FACTORS AFFECTING PROJECT PERFORMANCE OF PUBLIC CONSTRUCTION PROJECTS IN MOMBASA COUNTY, KENYA

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ABSTRACT

The study was about factors affecting project performance of public construction projects in Mombasa County. The study was guided by both general and specific objectives. To strengthen the conceptual framework the study used theory of constraints, project management competency theory and control theory. The study target population was180 and sample size was 126. This study adopted a cross-sectional research design. A modified Likert scale questionnaire was developed and divided into three parts. A pilot study was carried out to refine the instrument. The quality and consistency of the study was further assessed using Cronbach's alpha. Data analysis was performed on a computer using Statistical Package for Social Science (SPSS Version 25) for Windows. Data was presented in form of means, standard deviation, percentages and tables. Findings show that there was a strong positive correlation between project staff competencies, project monitoring and evaluation and project risk management and there was no correlation between project resource mobilization and performance of public projects in Mombasa County. The study findings further showed project staff competencies and project monitoring and evaluation have a significant effect on project performance of public construction projects in Mombasa County and project resource mobilization and project risk management have no effect on project performance of public construction projects in Mombasa County. The study recommends that counties should continuously train construction experts to be able to build their capacity as well as competencies to be able to deliver quality works and on time within the budgets; that counties should design better monitoring and evaluation tools to be adopted in service delivery; that counties should undertake projects that they have sufficient financial resources and human capacity to deliver the work and that counties should partner with the public under PPPs to deliver on projects where there have no sufficient resources.

Key Terms: *Project Staff Competencies, Project Evaluation, Project Resource Mobilization, Project Risk Management*

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INTRODUCTION

Public sector construction projects play a key role in the growth of economies in developing countries in terms of their contribution towards Gross Domestic Product (GDP), employment generation and provision of an important market for materials and products produced by other sectors of the economy (ILO, 2018). Khan (20017) argues that there is a clear relationship between a construction activity, economic growth and economic development. A recent survey reports that total world construction spending on infrastructural projects in 2007 was $4.7 trillion, which rose to $ 7.2 trillion in 2010 and is expected to grow to $12 trillion in 2020 (Global construction, 2020). A large proportion of this expenditure is in the public construction sector.

Performance assessment amongst public sector construction projects has assumed great importance in current scenario due to the sector's ability to create economic wealth, deliver social welfare services and at the same time its possibility to create negative environmental impact (Atkinson, 2019). With reference to developing countries, performance measurement of public sector construction projects has become even more important due to its immense potential in addressing the problem of poverty, unemployment, inequitable distribution of resources in different regions etc. However, as revealed in literature, these projects have mostly been evaluated on the criteria of time, cost and quality. This traditional approach, popularly known as the "iron triangle" (Atkinson, 2019) merely captures the economic aspects of public sector construction projects and ignores relevant social or environmental aspects.

Global Perspective of Public Construction Projects

Construction Industry is the backbone for economic development. Kenny (2016) mentions that construction sector role in economic development is Undeniable. In view of its importance, large investments were made by governments across the globe for many years. In view of its identity as world oldest engineering division, construction process and practices have evolved over the centuries. As, Kenny (2016) mentions, "During last 100 years, technology in construction has developed drastically paving way for modern buildings and scientific designs". Also, the importance of construction was aptly brought out by Leesard (2018)who says that "Large engineering projects are important not only because they transform the physical landscape and change the quality of human life, but because they are the crucibles in which new forms of collaboration are developed".

Reschke and Schelle (2017) mention that large engineering projects such as airports, transport, power, oil and gas constitute most important business sectors in the world. This massive infrastructure investment has led to the emergence of companies such as (Vandevoorde & Vanhoucke, 2016) who assert that "Construction is a $3.5 trillion industry worldwide, amounting to between 6 and 8 percent of GDP in most countries". The architecture, engineering and construction (AEC) industry is the largest industry in the United States and is even one of the largest in the world accounting for one tenth of the world's gross domestic product (GDP) (Murie, 2017). It is also known as a low-tech and low-efficiency industry (Gallaher, O'Connor, Dettbarn, & Gilday, 2017).

Project-based businesses have to go through a variety of challenges in order to survive. While these challenges vary for the diverse projects involved, all endeavors strive to complete the projects within time and budget. In the history of construction, numerous large construction projects have been plagued by cost overruns and schedule delays. A comprehensive study of cost overrun reported that almost 90% of public-work projects had problems with cost overruns (Flyvberg, Holm, & Buhl, 2018).According to Baccarini, a successful project should meet not only the quality output standards, but also time and budget objectives (Baccarini, 2018). Westhuizen also stated that "within time", "within budget" and "according to requirements" are three main objectives to complete a project successfully (van der Westhuizen & Fitzgerald, 2015).

The main barriers to overcome are the uncertainties in the project environment.

Regional Perspective of Public Construction Projects

In Zimbabwe, the construction industry is a key industry to economic growth of any nation providing shelter for economic and social activities including on-site and off-site infrastructure to facilitate the smooth functioning of these activities (Clough, Sears, & Sears, 2015). As a result of the sizeable nature of projects executed; the industry requires substantive injection of capital and any loss through failure or abandonment has a crippling effect on the capabilities of the investors and financiers (Nkwachukwu, Ibeawachi, & Okoli, 2016). Irrespective of the economics generated through effective cost management, most projects are delivered over-budget. Nine out of ten projects faced cost overrun in the range of 50 to 100%. The problems of project cost overrun are considered to be more severe in developing countries where the overrun sometimes exceed 100% of the anticipated cost of project (Momon, Rahma, & Azis, 2016).

