

**INFLUENCE OF PROJECT MANAGEMENT PRACTICE
ON PERFORMANCE OF PUBLIC HOUSING PROJECTS
IN RWANDA:
A CASE STUDY OF THE RWANDA HOUSING
AUTHORITY**

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**Influence of Project Management Practice on Performance of Public
Housing Projects in Rwanda: A Case Study of the Rwanda Housing
Authority**


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**A Thesis Submitted in Partial Fulfilment of the Requirements for the
Degree of Master of Science in Construction Project Management of
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DECLARATION

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

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DEDICATION

This report constitutes multiple efforts and support invested by myself and by my close people towards an achievement hereby packaged as a dedication to the same: my wife Maureen, my daughters Aquilah & Aamilah and my son Aayan. It is also a special dedication to siblings Aicha Uwamahoro, Amina Uwimbabazi and Abouba Tuyishime as well as my best friends Ingrid Grace Uwimana and her husband, Aimable Ruhumuriza and his wife, Junior Mutebi, Enock Musabyimana, Paulin Ruzibiza, John Kalamagye, and Commode Dushimirimana.

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ABBREVIATIONS AND ACRONYMS

A/B	Two versions A & B of a single variable to undergo comparison
BIM	Building Information Modelling
CMKN	Contract Monitoring Kenya Network
CPD	Continuous Professional Development
IER	Institution of Engineers Rwanda
MINAGRI	Ministry of Agriculture
MINECOFIN	Ministry of Finance and Economic Planning
MININFRA	Ministry of Infrastructure
NLR	National Leadership Retreat
NTB	National Tender Board
OAG	Office of Auditor General
PMO	Prime Minister's Office
RACPM	Rwanda Association of Construction Project Managers
REG	Rwanda Energy Group
RIA	Rwanda Institute of Architects
RHA	Rwanda Housing Authority
RPPA	Rwanda Public Procurement Authority
TIR	Transparency International Rwanda
TVETs	Technical and Vocational Education and Trainings
USA	United States of America
WASAC:	Water and Sanitation Corporation

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ABSTRACT

The practice of construction project management remains ineffective in the implementation of public projects in Rwanda according to the Office of Auditor General's reports; one rarely finds any public project completed within the specified time, cost or quality. Review of related literature shows that the challenge of poor delivery of construction projects is a widespread phenomenon in construction industry worldwide. All the same, the exact reasons underlying the phenomenon differ considerably from one county to another. The aim of this study was to investigate the influence of project management practice on the performance of public housing projects in Rwanda, particularly at the Rwanda Housing Authority (RHA) - a government institution that has been assigned the responsibility to ensure proper management of all public housing projects in the country. The specific objectives of the study were to: (i) describe the extent to which contract negotiation and award affect project performance; (ii) explain the influence of project monitoring and acceptance on project performance; (iii) define the impact of variations handling on project performance; (iv) describe the influence of project closure/termination on project performance; (v) highlight expert views for enhancement of project management performance in Rwanda Housing Authority. In the study, a cross-sectional survey research (in a case study) design was adopted. While the case was the RHA, the units of observation were the employees of RHA. Accordingly, the target population was the fifty-seven (57) employees of RHA who are directly deployed in the department in charge of construction project management as per their job profiles. Data were collected using a questionnaire by which both quantitative and qualitative data were captured. The data analysis was done using the Microsoft Excel package to compute descriptive statistics (means & standards deviations), frequencies and percentages. The study findings revealed that the respondents have sufficient knowledge on project management techniques and their potential for enhancing performance of housing projects in Rwanda. However, there appears to be a weakness in the actual application of the project management tools, which implies: (i) deficiencies in the skills and experience levels of the staff, and (ii) ineffectiveness in the organization structure in which the project management function is practiced in the public institution. From the findings of this study, the researcher recommends that the RHA strives to improve her contract management practice through: (i) further training or further capacity building for the staff-in-charge; (ii) refinement in the contract management set up in order to, for example, boost the timeliness of risk identification and response; and, (iii) embracing of ICT applications in the contract management function.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Over the recent two decades, Rwanda has made tremendous progress through infrastructure and urbanization projects. Speed has been one of those easily detectable characteristics of this nation's economic transformation as projects have been and are still being implemented very fast but of course with project management challenges down the road that hindered a significant number of development activities. Although, the country leadership in most cases had outsourced consulting services from highly acknowledged international firms that had been involved in very successful projects in the western world, many of their projects hardly achieved their budget, quality and timeline goals. Suspicions point fingers to local firms with questionable skills and experience that came on board to kick off implementation phase of well-planned and designed projects. In circumstances of lack of effective project management practice on the client side, struggling firms most of the time focus on interest optimization through flexibility provided in awarded contracts.

All over the world, projects are initiated, designed and implemented through contracts between employers, consultants and contractors aiming to achieve specific goals mostly in line with economic development, human welfare improvement, investments, environmental protection, et cetera. Project management has a wide scope, but special attention and care is always put on execution of projects through contract management practice. Construction projects being those consuming huge budgets with very complex execution procedures are also prone to jeopardy.

Project measures, such as plans, processes, organizations, contracts and information systems, should be ideally those that can function either in expected conditions or to changed conditions (Gilbreath, 1986). These measures should be designed to strike a balance between the need to be precise and firm while permitting looseness (Othman, 1997). Project Management and administration involves making decisions and the timely flow of information and decisions to enable completion of the project as required by the contract documents including review and observation of the construction project. This is important to the client, contractor and Consultant not only to determine that the work is proceeding in conformity with the contract documents, but also because it allows a final opportunity to detect any inaccuracies, ambiguities or inconsistencies in the design (National Council for Construction, 2012).

Rigidly designed construction projects lead to poor performance or worse to total failure of the construction projects. Although Pinto and Mantel (1990) are of the view that it is difficult to define exactly what constitutes a failed project, the Project Management Book of Knowledge according to Project Management Institute (2004) posits that the success or failure of a project is measured by the difference between what is expected of a project both during and after its completion and the actual observed performance of the project when it is put to use. Project success has been defined as the degree to which goals and objectives of a project are met (Frederikslust, 1978).

It has been observed that public projects cause the Rwandan Government to lose billions of Rwandan francs probably due to improper procurement process or specifically poor contract management practices. This generally happens in Government institutions due to issues, such as, corruption, litigations, contract management, contract cancellations and substandard service or product delivery. Countrywide, districts have had cases of delayed contracts triggered by weaknesses in contract management. A total seventy (70) contracts with a value of

48,605,709.515 US Dollars had either been delayed or abandoned in Districts as detailed in Table 1.1. Most of the affected contracts relate to works for improving roads, water supply systems, building the integrated model villages, improving markets, improving infrastructure for health centers, Technical and Vocational Education and Training (TVETs), classrooms and craft centers (Agakiriro), as well as projects to construct hotel/guest houses for revenue generation (Auditor General, 2017).

Most of the delayed contracts were noted in Nyaruguru, Karongi, Burera and Nyagatare districts and Rwanda Housing Authority was requested to technically assist all districts to optimize construction project performance (Office of Auditor General, 2017).

Table 1.1: Value of Delayed and Abandoned Contracts

Service Delivery Affected by Delayed Contracts and respective number of contracts	Value of Delayed and Abandoned Contracts (USD)
Seventeen (17) Roads contracts	19,555,384.169
Eight (8) Water supply system contracts	9,515,333.603
Six (6) Model villages contracts	2,384,401.436
Three (3) Markets contracts	3,956,910.549
Five (5) Health center contracts	1,413,168.579
Five (5) TVETs, classroom and craft centers (Agakiriro) contracts	2,161,588.272
Four (4) Genocide survivor houses contracts	405,817.396
Three (3) Public lights contracts	956,168.928
Four (4) Electrification contracts	873,919.011
One (1) Office admin building contracts	1,021,185.233
Three (3) Hotel/Guesthouse contracts	4,925,646.990
Other contracts	1,436,185.349
Seventy (70) construction contracts in total	48,605,709.515
Twenty-seven (27) total contracts for the case study	16,268,718.455

Office of Auditor General, 2017

Likewise, the Office of Auditor General's report also tackles issues related to failure or delay of some construction projects of roads and feeder-roads under the management of the Rwanda Transport Development Authority (RHA), the Ministry of Agriculture (MINAGRI), the Water and Sanitation Corporation (WASAC), the Rwanda Energy Group (REG) and Districts as stipulated in the table above.

Thereafter sometime during the year 2017, among many other resolutions adopted, as a response to OAG's report, the Government of Rwanda opted to withdraw from

Ministries and transfer to Rwanda Housing Authority (RHA) all public housing projects because of poor performance suspected to be resulting from poor project management. Among transferred project were construction of referral, provincial and District hospitals and construction of education facilities withdrawn from both the Ministry of Health and the Ministry of Education and handed over to Rwanda Housing Authority (RHA). Obviously, there are still some rooms for improvement especially contract management practice to meet the Cabinet expectations within Rwanda Housing Authority even though the institution was praised to be the best performing construction project manager by the State leadership (PMO, 2017).

Consequently, RHA was restructured in 2017 and reinforced by a bigger organization structure comprised with additional experts assigned to facilitate construction project management and at the same time focus on all transferred projects from above mentioned Ministries. Similarly, RHA invited experts from the University of Manchester (UM) to train available staff on how best to manage construction contracts (RHA, 2017).

Refocusing on literature, project management comprises a step related to contract management which is described as the process of monitoring whether the contract parties are complying and performing as per the agreement. Contract management is also described as the process that enables the agency and supplier to meet their obligations to deliver the objectives of the contract. This means tracking and monitoring delivery and costs, managing risks, and actively managing the relationships between the agency, the supplier and key stakeholders. Common contract management tasks include contractor monitoring and acceptance management; managing the contractor relationship; contract administration; dispute resolution; and contract closure (Crooper, 2008). Considering these steps or tasks, it is difficult to figure out how each stage of the contract management affects the project, when it is mishandled or carefully handled.

1.2 Statement of the Problem

The practice of construction project management remains ineffective in the implementation of public projects in Rwanda. Application of management principles in the projects appears to be inadequate and one rarely finds any public project completed within the specified time, cost and quality. According to the Auditor General (2017) report, for example, a great number of contracts, estimated to be around seventy (70), for public projects are either delayed or abandoned at an annual basis. And as for the RHA, the status of project management is worrisome as several contractors have taken cases to court for settlement whereas several other projects are under arbitration.

Two decades ago, Rwanda was facing many problems related to contract management of public construction projects. In 1997, the Government established a centralized public institution known as National Tender Board (NTB) with the aim of overcoming the rising procurement and projects management issues. At the beginning, this institution was given the responsibilities of undertaking the procurement processes, monitoring different projects implementation and handling contracts management issues (Isimbi, 2016).

However, though all procurement of projects were given to the NTB currently known as the Rwanda Public Procurement Authority (RPPA), the rest of projects activities or phases were given to Ministries and other implementing entities. Thereafter, the Government decentralized procurement to ensure that a given project is managed by same entity from initiation to its closure. Consequently, project management became inevitable in every State organization and should be conducted in line with the regulations outlined in the law on Public Procurement gazette in 2007 and complemented by the Ministerial Order N°001/14/10/Tc of 19/02/2014 Establishing Regulations on Public Procurement, Standard Bidding Documents and Standard Contracts.

Nevertheless, around seventy (70) contracts neither meet the allocated budget & time, nor executed up to the expected quality and standards at an annual basis. Contract addendums and extensions have become the norm. Worse, at the time of this study, two (2) former Chief Budget Managers under the title of Director Generals of the case study institution were in custody in the middle of judicial procedures due to project mismanagement, wasteful expenditure, or incompliance with project management procedures. Likewise, at least fifteen (15) new litigation cases taken to courts annually by either contractors, consultants or the case study institution seeking for settlement under the court of law and this issue always appears in the Office of Auditor General's annual reports.

1.3 Objectives of the Study

The main objective of this research was to establish the influence of project management practice on performance of public Housing project in Rwanda for the purpose of improving project performance in the public sector of the construction industry of Rwanda. The specific objectives of the study are:

- i. To find out whether the key components of project management at Rwanda Housing Authority - contract negotiation & award, contract monitoring & acceptance of works, variation handling, and contract closure - influence performance of the public housing projects.
- ii. To seek expert views on project management practice in Rwanda, for enhancement of performance for public housing projects at Rwanda Housing Authority.
- iii. To formulate a framework for improving project management performance at Rwanda Housing Authority.

1.5 Research Questions

- i. Do the key components of project management at Rwanda Housing Authority (Contract Negotiation & Award, Contract Monitoring &

Acceptance of Works, Variation Handling, and Contract Closure) influence performance of the public housing projects?

- ii. What are the expert views on project management practiced at Rwanda Housing Authority for enhancement of performance of public housing projects?
- iii. What framework should be proposed for improving project management performance at Rwanda Housing Authority?

1.6 Justification of the Study

The previous scholars insisted on the influence of project management on organization performance in profit making organizations, while this research investigated the influence of project management practice on performance of housing projects in the public sector as State corporations do not necessarily focus on profits; instead they aim at effective service delivery to the citizens or effective achievement of goals set for different development projects (Sinclair & Zairi, 1995). This makes it rational for the current research to investigate the influence of project management practice on project performance in public institution like RHA. As a matter of fact, East Africa governments have lost hundreds of millions of taxpayers' money through cancellation of contracts, unfinished projects, poor service or product delivery, litigations, corruptions and extended contract periods in the last eight years without major improvement (Transparency International Rwanda, 2017).

Likewise, in Rwanda several civil work projects in general have had additional contracts related to unplanned works and therefore additional cost which was not planned before their beginning. This requires an additional time and therefore, the objectives and purpose of the projects is not achieved on scheduled time which leads to poor performance of the projects (Rwanda Public Procurement Agency, 2014).

Also, costs incurred due to cancellation of contracts, or unfinished projects have been left unexplained by many public institutions when summoned by the Parliament. Furthermore, the project management of public projects in Rwanda has been a challenge; as stated in the budget execution report of the fiscal year 2016-2017 by the Ministry of Finance and Economic Planning (MINECOFIN); the country is still depending on foreign aids from developed countries with 40% of the national budget. The procuring entities face the problem of explaining to MINECOFIN the reasons of their request for additional funds to be able to pay the contractors for the unplanned additional works. The reasons for this failure are still unknown; hence, this research intends to investigate those reasons particularly focusing on project management practice in public projects.

