts by using the likert scales. As shown Table 4.3 below, it is clear that 39.4%, 50.6%, 8.2%, and 1.8% of all respondents were respectively strongly agree, agree, disagree and, strongly disagree that adopting unsuitable procurement practices is one of managerial causes. Also, 63.5%, 27.6%, 7.1%, and 1.8% of all respondents were respectively strongly agree, agree, disagree and, strongly disagree that poor accounting and control systems is one of those managerial causes. In the same way, the similar interpretation can be made for others causes listed in the Table 4.3 below.

Table 4.3: Managerial causes of contractor failure

Experience of respondents					Total
	Strongly agree	Agree	Disagree	Strongly Disagree	
AUPP	67 39.4%	86 50.6%	14 8.2%	3 1.8%	170 100.0%
AUP	98 57.6%	63 37.1%	9 5.3%	0 0.0%	170 100.0%
BDFCP	62 36.5%	90 52.9%	15 8.8%	3 1.8%	170 100.0%
CO	74 43.5%	80 47.1%	12 7.1%	4 2.4%	170 100.0%
Frauds	89 52.4%	32 18.8%	14 8.2%	5 2.9%	170 100.0%
LEC	93 54.7%	62 36.5%	5 2.9%	6 3.5%	170 100.0%
LLPI	59 34.7%	98 57.6%	10 5.9%	3 1.8%	170 100.00%
LUCA	44 25.9%	85 50.0%	33 19.4%	8 4.7%	170 100.00%
LIPMT	89 52.4%	63 37.1%	14 8.2%	4 2.4%	170 100.00%
PACS	108 63.5%	47 27.6%	12 7.1%	3 1.8%	170 100.0%

Source: Researcher, 2020

Key: AUPP: adopting unsuitable procurement practices, AUP: assigning unqualified personnel, BDFCP: bad decisions in formulating company policy, CO: company organization, LEC: lack of experience in contracts, LLPI: lack of labor productivity and improvement, LUCA: lack of using computers applications, LUPMT: lack of using project management techniques and PACS: poor accounting and control systems

Furthermore, the relative impact index of each cause was used as measure to rank those managerial causes with respect to perceptions of all parties namely consultancy, client, and contractor. The results given in the Table 4.4 below summarize the ranks of all causes with respect to each party. For instance, adopting unsuitable procurement practices was ranked on the first place by contractor party and as second by consultancy and client parties. Also, lack of using project management techniques,

was ranked as first cause by consultancy and client parties, third by contractors. Lack of labor productivity and improvement was ranked by all parties as the last cause. Similarly, we can obtain from the same table the rank of each cause.

Table 4.4: Rank of managerial causes of contractor failure

Managerial causes	Consultancy		Client		Contractor		Sum of ranks
	RII	Ranks	RII	Ranks	RII	Ranks	
Adopting Unsuitable Procurement	3.862	2	3.72	2	3.20	1	5
Assigning unqualified Personnel	3.517	8	3.34	8	3.00	8	24
Bad decisions in formulating company policy	3.638	6	3.47	6	3.03	5	17
Company organization	3.776	5	3.66	4	2.99	9	18
Fraud	3.810	3	3.69	3	3.09	2	8
Lack of experience in contracts	3.483	9	3.31	9	3.06	4	22
Lack of labour productivity and improvement	1.810	10	3.13	10	2.60	10	30
Lack of using computer applications	3.776	4	3.66	4	3.01	6	14
Lack of using project management techniques	3.897	1	4.00	1	3.08	3	5
Lack of accounting and control systems	3.570	7	3.41	7	3.01	7	21

Source: Researcher, 2020

4.5.3 Financial causes

To assess the perceptions of all parties regarding the financial challenges causing failure of contractors firms during execution of their construction contracts, the following financial causes were adopted from literature and respondents: Award contracts to lower price, cash flow mismanagement, depending on bank loans and paying high interest, difference of local currency exchange with contract currency, employee benefits and compensation, excessive wastage or theft of materials, inefficient deployment of resources, lack of capital, lack of controlling equipment cost and usage, and low margin profit due to competition.

The respondents were asked to indicate their perceptions about the financial challenges that causing the failure of contractors firms during the execution of their construction contracts by using the likert scale. Based on the results summarized in the Table 4.5 below, we can see that 54.1%, 41.2%, 3.5%, and 1.2% of all respondents were respectively strongly agree, agree, disagree and, strongly disagree that award contracts to lower price is one of financial causes. In addition, 42.4%, 48.8%, 7.1%, and 1.8% of all respondents were respectively strongly agree, agree, disagree and, strongly disagree that increased number of projects is one of those financial causes. In the same way, the similar interpretation can be made for others causes listed in the Table 4.5 below:

Table 4.5: Financial causes of contractor failure

Financial causes					Total
	Strongly agree	Agree	Disagree	Strongly Disagree	
ACLP	92 54.0%	70 41.2%	6 3.5%	2 1.2%	170 100.0%
CFMM	85 50.0%	76 44.7%	6 3.5%	3 1.8%	170 100.0%
DBLPHI	64 37.6%	87 51.2%	16 9.4%	2 1.8%	170 100.0%
DLCECC	31 18.2%	99 58.2%	35 20.6%	5 2.9%	170 100.0%
EBC	47 27.6%	103 60.6%	18 10.6%	2 1.2%	170 100.0%
EWTM	64 37.6%	81 47.6%	22 12.9%	3 1.8%	170 100.0%
IDR	68 40.0%	95 47.6%	4 2.4%	2 1.2%	170 100.0%
LC	116 68.2%	46 27.1%	6 3.5%	2 1.2%	170 100.0%
LCECU	68 40.0%	94 55.3%	7 4.1%	1 0.6%	170 100.0%
LMPDC	72 42.4%	83 48.8%	12 7.1%	3 1.8%	170 100.0%

Source: Researcher, 2020

Key: ACLP: Award contracts to lower price, CFMM: cash flow mis-management, DBLPHI: depending on bank loans and paying high interest, DLCECC: difference of

local currency exchange with contract currency, EBC: employee benefits and compensation, EWTM: excessive wastage or theft of materials, IDR: inefficient deployment of resources, LC: lack of capital, LCECU: lack of controlling equipment cost and usage, and LMPDC: low margin profit due to competition.

Moreover, the given ten financial causes were ranked based on their relative impact index of each cause. The results given in Table 4.6 below indicate for instance that lack of capital was ranked as the first financial cause that leads to failure of contractor firm by all parties, award contracts to lower price was ranked as second cause by consultancy and client parties, however as third cause by contractor party. Finally, difference of local currency exchange with contract currency was ranked as the last by all parties.

Table 4.6: Rank of financial causes of contractor failure

Managerial causes	Consultancy		Client		Contractor		Sum of ranks
	RII	Ranks	RII	Ranks	RII	Ranks	
Award contracts to lower prices	3.79	2	3.69	2	3.18	3	7
Cash flow mis-management	3.72	3	3.63	3	3.14	5	11
Depending on back loans and paying high interest	3.55	7	3.34	7	2.99	7	21
Difference of local currency exchange with contract currency	3.28	10	3.09	10	2.59	10	30
Employee benefits and compensation	3.40	9	3.19	9	2.95	8	26
Excessive wastage or theft of materials	3.55	7	3.34	7	2.91	9	23
Lack of labour productivity and inefficient deployment of resources	3.57	5	3.41	5	3.18	2	12
Lack of capital	3.57	5	3.41	1	3.20	1	3
Lack of controlling equipment cost and usage	4.00	1	4.00	1	3.16	4	14
Law margin due to profit completion	3.62	4	3.44	4	3.05	6	14

Source: Researcher, 2020

4.5.4 Expansion causes

To assess the perceptions of all parties regarding the expansion challenges causing failure of contractors firms during execution of their construction contracts, the following expansion causes were adopted from literature and respondents: Large construction types with less experience, expanding into new geographic locations, increased number of projects, increased size of projects, and lack of managerial maturity as the company grows.

The respondents were asked to show their perceptions about the expansion challenges that causing the failure of contractors firms during the execution of their construction contracts by using the likert scale. Based on Table 4.4.5 below, it is clear that 42.4%, 50.6%, 6.5%, and 0.6% of all respondents were respectively strongly agree, agree, disagree and, strongly disagree that large construction types with less experience is one of expansion causes. Also, 20.6%, 42.4%, 35.3%, and 1.8% of all respondents were respectively strongly agree, agree, disagree and, strongly disagree that increased number of projects is one of those expansion causes. In the same way, similar interpretation can be made for others causes given in the same table.

Table 4.7: Expansion causes of contractor failure

Expansion Causes					Total
	Strongly agree	Agree	Disagree	Strongly Disagree	
LCTCE	72 42.4%	86 50.6%	11 6.5%	3 0.6%	170 100.0%
EINGL	24 14.1%	70 41.2%	69 40.6%	7 4.1%	170 100.0%
INP	41 24.1%	66 38.8%	57 33.5%	6 3.5%	170 100.0%
ISP	35 20.6%	72 42.4%	60 35.3%	3 1.8%	170 100.0%
LMMCGs	70 41.2%	32 18.8%	9 5.3%	1 0.6%	170 100.0%

Source: Researcher, 2020

Key: LCTLE: Large construction types with less experience, EINGL: expanding into new geographic locations, INP: increased number of projects, ISP: increased size of projects, and LMMCG: lack of managerial maturity as the company grow.

In addition, the provided five expansion causes were ranked based on their relative impact index of each cause. The results are given in the following Table 4.4.6, large construction types with less experience was ranked as the first cause by consultancy and client parties, but on second place by contractor party, lack of managerial maturity as the company grow was ranked by client and contractor parties as the first cause, and second by consultancy party, increased size of projects was ranked as the third causes by consultancy and clients, and as fourth cause by contractor. Finally, expanding into new geographic locations was ranked as the last cause by all parties

Table 4.8: Rank of expansion causes of contractor failure

Expansion causes	Consultancy		Client		Contractor		Sum of ranks
	RII	Ranks	RII	Ranks	RII	Ranks	
Large construction types with less experience	3.62	1	3.44	1	3.11	2	4
Expanding into new geographic locations	3.03	5	2.72	5	2.35	5	15
Increased number of projects	3.28	3	3.09	3	2.41	4	10
Increased size of Projects	3.22	4	3.06	4	2.43	3	11
Lack of managerial maturity as the company grow	3.59	2	3.44	1	3.14	1	4

Source: Researcher, 2020

4.5.6 External causes

To assess the perceptions of all parties regarding the external challenges causing failure of contractors firms during execution of their construction contracts, the following external causes were adopted from literature and respondents: Banks policies (BP), construction industry regulation (CIR), delay in payment by clients (DPC), inflation, and monopoly.