In Ethiopia, despite the construction industry's significant contribution to the economy of developing countries and the critical role it plays in those "countries' development, the performance of the industry still remains generally low. As Idoko (2017) noted, many projects in developing countries encounter considerable time and cost overruns, fail to realize their intended benefit or even totally terminated and abandoned before or after their completion." Moreover, the development of the construction industry in developing countries generally lags far behind from other industries in those countries and their counter parts in developed nations. Generally, as (Ofori, 2016) & (Jekale, 2014) concluded, "The construction industry in developing countries failed to meet expectations of governments, clients and society as a whole".

Local Perspective of Public Construction Projects

Public sector construction projects play a key role in the growth of economies in developing countries in terms of their contribution towards Gross Domestic Product (GDP), employment generation and provision of an important market for materials and products produced by other sectors of the economy (ILO, 2018). Khan (2017) argues that there is a clear relationship between a construction activity, economic growth and economic development. A recent survey reports that total world construction spending on infrastructural projects in 2007 was $4.7 trillion, which rose to $ 7.2 trillion in 2010 and is expected to grow to $12 trillion in 2020 (Global construction, 2020). A large proportion of this expenditure is in the public construction sector.

Shan (2018) stated that Chinese construction firms in Kenya employed proper planning and control techniques, proper coordination between designers and contractors, technical and professional expertise which enabled the firms to complete their projects within the time schedule and budgeted cost. Management commitment, sufficient information and communication channels and competent staff was also significant in the delivery of success infrastructure projects (Boddy, 2019). Lavasseur (2018) noted that construction firms in Tanzania experienced lack of trained manpower, inefficient cost management and scope creep and these factors led to cost overruns and delays in the of infrastructure projects.

Mbaluka and Bwisa (2018) advocated for development of a public-private partnership framework to address the financing constraints of public infrastructure projects. To ensure that projects commenced at the stipulated time, a public private partnership framework would lead to timely clearence of regulatory approvals which could reduce the risk of cost and schedule overruns (Baziraake, 2017). Furthermore, a public private partnership project with government guarantee, would help firms secure lending from institutional lenders at a lower cost. For instance, the Public Private Partnership model in the public sector introduced in the Rajasthan government in India did result in large scale development of quality public projects (Lavasseur, 2018).

Statement of the Problem

The purpose of public sector construction projects is to provide services for public use, while charging minimal fees. In many developing countries, these construction projects include those projects that aim at providing basic educational facilities, health care facilities, social amenities like stadiums and social halls and roads. In order to enable the community, derive the benefits of the above projects, these projects need to be evaluated on all relevant dimensions including economic, social and environmental ones. However, as already mentioned, these projects have so far been evaluated mostly on the basis of traditional performance evaluation criteria of time, cost and quality which are found to be relevant for commercial projects. This criterion, though captures the economic aspects, ignores other important elements of public sector construction projects and hence makes it difficult to attain the main purpose for which the projects were conceptualized(Ngacho, Das, & Dhankar, 2018).

Despite the measures, public sector projects constructed by local firms in Kenya continued to face several challenges that led to poor performance of the projects (Meyer & Tim, 2018, Musa, 2018, KPMG Report, 2017). KPMG report (2017) noted that on average only 39.4 percent of the public infrastructure projects constructed by local firms in Kenya were completed within the budgeted cost and scheduled time. However, 60.6% of the public infrastructure projects are not completed within budget and scheduled time. Poor performance of the projects had led to slow economic growth, increased poverty levels and unemployment (Mattas &Ashkenas, 2018).

Few studies have been done in factors affecting project performance of public construction projects. Ngacho, *et al.,* (2018) carried out a study on performance of public sector construction projects funded by NG-CDF in Western Kenya counties and the study concluded that project managers competencies have a significant effect on performance of public sector construction projects. Alias, Rand and Ramasamy (2018) study investigated factors affecting the performance of construction projects in Algeria and most of the studies focused on developed countries and since no two countries are similar, there was need to conduct the study in Kenya. Ochenge, James and Ngugi (2017) examined project management practices and performance of public infrastructure projects at the Lake Basin region and Babalola and Ojo (2018) evaluated factors affecting performance of public construction projects in Laikipia county.From the aforementioned, the study sought to examine the factors affecting project performance of public construction projects in Mombasa County, Kenya.

Objectives of the Study

To examine the factors affecting performance of public construction projects in Mombasa County, Kenya.

Specific Objectives

- To examine the effect of project staff competencies on public construction projects in Mombasa County, Kenya.
- To determine the effect of project resource mobilization on public construction projects in Mombasa County, Kenya.
- To assess the effect of project evaluation on public construction projects in Mombasa County, Kenya.
- To evaluate the effect of project risk management on public construction projects in Mombasa County, Kenya.

Research Hypotheses

The study was guided by both null hypotheses:

- **$H_0$1**: Project staff competencies has no significant effect on public construction projects in Mombasa County, Kenya.
- **$H_0$2**: Project resource mobilization has no significant effect on public construction projects in Mombasa County, Kenya.
- **$H_0$3**: Project evaluation has no significant effect on public construction projects in Mombasa County, Kenya.

