MODEL FOR EVALUATING PERFORMANCE OF CONSTRUCTION PROJECTS INITIATED BY THE CONSTITUENCIES DEVELOPMENT FUND IN KENYA: A CASE STUDY OF SIAYA COUNTY

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Model for Evaluating Performance of Construction Projects initiated by the Constituencies Development Fund in Kenya: A Case Study of Siaya County

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DECLARATION

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

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This thesis has been submitted with our approval as university supervisors.

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DEDICATION

This work is dedicated to my grandfather, the late Ismael Omondi, for having given me academic hope during my early childhood. His commitment to my education was interrupted by death, but his words have continued encouraging me to surmount challenges in life.

May his dream come to pass!

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ACRONYMS OF TERMS

CPSS	Construction Project Success Survey
EIA	Environmental Impact Assessment
IEA	Institute of Economic Affairs
ILO	International Labor Organization
ISO	International Organization for Standards
KIPs	Key Performance Indicators
KSH	Kenyan Shillings
M&E	Monitoring and Evaluation
CDF	National Government Constituencies Development Fund
NPM	New Public Management
NTA	National Taxpayers Association
PMC	Project Management Committee
PQM	Performance Measurement Questionnaire
SAPS	Structural Adjustment Programs
UN	United Nations

ABSTRACT

Evaluation of projects initiated by the National Government Constituencies Development Fund (CDF) is critical to the assessment of their performance levels, offer public accountability, maximize benefits and generate feedback for future improvements. Despite providing for public participation in monitoring and evaluation of the projects, the CDF Act does not provide a framework to be followed.This situation has led to individuals and organizations giving their subjective outcome of evaluations based on varied criteria. As a result, the criteria for evaluating the performance of construction projects executed through the CDF remains vague.

For this reason, this study aimed at developing a standardized post-project review framework that can be utilized to evaluate the performance of construction projects initiated by CDF and identify the project management practices (performance factors) that are critical for the success of the projects. The specific objectives were: (1) to describe performance criteria for construction projects initiated by CDF; (2) to describe the determinants of performance for the construction projects; (3) to explain the relationship between project performance and its determinant factors; and (4) to develop a regression model for evaluating project performance.

Similarly, the study reviewed related pieces of literature focused on performance evaluation of similar projects to identify the various types of frameworks that have been developed over time and assessed each for its suitability in evaluating the performance of CDF construction projects. However, none of the existing frameworks was found to suit the evaluation of the performance of CDF construction projects. Besides, the study proposed an eclectic conceptual framework which is a modification of Baccarin's model of measuring construction project performance. The conceptual framework is for post-implementation review and forms the basis on which the variables measured during fieldwork were developed.

The study drew evidence from survey responses of 51 construction projects within Siaya County in Kenya. Statistical Package for Social Sciences (SPSS) software was then used to analyze the data, and the research findings generated presented in tables and figures. The study sampled all the 51 projects for analysis. Besides, the research also utilized descriptive and inferential analysis methods in data synthesis. Under the inferential analysis, Pearson’s correlation and Regression analysis were used to determine the significant factors affecting the performance of a project as well as establish a predictive model. Descriptive statistics, such as mean and variance, were used to describe project performance and the factors determining the performance of a project. The findings of this study sought to benefit project implementers, members of the public, policymakers as well as academia as it forms a basis for further research.

The findings of this study suggest that there was a positive and statistically significant linear relationship between the performance level and monitoring and control, financial resource, community involvement, stakeholder management, feedback capabilities, and knowledge of CDF management guidelines. A model was then established using these variables and was found to explain 73.3% of the variation in the project's performance level and, therefore, the model was good at predicting project performance. It was concluded that monitoring and control, financial resources, community involvement, stakeholder management, feedback capabilities, and knowledge of CDF management guidelines are critical factors for the performance level of CDF construction projects in Kenya. A recommendation was made that the model should be adopted for the evaluation of the performance of CDF construction projects. Apart from being an evaluation tool, the developed model can be useful in predicting performance level of a project at any stage of implementation; controlling the critical factors to improve the performance of a project; and, providing an explanation for decision-making in planning and policy formulation relating to CDF construction projects.