Additionally, poor performing entities have been reported and summoned by the Parliament for clarifications on their mismanaged projects. In most cases chief budget managers say that they came across unusual circumstances which could not be anticipated yet corruption perception index reports show that poor contract practices give huge room for corruption (Transparency International Rwanda, 2017). Moreover, the previous studies focused on private and non-governmental organizations and were conducted in different business environment outside Rwanda.

Hence it may be inappropriate or inaccurate to apply their findings and conclusions on the Rwandan public project context. Therefore, research on the clear link between the two variables (project management and project performance) was of a paramount importance to improve the status quo. It is for this reason that this research was proposed exploring the relationship between project management practice and public housing projects performance. Hence, the research aimed at answering the following question: “How does project management practice influence construction project performance in Rwanda Housing Authority?”

Therefore, this research helps the institution to figure out required adjustments for improvement when it comes to handling each phase or stage of construction contracts management. This research also comes up with a list of tools that can contribute to contract management and point out other research areas that may be of a paramount importance for Rwanda Housing Authority overall performance.

1.7 Significance of the Study

Rwanda Housing Authority (RHA) knows that expectations from Rwandans and their leadership are very high. Considering ongoing cases that are in courts and cases that are on arbitrators' desks, the institution agrees that there is a long way to go to achieve the best construction project performance there can be. Findings of this research provides helpful knowledge to all Government institutions regarding the effective project management practices. It also guides the central Government, policy makers and other stakeholders on sound and informed decision making on project management issues; henceforth achieving value for money.

Likewise, the research can be useful to the procurement and supply chain professionals on the importance of practicing good project management; determinants of best practice; as well as its challenges and solutions. For the supply chain organizations, the research enables them to practice appropriate project management by identifying key activities involved in the process. To the future researchers, this study forms a baseline upon which future studies can be done by establishing knowledge gap on the concept. Likewise, current and future students can use the research findings and conclusions to enrich their knowledge on the topic, create their literature review and establish new research areas. Both the private and public sector, Contractors, Consultants, Academicians and Citizens of Rwanda in general benefit from this research. Scope of the Study.

1.1. Limitations and Assumptions

This research has limited space or geography, content and time. Geographically this research was undertaken in Rwanda and focused on the institution in charge of public housing projects which is Rwanda Housing Authority (RHA). This study assessed execution practices of construction projects under RHA management. The researcher, being an employee at the managerial level of the case study institution, chose to abstain himself from administering questions related to corruption and conflict of interests because he assumed that feedbacks on those avoided questions would be questionable in terms of scrupulousness.

1.2. Outline of the Study

The study divided into five chapters to ensure that all crucial components of the research were captured and well explained. After this introduction formulated in Chapter one (1) which mainly introduces the research problem and justifies the study significance and addresses the research problem in general, the objectives of the study, research questions, limitations and scope; Chapter two (2) presents related studies on management practices of construction projects in other countries. It also discusses various concepts of contract management, history, trends, benefits, tools, risks, opportunities, and policies globally and relates in the Rwandan context. Chapter three (3) discusses the methodology used in conducting the study comprising the research design, population, data collection procedures and analysis whereas Chapter four (4) presents analysis of the data and the results observed. Lastly, Chapter five (5) covers conclusions and recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter gives the review of existing literature and focuses on pertinent literature and relevant empirical case studies related to project management. It also talks about project performance in terms of financial performance and physical performance. It starts with theoretical review and ends with empirical case studies.

2.2 Theories on Contract Management

The term contract management refers to the procedures that allow a contracting authority to verify that the contractor is executing the project in accordance with the terms of the contract, providing the services/ supplying the products or constructing the public works that have been set forth by the tender documents, at the time and in the quantity defined in the Contract but also with the quality and the cost that have also been defined in it. There are two theories of contract management that guides this study, namely the Relational Theory of Contracts of (MacNeil, 2004) and Principal Agency Theory of (Chiappori and Salinie , 2003).

2.2.1 The Principal Agency Theory

The underlying principle of the principal-agency theory is that there should be a clear understanding of the needs of the principal and ability of the agent to meet these needs competently. Principal must closely monitor agents' performance; create reward structures that reinforce desired performance (Chiappori and Salinie , 2003). Indeed, when procurement contract is well defined and planned, the principal and agents find it easy to meet needs of each other in an efficient way resulting into timely execution of the contract (Oluka & Basheka, 2012).

When project management team roles and responsibilities and Key Performance Indicators are well defined, the principal and agents will find it easy to meet needs of each other in an efficient way resulting into timely execution of the contract in predetermined performance level. Moreover, the Principle-Agency theory is concerned with the conflicting goals between the principal and agent in obtaining their respective objectives and is focused on mechanisms related to obtaining information. Thus, all contract management issues (contract planning, contract pricing, contract award, contract structure, cost reimbursement, contracts administration, contract centralization or decentralization, level and type of surveillance) have their basis in agency theory and the principal-agent problem (Rendon, 2009).

2.2.2 McNeils Relation Contract Theory

This theory was developed by Iain McNeils in 2003. This theory has been the object of theoretical research in common law Jurisprudence. It contracts legal formalism to a certain extent and assumes that all the contracts can fall along a relational range from discrete mere transaction to highly relational, although no relation can be totally separate from relational elements, the isolation of the contract from a relational context and the complete and exact planning of the relationship presentation, or having a great importance for contracts law, cannot explain totally modern contractual relationships. Highly relational contracts have an effect which is strongly based on a specific social and economic context, on an ongoing relation usually of trust between the parties, which influences the scope and content of the contract (Diathesopoulos, 2010).

2.3 Project Management Practice

A contract is the foundation of the establishment and maintenance of a favorable relationship between the contractor and contracting authority. It also forms a basis for the acceptance of the project deliverables hence ensuring the achievement of

value for money. If a contract fails to address the relevant issues required in the agreement, such as word ambiguities, it becomes hard for the contracting company to base a positive working relationship with the contractor (Lowe, 2013). For some researchers, execution of construction projects refers to contract management or contract administration.

In point of fact, Kelman (1994) defines contract administration as a set of activities performed by government officials (client's representatives) after a contract has been awarded to determine how well the government (client) and the contractor perform to meet the requirements of the contract. While strategizing to ensure that contract management successfully takes the right course, all the parties involved must pay keen attention to all provisions in the given or existing contract. Despite that, certainly there are activities that the contracting company can carry out upon awarding a contract to boost the contractor's performance and subsequently achieve effectiveness during the contract implementation, the major procedures in project management related to execution of all kinds of construction contracts are discussed as follows:

2.3.1 Negotiate and Award Contract

Negotiation is about reaching agreement on the essential terms of the contract and the deliverables under the contract. It can be a form of trading where both parties are seeking something from the other; there is an exchange of offers, concessions and bargaining. For collaborative relationships the focus will be on gaining a win-win solution. For tactical relationships the approach will be more competitive. Once the negotiation has completed key activities include accurately documenting what was agreed, debriefing both successful and unsuccessful suppliers, and effectively communicating the outcome to affected stakeholders and the wider market (Sanghera, 2014.).

The discussion may result in an official meeting, which is known as the "kick-off meeting". This meeting is conducted between the key representatives of the Contracting Authority. The key points to be discussed during the kickoff meeting include: Contract Scope, Terms of Contract, Requirements, Contract Administration, Rights and Obligations, Potential Problems, terms of Payment, Acceptance of Deliverables and then Competencies or Powers. It is essential to record the exact terms of the negotiated agreement and reflects these in the contract. It is good practice to have an independent officer check and sign the contract. There should be a separation between the person signing the contract and the person who will have day-to-day responsibility for contract management. Most agencies adopt the 'one-up' system, where a manager at the next level up signs the contract (Cruz and Marques, 2013).

A good debrief to both successful and unsuccessful suppliers at the end of a tender helps to identify areas where they can improve in future tenders. It gives suppliers the chance to ask questions about the process and to improve their knowledge and understanding of government procurement. It also allows you to show your transparency and accountability in awarding contracts. And it is a two-way street – suppliers can provide feedback to your agency and suggest ideas that could make it easier to do business with government. The decision to award a contract is typically made when the evaluation panel's recommendation on the preferred supplier has been approved, and any conditions attached to the recommendation (e.g. subject to reference checks) have been resolved. To ensure transparency you need, at the very least, to communicate the two key decisions relating to the award: Step 1: Once the contract award decision has been made, promptly inform all the suppliers that submitted tenders – either directly (by phone, e-mail or letter) or by publishing a notice. Step 2: Once the contract has been awarded (signed by both parties), promptly publish a notice (Sanghera, 2014.).

2.3.2 Contract Monitoring & Acceptance Management

Contract management starts with contractor monitoring and acceptance management. This is vital in enabling the contracting organization to ascertain that the contractor is undertaking his or her duties and fulfilling his or her obligations in compliance with the contract provisions. This also allows the contracting organization to pinpoint any issues or problems in advance that could arise and offer timely solutions. Particularly, the outline of contract monitoring and acceptance management includes: monitoring, controlling, and evaluating the contractor's performance; evaluating the quantity and quality of services, works, or products delivered; and identifying and handling risks (Crooper, 2008).

2.3.3 Variation Handling in Project Management

A variation (sometimes referred to as a variation instruction, variation order or change order) is an alteration to the scope of works in a contract in the form of an addition, substitution or omission from the original scope of works (Michael Rycroft., 2019).

Almost all projects deviate from the original design, scope and definition. Whether small or large, projects inevitably depart from the original tender design, specifications and drawings prepared by the design team. This can be because of technological advancement, statutory changes or enforcement, change in conditions, geological anomalies, non-availability of specified materials, or simply because of the continued development of the design after the contract has been awarded. In large civil engineering projects variations can be very significant, whereas on small building contracts they may be relatively minor. Variations may include: alterations to the design; alterations to quantities; alterations to quality; alterations to working conditions; and alterations to the sequence of work (Office of Auditor General, 2017).

Variations are an inevitable aspect of every project. Very few projects are completed without any changes being requested or implemented. Unfortunately, the sheer diversity of variations can make it difficult to predict in advance which issues (if any) might arise during a project's lifespan. Every project is subject to the inevitable fluctuations in unit prices, timetables or last-minute changes from a client. Experienced project managers and contractors will plan to make sure these variations can be accommodated without losing time or money on the job. The most common variations to projects are due to: Client revisions requested during the project; Cost-cutting due to unforeseen financial problems; poorly defined or un-detailed project objectives, scale and scope (Office of Auditor General, 2017).

Legislative changes, third-party issues or new demands resulting in replacement of materials or products and changes of schedule resulting from bad weather or inadequate workforce or sub-contractors. The following are tips to handle Project variation in order to keep your projects profitable: manage expectations and communicate changes; keep everything documented; make sure you have a clear financial overview. Therefore, companies need to be far more prudent with their finances and this section considers five ways that variation orders in various projects can be managed: plan in advance; check the figures as often as possible; monitor sub-contractor behavior; be prepared for late costs and avoid presuming variations will deliver a profit (Office of Auditor General, 2017).

Variations may be valued by: agreement between the contractor and the client; the cost consultant; a variation quotation prepared by the contractor and accepted by the client or by some other method agreed by the contractor and the client. Valuations of variations are often based on the rates and prices provided by the contractor in their tender, provided the work is of a similar nature and carried out in similar conditions (Henry Boot Construction & Alstom, 2000).

Moreover, Saxena (2008) also emphasizes that firms that strive for success also ensure that they have a provision for execution of changes. The contracts: specific and general conditions, are set together with other Tender Documents at a fairly early stage of the project. This is imperative because then, possible risks or other issues that may arise next are not relatively different. This is the main reason why contracts should provide for the probability that require change and therefore, they must establish mechanisms and procedures by which the appeals for change will be made, reviewed, and either rejected or accepted.

Finally, Saxena (2008) argued that for contract management to be successful, the parties need to take initiatives and preventive actions. This implies that the process should be based on preventive actions with anything relating to potential risks, changes, substandard contractor performance, supply or delivery of low-quality products or services. They should avoid activities of suppressive nature.

2.3.4 Contract Closure or Termination

The final activity of contract management is contract closure. The contract closure is an administrative procedure, which is aimed at confirming that both parties (Contractor and Contracting Authority) have fulfilled their contractual obligations and there are no unexecuted tasks or other types of pending issues. This entails the control and certification practices that both contracting parties have honored their contractual responsibilities as well as activities involved in evaluating degree of successful contract execution and achievement of expected results (Balamuralithara & Chong, 2011).

It was pointed out by (Gupta, Karayil & Rajendran, 2008) that the actions for contract closure: during the contract closure procedure the Project Manager (or the Engineer in the case of public works) should:

- i. Check that all products have been delivered and accepted (case of supply contract), all works have been completed and accepted (case of building works or civil engineer's works), all services have been rendered and their deliverables have been accepted (case of service contracts);
- ii. Check that the initiation and completion Reports (case of supply contracts) or the interim and final Progress Reports (case of service or public works contracts) have been submitted and have been accepted.
- iii. Check that all interim payments as well as the final payment have been impacted and that the Performance Guarantee has been returned to the Contractor.
- iv. Check that all issues that resulted during the execution of the contract have been dealt with and there are no open issues.
- v. Ensure that all the rights, including copyright, and other intellectual and industrial property rights that were ensured during the execution of the contract are devolved to the ownership of the Contracting Authority.

The project manager should also notify all stakeholders that the contract has been completed; release the resources (human resources, machinery, equipment, materials and infrastructures) of the Contracting Authority that were utilized in the execution of the contract; provide the contractor with a good performance certificate as long as it is requested by him/her; and return to the contracting authority its assets that were made available to the Contractor in the context of execution of the contract and check that these have not suffered damages (Gupta, Karayil & Rajendran, 2008).

Contract closure concerns the activities associated with closing the project down, whether in accordance with the contract or as a result of early termination (Else, 2007). Lee (1996); and Thai (2004) guide that in cases where arbitration does not work and termination becomes inevitable, the consequences of termination must be taken into account and appropriate provisions made prior to contract signing.