- **$H_0$4**: Project risk management has no significant effect on public construction projects in Mombasa County, Kenya.

LITERATURE REVIEW

Theoretical Framework

The theoretical framework introduces and describes the theory which explains why the research problem under study exists. A theoretical framework consists of concepts, together with their definitions, and existing theory/theories that are used for the particular study(Sekaran & Bougie, 2016). This study will be anchored on the theory of constraint project management competence theory, control theory and Resource Based View.

Theory of Constraint

The primary theoretical anchorage of this study is the Theory of Constraints (TOC), a management paradigm that postulates that any manageable system faces a number of constraints that limit the achievement of its organizational goals (Goldratt, 2016).The TOC was the main theory for this study, as it interrogated the entire construction value chain, from start to finish. The TOC largely takes a process-based view of firm performance and identifies the rate determining steps, that is, those that are most critical in affecting project performance, and by extension, firm performance. When these are resolved, they have a net effect of enhancing the flow of work and effective allocation and distribution of firm resources.

At the minimum, TOC holds that there is at least one constraint and proposes the use of a focusing process to identify the constraint and organize the rest of the processes around it. In identifying the constraint or constraints, TOC proposes measurement and control using three key parameters, namely, the throughput, operational expense and inventory. Inventory represents the financial costs of all items necessary in production; operational expense, on the other hand, is the cost of production (converting inventory into throughput); while throughput refers to the rate at which the system generates sales revenues.

According to TOC, if there were no constraints inhibiting an organization from achieving its throughput, its sales revenues would be infinite. This is, however, impossible in a real-life system, and only by optimizing flow through the constraints, can overall throughput be maximized. Constraints can be internal, where the system fails to generate sufficient supply to match demand, conversely, external, where supply exceeds demand. In order to focus processes through the constraints, TOC proposes five key steps, namely, identification of the systems constraints, formulating strategies on exploiting the identified constraints, prioritizing these strategies, increasing the constraints throughout capacity and monitoring and elevating with the necessary feedback loops. The five focusing steps are known as the Process of Ongoing Improvement (POOGI) and the centroid of their implementation is the identified system constraints (Goldratt, 2016).

Project Management Competency Theory

The work of McClelland and McBer in the 1980s established the competency theory. The authors defined competency as the underlying characteristics of an individual that is causally related to criterion-referenced effective and/or superior performance in job or situation. Since then a number of competency frameworks have been developed by different project management institutes. Crawford (2016) puts a model of competence integrates knowledge, skills, demonstratable performance and core personality characteristics, noting that the last personality characteristics, as challenging to develop and assess through training. She argues that two of the most influential project management standards, the PMBOK address only the knowledge aspect of competence while a third, Australia's National Competency Standards draws from knowledge but focuses only on demonstratble performance(Jacobides, 2017).

Interest in project management competence stems from the very reasonable and widely held assumption that if people who manage and work on

projects are competent, they will perform effectively and that this will lead to successful projects and successful organizations (Thomsett, 2016). Competency is generally acceptable, however, as a compassing knowledge, skills, attitudes and behaviors that are causally related to superior job performance. Oguulana and Bach (2017) stated that professionl competency in project management is attained by combination of knowledge acquired from training and its subsequent application and other skills developed in the course of work. Previous management studie have investigated the impact of competency on performance.

Conceptual Framework

Bryman and Bell (2018) defines conceptual framework as a diagrammatical, graphical or visual depiction of a relationship between the independent variables and the dependent variable as shown in Figure 1.