Table 4.9: External causes of contractor failure

Expansion Causes					Total
	Strongly agree	Agree	Disagree	Strongly Disagree	
BP	20 11.8%	67 39.4%	61 35.9%	22 12.9%	170 100.0%
CIR	28 16.5%	64 37.6%	58 34.1%	20 11.8%	170 100.0%
DPC	80 47.1%	13 7.6%	69 40.6%	8 4.7%	170 100.0%
Inflation	23 13.5%	98 57.6%	41 24.1%	8 4.7%	170 100.0%
Monopoly	69 40.6%	50 29.4%	43 25.3%	8 4.7%	170 100.0%

Source: Researcher, 2020

Key: BP: Banks policies, CIR: construction industry regulation, and DPC: delay in payment by clients

The respondents were asked to show their perceptions about the external challenges that causing the failure of contractors firm by using the likert scale. The results summarized in the above reveal that 11.8%, 39.4%, 35.9%, and 12.9% of respondents were respectively strongly agree, agree, disagree and, strongly disagree that bank policies is one of those external causes. Similarly, 40.6%, 29.4%, 25.3%, and 4.7% of respondents were respectively strongly agree, agree, disagree and, strongly disagree that monopoly is one of those external causes. Thus, the same interpretation can be made for others causes listed in the Table 4.9 above.

Furthermore, the relative impact index of each cause was used as measure to rank those external causes with respect to perceptions of all parties namely consultancy, client, and contractor. The results given in the Table 4.10 below show that the monopoly was ranked on the first place by all parties, delay in payment by clients was ranked as second, inflation as third, and construction industry regulation as fourth and bank policies as the last cause among all provided causes.

Table 4.10: Rank of external causes of contractor failure

External causes	Consultancy		Client		Contractor		Sum of ranks
	RII	Ranks	RII	Ranks	RII	Ranks	
Bank prices	2.95	5	2.65	5	2.13	5	15
Construction industry regulations	3.03	4	2.75	4	2.2	4	12
Delay in payment by clients	3.50	2	3.25	2	2.48	2	6
Inflation	3.22	3	3	3	2.41	3	9
Monopoly	3.57	1	3.44	1	2.54	1	3

Source: Researcher, 2020

Perceptions of parties

This section summarize the results and approaches used to test if there is a significant difference in perceptions of contractors, consultants and clients regarding the managerial, financial, expansion, and external challenges causing failure of contractors in the execution of contracts.

Perceptions of parties about managerial causes

To understand if there is or no statistical significant difference in perceptions of contractors, consultants and clients regarding the managerial challenges causing failure of contractors during the execution of contracts; the One Way Analysis of Variance was performed combined with multiple comparisons by using two well-known Scheffe and Bonferroni methods.

Table 4.11 ANOVA table for managerial causes

	Sum of squares	Df	Mean of squares	F	Sig
Between Groups	1.802	2	.901	.7668	.008
within Groups	4.219	27	.156		
	6.022	29			

Source: Researcher, 2020

From the above One Way ANOVA Table 4.11, we can conclude that there is statistical significant difference in means of Relative Impact Index from different three parties that are under study. Since the p-value of 0.008 which is less than to our level of significance of 5% was observed. Thus, to know where there is a difference the multiple comparisons shown in the following Table 4.12 was conducted.

Table 4.12: Multiple comparison table for Managerial causes

	(I)Party	(J)Party	Mean difference (I-J)	Std Error	Sig	95% confidence interval	
						Lower bound	Upper bound
Scheffe	Consultancy	Client	-2373	.17679	.991	-4816	.4342
		contractor	.50765	.17679	.027	.0498	.9655
	Client	Consultancy	.02373	.17679	.991	-4342	.4816
		contractor	.53138	.17679	.020	.0735	.9893
	Contractor	Consultancy	-50765	.17679	.027	-4750	-.0498
		Client	-53138	.17679	.020	0564	.9589
Bonferroni	Consultancy	Client	-02373	.17679	1.000	-4750	.0475
		contractor	.50765	.17679	.024	.0564	.9589
	Client	Consultancy	-02373	.17679	1000	-4275	.4750
		contractor	-53138	.17679	.017	.0801	.9826
	Contractor	Consultancy	-50765	.17679	.024	-9589	-.0589
		Client	-53138	.17679	.017	-9826	-.0801

Source: Researcher, 2020

As revealed in Table 4.12, there is a statistical significant difference in means of Relative Impact Index between consultancy and contractor, and between client and contractor parties since their corresponding p-value are respectively 0.027 and 0.020 using

Scheffe method and 0.024 and 0.017 using Bonferroni method which are both less than 5%. Thus, we conclude that there is statistical significant difference in perceptions of between consultancy and contractor, and between client and contractor parties regarding the managerial causes causing failure of contractors during the execution of contracts. However, both methods indicate that there no such difference between client and consultancy, since the corresponding p-value is 0.991 and 1 respectively from Scheffe and Bonferroni methods.