Young (2008), in a study on health services in United Kingdom, observed that contract termination occurs mainly due to contractor's inability to perform the work to the required outcomes due to underpricing or misunderstanding the specifications (Aluonzi, 2016).

The contract relationship management affects performance, more specifically mutual processes between suppliers and buyers. Relationship management is strongly affected by mutual processes which in turn affect performance in terms of achieving their objectives especially on reduction of supplier defect rate. Contract cost management affects performance with more emphasis on contract planning and contract monitoring. It's clear from the findings that proper contract planning affects performance. The study further concluded that proper contract management is essential in ensuring that all parties to the contract fully meet their respective obligations as efficiently and effectively as possible, delivering the business and operational outputs required from the contract and providing value for money, customer satisfaction and reducing cycle time.

2.3.5 Problems Related to Poor Contract Management

It has been observed that ineffective contract management may bring about the following: decisions are not taken at the proper time thus allowing potential risks to appear, and the project implementation described in the contract is underestimated by the contractor both in terms of time and human resources required, leading eventually to deviations from the initial. The Contractor executes the project based on the understanding that he has formulated himself regarding the contract requirements, without realizing the actual goals and results expected from the execution of the project planning and possibly to exceeding the initially estimated budget (Young, 2008).

Due to high turnover related to leadership change or promotion of performing leaders, Rwanda Housing Authority has been suffering from frequent change of

leaders and technical staff in charge management of construction projects. Thus, a big number of projects always go beyond project budget due to improper communication in case of staff replacement. Another issue that is always hard to detect timely is the problem caused by frontloading especially when permitted by a manager who does not stay to finalize the project.

The project is implemented at a low rate, increasing the possibility for new risks to appear in the implementation. The handling of problems that arise during the execution of the Contract is not conducted timely and effectively, which usually leads to tension between the Contracting Authority and the Contractor. In addition, communication between the Contracting Authority and Contractor is limited, and this increases the possibility for misunderstandings, misinterpretations and the drawing of incorrect conclusions. Besides, the Contractor's performance is not evaluated throughout the execution of the contract thus not fully or adequately implemented. The payments that are made and the amounts paid do not correspond to the works that have been done (Saxena, 2008). The opportunities to improve value for money are lost, and the variations in the contract are not realized in accordance with a specific and agreed fashion thus the products. Also, services and public works are delivered or accepted without meeting the acceptance criteria that had been set for them (Young, 2008).

2.4 Project Performance

Performance measurement is the process of determining how successful organizations or individuals have been in attaining their objectives (Sinclair & Zairi, 1995). It is a means by which unnecessary causes of waste can be identified so that the organization knows where to focus its effort (Cain, 2004). The purpose of performance measurement is to provide timely and accurate feedback on the efficiency and effectiveness of operations and to focus attention on continuous improvement (Amaratunga and Baldry, 2002).

organization which helps to recognize

Performance measures are vital signs of an organization which helps to recognize whether the activities of a process or the outputs of the process achieve the specified objectives (Horonec, 1993). They can be used to translate the strategy of the organization into a set of goals and objectives and the results obtained through the measures reflect the successfulness of achieving the strategy (Eccles, 1991). Performance measures indicate the priority factors of the organization and the way the employees should behave to give maximum outcome to the organization (Neely 2002). In the construction industry, there are six major performance measurement frameworks which may be outlined as follows:

2.4.1 Construction Project Performance Frameworks

Integrated Performance Index (IPI) is a framework developed by Pillai et al., (2002) for assessing the performance of research and development (R&D) projects in India. The advantage of IPI is that it can be applied to all the phases of the project life cycle. However, the way in which its mathematical formulae are used to integrate the identified key factors into an integrated performance index is not clear (Tekim & Al, 2003).

Key Performance Indicators (KPI) were introduced in the UK construction industry after the Egan 1998 report. Key performance indicators consist of seven project performance indicators: construction cost, construction time, cost predictability, time predictability, defects, client satisfaction with product, client satisfaction with service and three business performance indicators namely: safety, profitability, and productivity. The advantage of this framework is that the overall concepts are easily understood and implemented by project participants. However, the measures used for KPI are retrospective and they are not compartmentalized along project phases (Tekim & Al, 2003).

2.4.2 Client Satisfaction Framework

In the UK, the CCF/CBPP (1998; 1999) and the CIB (1999) introduced performance measures which enabled client to measure the performance of the contractor. These metrics were however, reported to be retrospective (Ankrah & Proverbs, 2005).

2.4.3 Contractor Business Performance Framework

Mbugua (2000) developed a framework for assessing the business performance of contractors in the UK. The major advantage of the framework was that it synthesizes several existing business performance frameworks such as the balance score card (Ankrah & Proverbs, 2005).

However, most of its measures cannot be applied in a project context and it is retrospective. Robertson (1997) developed the fundamental behavior to performance to outcome (B-P-O) cycle for business performance measurement in a construction company.

2.4.4 Participant's Project Performance Framework

Soetanto et al., (2002) developed a framework for evaluating the project performance of all participants of a construction project in the UK. It was found out that the measures employed in the framework were mainly retrospective. Contractor's Project and Business Performance Framework – a framework for assessing contractor's project and business performance in the UK was developed by Xiao (2002). The framework was reported to be retrospective. In Brazil Costa, Lima, and Formoso, (2004) also developed another framework for evaluating the project and business performance of contractors. Although, the framework consisted of some 'leading' measures, it made use of too many measures (Ankrah & Proverbs, 2005).

2.4.5 Project Quality Performance Framework

The Construction Industry Development Board of Malaysia developed a framework called QCLASSIC to evaluate contractor's quality performance (CIDB Malaysia, 2006). The major strength of this framework is that it is easy to implement (Ankrah & Proverbs, 2005). However, it is retrospective and measures only structural, architectural and external works (Tekim & Al, 2003).

In Hong kong, Chan (2001) developed a project quality performance framework. The framework was based on the variables of client, project, project environment, project team leader, project management act and project procedure. Chan (2001) found out a causal relationship between the factors affecting quality performance. A weakness of the framework is that its variables are not grouped based on project phases and fail to identify the responsibility, needs and expectations of project stakeholders in each project phase. In the US, blueprint was introduced to measure quality performance on engineer procure-construct (EPC) (Stevens, 1996). Blueprint involves four stages. Stage one; project variables important in improving quality are identified. Stage two; the reasons and time when these variables should be measured are illustrated. Stage three; examples of how to measure these variables are given; and stage four; suggestions on how the results of the measure can be used in making project decisions are provided (Tekim & Al, 2003).

2.4.6 Construction Productivity Measurement Framework

Early academicians (Winch & Carr, 2001) developed a computerized activity sampling called the CALIBRE approach for assessing construction productivity of on-site performance. This framework measures performance based on the activity of an identified worker at a particular location and point in time. Although the framework enables contractors to compare their physical productivity performance with others and to improve on project productivity, the framework would require an

expert to input the data to ensure reliability and validity of the data (Tekim & Al, 2003).

Other frameworks include the self-auditing performance measurement system which examines the use of information technology based management tools; construction firms' performance evaluation model using the financial, economic and industrial characteristics of companies, the six-sigma concept to construction recommended by (Pheng and Hui, 2004), resource based and institutional perspectives for identifying the industry and company specific factors that affect construction companies' performance.

2.5 Empirical Review

There are various studies conducted both globally relating to contract management practice and operational performance. Costello (2008) argues that suppliers get motivated to do business with firms that have effective contract units where activities are straightforward, needs and deadlines met, and costs are well managed; hence enhanced operational performance. As well, Nysten-Haarala, Lee and Lehto (2010) sought to establish the effective incorporation of flexibility in contracting process. They found out that flexibility is important in contract management; thus, improved operational performance. Likewise, Quesada, González and Mueller (2010) sought to establish the effect of e-procurement on procurement and performance and identified a positive link between the variables.

Besides, confirmed data shows that the government of Kenya, a country that is located in the East Africa Community where Rwanda is a member as well, spends between 10% - 30% of GDP on procurement alone (Maria, 2013). Out of that 5% goes to waste due to lack of proper management of the contracts (Gordon, 2009). As a result of these economic situations, the World bank and the International monetary Fund (IMF) had to intervene by putting in stringent conditionality's for lending funds to the government which slowed down economic development by

2.1% (T.I, 2009). The effect of good contract management practice on operational performance can be measured successfully using suitable operational Key Performance Indicators. Depending on the nature of the business, operational measures vary across firms and industries (Jusoh & Parnell, 2008).

In such a competitive corporate world, organizations strive to establish performance measurement metrics to gauge against their targets and business rivals. Some of the key indicators of operational performance used include efficiency, quality, flexibility, compliance, supplier relationship, supplier defects rates and procurement cycle time (Cho & Pucick, 2005). These statements emphasize on three focus items which are Quality equivalent to physical performance, then Budget and time. Thus, for this specific research successful project must achieve their set goals as per technical specifications, within the allocated budget and within accorded project duration.

2.6 Theoretical Framework

In this study, project performance is construed to be the accomplishment of a given project measured against preset known standards of accuracy, completeness, cost, and speed. In a contract, project performance is deemed to be the fulfillment of an obligation, in a manner that releases the performer from all liabilities under the contract. In fact, projects by their very definition have a start point and an end. The reason we do projects is to make a difference and usually the difference we are trying to make is to make result, especially in business, better (Costello & Al, 2008). Accordingly, project performance, the dependent variable was summarized in terms of three sub-variables or indicators, namely:

- Physical/Quality performance
- Financial Performance
- Time Performance

For On-time & On-budget perspective, the time taken to accomplish the project is compared against the time planned (allowed) and then the money spent to accomplish the project is compared versus the planned budget at the beginning. A project that is performed using the allowed budget and allowed time or less is said to be efficient when all the expected outcomes were achieved, and hence its performance is better than a project performed using more budget and more time than allowed budget and time, and hence its performance is said to be poor. From the foregoing review of literature, project performance is influenced by contract management, a core component of project management through four main factors, namely:

- Negotiation and award of contracts.
- Contract monitoring and acceptance management.
- Variations handling; and
- Contract closure.

Specific items describing the relationship between these factors and variables are listed on Table 2.1.

Table 0.1: Contract Management Practice versus Project Performance

S/N	Management Practice	Relevant Related Items
1	Housing Project Performance:	Physical items: - Specification - - Professional Ethics Financial items: - contract amount Time items: - contract period
		Compliance with BoQ & Compliance with Standards Compliance with Performance within Performance within
2	Negotiate & award contract:	Physical items: - - - - - availability - Financial items: - - - - fluctuation - - - -
		Bill of Quantities Site visits & assessment Site location & accessibility Drawings Building materials Required expertise Advance payments Advance payment guaranty Performance guaranty Price adjustment & Project insurance Remunerations Currency volatility Leasing cost

		Time items:	
		-	Political pressure
		-	Delays (weather, payments,
		suppliers...)	
3	Contract monitoring and acceptance management:	Physical items:	
		-	Expertise of supervisor &
		contractor	
		-	Professional conduct
		-	Site procedures
		-	Correspondences &
		documentation	
		-	Archiving
		-	Works acceptance
		-	Relationship (Contractor,
		Supervisor & Client)	
		Financial items:	
		-	Invoice approvals
		-	Payments
		-	Cash disbursement by
		financiers	
		-	Front loading
		-	Price adjustment
		-	Remuneration of contractor
		personnel	
		-	Cash availability for
		contractor	
		Time items:	
		-	Extensions
		-	Detailed implementation
		plan	
		-	Delays
		Works acceleration	
4	Variation Handling in	Physical items:	
		-	Change of materials

	Contract	-	Additional works
	Management:	-	Change of designs
		-	Introduction of new items
		-	Change of site
		-	Change of technology
		Financial items:	
		-	Variation performance
		guaranty	
		-	Budget availability
		-	Approvals of finances
		-	Supervision of variations
		Time items:	
		-	Extension
		-	Delays
		-	Acceleration of works
5	Contract Closure	Physical items:	
	or termination:	-	Final physical account
		-	Snags
		-	Incomplete works
		-	Correction of snags
		Financial items:	
		-	Final financial account
		-	Performance guaranty
		-	Retentions
		-	Legal fee
		Time items:	
		-	Litigation
		-	Liability period
		Acceleration of correction works	

2.7 Summary of the Review and Knowledge Gap

Every country has its sovereignty and constitutional framework that guides its governance, vision and growth. So many literature materials were availed with attempt to address the problem stated for this research, but all solutions provided therein were easily interpretable and implementable in countries where those researches had taken place. At the time of the study, no literature material on the Rwandan construction industry could be found online or in libraries yet the institutions in the sector had already expressed their interest in such material with the aim to build the capacity of their personnel and mitigate issues and challenges that were hindering construction projects.

Furthermore, it was observed that in the history of the country there have never been a university, school or institution that trained in the field of construction project management. Therefore, the study can help practitioners in the sector to have a clearer picture of management practices appropriate for the construction industry in Rwanda. Availability of such report can guide concerned state corporations to put in place procedure manuals which can regulate and lead contract managers on what elements to focus on to achieve optimum performance of public housing projects. The available literature lacks materials on the behavior of non-regulated procurement and regulated or over-regulated procurement, in the construction sector. Likewise, no materials could be found on the role of public procurement & project management in the Rwandan construction industry.

2.8 Conceptual Framework

From the theoretical framework, a conceptual framework for this study can be devised as shown in figure 2.1. The model shows the relationship between project management and project performance. It interlinks independent variable, dependent variable and intervening variable as depicted in the figure 2.1.