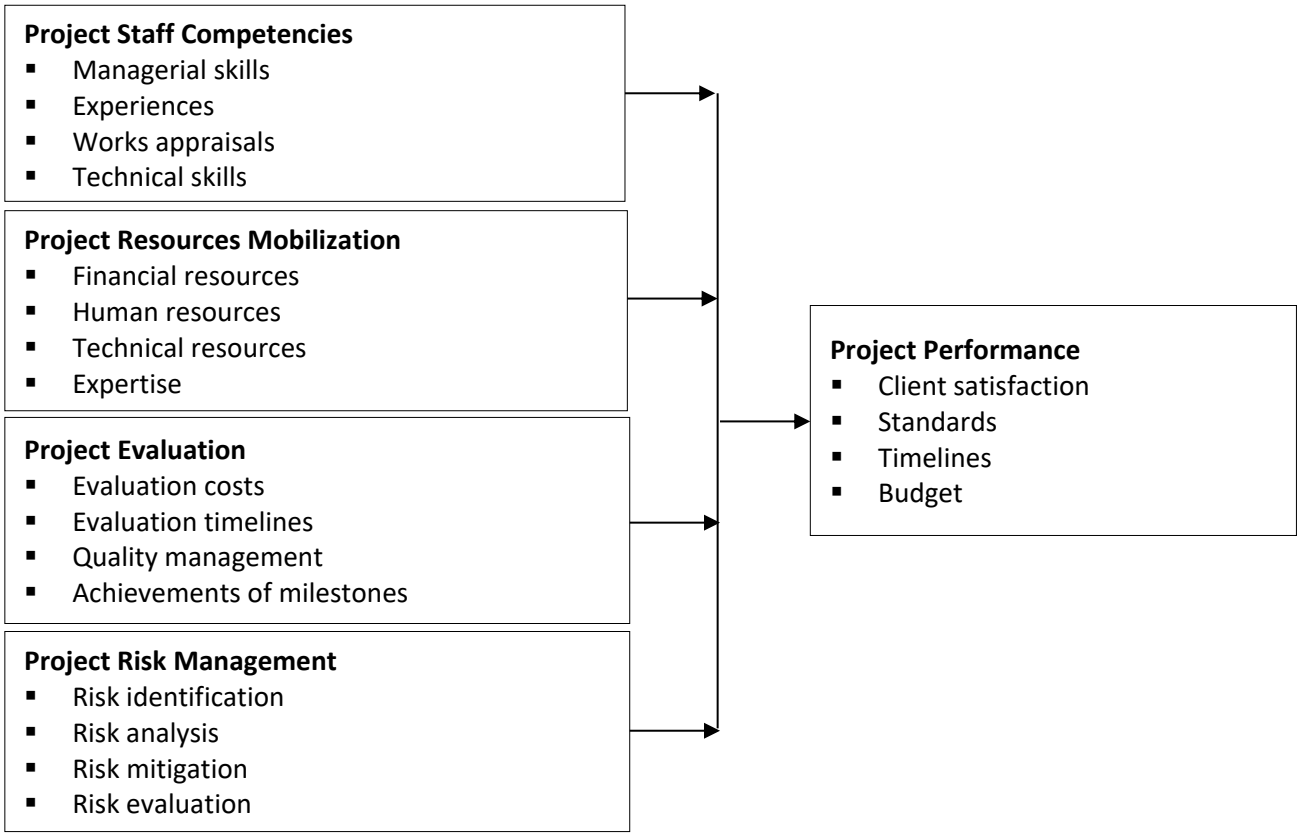

Figure 1: Conceptual Framework

Project Staff Competencies

A project team can be viewed as a team that is newly formed to undertake a unique task (Hass, 2019). This definition of a project team frames some of the complex challenges that successful project teams must overcome, such as delivering on unique tasks which are often higher risk than more mundane operations, forming disparate participants into an effective team, preserving knowledge as the team changes over time and once the project team is disbanded (Costello, 2018).Different types of projects require different competency sets for the team managing the project. Wang, (2013) notes that it is important for the appraisal to consider the competencies required by a project team to carry out a project proficiently and with an acceptable level of risk. Care should be taken to avoid building up a project team that is too large to manage. Where a project team becomes large due to the scale and complexity of a project consideration should be

given to separating the operational project delivery team (the project team) from those with stakeholder duties (Kerzner, 2016).

The stakeholder role could be formed into a separate group that meets with the Project Manager at suitable times, although this would only normally be suitable for the riskiest and largest projects. For small less risky projects one or two individuals may perform all the all of these roles. For larger riskier projects it may be necessary to have more than one team and to use external advisors and consultants (Harris, 2018).A project manager's role is to manage the day to day activities of a project such that the outputs are delivered to time using the agreed level of resources (including the budget)(Hass, 2019). The project manager should have the necessary project management skills to enable them to discharge this function efficient and effectively (Hass, 2019). The Project Manager is responsible for reporting the progress on the delivery of the project.

In all projects the user needs to be involved in how the project is progressing and as a point of contact in ensuring that complications arising during the implementation stage of the project can be discussed. Rojas (2019) states that the user representative will be the custodian of the project outputs and key deliverables. The user may comprise one representative or more. In addition, any project activities that may cause disruption to the user's operational activities need to be discussed and communicated to them through the user representative(s). Depending upon the nature of a project certain areas of technical expertise may be required (Harris & Short, 2014). The appraisers of a project need to be satisfied that appropriate technical expertise exists within a project team to ensure that a project is capable of proficient delivery. It is possible that this will be acquired externally (for example quantity surveyors etc), but where such expertise exists within the consideration should be given to inviting these specialists on to the project team(Costello, 2018).

Different roles in project management will require different competencies (Cleland, 2016). For example, the project sponsor level will require mainly general management knowledge. The project leader will require mostly general management skills, followed by project management skills and, possibly, cursory IT management skills(Nicholas, 2017). The project management master will require some general management skills, many project management skills and some IT management skills. The professional may require some general management skills; he or she will require mostly project management skills and many IT management skills(Talukhaba, 2016).

The communication skills of the project team leader are critical. Wang, (2018) did a study and reported that cooperation levels were higher when team leaders clearly explain project objectives and team member responsibilities. One study asked project managers and participants to identify the threshold and superior competencies of project managers. The study found project team leader's role as a technical expert, team builder (team cohesiveness, team spirit), gatekeeper (collecting, interpreting and disseminating information from external sources to team members) and strategic planner (setting project goals, time planning, resource allocation, project evaluation etc.), all positively related to team performance. Project team leaders pushed team members to overcome obstacles(Pinto & Covin, 2016).

The framework that senior management places on project team leaders is an important area for consideration. As well as manage their team members the project leader should be able to manage upwards, as the senior management team will significantly influence the environment, they operate in(Atkinson, 2019). The project leader in conjunction with the upper management must ensure that clear performance standards are put in place and that the teams are accountable for their own actions (Costello, 2018).

However, unnecessary process controls should be avoided. As with project team leaders, the ability to communicate effectively on the intrateam level is a critical competency for project team members

(Buono, 2018). Existence of team goals, positive group dynamics and project member satisfaction were all associated with less organizational conflict and project team conflict. In addition to positive attitude, an effective team member should have the ability to question assumptions. They should have problem solving skills and the capacity to analyze a range of situations(Kerzner, 2016). These skills should be underpinned by a broad range of technical skills and business competencies distributed throughout the team. There is importance in also recruiting high quality team members, training them and developing their skills and retaining those team members with the highest ability levels (Van *et al*, 2018).