4.5.7 Perceptions of parties about financial causes

To understand if there is or not a statistical significant difference in perceptions of contractors, consultants and clients regarding the financial challenges causing failure of contractors during the execution of contracts; the One Way Analysis of Variance was performed combined with multiple comparisons was made by using two well-known Scheffe and Bonferroni methods.

Table 4.13: ANOVA table for Financial causes

	Sum of squares	Df	Mean squares	F	Sig
Between Groups	1.744	2	.872	18.170	.000
within Groups	1.296	27	.040		
Total	3.040	29			

Source: Researcher, 2020

From the above One Way ANOVA Table 4.5.3, we can conclude that there is a significant difference in means of Relative Impact Index from different three parties that are under study. Since the p-value of 0.000 which is less than to our level of significance of 5%. Thus, to know where there is a difference, the multiple comparisons shown in the following table are used.

Table 4.14: Multiple comparison table for financial causes

	(I)Party	(J)Party	Mean difference (I-J)	Std Error	Sig	95%confidence interval	
						Lower bound	Upper bound
Scheffe	Consultancy	Client	15100	.09798	.320	-1028	.4048
		contractor	57000	.09798	.000	.3162	.8238
	Client	Consultancy	.15100	.09798	.320	-4048	1028
		contractor	.41900	.09798	.001	.1652	.6728
	Contractor	Consultancy	57000	.09798	.000	-4048	.3162
		Client	-41900	.09798	.001	-1652	.1652
Bonferroni	Consultancy	Client	.15100	.09798	.405	-8238	.4011
		contractor	.41900	.09798	.000	.6728	.8201
	Client	Consultancy	.15100	.09798	.405	-0991	.0991
		contractor	.41900	.09798	.000	.3199	.6691
	Contractor	Consultancy	-57000	.09798	.000	-8201	-3199
		Client	-41900	.09798	.001	-6691	-1689

Source: Researcher, 2020

As revealed in Table 4.5.4 there is a statistical significant difference in means of Relative Importance Index between consultancy and contractor, and between client and contractor parties since their corresponding p-value are respectively 0.000 and 0.001 for both Scheffe and Bonferroni methods which are both less than 5%. However, both methods indicate that there no such difference between client and consultancy, since the corresponding p-value are 0.320 and 0.405 respectively from Scheffe and Bonferroni methods.

Perceptions of parties about expansion causes

To investigate whether there is or no statistical significant difference in perceptions of contractors, consultants and clients regarding the expansion challenges causing failure of contractors during the execution of their construction contracts; the One Way Analysis of Variance was performed combined with multiple comparisons using the same Scheffe and Bonferroni methods.

Table 4.15: ANOVA table for Expansion causes

	Sum of squares	Df	Mean squares	F	Sig
Between Groups	1.150	2	.575	5.503	.020
Within Groups	1.254	12	.104		
Total	2.403	14			

Source: Researcher, 2020

The One Way ANOVA Table 4.5.5 reveals that there is a significant difference in means of Relative Impact Index from different three parties that are under study. Since the pvalue of 0.020 which is less than to our level of significance of 5% was obtained. Thus, to know which parties that have difference means of Relative Impact Index, multiple comparisons shown in the following Table 4.5.6 were used.

Table 4.16: Multiple comparison table for Expansion causes

	(I)Party	(J)Party	Mean difference (I-J)	Std Error	Sig	95%confidence interval	
						Lower bound	Upper bound
Scheffe	Consultancy	Client	.19828	20442	.636	-1028	.4048
		contractor	.66078	20442	.023	.3162	.8238
	Client	Consultancy	.19828	20442	.636	-4048	1028
		contractor	.446250	20442	.119	.1652	.6728
	Contractor	Consultancy	-.66078	20442	.023	-4048	.3162
		Client	-.46250	20442	.119	-1652	.1652
Bonferroni	Consultancy	Client	.19828	20442	.405	-8238	.4011
		contractor	.66078	20442	.000	.6728	.8201
	Client	Consultancy	.19828	.20442	.405	-0991	.0991
		contractor	.66078	20442	.000	.3199	.6691
	Contractor	Consultancy	-.66078	20442	.000	-8201	-.3199
		Client	-.46250	20442	.001	-6691	-1689

Source: Researcher, 2020

As revealed in Table 4.5.6 there is no statistical significant difference in means of Relative Impact Index between consultancy and client, and between client and contractor parties since their corresponding p-value are respectively 0.636 and

0.119 and 1 and 0.129 for Scheffe and Bonferroni methods respectively which are both greater than 5%.