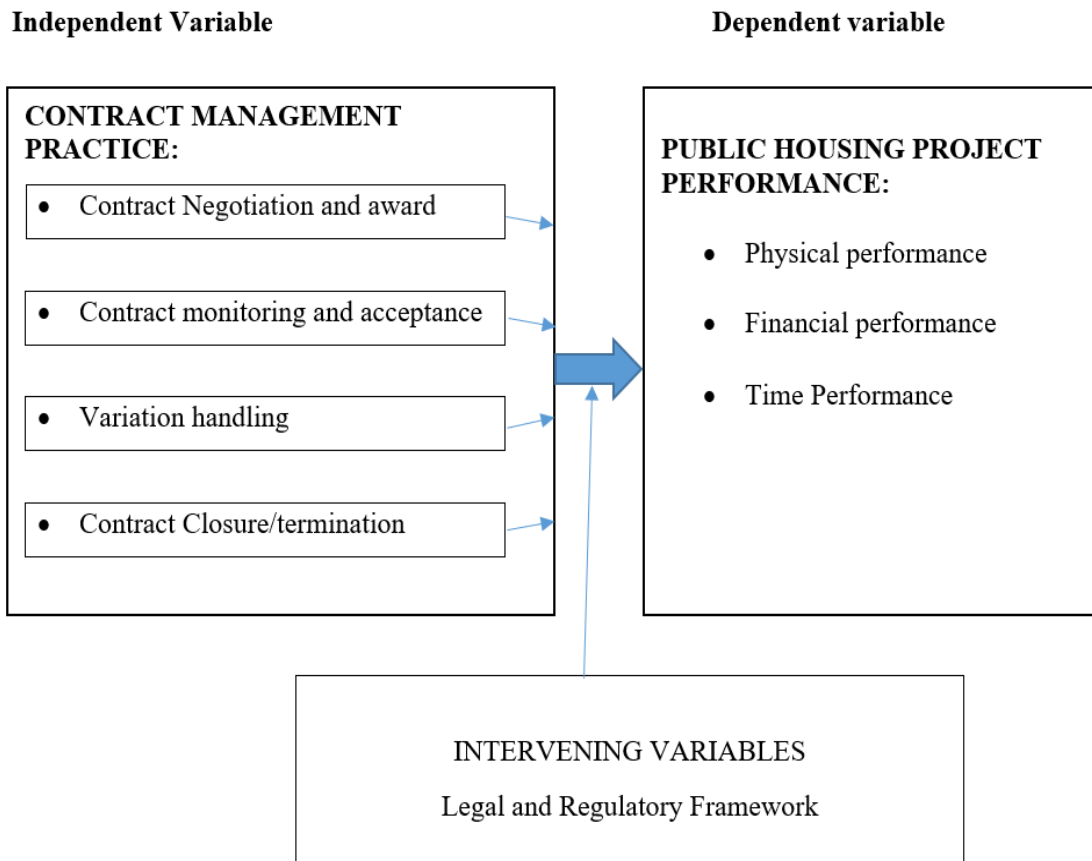


Figure 2.1: Conceptual Framework

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter presents the research design and methods, the research area, the target population, the sample size and sampling techniques, data collection instruments, research variables and their measurements, the validity and reliability of instruments, source of data, data processing, methods of data analysis and ethical consideration.

3.2 Research Design

The research is valid when a conclusion is accurate or true and research design is the conceptual blueprint within which research is conducted. A scholar for his research, prepares an action plan which constitutes the outline of collection, measurement and analysis of data. Research design is not associated to any technique of data collection or any particular type of data. When designing research, it is necessary that we recognize the type of evidence required to answer the research question in a reasonable way (Akhtar, 2016).

This research used both a descriptive cross-sectional survey research design and the correlational research design. It was appropriate for the research because it enabled collection of data which describe events; organize, tabulate, predict and describe data. Since it is characterized by the questions: who, how, and what, the design enabled the collection of data that answer the research question. In addition, a correlation research design was also employed in order to establish the relationship between project management and project performance. Even though this research adopted both quantitative and qualitative approaches, the general nature of this study's aim is to quantify the extent to which project management practice influences performance of public housing projects in Rwanda. Nevertheless,

qualitative approach was also used to seek in-depth information from employees of Rwanda Housing Authority (RHA) via open ended questionnaire.

3.3 Research Area

This research was carried out within RHA, a Government Institution which is under Ministry of Infrastructure. RHA Office is located in Kacyiru, the City of Kigali, in the District of Gasabo, Relax House. The mandate of RHA is summarized as follow:

- i. Public Building Construction and Maintenance
- ii. Government Assets Management
- iii. Building Regulation, Inspection and Audits
- iv. Elaboration of Master plans and Human Settlement
- v. Eradication of Asbestos
- vi. Affordable Housing

This study focused on the first mandate related to public construction projects undertaken by Rwanda Housing Authority.

3.4 Target Population

Amin (2005) define population as « a set of cases from which a sample is drawn and to which a researcher wants to generalize». The targeted population for this research consists of 57 employees of RHA involved in contract and project management. The researcher focused on employees who have been involved in management of construction projects for quite some years. Such employees face a lot of challenges on a daily basis and this equip them with very productive experience and information which can lead to a good report when properly collected, analyzed and interpreted.

3.5 Census

The researcher adopted the census method targeting every employee of the Rwanda Housing Authority involved in management of construction projects regardless of their professions (engineering, architecture, quantity surveying, et cetera) and regardless of the hierarchical level (Managerial level, seniors' level or office's level).

3.6 Population Size

Rwanda Housing Authority was established by the law n°40/2010 of 25/11/2010 Law determining its responsibilities, organization and functioning. This law also provides the organization structure which could lead the researcher to easily identify targeted people for data collection.

Nevertheless, the top management of Rwanda Housing Authority informed the researcher that there are only fifty-seven (57) staff in charge of construction project management within the institution though the number was supposed to be 65 but there were still some vacant posts at the time of data collection. However, the institution leadership planned to recruit to reinforce available personnel.

The Rwanda Housing Authority has been undergoing various restructuring with aim to optimize performance of the corporation and at the same time provide a conducive working environment to available personnel. At the time of data collection, the researcher was informed that the organizational structure was not yet fully filled with all needed employees. There were still some vacant posts, thus the number (57) of relevant staff were interviewed.

Upon identification of the 57 staff, top management inclusive, the researcher was advised to conduct a census and administer a questionnaire to each staff to ensure quality of data to be collected as expectations of RHA from the researcher were very high. The conclusion and recommendations of the study may provide a

helping hand to draw measures aiming to optimize performance in public housing project.

Rwanda Housing Authority has a board of directors that report to the Ministry of Infrastructure. The institution is managed by the General Directorate with the following staff:

- Director General (1)
- Advisor (1)
- Legal affairs (1)
- Research development specialist (1)
- GIS mapping and surveying specialist (1)
- GIS mapping and surveying Officer (2)
- Internal auditor (1)
- Public relations officer (2)
- Administrative assistant (1)

Under the General Directorate, there are two departments and two divisions named as follows:

- Human settlement planning and development department,
- Affordable housing planning and development department,
- Construction, rehabilitation and management of government buildings department,
- Corporate services division, and
- Building regulation, inspection and audit division.

The human settlement planning and development department is led by a Head of department and supervises two divisions structured and staffed as follows:

- Urban planning and development division manager,
- Urban design senior engineer,
- Urban informal settlement upgrading senior engineer,

- Green and smart development senior engineer,
- Urban development senior economist,
- Urban physical planner (2),
- Rural settlement division manager,
- Rural settlement planning senior engineer,
- IDP model village senior architect,
- Public awareness and mobilization officer,
- Rural settlement planning engineer, and
- Rural development senior economist.

The affordable housing planning and development department is led by a Head of department and supervises two divisions structured and staffed as follows:

- Affordable housing planning and investment division manager,
- Affordable housing finance and investment specialist,
- Land acquisition specialist,
- Affordable housing technology engineer,
- Affordable housing products planning engineer,
- Social and affordable housing design and development division manager,
- Affordable housing senior engineer,
- Affordable housing senior architect,
- Quantity surveyor,
- Affordable housing architect,
- Affordable housing electrical engineer, and
- Affordable housing mechanical engineer.

The construction, rehabilitation and management of government buildings department is led by a Head of department and supervises two divisions structured and staffed as follows:

- Government buildings design and construction division manager,
- Building construction senior engineer,

- Building design senior architect,
- Building design engineer,
- Building design architect,
- Building construction electrical engineer,
- Building construction mechanical engineer,
- Building construction quantity surveyor,
- Building construction structural engineer; and
- Government building rehabilitation, institutions accommodation and office space management division manager,
- Building rehabilitation senior engineer,
- Building rehabilitation electrical engineer,
- Building rehabilitation mechanical engineer,
- Building rehabilitation structural audit engineer,
- Director of public accommodation and office management,
- Government asset data management specialist,
- Property valuation specialist,
- Office allocation and management engineer,
- Government assets data management officer.

The corporate services division is structured and staffed as follows:

- Division manager,
- Administrative assistant,
- Procurement specialists (2),
- Director of Finance,
- Accounts (2),
- Budget officer,
- Logistic officer,
- Secretary,
- Director of human resource and administration,
- Human resource officer,

- Archivist and documentation,
- Head central secretariat,
- Secretary in central secretariat,
- Driver,
- Director of planning,
- Planning and monitoring and evaluation specialist,
- Planning officer,
- Monitoring and evaluation officer;
- Director of ICT,
- Network and systems administrator,
- Database and application administrator, and
- IT officers (2).

The building regulation, inspection and audits division is structured and staffed as follows:

- Division manager,
- Permitting officers (2),
- Building technology applications and scrutiny engineer,
- Director of inspection and audits unit,
- Building inspection and audits specialists,
- Mechanical inspection specialist,
- Building inspection and audits officers (5),
- Director of regulation and professional services unit,
- Regulation design specialist,
- Professional bodies regulation officer, and
- Design conformity and material testing engineer.

According to the guidance given by members of the top management of Rwanda Housing Authority, only 57 employees qualified to possess useful experience and information related to the study. These fifty-seven (57) individuals were

approached and interviewed one by one for accurate and effective data collection.

3.7 Sources of Data

According to Yin, (2003), evidence for case studies may come from six sources: documents, archival records, interviews, direct observation, participant-observation and physical objects. Data of this research were collected through primary means. Primary data involve information collected by the researcher directly through instruments such as questionnaire and interview guide (Amin, 2005).

The primary sources included survey through questionnaires which were administered to respondents selected from Technical Departments of Rwanda Housing Authority focusing on staff deeply deployed in management of contract for construction projects. All respondents were interviewed in line with ethics requirements and protection of respondents in line with the targeted information expected from them. Thereafter, a brief summary of the research objectives was shared to motivate all respondents to provide resourceful answers.

Furthermore, some project files were shared were also provided by some respondents for the purpose of emphasizing on relevance and accuracy of their responses. This additional information helped the researcher to better understand responses collected especially those which turned out to be surprising or differing to the researcher's expectations.

3.7.1 Filtering Survey Results

The Filter rules allow to break down survey results and focus on a specific subset of data. For example, filtering can be done by question and answer to view respondents who answered a question a certain way, or by completeness to view only complete responses (SurveyMonkey, 2018). The survey design requires to think about how to filter results. In order to be able to filter respondents by group, a question is included within the survey that will allow such filtering. For example,

asking employees or respondents to select their department, filtering can be executed by question and answer to view only the results from human resources department. To view only completed responses, filtering can then be done by completeness as shown in Table 3.1 (SurveyMonkey, 2018).

Table 3.1: Filter Type & Description

Filter Type	Description
Question & Answer	View only respondents who answered a question in a certain way. For closed-ended questions, select the answer choices you'd like to include in the filtered view. For open-ended questions, enter the phrases to include, separated by commas.
Tag	For surveys using a question with open-ended responses, you can manually tag individual responses and sort by specific tags.
Completeness	Show only particular response statuses: Complete, Partial, Disqualified, or Over Quota.
Collector	If you used multi collectors, show only the responses recorded through certain collectors.
Period	View responses submitted on or between a specific time frame.
Respondent Metadata	Filter by other respondent metadata: response time, IP address, email address, first name, last name, or custom data 1.
A/B Test	If you used an A/B test in your survey, show only respondents who saw a particular variable.
Tag	For surveys using a question with open-ended responses, you can manually tag individual responses and sort by specific tags.
Language	For multilingual surveys, filter by language.

Sentiment	Filter by the sentiment of open-ended text responses: Positive, Neutral, or Negative.
Range	If you choose to show people their score and set up custom score ranges when creating a quiz, you can sort responses by those ranges with this filter.
Response Quality	If you have 50 or more responses, you can filter for poor Response Quality. You can review and keep your flagged responses or delete them to focus on high quality answer choices.

Survey Monkey Help Center, 2019

A/B testing, also known as bucket testing or split-run testing, is a user experience research methodology. It consists of a randomized experiment with two variants, A and B. It includes application of statistical hypothesis testing or "two-sample hypothesis testing" as used in the field of statistics. A/B testing is a way to compare two versions of a single variable, typically by testing a subject's response to variant A against variant B, and determining which of the two variants is more effective (Wikipedia, 2022).

3.8 Data Collection Instruments

According to (Ranjit, 2005), there are several research instruments available to researchers to gather information such as guide for interview, questionnaire, documents, and the guide for observation. To carry this research a variety of tools were used, as practical means of obtaining information related to the research topic. The researcher mainly focused on documentation and questionnaires as techniques of data collection.

3.8.1 Questionnaire

A questionnaire is a written list of questions, the answers to which are recorded by respondent, questionnaire respondents read the questions, interpret what is expected and then write down the answers (Ranjit, 2005).

Questionnaire was proposed and distributed to 57 respondents to get the needed information. It is a standardized questionnaire with both close ended and open-ended questions. The questions were structured in a way that the respondents have close ended questions, in which the respondents were asked to select an answer from a provided list. Whereas for the open-ended questions provided room for respondents to express their views freely in the provided space to seek deep information on the research variables.

A number of questions were asked to respondents to achieve the research objectives, and other questions were also asked to get information on respondents 'profile. The main advantage of self-administered questionnaire is that the researcher can collect all completed forms within a short time (Sekaran, 2003).

3.8.2 Documentation

This is a secondary data collecting technique basing on reading books, journals, and different reports, (Eriksson, 2008). During the research, the researcher had to consult annual reports of RHA. Besides, the researcher also read textbooks, journals, newspapers, and websites that contain the information on RHA, project management and project performance.

3.9 Data Quality Control

3.9.1 Reliability

A reliable instrument is the one that consistently produces the expected results and ensure the extent to which the results are consistent over time and can be reproduced outside the geographical area of the research (Mugenda, 2003). To

ensure the reliability of research instrument, under similar methodology the researcher conducted pilot research in a different public institution, hence, the questionnaire was pre-tested using random sampling for purposes of ascertaining accuracy and ability to elicit the required information. The respondents were requested to make positive criticisms, make comments and suggest improvements.