Appraising project team member performance is an increasingly vital, yet complex, challenge as the teams are often cross-functional and self-managing (Wang, 2018). It is important that personal team member and team performance goals are in some way aligned. Accordingly, the commitment of the project team to the task is important for project team success. The team must be provided with a supportive atmosphere where their participation and ideas are backed up(Denzin & Lincoln, 2019). The team must clearly understand the rewards systems made available to them, but purely financial rewards need not be the main consideration. In fact, continual referral to financial rewards can be counterproductive (Askov, 2015).

Project Resource Mobilization

Project resource mobilization involves identifying financial, human, physical, and technical resources and organizing them in a way that leads to successful implementation of a project (Crivelli & Gupta, 2017). Financial resources refer to funds that are required by project contractors to buy the equipment and machinery needed in undertaking the road projects and meet other expenses related to the project such as salaries and wages for the workers and cost of fuelling the vehicles (Miller & Lessard, 2017). These equipment and machinery include tippers, graders, escavators and rollers. Many of this equipment cost millions of shillings.

Project contractors therefore need to look for adequate finances to be able to implement road infrastructure projects successfully. Project managers also need to employ qualified and competent staff to operate the plant machines and carry out other activities related to road infrastructure projects (Crivelli& Gupta, 2017). Technological resources refer to modern tools and techniques used in the implementation and management of projects. Human resources involve recruitment of technical staff with competency and experience that will enable the implement infrastructure projects effectively and efficiently (Smith & Jagger, 2016).

Robert and Bradley (2016) asserted that for a firm to attain superior performance over other firms, it must first look at what resources it possesses; then it assesses their potential value generation and finally the firm defines a strategy that allows it to capture the maximum of value in a sustainable way. Robert and Bradley further argued that resources such as capital, equipment, skills of employees and patents can enable a firm to implement its projects in an efficient manner. Also, such a firm can easily deliver projects that meet customer standards.

Majanja (2017) conducted a study on financing constraints of infrastructure projects in Kenya. The study covered 87 construction firms. Two alternative variables to measure financing constraints were used. The first on was based on the degree of financing constraints that firms face and the other was the use of bank credit by firms. To measure perceived financing constraint, respondents were asked to rate access to financing as a constraint of project performance (Crivelli & Gupta, 2017). The study results found out that financing constraints were a major obstacle faced by construction firms. Simmons, (2012) also noted that local firms had a problem of accessing credit facilities as they were viewed to lack collateral security.

Gitenya and Ngugi (2016) study on the assessment of determinants of performance of housing projects in Kenya pointed out that most of the local firms engaged in infrastructure projects are often

hindered by lack of adequate financial resources. There is always a budget for the project, and this is a major constraint. Wysocki (2017) stated that while the overall resources available may be in theory sufficient to complete the project, there were difficulties arising out of the way in which the project has been scheduled. For example, there may have been several activities scheduled to take place at the same time and this could not be possible given the amount of resources available. The amount of resources available therefore, plays a critical role in the success of a project undertaken.

A project manager's primary role therefore is to find a way to successfully execute a project within these resource constraints. Proper execution of road infrastructure projects requires thorough resource planning which comprises of establishing a team that possesses the skills required to perform the work as well as scheduling the non-Labour resources such as tools equipment and processes (Warner well, 2013).

Project Evaluation

Proudlock (2018) opined that impact evaluation process particularly the analysis and interpretation of results can be improved by the participation of intended beneficiaries, who are the primary stakeholders in their own development and the best judges of their own situation. However, stakeholder's engagement needs to be managed with care too much stakeholder's involvement could lead to undue influence on the evaluation, and too little could lead to evaluators dominating the process (Patton, 2018).

Although the CDF allows the community to identify the projects close to their interests at the Location Development Committee Levels CDF Act (GoK, 2017) it's difficult to tell their level of competency in determining what is beneficial in the long run or how to integrate the projects within neighbors locations or constituencies for maximum benefit (Mwangi, 2018). Whether the community participates in the identification of projects depends on how the MP shapes the boundaries of engagement. There are those who will be invited and those who will not be invited in the identification of projects in CDF. Nevertheless, in order to improve project management in future, the current projects or proposed projects, the stakeholders need to evaluate and monitor these projects. These will provide information on project implementation and difficulty that face this project thus providing records that can be used to try and reduce these problems and also make sure the goals of CDF is always achieved in all the projects, feedback help in controlling the workmanship thus enhancing the performance of a project.

According to Rogito (2018) study on the influence of monitoring and evaluation on projects performance found that a project implemented without the baseline study encountered serious challenges on tracking its progress effectively on indicators. According to Rogito, baseline needs to be planned and done a year earlier to get full information on the project to undertake which was not done from the study findings. He concludes that youth projects were poorly performing as baseline survey study was minimally done hence it was hard to achieve project goals. He recommended that baseline study need to be properly timed before project implementation and the findings kept properly and used to monitor progress of project.