Thus, we can conclude that there is no statistical significant difference in perceptions between consultancy and client, and between client and contractor regarding the expansion challenges causing failure of contractors during the execution of contracts. However, both methods indicate that there is such difference between contractors and consultancy, since the corresponding p-value are 0.023 and 0.022 respectively from Scheffe and Bonferroni methods.

Perceptions of parties about External causes

To understand if there is or not a statistical significant difference in perceptions of contractors, consultants and clients regarding the external challenges causing failure of contractors during the execution of contracts; the One Way Analysis of Variance was performed combined with multiple comparisons was made by using two well known Scheffe and Bonferroni methods.

Table 4.17: ANOVA table for External causes

	Sum of squares	Df	Mean of squares	F	Sig
Between Groups	2.195	2	1.098	14.861	.001
within Groups	.886	12	..074		
	3.082	14			

Source: Researcher, 2020

From the above One Way ANOVA Table 4.5.7, we can conclude that there is a significant difference in means of Relative Impact Index from different three parties that are under study. Since the p-value of 0.001 which is less than to our level of significance of 5%. Thus, to know where there is a difference the multiple comparisons shown in the following table are used.

As revealed in Table 4.18 below there is no statistical significant difference in means of RII between consultancy and client, and between client and contractor parties

since its corresponding p-value are 0.398 and 0.550 for Scheffe and Bonferroni methods respectively which are both greater than 5%. Thus, we conclude that there is no statistical significant difference in perceptions between consultancy and client regarding the external challenges causing failure of contractors during the execution of contracts. However, both methods indicate that there such difference between any other combination two parties since the corresponding p-value are less than our level of significance of 5% respectively from Scheffe and Bonferroni methods.

Table 4.18: Multiple comparison table for External causes

	(I)Party	(J)Party	Mean difference (I-J)	Std Error	Sig	95% confidence interval	
						Lower bound	Upper bound
Scheffe	Consultancy	Client	.24267	.17188	.398	-2365	.7218
		contractor	.90517	.17188	.001	.4260	.1.3843
	Client	Consultancy	.24267	.17188	.398	-7218	.2365
		contractor	.66250	.17188	.008	.1834	.1.1416
	Contractor	Consultancy	.90517	.17188	.001	-1.3843	.4260
		Client	.66250	.17188	.008	-1.1416	.18341652
Bonferroni	Consultancy	Client	.24267	.17188	.550	-2351	.7204
		contractor	.90517	.17188	.001	.4274	.1.3829
	Client	Consultancy	-.24267	.17188	.550	-7204	.02351
		contractor	.66250	.17188	.007	.1848	1.1402
	Contractor	Consultancy	-.90517	.17188	.001	-1.3829	-.4274
		Client	-.66250	.17188	.007	-1.1402	-.1848

Source: Researcher, 2020

From the ANOVA results presented on tables 4.5.1 to 4.5.8 an overall conclusion is that the perceptions of contractors regarding causes of failures are generally different from those of the clients and consultants, regarding the same phenomena. Why? Perhaps, the parties in the responses were simply playing a blame game, in their perceptions, without really understanding the exact cause of the failure is. Additionally, this difference in perception would be a first thing for the construction industry's policy maker or manager to address in order to bring the unity of purpose in addressing the contractors' failure problem.

4.6 Strategic mitigation of contractors' failure structure

From the foregoing data analysis observations presented in sections 4.4 and 4.5 a schematic model of the strategy for mitigating contractor failures in Rwanda can be synthesized as shown in Figure 4.2. The figure illustrates the most highly weighted managerial, financial, expansion and external causes that lead to contractors failure, and if they have been paid keen attention to in the beginning of execution of any contract such attention will result in project success. Hence, the contractors should take care of them to mitigate the failure from the very start of a given project, and also continually in the cause of the business of contracting.