3.9.2 Validity

According to Easterby-Smith, (2008), validity is the extent to which a test (items of research instrument) measures what it claims to measure. The instrument applied was validated and free from bias and practical to see whether they measure to the assumed attributes, and deficiency. This therefore helped the researcher to minimize bias during the study. To ensure that the instruments are valid the researcher submitted the questionnaire to the supervisor and later to other 10 people more experienced in research field that undertook studies in similar domain for them to judge if the questions to be used can effectively serve the purpose of the research.

3.10 Data Analysis

The research undertook different statistical operations using Microsoft Excel to achieve manipulability of all obtained data collected at Rwanda Housing Authority. Thereafter, the researcher converted obtained aggregates in an easily readable format for fast understanding and easy presentation and interpretation.

Data analysis was done using descriptive statistics (means and standards deviations) frequencies and percentages, with the aid of the Microsoft Excel program. Additionally, thematic analysis was adopted to analyse the qualitative data obtained from the open-ended sections of the questionnaire which sought expert views of the respondents on the strategies for enhancing project performance at the Rwanda Housing Authority.

All the fifty-seven collected questionnaires were recorded in a Microsoft Excel sheet whereas responses in a form of figures: 1= Fully Disagree, 2= Strongly Disagree, 3= Disagree, 4=Agree and 5=Strongly Agree; were put in front of each question. Through use formulas, the frequency of each figure was calculated to determine the tendencies of respondents. Thereafter, the frequencies were converted into percentages to facilitate the researcher in illustrating the picture of collected data in line with independent and depend variables.

3.11 Ethical Considerations

Ethics is not an afterthought or side note to the research study. It is an integral aspect of research that needs to remain at the forefront of his work. The research being aware of the sensitivity of the chosen area, the following element were considered:

- Validity,
- Voluntary Participation and Consent
- Sampling
- Confidentiality
- Risk of Harm
- Research Methods
- Research Methods
- Participants
- Benefits of the Study
- Integrity

3.11.1 Validity

The research design addressed specific research questions. Thence, the conclusions of the study correlated to the questions posed and the results. Also, research ethics demands that the methods used must relate specifically to the research questions.

3.11.2 Voluntary Participation and Consent

The study ensured that all individuals at no point felt any coercion to participate in a study. Any type of persuasion or deception in attempting to gain an individual's trust was avoided. Respondents were informed about consent states that an individual must give their explicit consent to participate in the study because it is thought of consent form as an agreement of trust between the researcher and the participants.

3.11.3 Confidentiality

The United Kingdom website published that the Economic and Social Research Council instructs that: "The confidentiality of the information supplied by research subjects and the anonymity of respondents must be respected." However, sometimes confidentiality is limited (ukri.org, 2022). For example, if participants are at risk of harm, they must be protected. This might require releasing confidential information. However, the research ensured that no dangerous or harmful information was shared in the report. All collected confidential data were kept out of the report but were very resourceful for the study in terms of data analysis and concluding.

3.11.4 Risk of Harm

All the report was screened and scrutinized to ensure that there is zero risk of harm for all respondents. Instead the report outlines resourceful recommendations which can help institutions employing the respondents to better perform vis a vis their organizational mandate and individual responsibilities related to management of public housing projects.

3.11.5 Research Methods

The considered numerous research methods. However, when it comes to ethical considerations, the following key questions helped to find the right approach for the study:

- i. Which methods most effectively fit the aims of the research?
- ii. What are the strengths and restrictions of a particular method?
- iii. Are there potential risks when using a research method?

3.11.6 Participants

It was vital to make it clear that individuals were provided with enough information in order to make an informed decision on their participation. In addition, it was needed to demonstrate that the ethical issues of consent, risk of harm, and confidentiality were clearly defined.

3.11.7 Benefits of the Study

The researcher needed to prove to the panel that your work is essential and will yield results that contribute to the scientific community. For this, you should demonstrate the following:

- i. The conduct of research guarantees the quality and integrity of results.
- ii. The research will be properly distributed.
- iii.

T

he aims of the research are clear, and the methodology is appropriate.

3.11.8 Integrity

The researcher being a compliant member of the Institution of Engineers Rwanda (IER), and an overseer of the Rwanda Institute of Architects (RIA) due to his current responsibilities of regulating professional bodies in the Rwandan construction sector, he adhered to professional ethics.

CHAPTER FOUR

DATA ANALYSIS AND RESULTS

4.1 Introduction

This chapter highlights the presentation, analysis and interpretation of data collected from the targeted population or questionnaire respondents. The analysis was subdivided into segments in accordance to the questionnaire and received feedback.

It presents bio data of respondents and other findings on the contract management practices on performance of public housing projects in Rwanda. The study was done on population size of 57 respondents, and all of them responded, thus making a response rate of 100%. The study used a Likert scale to collect and analyze data and five-point scale was used to compute the means and standard deviations. Frequencies were used to analyze data on single response questions. The study also used regression analysis model to determine the relationship between project management practices on performance of public housing projects in Rwanda. Lastly, the data was presented using tables, and equations.

4.2 Background Information on Respondents

The study sought information on the respondents' education background, age bracket, sex, as well as the number of years the respondents had worked in Rwanda Housing Authority as shown in Table 4.1. The information was relevant in testing the suitability of the respondents' ability to answer the questions on project management and performance of public institutions.

Table 4.1 shows that 80.7% of respondents are bachelor's degree holders, whereas 19.3% have master's Level. None of the respondents had a PhD, A1 Diploma nor A Level. This implies that all respondents have a good education background and it gives confidence that the information they provided can be considered credible.

Table 4.1: Education Level of Respondents

Education	Frequency	Percentage
A1	0	0%
Bachelors	46	80.7%
Masters	11	19.3%
PhD	0	0%
Total	57	100%

Source: Field Survey, 2019

The table 4.2 shows that majority of the respondents (49.12%) had worked in RHA for 2-4 years, while 33.33% had worked for 4-6 years and 2-4 years whereas 7.01% had worked for 6-8 years. The table also reveals that 8.77% had been in the RHA for a period less than 2 years, while only 1.75% had worked for more than 8 years. This shows that majority of the respondents had a lot of skills in contract management practice and project performance of public projects due to several years of work in RHA. It is also evident from the results that the information collected from the state agency is credible.

Table 4.2: Experience of Respondents

Work Experience	Frequency	Percentage
Less than 2 years	5	8.77%
Between 2 and 4 years	28	49.12%
Between 4 and 6 years	19	33.33%
Between 6 and 8 years	4	7.01%
More than 8years	1	1.75%
Total	57	100%

Source: Field Survey, 2019

Table 4.3 shows that the majority (56.14%) of the respondents were in the age bracket between [35-65] whereas (43.86%) of respondents fall in the age bracket between [25-35]. This implies that most respondents are adult people who own families. Reasons are clear as these people are active and working hard for the prosperity of their families. In the same line no age bracket above 65 years old was used because that age is for old people who are retired.

Table 4.3: Age bracket of respondents

Age Bracket	Frequency	Percentage
Between 25 and 35	25	43.86%
Between 35 and 65	32	56.14%
Total	57	100%

Source: Field Survey, 2019

Table 4.3 shows that majority of the respondents (86%) were male, while 14% were females. This could be justified by the fact that RHA deals with technical works and engineering related works that in the past were undertaken by more boys than girls.

Table 4.4: Gender of Respondents

Gender	Frequency	Percentage
Female	8	14%
Male	49	86%
Total	57	100%

Source: Field Survey 2019

4.3 Findings on Influence of the Project Management Practice on Performance

This section of the questionnaire sought to find out the effect of effective contract management process on performance of public projects undertaken by Rwanda Housing Authority. The project performance was evaluated in terms of physical, financial and time performance considered as dependent variables for this

research, whereas the project management practice was divided into four components namely: contract negotiation and award, contract monitoring and acceptance, variations handling and contract closure considered as independent variables for this research.

The researcher evaluated the effect of each of the 4 components of contract management on physical, financial and time performance using a 5-point Likert Scale ranging from 1= Fully Disagree; 2= Strongly Disagree; 3= Disagree; 4=Agree; 5=Strongly Agree. Using Microsoft Excel descriptive tables were generated, whereby the mean value indicates the general answer for all 57 respondents, while the value of standard deviation indicates the homogeneity or heterogeneity of respondents' answers.

According to the questionnaire structure, the obtained standard deviations within components confirmed validity of received feedback. They were found to be:

- 0.40 for Contract Negotiation & Award,
- 0.37 for Contract Monitoring & Acceptance of Works,
- 0.37 for Variation Handling, and
- 0.47 for Contract Closure.

All of the values of standard deviations are below 0.5 and this proves that the answers provided were closer to the mean or were homogenous, whereas the standard value greater than 0.5 indicates heterogeneous answers or very different answers to proposed statements.

Descriptive statistics, showing respondents' views on each statement reflecting the effect of each component on project performance, was used. Thereafter, percentages were computed to display the level of agreement or disagreement of respondents on each statement derived from the first research question.

4.3.1. Influence of Contract Negotiation & Award on Performance

The objective of the first question was to examine the extent to which contract negotiation and award affect project performance. Therefore, this section presents the respondents' views on the influence of effective "Contract Negotiation and Award" on the financial, physical and time performance of public housing projects within Rwanda Housing Authority.

The mean for effect of "contract negotiation and award" was found to be 3.881 which becomes 4 once rounded up. The standard deviation was found to be small enough (0.40) thence confirming consistence of responses as shown in Table 4.5. The detailed collected rankings are displayed in the Figure 4.1 for easy detection of the most influencing element of the variable "contract negotiation and award" on performance of public housing projects undertaken in Rwanda.

Table 4.5: Aggregates and Deviations for Contract Negotiation & Award

Contract Negotiation and Award	Aggregates	Deviations
Availability of expertise affects performance	4.316	0.435
Availability of materials affects performance	3.912	0.031
Proper site assessment affects performance	3.877	-0.004
Site location & accessibility affects performance	3.825	-0.056
Proper designs and drawings affect performance	4.053	0.172
Accurate Bills of Quantities affect performance	3.789	-0.092
Advance payments affect performance	4.053	0.172
Advance payment guarantee affects performance	3.088	-0.793
Performance guarantee affects performance	3.281	-0.600
Project insurance affects performance	3.386	-0.495
Remunerations affect performance	3.737	-0.144

Cost of materials affects performance	4.246	0.365
Price fluctuation affects performance	3.912	0.031
Political pressure affects performance	4.649	0.768
Realistic vs targeted time affect performance	4.088	0.207
Mean	3.881	
St Deviation	0.40	
Total Respondents	57	
Sum of Squares	2.283	

Source: Field Survey, 2019



Figure 4.1: Influence of Contract Negotiation & Award on Project Performance

As per the Table 4.5. and the Figure 4.1 above, the majority of the respondents agreed that the following statement derived from contract negotiation and award have significant influence on performance public housing projects in Rwanda:

- Proper designs and drawings affect performance,
- Advance payment,
- Political pressure, and

- Cost of materials,

This was shown by the fact that all the above listed statements scored more than 4. The mean for “contract negotiation and award” was found to be 4 once rounded up and the standard deviation was found to be 0.40 which is smaller than 0.5. This attests homogeneity of feedback from respondents. Thereafter, the frequency percentages were computed from calculated aggregates to determine how fairly, fully or strongly were the respondents in disagreement or agreement as shown in the bellow Table 4.6.

Table 4.6: Percentages for Influence of Contract Negotiation & Award

Questions	Fully Disagree in %	Strongly Disagree in %	Disagree in %	Agree in %	Strongly Agree in %
Availability of required expertise affects project performance	0%	9%	9%	25%	58%
Availability of building materials affects project performance	9%	9%	0%	47%	35%
Proper site assessment affects project performance	0%	18%	0%	60%	23%
Site location and accessibility affects project performance	9%	9%	7%	42%	33%
Proper designs and drawings affect project performance	0%	9%	18%	33%	40%
Accurate Bills of Quantities affect project performance	9%	18%	0%	33%	40%
Advance payments affect project performance	9%	0%	0%	60%	32%
Advance payment guarantee affects project performance	18%	18%	26%	16%	23%
Performance guarantee affects project performance	18%	18%	9%	32%	25%
Project insurance affects project performance	9%	18%	25%	25%	25%
Cost of materials affects project performance	0%	9%	7%	35%	49%
Price fluctuation affects project performance	9%	0%	16%	42%	33%
Political pressure affects project performance	0%	0%	0%	35%	65%
Realistic vs targeted time affect project performance	0%	0%	9%	74%	18%
Delays from calamities affect project performance	0%	9%	9%	26%	56%
Delays from payments affect project performance	0%	0%	9%	18%	74%
Delays from suppliers affect project performance	0%	9%	7%	26%	58%

Contract Negotiation and Award	6%	8%	10%	38%	38%
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Source: Field Survey, 2019

It was observed that 76% of respondents agree that Contract Negotiation and Award affect performance of public housing projects in Rwanda. Whereas 24% disagree with the statement. Thence inferring that Contract Negotiation & Award influence performance of housing projects at the case study institution.

4.3.2. Influence of Project Monitoring and Acceptance of Works

The objective of the second question was to examine the extent to which “contract monitoring and acceptance” affect project performance. Therefore, this section presents the respondents’ views on the influence of effective “contract monitoring and acceptance” on the financial, physical and time performance of public housing projects within Rwanda Housing Authority. Thereafter, the researcher converted obtained aggregates in an easily readable format for fast understanding and easy presentation and interpretation. The mean for effect of “contract monitoring and acceptance” was found to be 4.08 which becomes 4 once rounded up. The standard deviation was found to be (0.37) thence confirming consistence of responses as shown in Table 4-7 and in Figure 4.2.