Project Risk Management

Risk management is one of the nine knowledge areas propagated by the Project Management Institute (PMI). The PMBOK® Guide recognizes nine knowledge areas typical of almost all projects. Each PMI knowledge area contains some or all of the project management processes. Risk management is a difficult aspect of project management. The project manager must be able to recognize and identify the root causes of risks and correlate them to their effects on project performance. Risk management in the construction project management context is a comprehensive and systematic way of identifying, analyzing, and responding to risks to achieve the project objectives (PMI, 2017; ICE, 2016). Major decisions and influence on the choice of alignment and selection of construction methods are made at the early stages of a project, making risk

management at this stage very essential (Eskesen, Tengborg, Kampmann, &Veicherts, 2018).

The construction industry involves many players and is inherently complex. The major classifications of construction works are housing, non- residential building, heavy, highway, utility, and industrial (Clough *et al*., 2018). Construction projects may be new construction or renovation and rehabilitation of existing infrastructure facilities. Most construction work in Rwanda involves new public and private infrastructure projects. Large construction projects are exposed to risks arising from planning, design and construction complexity, many players, use of many resources and their availability, unpredictable environmental factors, the continuously changing economic and political environment, and statutory regulations.

The risk analysis and management techniques have been described in detail by many authors (Ahmed, 2018, Cretu, 2018; Chapman, 2018; Klemetti, 2016; Smith, 2017). A typical risk management process includes risk identification; risk assessment; risk mitigation; and risk monitoring. Risk identification process attempts to identify the source and type of risks. Risk identification involves the recognition of potential risk event conditions in the construction project and the clarification of risk responsibilities (Wang, Dulaimi, & Aguria, 2017). Risk identification is the basis for analysis and control of risk management and ensures risk management effectiveness.

Critical decisions made at the very beginning of every capital development project have major consequences for the overall success of the project. The site affects the organization, massing; functionality; sustainability; operation and economic efficiency; security; and lastly the aesthetic qualities of a building (GSA, 2018). The decision-making about the location of a construction site is an important risk management practice at planning stage. Buildings are inseparable from the location. The location has a strong influence of building design and structural characteristics and thus the execution of the project. The decision-making about location of investment is complex, low structured and multi-criteria problem (Jajac, Bilic, &Adjuk, 2016).

Public Construction Projects

Public Private Partnerships (PPPs) are collaborations between public entities (governmental agencies) and private sector companies. PPPs are defined as contractual agreements between a public agency or public-sector authority and a private-sector entity that allow for greater private participation in the delivery of public services, or in developing an environment that improves the quality of life for the general public (Witters, Marom & Steinert, 2016). The private sector, in such partnerships, implements projects or provides services that would traditionally be provided by public entities. These partnerships provide an alternative method of procurement for large public infrastructure projects especially for governments that are short of funding. Further, these partnerships are important for addressing complex social issues such as poverty, crime, and economic development which cannot be managed by a single entity and therefore require collaborations across multiple organizations (Austria, 2017).

Tonnquist (2018) considers competence of project manager, competence of project team, quality of subcontractor services, and top management support as CSFs of project management. In Lithuania, Gundecha (2017) states that project management's experience, project value, project manager's experience, experience of contractor, project size, competence of project team members, clear and realistic goals, decision making effectiveness of project management, and technical capability of project management are the most important success factors for construction projects. Wanjiku (2016) contends that financial issues, human resources conditions, site characteristics and design quality aspects to be factors influencing performance of contractors of government funded building projects in Kirinyaga County.

Wambugu (2016) identifies strategy, project term capacity, project communication, monitoring and evaluation, and client consultation as factors

influencing success of projects in Nyeri County. Moreover, Kabutu (2017) argues that top management support, technology, training and competence, organizational resource, and funds management to be success factors for offshore software development and implementation projects.

METHODOLOGY

Research Design

Research design is basically collection of data and the process of analyzing collected data (Creswell, 2016). The study employed cross-sectional descriptive design where data was collected to aid in achieving the study objectives. The choice of survey design is that they tend to be more flexible hence lead to collection of a wider range of information (Cooper & Schindler, 2013). The choice of the research design has been motivated by the capability of the design to offer practical framework for accessing large groups to sample its ability to provide reliable data (Kothari, 2014). This study involved 60 public construction projects in Mombasa County which formed the unit of observation. The study unit of analysis was project managers, engineers and quantity quantity surveyors

Stratified random sampling method is used to select relevant respondents from various sectors of government agencies in Kenya. Bryman and Bell (2018) argue that stratified random sampling is where a given number of cases are randomly selected from each population sub-group. It thus ensures inclusion in the sample of subgroup which otherwise could be omitted entirely by other sampling methods. In this case stratification was based on department from which employees come from.

Stratified sampling enables the population to be divided into three segments (relevant departments within the Projects) called strata. Simple random sample is then drawn from each stratum, and then those sub-samples joined to form complete stratified samples. In addition, proportional allocation is done, where each stratum contributed to the sample a number that is proportional to its size in the population.