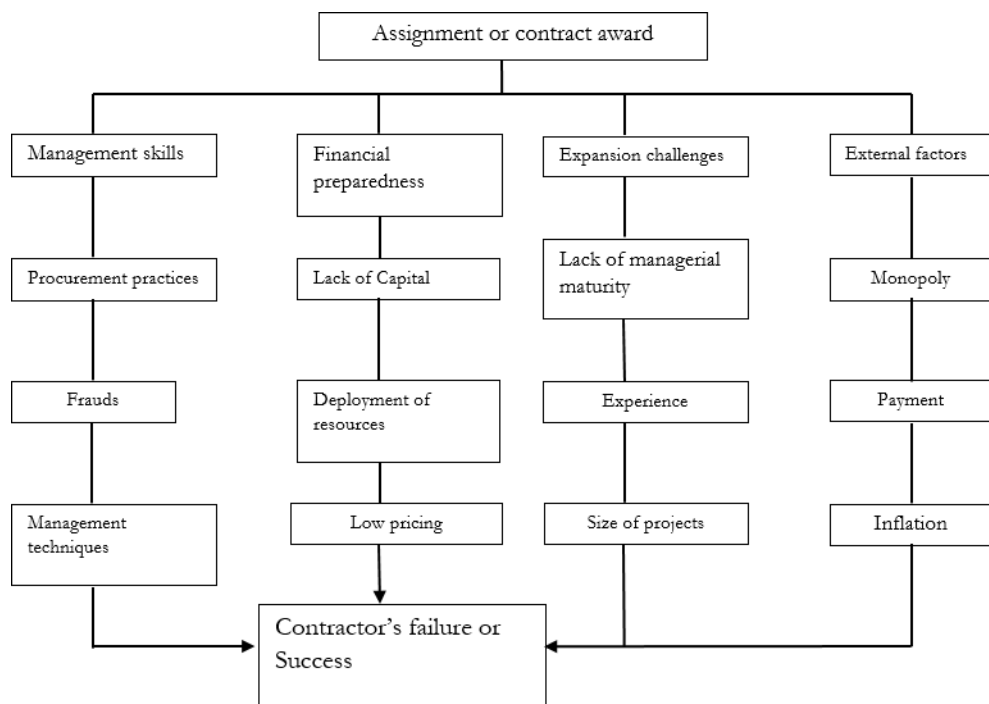


Figure 4.2: Weighted strategic mitigation structure

Source: A synthesis of the Author, 2020.

Key:—→ means flow of influence of contractors' attention to the potential causes of failure or success.

This framework gives the checklist of factors that consultants and clients should prioritize in assessing the suitability of interested or pre-qualified contractor for a project assignment in three ways. Firstly, the contractor showing/ demonstrating in built capacity to pay careful attention to every one of these priority factors in this strategy is the one with the highest probability for success in the project execution and in the contracting business. Secondly, some of the critical factors in Figure 4.2, such as payments which mainly are the domain of the clients, should be streamlined upfront so that delays in payments, design approvals or the like do not disrupt the regular progress of the contractor's works on site and cause project delays or contractual claims.

Finally, at the individual contractor level and the overall industry level, policies addressing construction project management, construction site management and construction financing (sources and security) would be great leverage points towards the salvaging of contractor business in Rwanda. As illustrated in Sections 4.4.1 & 4.4.2 these two factors, management and finance constituted 20 out of the 30 explanatory variables in this study.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In this chapter a summary of the findings from the research is given for each specific objective of the study, here as follows: assessing and rank the challenges which cause failure encountered by contractors during implementation of contracts; evaluating the difference in perceptions of contractors, consultants and clients regarding the challenges which cause failure of contractors during the execution of contracts; and developing a strategy to mitigate contractors' failure in construction industry in Rwanda. Based on the main findings of the study, the conclusions and recommendations for policy makers and future researchers are presented.

5.2 Summary of findings

To achieve on each objective of the study, 30 potential challenges were conceptualized from the literature reviewed and data collected accordingly from respondents, and all those causes were categorized into four main groups namely managerial, financial, external and expansion causes that lead to failure of contractors during execution of their construction contracts. Moreover, the respondents were categorized into groups with respect to the party where the respondent comes from.

As the first specific objective was to assess and rank the challenges which cause failure encountered by contractors during implementation of contracts. In Table 4.12, Table 4.14, Table 4.16 and Table 4.18 the ranking of managerial, financial, expansion and external causes respectively were summarized. For instance adopting unsuitable procurement practices was ranked by contractor party and as second by consultancy and client parties. Also, lack of using project management techniques, was ranked as the first cause by consultancy and client parties, third by contractors, and lack of labor productivity and improvement was ranked by all parties as the last managerial cause.

Lack of capital was ranked as the first financial cause that leads to failure of contractors firms by all parties and difference of local currency exchange with contract currency was ranked as the last financial cause by all parties. Large construction types with less experience was ranked as the first expansion cause by consultancy and client parties, but as second place by contractor party, lack of managerial maturity as the company grow was ranked by client and contractor parties as the first cause, and expanding into new geographic locations was ranked as the last expansion cause by all parties.

Finally monopoly was ranked as the first external cause by all parties, delay in payment by clients was ranked as second, inflation as third, construction industry regulation as fourth and bank policies as the last cause among all provided five external causes. Furthermore, all 30 causes were combined together and ranked with respect to perceptions of respondents from all three parties. The results are summarized in the following Table 5.1.

Based on the results summarized in the Table 5.1 it is clear that lack of capital is ranked by all parties as the first cause that lead to failure of contractor during the implementation of their construction contracts. Lack of using project management techniques was ranked as second and first by consultancy and client parties respectively, but on 10th place by contractor party. Finally bank policies was ranked on 30th place by client and contractor parties and 29th place by consultancy. Lastly the rank of each cause from each party can be obtained from that same Table 5.1.

The second objective was to evaluate if there is difference in perceptions of contractors, consultants and clients regarding the challenges which cause failure of contractors during the execution of contracts. The results summarized in Section 4.5, especially in Table 4. 2, Table 4.4, Table 4 6, and Table 4.8 respectively; it was observed that there is statistical significant difference in perceptions between consultancy and contractor, and between client and contractor parties regarding the managerial causes causing failure of contractors during implementation of construction contracts. However, both methods indicate that there is no such difference between client and consultancy.