Table 4.7: Aggregates and Deviations for Contract Monitoring & Acceptance of Works

Contract Monitoring & Works Acceptance	Aggregates	Deviations
Expertise of supervisor/ contractor affects performance	4.404	0.322
Understanding of standards affects performance	4.474	0.392
Professional conduct affects performance	4.070	-0.012
Site procedure affects performance	3.719	-0.363
Communication & correspondences affect performance	4.175	0.093
Documentation and archiving affect performance	3.719	-0.363
Works acceptance affects performance	3.649	-0.433
Players relationship affects performance	4.228	0.146
Invoices approvals affect performance	4.333	0.251
Payments affect performance	4.596	0.514
Cash disbursement affects performance	3.807	-0.275
Frontloading affects performance	3.649	-0.433
Remunerations affect performance	3.579	-0.503
Cost of materials affects performance	4.509	0.427
Price fluctuation affects performance	4.351	0.269
Contract extensions affect project performance	4.018	-0.064
Detailed implementation plan affects performance	3.544	-0.538
Delays affect performance	4.737	0.655
Works acceleration affects performance	3.842	-0.240
Completion deadlines affect performance	4.246	0.164
Mean	4.082	
St Deviation	0.37	
Total Respondents	57	
Sum of Squares	2.643	

Source: Field Survey, 2019



Figure 4.2: Influence of Contract Negotiation & Award on Project Performance

As per the Table 4.7 and the Figure 4.2 above, most of the respondents agreed that the following statement derived from contract negotiation and award have significant influence on performance public housing projects in Rwanda:

- Payments affect performance,
- Cost of materials affects performance,
- Price fluctuation affects performance,
- Contract extensions affect project performance
- Delays affect performance, and
- Completion deadlines affect performance,

This was proved by the fact that all the above listed statements scored more than 4. The mean for “contract negotiation and award” was found to be 4.08 and the standard deviation was found to be 0.37 which is smaller than 0.5. This proves homogeneity of feedback from respondents. Thereafter, the frequency percentages were computed from calculated aggregates to determine how fairly, fully or strongly were the respondents in disagreement or agreement as shown in the table 4.8.

Table 4.8: Percentages for Influence of Contract Monitoring & Acceptance Of Works

Questions	Fully Disagree in %	Strongly Disagree in %	Disagree in %	Agree in %	Strongly Agree in %
Expertise of supervisor/ contractor affects project performance	0%	9%	9%	16%	67%
Understanding of standards affects project performance	0%	9%	0%	26%	65%
Professional conduct affects project performance	9%	0%	9%	40%	42%
Site procedure affects project performance	9%	0%	16%	61%	14%
Communication & correspondences affect project performance	0%	0%	7%	68%	25%
Documentation and archiving affect project performance	0%	0%	44%	40%	16%
Works acceptance affects project performance	0%	9%	25%	60%	7%
Client, contractor & supervisor relationship affects performance	0%	0%	18%	42%	40%
Invoices approvals affect project performance	0%	0%	0%	67%	33%
Payments affect project performance	0%	0%	7%	26%	67%
Cash disbursement affects project performance	9%	0%	18%	49%	25%
Frontloading affects project performance	9%	0%	25%	51%	16%
Remunerations affect project performance	0%	9%	40%	35%	16%
Cost of materials affects project performance	0%	0%	0%	49%	51%
Price fluctuation affects project performance	0%	0%	7%	51%	42%
Contract extensions affect project performance	0%	7%	18%	42%	33%
Detailed implementation plan affects project performance	9%	0%	26%	58%	7%
Delays affect project performance	0%	0%	9%	9%	82%
Works acceleration affects project performance	9%	9%	23%	9%	51%
Completion deadlines affect project performance	0%	0%	18%	40%	42%
Contract Monitoring and Works Acceptance	2%	3%	16%	42%	37%

Source: Field Survey, 2019

It was observed that 79% of respondents agree that “contract monitoring and acceptance” affect performance of public housing projects in Rwanda. Whereas 21% disagree with the statement. Any case of disagreement, respondents provided additional or explanatory information which was used to draw conclusion and recommendation.

4.3.3. Influence of Variations Handling on Project Performance

The objective of the third question was to examine the extent to which “contract variations handling” affect project performance. Therefore, this section presents the respondents’ views on the influence of effective “Variations Handling” on the financial, physical and time performance of public housing projects within Rwanda Housing Authority.

The mean for effect of contract variations handling was found to be 4.29. The standard deviation was found to be small enough (0.37) thence confirming consistence of responses as shown in Table 4.9 and in Figure 4.3 which gives details on aggregates derived from the collected questionnaires. This “variation handling” was found to be the most controversial component that has been in the center of issues frequently hindering most of public housing projects undertaken in Rwanda (Auditor General, 2017). This was expressed by most of the respondents as they shared relevant information on the second part of the questionnaire where they were allowed to provide additional information they think should be considered or given more focus by the researcher. Some respondents went further and requested for special discussion with the respondents for the purpose of better sharing their experience through concrete examples of ongoing projects jeopardized by variations. A significant number of shared projects were already in the middle of disputes at courts level.

Table 4.9: Aggregates for Variations Handling on Performance

Variation and Handling	Aggregates	Deviations
Change of materials affects performance	4.228	-0.064
Additional works affect performance	4.298	0.006
Change of designs affects performance	4.649	0.357
Introduction of new items affects performance	4.649	0.357
Change of site affects performance	4.579	0.287
Change of technology affects performance	4.667	0.375
Variation performance guarantee affects performance	3.719	-0.573
Variation budget availability affects performance	4.491	0.199
Variation approvals affect performance	4.070	-0.222
Price adjustments affect performance	3.807	-0.485
Supervision of variations affects performance	3.737	-0.555
Political pressure affects performance	4.491	0.199
Delays affect performance	4.737	0.445
Works acceleration affect performance	3.965	-0.327
Mean	4.292	
St Deviation	0.37	
Total Respondents	57.000	
Sum of Squares	1.787	

Source: Field Survey, 2019

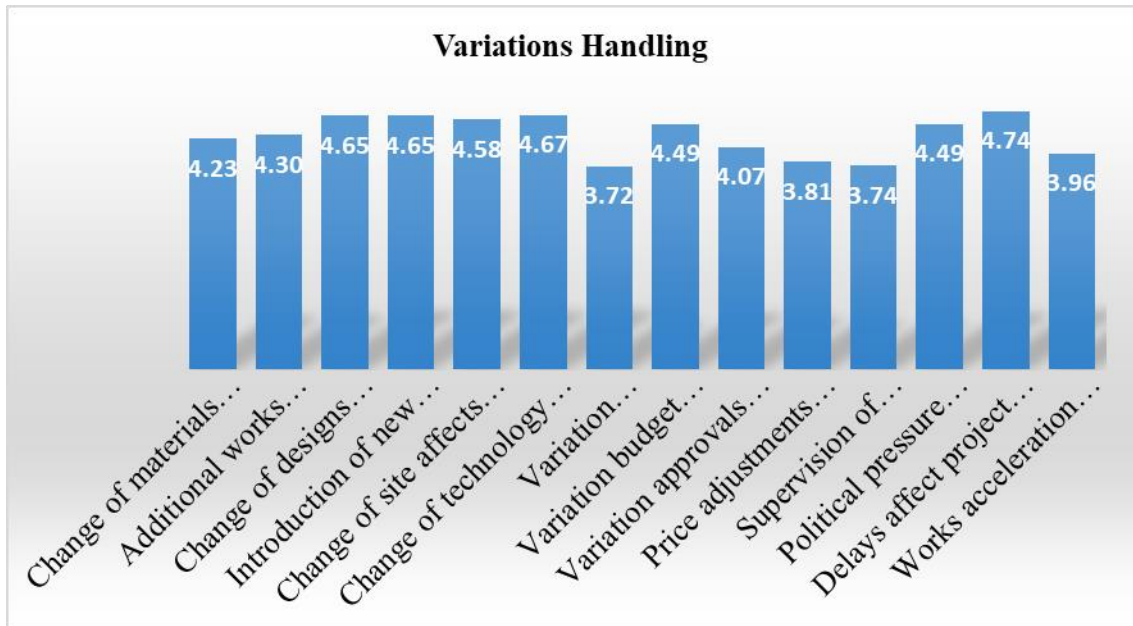


Figure 4.3: Influence of Variations Handling on Project Performance

As per the table 4.9 and the figure 4.3 above, the majority of the respondents agreed that the following statement derived from contract negotiation and award have significant influence on performance public housing projects in Rwanda:

- Change of materials affects performance,
- Additional works affect performance,
- Change of designs affects performance,
- Introduction of new items affects performance,
- Change of site affects performance,
- Change of technology affects performance,
- Variation budget availability affects performance,
- Variation approvals affect performance,
- Political pressure affects performance, and
- Delays affect performance.

This was proved by the fact that all the above listed statements scored more than 4. The mean for “contract negotiation and award” was found to be 4.29 and the standard

deviation was found to be 0.37 which is smaller than 0.5. This proves homogeneity of feedback from respondents. Thereafter, the frequency percentages were computed from calculated aggregates to determine how fairly, fully or strongly were the respondents in disagreement or agreement as shown in the Table 4.10.

Table 4.10: Percentages for Effect of Variations Handling on Performance

Questions	Fully Disagree in %	Strongly Disagree in %	Disagree in %	Agree in %	Strongly Agree in %
Change of materials affects project performance	0%	0%	18%	42%	40%
Additional works affect project performance	0%	9%	18%	9%	65%
Change of designs affects project performance	0%	9%	0%	9%	82%
Introduction of new items affects project performance	0%	9%	9%	7%	75%
Change of site affects project performance	0%	0%	9%	25%	67%
Change of technology affects project performance	0%	0%	0%	33%	67%
Variation performance guarantee affects project performance	0%	9%	26%	49%	16%
Variation budget availability affects project performance	0%	0%	0%	51%	49%
Variation approvals affect project performance	0%	9%	9%	49%	33%
Price adjustments	0%	0%	26%	67%	7%

affect project performance					
Supervision of variations affects project performance	0%	9%	18%	65%	9%
Political pressure affects project performance	0%	0%	9%	33%	58%
Delays affect project performance	0%	0%	0%	26%	74%
Works acceleration affect project performance	9%	9%	0%	42%	40%
Variation Handling	1%	4%	10%	36%	49%

Source: Field Survey, 2019

It was observed that 85% of respondents agree that “contract variations handling” affects performance of public housing projects in Rwanda. Whereas 15% disagree with the statement.

4.3.4. Influence of Contract Closure on Project Performance

The objective of the fourth question was to examine the extent to which “contract Closure” affects project performance. Therefore, this section presents the respondents’ views on the influence of effective “contract closure” on the financial, physical and time performance of public housing projects within Rwanda Housing Authority.

The mean for effect of “contract closure” was found to be 3.49. The standard deviation was found to be small enough (0.40) thence confirming consistence of responses as shown in Table 4-11 and in Figure 4.4. The most influencing elements of the variable “contract closure” on performance of public housing project can be easily detected on the Figure 4.4. The respondents’ concern was focused on incomplete works and snags.

Table 4.11: Aggregates for Influence of Contract Closure on Project Performance

Contract Closure	Aggregates	Deviations
Final account affects performance	3.228	-0.267
Snags affect performance	3.737	0.242
Incomplete works affects performance	4.649	1.154
Final account affects performance	3.140	-0.355
Retentions affects performance	3.228	-0.267
Performance Guarantees affect performance	3.298	-0.197
Legal fees affect performance	3.281	-0.214
Liability period affects performance	3.316	-0.179
Litigation period affects performance	3.579	0.084
Average	3.495	
St Deviation	0.47	
Total Respondents	57	
Sum of Squares	1.783	

Source: Field Survey, 2019

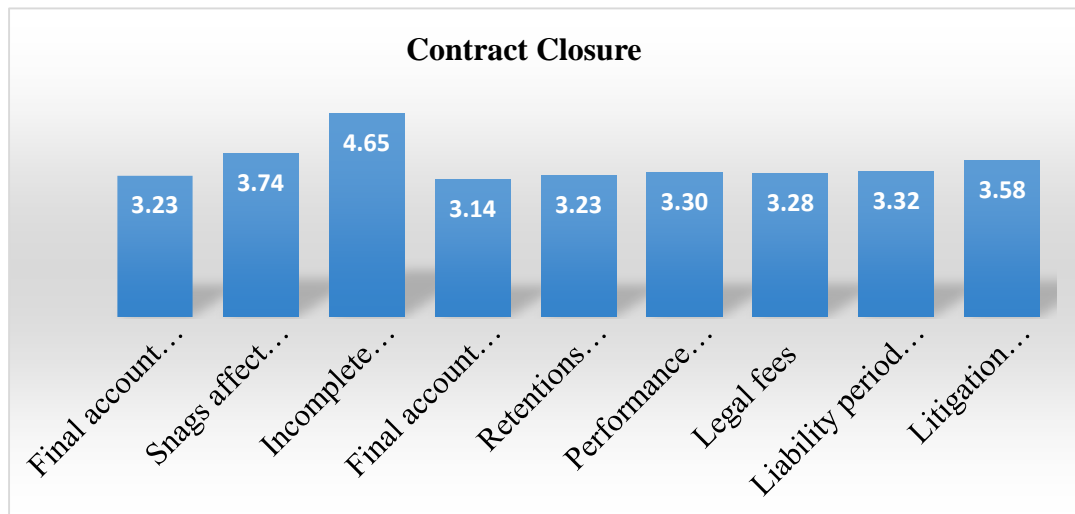


Figure 4.4: Influence of Contract Closure on Project Performance

As per the Table 4.11 and the Figure 4.4 above, the majority of the respondents agreed that only one statement “incomplete works” derived from “contract closure” affects

project performance as it scored more than 4. The mean for “Contract Closure” was found to be 3.49 and the standard deviation was found to be 0.47 which is smaller than 0.5. This proves homogeneity of feedback from respondents.

Thereafter, the frequency percentages were computed from calculated aggregates to determine how fairly, fully or strongly were the respondents in disagreement or agreement as shown in the bellow Table 4.12.