Quantitative methods of data analysis was used to analyze the research variables. A Likert scale was adopted to provide a measure for qualitative data. The scale helped to minimize the subjectivity and make it possible to use quantitative analysis. The numbers in the scale was ordered such that they indicated the presence or absence of the characteristic to be measured Kothari and Gang, (2018). The multiple regression analysis was used to explore the relationship between project managers competencies, project resource mobilization, project monitoring and evaluation and project risk management as the independent variables and project performance of public construction in Mombasa County as the dependent variable. Pearson's product moment correlation analysis will also use and it's a powerful technique for exploring the relationship among variables. Correlation coefficient was used to analyze the strength of the relations between variables. Correlation coefficients was calculated to observe the strength of the association. A series of multiple regression analysis (standard and step wise) was used because they provide estimates of net effects and explanatory power. Analysis of variance (ANOVA) was used to test the significance of the model. $R^2$was used in this research to measure the extent of goodness of fit of the regression model. The multiple linear to be used to estimate the coefficient is as follows:

$Y=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4+e$ …… (eqn 1)

Where: -

Y = represents the dependent variable, Project performance of construction projects in Mombasa County

$\beta_0, \beta_1, \beta_2, \beta_3$ *and* $\beta_4$arethe Regression Coefficient to be estimated

$\mathbf{X_1}$= Project staff Competencies

$\mathbf{X_2}$= Project Resource Mobilization

$\mathbf{X_3}$= Project Evaluation

$\mathbf{X_4}$= Project Risk Management

e = Error term

FINDINGS

Response Rate

The study issued 126 questionnaires to respondents. 100 questionnaires were filled and returned representing 79.4% response rate. Bryman and Bell, (2018) posits that a response rate of 50% is adequate for analysis and reporting, 60% is good and 70% and above is execellent. For this study the response rate was execellent as shown in Table 1.

Table 1: Questionnaire Response Rate

	Frequency	Percentage
Respondents	100	79.4
Non-Respondents	26	20.6
TOTAL	**126**	**100**

Correlation Analysis

To establish the relationship between the independent variables and the dependent variable the study conducted correlation analysis which involved coefficient of correlation and coefficient of determination.

Pearson Bivariate correlation coefficient was used to compute the correlation between the dependent variable (Project Performance) and the independent variables (Project Staff Competencies, Project Resource Mobilization, Project Monitoring & Evaluation and Project Risk Management). According to Sekaran, (2015), this relationship is assumed to be linear and the correlation coefficient ranges from -1.0 (perfect negative correlation) to +1.0 (perfect positive relationship). The correlation coefficient was calculated to determine the strength of the relationship between dependent and independent variables (Kothari & Gang, 2014).

In trying to show the relationship between the study variables and their findings, the study used the Karl Pearson's coefficient of correlation. This is as shown in Table 1 below. According to the findings, it was clear that there was a positive correlation between the independent variables, project staff competencies, project resource mobilization, project monitoring and evaluation and project risk management and the dependent variable project performance. The analysis indicates the coefficient of correlation, r equal to 0.520, -0.1, 0.615 and 0.555 for project staff competencies, project resource mobilization, project monitoring and evaluation and project risk management respectively. This indicates positive relationship between the independent variable namely project staff competencies, project monitoring and evaluation and project risk management and the dependent variable project performance. The study results show that there was a negative correlation between the independent variable project resource mobilization and the dependent variable project performance.

Table 2: Pearson Correlation

	Project Performance	Project Staff Competencies	Project Resource Mobilization	Project Monitoring Evaluation	Project Risk Management
Project Performance	1				
	100				
Project Staff Competencies	.520**	1			
	.000				
	100	100			
Project Resource Mobilization	-.100	-.006	1		
	.322	.952			
	100	100	100		
Project Monitoring Evaluation	.615**	.332**	.226*	1	
	.000	.001	.023		
	100	100	100	100	
Project Risk Management	.555**	.617**	.076	.638**	1
	.000	.000	.453	.000	
	100	100	100	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Multiple Regression Analysis Results

To assess the research model, a confirmatory factors analysis was conducted. The four factors were then subjected to linear regression analysis in order to measure the success of the model and predict causal relationship between independent variables (project staff competencies, project resource mobilization, project monitoring and evaluation and project risk management), and the dependent variable (Project Performance).

Model Summary

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.733[a]	.537	.518	1.75857

a. Predictors: (Constant), Project Risk Management, Project Resource Mobilization, Project Staff Competencies, Project Monitoring Evaluation

The model explains 53.7% of the variance (R Square = 0.518) on project performance. Clearly, there are factors other than the four proposed in this model which can be used to predict project performance. However, this is still a good model as Bryman and Bell, (2018)pointed out that as much as lower value R square 0.10-0.20 is acceptable in social science research. This means that 53.7% of the relationship is explained by the identified four factors namely project staff competencies, project resource mobilization, project monitoring and evaluation and project risk management. The rest 46.3% is explained by other factors in the project performance in Kenya not studied in this research. In summary the four factors studied namely, project staff competencies, project resource mobilization, project monitoring and evaluation and project risk management or determines 53.7% of the relationship while the rest 46.3% is explained or determined by other factors.

Analysis of Variance (ANOVA)

The study used ANOVA to establish the significance of the regression model. In testing the significance level, the statistical significance was considered significant if the p-value was less or equal to 0.05. The significance of the regression model was as per Table 4 below with P-value of 0.00 which is less than 0.05. This indicates that the regression model is statistically significant in predicting factors of project performance. The overall Anova results indicates that the model was significant at F = 27.562, p = 0.000.

Table 4: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	340.955	4	85.239	27.562	.000[b]
	Residual	293.795	95	3.093		
	Total	634.750	99			

a. Dependent Variable: Project Performance

b. Predictors: (Constant), Project Risk Management, Project Resource Mobilization, Project Staff Competencies, Project Monitoring Evaluation

Regression Coefficients

The researcher conducted a multiple regression analysis as shown in Table 5 to determine the relationship between project performance and the four variables investigated in this study.