Table 5. 1: Ranks of all causes

Managerial causes	Consultancy		Client		Contractor		Sum of ranks
	RII	Ranks	RII	Ranks	RII	Ranks	
Adopting Unsuitable Procurement	3.862	2	3.72	2	3.2	1	5
Assigning unqualified Personnel	3.517	8	3.34	8	3	8	24
Bad decisions in formulating company policy	3.638	6	3.47	6	3.03	5	17
Company organization	3.776	5	3.66	4	2.99	9	18
Fraud	3.81	3	3.69	3	3.09	2	8
Lack of labour productivity and improvement	1.81	10	3.13	10	2.6	10	30
Lack of using computer applications	3.776	4	3.66	4	3.01	6	14
Lack of using project management techniques	3.897	1	4	1	3.08	3	5
Poor accounting and control systems	3.57	7	3.41	7	3.01	7	21
Award contracts to lower prices	3.79	2	3.69	2	3.18	3	7
Cash flow mis-management	3.72	3	3.63	3	3.14	5	11
Depending on back loans and paying high interest	3.55	7	3.34	7	2.99	7	21
Difference of local currency exchange with contract currency	3.28	10	3.09	10	2.59	10	30
Employee benefits and compensation	3.4	9	3.19	9	2.95	8	26
Excessive wastage or theft of materials	3.55	7	3.34	7	2.91	9	23
Lack of labour productivity and inefficient deployment of resources	3.57	5	3.41	5	3.18	2	12
Lack of capital	3.57	5	3.41	1	3.2	1	3
Lack of controlling equipment cost and usage	4	1	4	1	3.16	4	14
Law margin due to profit completion	3.62	4	3.44	4	3.05	6	14
Large construction types with less experience	3.62	1	3.44	1	3.11	2	4
Expanding into new geographic locations	3.03	5	2.72	5	2.35	5	15
Increased number of projects	3.28	3	3.09	3	2.41	4	10
Increased size of Projects	3.22	4	3.06	4	2.43	3	11
Lack of managerial maturity as the company grow	3.59	2	3.44	1	3.14	1	4
Bank prices	2.95	5	2.65	5	2.13	5	15
Construction industry regulations	3.03	4	2.75	4	2.2	4	12
Delay in payment by clients	3.5	2	3.25	2	2.48	2	6
Inflation	3.22	3	3	3	2.41	3	9
Monopoly	3.57	1	3.44	1	2.54	1	3

Source: Researcher, 2020

Also it was observed that there is a statistical significant difference in perceptions between consultancy and contractor, and between client and contractor parties regarding the financial challenges that cause failure of contractors during execution of construction contracts. However, both methods indicate that there is no such difference between client and consultancy. In addition no statistical significant

difference observed in perceptions of consultancy and client, and between client and contractor regarding the expansion challenges causing failure of contractors during the execution of contracts. However, both methods indicate that there is such difference between contractors and consultancy.

The results make clear that there is no statistical significant difference in perceptions between consultancy and client, and between client and contractor regarding the expansion challenges causing failure of contractors during the execution of contracts. However, both methods indicate that there is such difference between contractors and consultancy. Finally, there is no statistical significant difference in perceptions between consultancy and client regarding the external challenges causing failure of contractors during the execution of contracts. However, both methods indicate that there is such difference between any other combinations of two parties.

Finally, a schematic model of strategy for mitigating contractor failure at the site and corporate levels, was formulated from the findings of the data analysis. The strategy is developed by selecting the top most three variables in each of the five categories of the causes of contractor failure, to the priority areas which the contractor should pay keenest attention to from the very onset of a project assignment and/ or contract award. Assessment of a contractor's suitability to execute a project successfully should be based on a checklist created from this framework.

5.3 Conclusions

Based on the results displayed in Table 5.1.1 before, among all 30 identified causes, here are top five causes as ranked by consultants: (1) lack of capital, (2) lack of using project management techniques, (3) adopting unsuitable procurement practices, (4) frauds, and (5) award contracts to lower price.

The top five causes as ranked by clients: (1) lack of using project management techniques, (1) lack of capital, (3) adopting unsuitable procurement practices, (4) frauds, (4) award contracts to lower price. Also (1) adopting unsuitable procurement

practices, (1) lack of capital, (3) inefficient deployment of resources, (5) award contracts to lower price were ranked as top five causes.

Furthermore, the results summarized in Section 4.5 especially in Table 4.1, Table 4.3, Table 4.5 and Table 4.7 respectively indicate that there is a statistical significant difference in perceptions between different parties namely consultancy, client, and contractor regarding the managerial, financial, expansion, and external causes that lead to failure of contractors during implementation of their construction contracts.

Mitigation of contractors' failure in project delivery and business performance can be realized by the contractor paying more keen attention to the critical factors that can cause the failure. Additionally, consultants and clients can create a more enabling environment for the contractor success, by selecting the contractor with the lowest probability for failure (i.e highest built capacity for paying keen attention to the priority factors of success) and putting in place efficient structures (e.g cash-flow projections and availability of funds) to avoid delays or disruption of the regular progress of the works.

5.4 Recommendations

From the findings of the study, the author recommends the following:

Contractors should adopt the suitable procurement practices. Since adopting unsuitable procurement practices was observed to be the first cause of contractors' failure.