Table 4.12: Percentages for Influence of Contract Closure on Project Performance

Questions	Fully Disagree in %	Strongly Disagree in %	Disagree in %	Agree in %	Strongly Agree in %
Final account affects project performance	9%	9%	49%	18%	16%
Snags affect project performance	0%	9%	25%	51%	16%
Incomplete works affects project performance	0%	0%	0%	35%	65%
Final account affects project performance	18%	0%	49%	18%	16%
Retentions affects project performance	0%	18%	42%	40%	0%
Performance Guarantees affect project performance	9%	18%	25%	33%	16%
Legal fees	9%	18%	33%	18%	23%
Liability period affects project performance	0%	9%	67%	9%	16%
Litigation period affects project performance	0%	18%	32%	26%	25%
Contract Closure	5%	11%	36%	27%	21%

Source: Field Survey, 2019

It was observed that 48% of respondents agree that Contract Negotiation and Award affect performance of public housing projects in Rwanda. Whereas 52% disagree with the statement.

4.4 Expert Views on Ways of Enhancing Project Performance

The respondents informed the research that projects with political pressure, which are executed through open tender method, tend to failed but those which are directed through single-source or force-account procurement methods tend to perform better. They suspect that experienced failures may have resulted from the very short and unrealistic time accorded to inhouse engineers (respondents) to prepare tender documents thence submitting substandard and inaccurate information to bidders. They believe that establishment of Technical Committees to report to Steering Committees may mitigate risks of failure. Therefore, these experts' views were found to be in total concurrence with the research findings on the variable related to effect of contract negotiation and award on project performance.

Additionally, respondents also emphasized on negative impacts of high turnover in terms of personnel whereas it is suspected that engineers resign from Rwanda Housing Authority seeking for greener pasture easily accessible from the private sector. This challenge leads to overloading remaining staff as they find themselves inheriting projects whose managers just left or are leaving the institution. Moreover, there are no deployed software that can facilitate project managers to easily navigate in all project documents for timely decision making to ensure success of projects they are assigned to. This falls in line with the effect of contract monitoring and works acceptance.

Alarmingly, the experts expressed the worry of variation handling. They informed the researcher that at a 100% rate, all projects were prone to variation issues and some of them resulted in disputes between the client who happens to be Rwanda Housing Authority and supervisors or contractors as per the Rwanda Housing Authority quarterly reports. Nonetheless, the respondents did not express any worrisome element that could

significantly affect project performance at contract closure step except a slight importance to be given to archiving and management of snags.

Experts feel that improving management of human resource through empowerment, capacity building, retention strategies and use of project management software for construction project managers where applicable may optimize project performance and thence mitigating losses that the Government of Rwanda has been incurring since establishment of the case study institution. They are also of the view that improving project management practices through establishment of Technical Committees in charge of validating ToRs, Design Review, Works Acceptance, Variation Handling would provide a helping hand in risk mitigation. Proper assessment of potential risks and challenges regarding contract negotiation, award, management and variation handling can be performed to come up with mitigation measures in advance. For instance, the case study institution may adopt a proper categorization of projects depending on their sizes, budgets, magnitude, and complexity to determine project management requirements and procedures applicable for each category.

4.5 Framework for Improving Project Management Performance at the RHA

From the data analysis findings presented in Sections 4.3 and 4.4 before, a framework for improving project management performance at the RHA can be formulated, as shown in Figure 4.5, to aid project management reform at the RHA. The figure shows the articulated reform process and players in a schematic framework.

Ideally, adequate reforms are always initiated at the policy level. Today, there is no specific policy promoting practices and means of construction project control that can help in elevating of project performance. This first step would be spearheaded by the Ministry of Infrastructure in collaboration with the Ministry of Labor and professional Construction Project Managers gathered in relevant associations or professional bodies. Upon enactment and dissemination of an appropriate policy, implementing laws such as Presidential or Prime Minister's or Ministerial orders can be enforced along with their

supporting bylaws, standards and related guidelines. This second step would be led by the case study institution in support of the Rwanda Law Reform Commission and the Parliament.

After putting in place required laws including the one that would establish the Rwanda Association of Construction Project Managers (RACPM), available graduates in collaboration with the Ministry of Labor and the Association of Contractors would come together to strategize on how best to implement proper construction project management practices as the third step. Following enforcing the aforementioned Association, the fifth step would be to review the organization structure of the case study institution with the aim to allowing smooth execution of projects through use of resourceful professions with an appropriate dose of division of labor. The step would require involvement of the Rwanda Law Reform Commission and the Board of Directors of the case study institution. Available construction project managers may also be consulted.

Subsequently, the Prime Minister's Office can go ahead and establish Steering Committees for projects falling in categories that require them. Steering Committees would follow and nominate members of Technical Committees assigned to specific project. All members would go through capacity building to boost their resourcefulness.

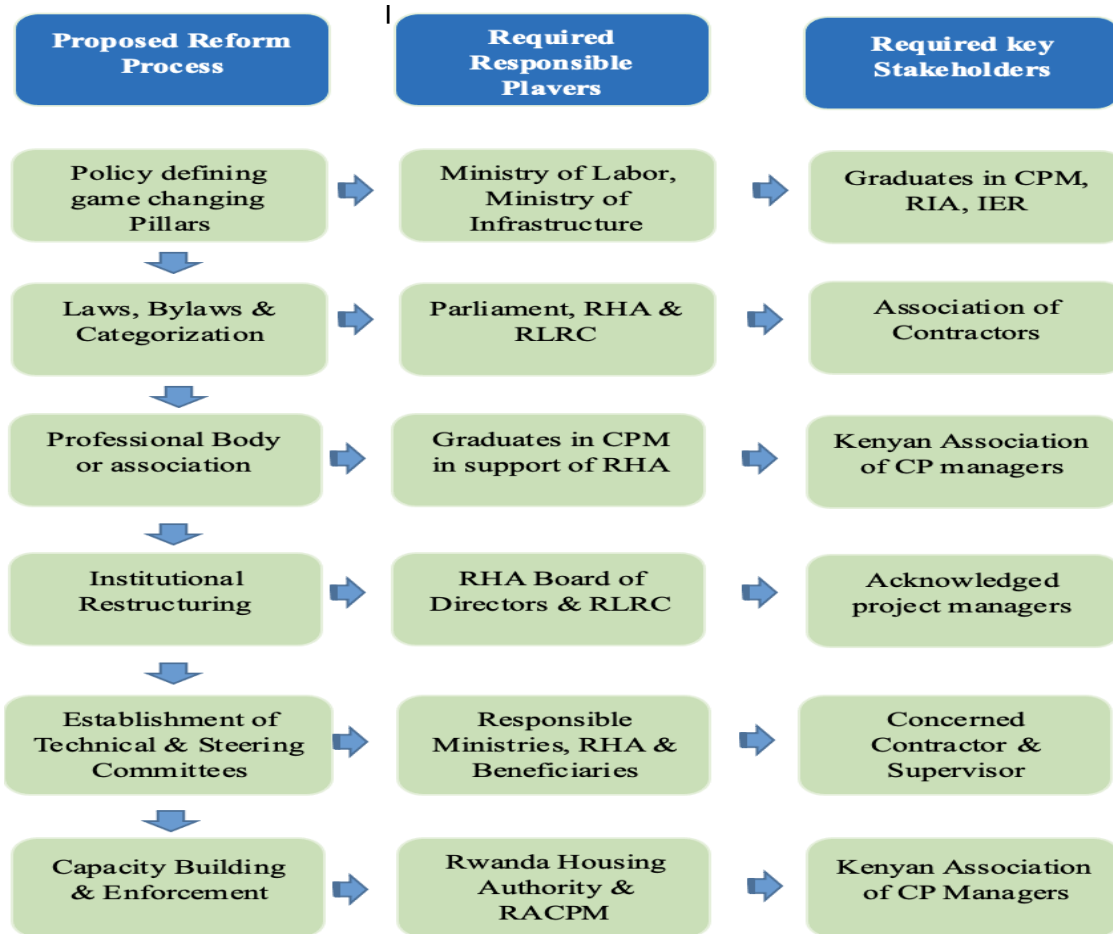


Figure 4.5: Diagram of the Proposed Framework's Steps and Players

4.6 Conclusion

The study investigated the influence of project management practices on performance of public housing projects in Rwanda, and the study results show that project management practices significantly influence performance of public housing projects in the country. Also, a schematic framework for improving the project management performance at the practice and policy levels of the industry has been synthesized from the data analysis findings.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The chapter presents a summary of the study findings, conclusions from the findings, and recommendations for effective contract management practice in Rwanda Housing Authority in order to optimize performance of public housing projects.

5.2 Summary of the Research Findings

Firstly, the study established that the Rwanda Housing Authority is engaged in the contract management process to a great extent. These activities include contract negotiation and award, contractor monitoring and acceptance management, contract variation handling and contract closure. This shows that most departments within the institution and other public institutions in Rwanda have embraced the idea of contract management in their procurement process and contract management practices so as to enhance their projects performance.

Secondly, the study also discussed and established relevancy of the experts' views on actions and reforms proposed for enhancement of performance of public housing projects at Rwanda Housing Authority.

Thirdly, the study achieved a proposal of the framework to guide the case study institution, the line Ministry, and key stakeholders on reform steps that can lead to a better legal, organizational, functional framework to be complied with by all players operating or involved in housing construction industry that is under Rwanda Housing Authority.

5.2.1. Effect of the Project Management Components on Project Performance

a) Influence of Contract Negotiation & Award

The findings revealed that proper contract negotiation and award phase is of a

paramount importance for any construction project to achieve its set goals and expected output. The study figured out that all involved parties must take good care of this stage and invest much attention to ensure any agreement likely to come out of the negotiation through public procurement process in line with the legal framework currently in force and matching with reality on the ground such as site characteristics and environmental aspects.

In Rwanda, the services that are the most outsourced in the construction industry are construction execution services through a contractor and supervision services through a consultant. The research found that it very useful for notified contractors and supervisor to anticipate projects that are likely to be associated with some kind of political pressure and thus negotiate their contracts consequently.

The findings revealed that majority of the respondents agreed that effective “contract negotiation and award” lead to a win-win situation for both parties and hence better service/product delivery, timely completion of the project, motivation and commitment of both parties, compliance with terms of reference as per signed contract, few/no disputes and hence high quality and productivity, optimum expected outcomes and prevention of issues of extending contract periods. Moreover, regarding the effect of contract negotiation and award on RHA project financial performance, respondents have strongly agreed that an effective contract negotiation and award facilitates the budget preparation and implementation, proper management of assets/funds, cost effective, to avoid unnecessary expenditures, cash flow management and in the management of medium-term expenditures. It also leads to the high performance as the tender is won by eligible and competent bidder, timely payment of the contractor, prevention of additional cost also was found to contribute to project performance.

b) Impact of Contract Monitoring & Works Acceptance

The study findings showed that effective “contract monitoring and acceptance” help to identify any issues or problems in advance that could arise therefore offer timely

solutions; such as monitor, control and evaluate the contractor's performance, identify and handle risks, the contractor to undertake his duties and fulfill his obligations in compliance with the contract. For the project financial performance, respondents were of views that an effective "contract monitoring and works acceptance" lead to cost effectiveness in the performance housing projects, avoidance of unnecessary expenditures, timely payment to contractor, prevention of additional costs, easy budget preparation and implementation, proper management of assets/funds, assists in cash flow management and it facilitates in the management of medium-term expenditures.

Likewise, the research also found a positive impact of effective "contract monitoring and works acceptance" on both physical and financial performance of public projects undertaken by Rwanda Housing Authority. Control of Execution works is achieved through proper site meetings, timely decision making, and accurate acceptance of invoiced works. Appropriate recording and communication of relevant site events also helps the managing institution to follow up on progress of the project regardless of the appointed staff in charge of the project or his/her substitute in case of absence. Regular inspections against the Rwanda Building Code makes this stage more relevant as it becomes very easy to avoid administrative sanctions and fines by Districts which could negatively affect the project budget and overall progress of works in case of a stop notice or demolition of works through malpractice in case of incompliance with or violation of the above-mentioned code.

Rwanda Housing Authority can achieve effective contract monitoring and works acceptance through professional assistance of a consultant or a supervising firm regularly deployed onsite to ensure that every work is done as per the contract and its annexes such as the bill of quantities or technical specifications. Rwanda Housing Authority may need to compel the contract and the supervisor to sign off and certify all technical works such as installation of elevators, electricity, air-condition equipment to guarantee that they were properly executed for the purpose of ensuring that professional liability is properly shared or oriented to responsible practitioners involved onsite. The

institution and similar entities make good use of outsourced supervisors or consultant to mitigate workload of staff assigned to manage a lot of projects or contracts at once.

c) Impact of contract variation handlings

The findings of this study further revealed that the majority of the respondents were of views that timely variation handling in contracts have a positive effect on both physical and financial performance of public housing projects. The findings showed that thanks to effective variation handling, the project outcomes are achieved on time, the organization creates and maintains a positive relationship with the contractor; there is a mutual understanding between the organization and the contractors; there is also timely management of possible problems in the contract. It was also found that proper variation handling helps to avoid unnecessary; assists in cash flow management; helps to avoid budget overlap, there is little or no litigations and related costs and hence better performance of the project, there is cost effective; facilitates in the management of medium term expenditures, prevent additional costs and the contractor is paid on time; it facilitates the budget adjustments and implementation, proper management of assets/funds, easy cash flow management.

This stage subsequently happens along with contract monitoring and works acceptance. It is a very dangerous but unavoidable practice. As a matter of fact, the Rwanda Public Procurement Law limits variations works equal to or under 20% of the total cost of the project. Not only entities discourage addendums but also other researchers in the matter have been expressing the same worry.

Although a change in circumstances may permit the client unilaterally to order variations, a reciprocal gesture should also be afforded to the contractor to negotiate terms of the contract that may be unsuitable to carry out the varied or added works. The contractor is obliged to carry out instructions, committing extra resources, without guarantee that there will be adequate compensation for the effort. The vagueness of some of the terms is not of much help in providing guidance and direction as to the

intended effect of the contract. These uncertainties generate tension, consequently leading to disputes and conflicts (Othman, 1997). This statement emphasizes on the need for both the procuring entity and firms outsourced for execution works to mind enough about variations handling during execution works as they have significant but also a dangerous influence on construction projects in general.

d) Impact of Contract Closure

The study findings revealed that the majority of the respondents confirmed that proper “contract closure” through its one derived statement “incomplete works” has a positive impact on physical and financial performance of public housing projects. They were of views that this ensures the achievement of expected results; helps to control and certifies that both contracting parties have honored their contractual responsibilities; Facilitate to control and certify activities involved in evaluating degree of successful contract execution. Nonetheless, respondents have disagreed that the other proposed derived statements of “contract closure” affect project performance.