Table 5: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	10.577	1.767		5.987	.000
	Project Staff Competencies	.236	.066	.321	3.602	.001
	Project Resource Mobilization	-.280	.091	-.222	-3.087	.003
	Project Monitoring Evaluation	.404	.070	.540	5.771	.000
	Project Risk Management	.030	.114	.029	.265	.792

a. Dependent Variable: Project Performance

The regression equation was:

$Y = 10.577 + 0.236\ X_1 - 0.280\ X_2 + 0.404X_3 + 0.030X_4$

Where;

Y = the dependent variable (Project Performance)

X_1 = Project Staff Competencies

X_2 = Project Resource Mobilization

X_3 = Project Monitoring and Evaluation

X_4 = Project Risk Management

The regression equation below established that taking all factors into account (Project performance of public construction projects in Mombasa County) constant at zero, Project Performance of public construction projects in Mombasa County, Kenya was 10.577. The findings presented also showed that taking all other independent variables at zero, a unit increase in project staff competencies would lead to a 0.236 increase in the scores of project performance of public construction projects in Mombasa County; a unit increase in project resource mobilization would lead to a negative 0.280 increase in Project

Performance of Public Construction Projects in Mombasa County; a unit increase in project monitoring and evaluation would lead to a 0.404 increase the scores of Project Performance of Public Construction Projects in Mombasa County and a unit increase in project risk management would lead to 0.0.555increase the scores of Project Performance of Public Construction Projects in Mombasa County.

Table 6: Hypothesis Testing

Hypothesis Statement	Regression Results	Decision
$H_0$1:Project staff competencies has no significant effect on public construction projects in Mombasa county, Kenya.	t = 3.602 P = 0.001	Reject $H_0$1 null hypothesis Project staff competencies has no significant effect on public construction projects
$H_0$2:Projectresource mobilization has no significant effect on public construction projects in Mombasa county, Kenya.	t = -3.087 P = 0.003	Accept $H_0$2 null hypothesis. resource mobilization has no significant effect on public construction projects
$H_0$3:Project evaluation has no significant effect on public construction projects in Mombasa county, Kenya.	t = 5.771 P = 0.000	Reject H_{03} the null hypothesis monitoring and evaluation has no significant effect on public construction projects
$H_0$4: Project risk management has no significant effect on public construction projects	t = 0.265 P = 0.792	Accept H_{04} null hypothesis risk management has no significant effect on public construction projects

Discussion of the Findings

The study was on factors affecting project performance of public construction projects in Mombasa County in Kenya. The study was based on four specific objectives namely project staff competencies, project resource mobilization, project monitoring and evaluation and project risk management.

On project staff competencies showed that Contractor's experience affects performance of construction projects and that technical skills of the contractor affect performance of construction projects. Knowledge of the contractor affects performance of construction projects. Alvarenga, Branco, Guedes, Soares, and Silva (2019) results show that project management competence have a positive effect on project performance, like leadership, management skills, communication, ethics, honesty have a strong impact on project performance.

On project resource mobilization the study showed that county governments partner with other stakeholder to deliver projects and further county governmePublic Private Partnership increases funding to struggling projects. The findings on correlation showed that there was a negative correlation with the dependent variable project performance.

On project evaluation the study showed that there was a strong positive correlation between the independent variable project evaluation and the dependent variable project performance. Muchelule (2018) shows that monitoring and evaluation was of central importance to the performance public projects, second objective found that There was a high correlation between Influence of Training and Performance of Evaluation, Influence of Time and Performance of Evaluation and Influence of Strength of Monitoring Team. M & E is important for success of any project, yet it is in most Government projects they have not been able to adopt it effectively.

On project risk management the study showed that management of financial risks that may lead to cost overruns are well mitigated. Management of

technical risks in infrastructure projects and project risk management and performance of construction projects. Further the study shows that there was a positive correlation between the independent variable project risk management and the dependent variable project performance.

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions were drawn based on the study findings:

The study results reject the null hypothesis that project staff competencies has a significant effect on project performance of public construction projects in Mombasa. The study concludes that project staff competencies has a significant effect on performance of public construction projects in Mombasa.

The study results accept the null hypothesis that project resource mobilization has no significant effect on project performance of public construction projects in Mombasa. The study concludes that project resource mobilization has no significant effect on performance of public construction projects in Mombasa.

The study results reject the null hypothesis that project evaluation has a significant effect on project performance of public construction projects in Mombasa. The study concludes that project evaluation has a significant effect on performance of public construction projects in Mombasa.

The study results accept the null hypothesis that project risk management has no significant effect on project performance of public construction projects in Mombasa. The study concludes that project risk management has no significant effect on performance of public construction projects in Mombasa.

The following recommendation are drawn from the study findings:

- That counties should continuously train construction experts to be able to build their capacity as well as competencies to be able to deliver quality works and on time within the budgets.
- That counties should design better evaluation tools to be adopted in service delivery.
- That counties should undertake projects that they have enough financial resources and human capacity to deliver the work.
- That counties should partner with the public under PPPs to deliver on projects where there have no enough resources.

Suggestion for Further Study

The study was based on factors affecting project performance of public construction projects in Mombasa County. The study specific objectives were project staff competencies, project resource mobilization, project evaluation and project risk management. The study therefore recommends that other researcher should examine the other factors that were not considered in the study.

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