Contractors should find the way to increase their capital since lack of capital was ranked by all parties as the first cause that leads failure of contractor.

Contractor should be aware of risks involved in contracting contracts to lower price, and contract to suitable price.

Contractor should appreciate the importance of having skills in project management techniques.

Consultants should refine the contractor evaluation criteria to take account of the 12 priority success factors observed in this study.

Clients should provide a more enabling environment in which the project should progress more effectively, without delays of payments.

5.5 Areas for further Study

From the observations made in this study, the following are the areas suggested for the future research.

Investigation of more causes of contractors' failure in general, not just in construction of roads and bridges.

The reasons for differences amongst perceptions of contractors, consultants, and clients regarding the causes of contractor failures. Management of construction industry as whole would benefit from the understanding of this difference, in order to correct it or capitalize on it. Since contractors, consultants, and clients are simply parts of the whole industry unity of purpose in steering the industry towards the goal of contractors' success would be more effective where the differences in the perceptions are minimal. Fit a multiple regress model of contractor failure and its 30 explanatory variables.

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APPENDICES

Appendix I: Questionnaire

Questionnaire

I am John Kalamagye, a student at the Jomo Kenyatta University of Agriculture and Technology (JKUAT), conducting a research in "Causes of Contractors' Failure in the Construction Industry in Rwanda" as partial fulfillment for the award of Master of Construction Project Management degree. Here do request for your assistance in responding to this questionnaire and assure you that data collected herewith will be solely used for academic purpose and will be kept confidential. For any clarification, please contact me on +250788301408, jkalamagye@yahoo.co.nz

SECTION A1: Respondents information

Description (optional)

1. Position of the respondent

- Director
- Engineer
- Architect
- Quantity Surveyor
- Administrator
- Technician
- Other...

2. Qualification of the respondent

- PhD
- Masters
- Bachelor
- Diploma
- Certificate
- Other...

3. Experience of the respondent

- 0 - 3 years
- 3 - 6 years
- 6 - 9 years
- Over 9 years

A2: Company/Institution information

Description (optional)

1. What is your business type?

- Consultancy Services
- Client (Employee from either MININFRA, RTDA, City of Kigali or District)
- Contractor

2. Contractor's information (if you are contractor, choose the category of your company (as per RPPA ranking A1, A2, B1, B2, C, D, E)

- A1. Allowed to bid for tender whose value is greater than 2 billion Rwandan Francs (All road projects)
- A2. Allowed to bid for tender whose value is greater than 2 billion Rwandan Francs (All roads except asphalt roads)
- B2. Allowed to bid for tender whose value is between 1.5-2 billion Rwandan Francs (All roads except asphalt roads)
- C. Allowed to bid for tender whose value is between 800 million-1.5 billion Rwanda francs
- D. Allowed to bid for tender whose value is between 300 -800 million Rwandan Francs
- E. Allowed to bid for tender whose value is between 100-300 million Rwandan Francs

Section B: Challenges causing failure to construction contractors

B1: Managerial causes

Please rate the following causes by ticking (use) to show your agreement about each cause how it leads to failure of construction contractors.

Causes of failure

	Strongly agree	Agree	Disagree	Strongly disagree	Neutral
Adopting unsuitable procurement practices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Assigning unqualified personnel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bad decisions in formulating company policy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
company organization	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Frauds	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of experience in contracts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of labor productivity and improvement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of using computers applications	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of using project management techniques	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Poor accounting and control systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

B2: Financial causes

Please rate the following causes by ticking to show your agreement about each cause how it leads to failure of construction contractors.

Causes of failure

	Strongly agree	Agree	Disagree	Strongly disagree	Neutral
Award contracts to lower price	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cash flow mismanagement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Depending on bank loans and paying high interest	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Difference of local currency exchange with contract currency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Employee benefits and compensation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Excessive wastage or theft of materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inefficient deployment of resources (labor, plant, and materials)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of capital	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of controlling equipment cost and usage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Low margin profit due to competition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

B4: External Causes

Please rate the following causes by ticking to show your agreement about each cause how it leads to failure of construction contractors.

Causes of failure

	Strongly agree	Agree	Disagree	Strongly disagree	Neutral
Banks policies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Construction industry regulation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Delay in payment by clients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inflation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Monopoly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Thank you for your valuable time!

Appendix II: approval of research proposal and supervisors



**JOMO KENYATTA UNIVERSITY
OF
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05TH NOVEMBER, 2018

KALAMAGYE JOHN
C/o SABS
JKUAT

Dear Mr. Kalamagye,

RE: APPROVAL OF RESEARCH PROPOSAL AND OF SUPERVISORS

Kindly note that your MSc. research proposal entitled: "CAUSES OF CONTRACTORS' FAILURE IN CONSTRUCTION INDUSTRY IN RWANDA" has been approved. The following are your approved supervisors:-

1. Dr. Abednego Gwaya
2. Dr. Githae Wanyona

Yours sincerely,


PROF. MATHEW KINYANJUI
DIRECTOR, BOARD OF POSTGRADUATE STUDIES

Copy to: Dean, SABS
/cm



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