Although (Aluonzi, 2016) states in his paper title “Contract Management and Performance of Road Maintenance Projects: The Case of Arua Municipality” that overall contract management (through its dimensions of contract administration, relationship management and contract closure) has a moderate significance and effect on performance of road maintenance projects; this study found that contract closure has big impact on performance of public housing project with Rwanda Housing Authority. There is not even one single project that was completed without snags and liability issue in Rwanda Housing Authority. In Rwanda, all public buildings can only be occupied upon issuance of an occupancy permit granted by Districts or the City of Kigali. This has caused a lot of disturbances especially when some works listed on the occupancy permit checklist appear on the snag list. In that case the owner of the building in collaboration with his/her consultant and contractor has to ensure that the building does not stay idle for long when contracts have been closed.

5.2.2. Expert Views for Enhancing Contract Management in Public Projects

The research, upon analysing respondents' feedback concluded that projects with political pressure, which are executed through open tender method, tend to failed but those which are directed through single-source or force-account procurement methods tend to perform better. It is suspected that experienced failures may have resulted from the very short and unrealistic time accorded to inhouse engineers (respondents) to prepare tender documents thence submitting substandard and inaccurate information to bidders. They believe that establishment of Technical Committees to report to Steering Committees may mitigate risks of failure. Therefore, these experts' views were found to be in total concurrence with the research findings on the variable related to effect of contract negotiation and award on project performance.

Additionally, the researcher agreed with respondents that high turnover experienced at Rwanda Housing Authority leads to overloading remaining staff as they find themselves inheriting projects whose managers just left or are leaving the institution. Moreover, the researcher found that there was no deployed project management software that can facilitate project managers to easily navigate in all project documents for timely decision making to ensure success of projects they are assigned to. This falls in line with the effect of contract monitoring and works acceptance and the researcher concluded that it influences project performance.

The researcher concluded that all projects are prone to variation issues and some of them resulted in disputes between the employer, supervisors or contractors as per the quarterly reports. Nonetheless, the respondents did not express any worrisome element that could significantly affect project performance at contract closure step except a slight importance for proper management of snags.

Furthermore, the researcher concluded that management of human resource through empowerment, capacity building, retention strategies and use of project management software for construction project managers where applicable may optimize project

performance and thence mitigating losses. The researcher also concurs with the experts views that improving project management practices through establishment of Technical Committees in charge of validating ToRs, Design Review, Works Acceptance, Variation Handling would provide a helping hand in risk mitigation and therefore heighten project performance. Proper assessment of potential risks and proper categorization of projects depending on their sizes, budgets, magnitude, and complexity to determine project management requirements and procedures applicable for each category can help to enhance project performance.

5.2.3. Framework for Improving Project Management Performance

A schematic framework for improving the project management performance at the practice and policy levels of the industry has been synthesized from the data analysis findings. Seven major players in the synthesized framework are: Ministry of Labour; Ministry of Infrastructure; Parliament of Rwanda; Rwanda Housing Authority; Rwanda Law Reform Commission; Rwanda Association of Construction Project Managers; and, CPM Graduates in Rwanda. The players need to follow a 6-step process which starts with policy design and ends with capacity building, to set the enabler environment for actualization of the project management reform.

5.3 Conclusions

Based on the study findings, the preset objectives of the study were achieved. All the research questions were answered and it can be concluded that project management practice applied at Rwanda Housing Authority moderately affect performance of public housing projects.

It is also clear from the study that there is a positive relationship between effective contract management components (contract negotiation and award, contract monitoring and acceptance, variation handling and contract closure) on financial, time and physical performance. Therefore, based on the study findings for each project management component all the research questions were answered in a manner which confirmed

moderate influence of proper contract management practice on performance of Public Housing Projects undertaken by the case study institution.

In terms of the challenges involved in contract management, the study discovered that most of the respondents strongly agreed that unclear project scope; unrealistic timeline and budgets; and payment delays hampers contract management; statutory amendments; and difficulty in managing data in various locations hinders effective contract management in Rwanda Housing Authority.

The study also revealed that external factors leading to contract amendments are among others: geological anomalies, non-availability of specified materials; change in the project design after the contract has been awarded; project revisions requested during the project ; cost-cutting due to unforeseen financial problems; poorly defined or un-detailed project objectives, scale and scope; new demands resulting in replacement of materials or products; poor preparation of contract documents that do not properly describe the works actually required; changes of schedule resulting from bad weather or inadequate workforce or sub-contractors; statutory and legislative changes, technological advancement; and the alterations to quantities and quality.

Nonetheless, (Zulu, 2007) in his publication on “Impact of Project Management on Project Performance: A Structural Equation Modelling Approach” concludes that an examination of the significance of the relationships suggests that not all postulated relationships were statistically significant. Based on the findings it can be generally concluded that project management variables impacting on project performance can be portrayed as a myriad of causal relationships both directly and indirectly impacting on project performance; this study found that the main stages of project management practice were all significant. However, when broken down, some components in the first and the fourth stages were found irrelevant to project performance as suggested by (Zulu, 2007). For example, the study concluded that only the first three (3) components (Contract negotiation & award, Contract monitoring & acceptance of works, and

Variation handling) of project management practiced at the case study institution fairly influence project performance whereas it was found that the last component (Contract closure) does not influence performance of public housing projects.

Through received experts' views, the study also concluded that the current working framework is not effective and therefore the researcher concluded that there is need to adopt framework reforms to optimize performance of public housing project at Rwanda Housing Authority. Similarly, It was concluded that, upon enactment and enforcement of a reform framework, capacity building for project managers at the case study institution is needed to heighten performance of housing projects.

5.4 Recommendations

Generally, the study recommends that state corporations' management strives to improve contract management practice so as to boost projects performance. Specifically, there is also a need for Rwanda Housing Authority to invest in constant training of their employees on effective contract management practices, especially trainings tackling the four (4) researched components (Contract negotiation & award, Contract monitoring & acceptance of works, Variation handling, and Contract closure), to enhance performance of public housing projects. Further, the study recommends that Rwanda Housing Authority and state corporations in Rwanda should put in place appropriate measures that ensure that potential risks and challenges regarding contract management are detected in advance and mitigated timely to enhance performance of their projects.

The study recommends enactment of an adequate policy that can give birth to related laws, other bylaws, and other legal tools to regulate construction project management in Rwanda with the aim to optimize project performance and mitigate annual losses incurred by the Government of Rwanda as reported by the Office of Auditor General.

Particularly, it is also critical for Rwanda Housing Authority to ensure adequate use of information technology in order to improve quality, speed, effectiveness and efficiency of their contract management practices. Tools such as Systems like BIM (Building

Information Modelling) can boost the performance of construction projects.

Rwanda as a very busy nation undertaking big projects such as Amahoro Stadium Upgrade & Renovation Project, National Heroes Mausoleum Project, the Vision City, Kigali Green Complex, Inzovu Project, Kigali Conventional Center, Bugesera International Airport, Kigali Multipurpose Arena, et cetera. Thus, establishment of a professional body or an active association of Construction Project Managers can bear fruits in building the capacity of all practitioners of the construction sector especially construction project managers. Such entity could endeavor to organize Continuous Professional Development (CPDs) to build the capacity of all project managers practicing in the construction sector.

Finally, the research recommends proper archiving of all project documents to ensure that, once auditing teams from the Office of Auditor General are deployed, everything is found in order as they are the only people to say the last word confirming that a given audited project was a success.

5.6 Areas for Further Research

The study suggests that further research should be conducted on contract management practice in other sectors in Rwanda. It is also important to carry out a study on the impact of the components that were not used in this study such as managing the contractor relationship, contract administration and dispute resolution to evaluate their influence on both project physical and financial performance.

It is also important to carry out a study on contract management practice and organizational performance of the private sector in Rwanda. Further study should also be conducted to establish the challenges involved in contract management in the private companies in Rwanda.

This research focuses on construction projects under RHA management, it would be more helpful if other researchers scale it up or complement on its findings by conducting studies on areas left out. The researcher also recommends to do the same study using a cross-sectional design and/ or a different unit of observation or analysis.

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APPENDICES

Appendix I: Letter of Introduction

Jomo Kenyatta University of Agriculture
and Technology (JKUAT)
School of Architecture and Building Sciences
Nairobi, Kenya

January 30, 2019

Dear Respondent,

RE: INVITATION TO PARTICIPATE IN A RESEARCH STUDY

Reference made to that fact that I am undertaking a study entitled “Influence of Project Management Practice on Performance of Public Housing Projects in Rwanda” in partial fulfilment for the Degree of Master of Construction Project Management in the Jomo Kenyatta University of Agriculture and Technology, Nairobi-Kenya;

I humbly request you to accept my invitation to participate as a potential contributor to this research because your responses to the attached questionnaire are of paramount importance to achieve meaningful results and I guarantee you that the information you may provide shall be kept confidential and shall only be used for academic purpose. Furthermore, I promise to share with you the outcomes if need be.

We thank you and value your responses!

Yours faithfully,



Harouna Nshimiyimana
Researcher, Master of Science in

Construction Project Management

Tel: +250 788 588 886

Email: harouneic@gmail.com

Supervisors:

- Prof. Peter Titus Kivaa

- Dr. Githae Wanyona

Appendix II: Questionnaire to Be Filled by Selected Staff of RHA

Please answer the following questions by ticking in the brackets or filling in the blank spaces provided.

5.6.1.1.1.1 Background of the respondent

Please tick for the appropriate answer

a. Gender

Male

Female

b. Age

Below 25

35 -<65

25-<35

65 Years and Above

c. What is your highest level of Education?

A level

A1

A0

Master

PhD

d. For how long have you been working with this institution?

For less than 2 years

Between 2 to 4 years

Between 4 to 6 years

Between 6 and 8years

For more than 8 years

5.6.1.1.1.2 Extent to which contract negotiation & award affect project performance

Please indicate by ticking the extent to which you agree with the following statements on the effect of contract negotiation and award on public housing projects performance. Use the following scale:

1= Fully Disagree; 2= Strongly Disagree; 3=Disagree; 4=Agree; 5=Strongly Agree

EFFECT OF CONTRACT NEGOTIATION & AWARD

Physical performance Related statements	Level of agreement				
	1	2	3	4	5
Proper project documentation affects project performance					
Availability of building materials affects project performance					
Availability of required expertise affects project performance					
Site location and accessibility affects project performance					
Proper designs and drawings affect project performance					
Accurate Bills of Quantities affect project performance					
Financial performance related statements	Level of agreement				
	1	2	3	4	5
Advance payments affect project performance					
Advance payment guarantee affects project performance					
Performance guarantee affects project performance					

Project insurance affects project performance					
Renumerations affect project performance					
Cost of materials affects project performance					
Price fluctuation affects project performance					
Time performance related statements	<u>Level of agreement</u>				
	1	2	3	4	5
Political pressure affects project performance					
Realistic vs targeted time affect project performance					
Delays from calamities affect project performance					
Delays from payments affect project performance					
Delays from suppliers affect project performance					

5.6.1.1.1.3 Effect of contract monitoring and acceptance on project performance

Please indicate by ticking the extent to which you agree with the following statements on the effect of contract monitoring and acceptance on public housing projects performance. Use the following scale:

1= Fully Disagree; 2= Strongly Disagree; 3=Disagree; 4=Agree; 5=Strongly Agree

CONTRACT MONITORING AND WORKS ACCEPTANCE

Physical performance related statements	Level of agreement				
	1	2	3	4	5
Expertise of supervisor/ contractor affects project performance					
Understanding of standards affects project performance					
Professional conduct affects project performance					
Site procedure affects project performance					
Communication & correspondences affect project performance					
Documentation and archiving affect project performance					
Works acceptance affects project performance					
Client, contractor & supervisor relationship affects performance					
Financial performance related statements	Level of agreement				
	1	2	3	4	5

Invoices approvals affect project performance					
Payments affect project performance					
Cash disbursement affects project performance					
Frontloading affects project performance					
Remunerations affect project performance					
Cost of materials affects project performance					
Price fluctuation affects project performance					
Time performance related statements	<u>Level of agreement</u>				
	1	2	3	4	5
Contract extensions affect project performance					
Detailed implementation plan affects project performance					
Delays affect project performance					
Works acceleration affects project performance					
Completion deadlines affect project performance					

5.6.1.1.1.4 Effect of Variation Handling on project performance

Please indicate by ticking the extent to which you agree with the following statements on the effect of variation handling on public housing projects performance. Use the following scale:

1= Fully Disagree; 2= Strongly Disagree; 3=Disagree; 4=Agree; 5=Strongly Agree

VARIATION AND HANDLING

Physical performance related statements	Level of agreement				
	1	2	3	4	5
Change of materials affects project performance					
Additional works affect project performance					
Change of designs affects project performance					
Introduction of new items affects project performance					
Change of site affects project performance					
Change of technology affects project performance					
Financial performance related statements	Level of agreement				
	1	2	3	4	5
Variation performance guarantee affects project performance					
Variation budget availability affects project performance					
Variation approvals affect project performance					
Price adjustments affect project performance					
Supervision of variations affects project performance					
Time performance related statements	Level of agreement				
	1	2	3	4	5
Political pressure affects project performance					
Delays affect project performance					
Works acceleration affect project performance					

5.6.1.1.1.1.5 Effect of contract closure or termination on project performance

Please indicate by ticking the extent to which you agree with the following statements on the effect of contract closure or termination on public housing projects performance.

Use the following scale:

1= Fully Disagree; 2= Strongly Disagree; 3=Disagree; 4=Agree; 5=Strongly Agree

TERMINATION/ CLOSURE

Physical performance related statements	Level of agreement				
	1	2	3	4	5
Final account affects project performance					
Snags affect project performance					
Incomplete works affects project performance					
Financial performance related statements	Level of agreement				
	1	2	3	4	5
Final account affects project performance					
Retentions affects project performance					
Performance Guarantees affect project performance					
Legal fees					
Time performance related statements	Level of agreement				
	1	2	3	4	5
Liability period affects project performance					