Keywords: Constituencies Development Fund, Project Performance, Evaluation Model, Performance Criteria, Performance Factors.

CHAPTER ONE

INTRODUCTION

1.1 Background of the problem

The concept of decentralization of responsibility and power for local development to local governments and other local institutions has gained ground globally, specifically in developing and underdeveloped countries, who have steadily picked up the concept over the last three decades. Parker and Serrano (2000) observed this trend and attributed it to the decision of the World Bank and other donor agencies to increase their focus on local governance and support initiatives that allow local institutions to play a much greater role in planning, design, implementation, operation, and maintenance of small-scale investment projects. The donors do this by providing direct financing for community projects designed to have a quick impact on improving basic services and reducing poverty. Accordingly, The World Bank alone, between 1987 and 2000, approved about 100 such projects in more than 60 countries totaling up to US$3.4 billion (Parker, 2001). This financial incentive from development partners has motivated many countries to set up decentralized funds systems.

Kenya has not been left behind in this paradigm shift in development. In the last two decades, the country has witnessed an increase in the number of funds targeted at the local level governance units such as districts, constituencies, and local authorities. Gikonyo (2006) identifies thirteen such types of decentralized funds as follows:

1. Local Authorities Transfer Fund (LATF)
2. Road Maintenance Levy Fund (RMLF)
3. National Government Constituencies Development Fund (CDF)
4. Poverty Eradication Loan Fund (PELF)
5. Secondary School Education Bursary Fund (SSEBF)

6. Free Primary Education Fund (FPEF)
7. Rural Electrification Programme Levy Fund (REPLF)
8. Community Development Trust Fund (CDTF)
9. Water Services Trust Fund (WSTF)
10. Constituency HIV/AIDS Control Fund
11. National Development Fund for Persons with Disabilities
12. Youth Enterprise Fund, and
13. Women Enterprise Fund.

On the same note, some of these funds are entrenched in statutes while others are not. The funds formed through statutes, for example, the National Government Constituencies Development Fund (simply referred herein as CDF), are operational irrespective of the government of the day while those that are not backed by law exist and operate dependent on the policy of the government in power.

All the funds are allocated from the consolidated fund which are revenues collected from taxes, fees and fines, public corporations, public investments and borrowing, and grants from various donors. According to Kenya Institute for Public Policy Research and Analysis (KIPPRA) report (2006), almost 82-89% of the consolidated fund is allocated to recurrent expenditure, while 11-14% goes to the development vote of which about 5% makes up decentralized funds. This 5% translates to huge sums of public money allocated to decentralised funds, and which can create a significant impact if well managed.

Although a construction project may arise from any of the decetralised funds listed above, some of the funds are like to have more influence in the construction industry than others. The fundamental objective of these decentralized funds is to alleviate poverty, reduce regional imbalances in resource distribution, and improve the quality of life and the general level of economic development (IEA-Kenya & KNCHR, 2006). To meet these objectives, the fund with the direct and greatest influence on the construction activities at the grassroots level is the National Government Constituencies Development Fund (CDF).

It is this fund that this study will focus on in evaluating the performance of construction projects that are funded by decentralized funds in Kenya.

In projects initiated by decentralized funds such as CDF, project implementers perceive community participation as a prerequisite for ensuring local ownership and sustainability of project activities. The performance of such projects, therefore, is influenced by other factors beyond the traditional triangle of cost, time and quality. According to Mulwa (2008), the performance level of a project regarding costs, time and quality will only help in achieving material development, which is no longer seen as the primary motivation for development endeavors although a necessary 'dividend' of the participatory development process. Public participation calls for inclusion of community members in the delivery process of projects financed by a decentralised or devolved fund such as CDF. Moreover, the Constitution of Kenya and the CDF Act provide for public participation in such projects.

Researchers in construction project management have focused on the material development of individual projects regarding cost, time and quality (Zuo *et al*., 2007; Ahadzie *et al.*, 2008; Kaliba et al., 2009; Kamrul and Indra, 2010) while evaluating the performance of construction projects. The use of these three metrics is still considered a good practice for some projects, while in others it could undermine some important project outcomes. However, critics of these three criteria have indicated that they do not adequately cover all aspects of performance measurement (Gardiner, 2000). In pursuit of better criteria to measure performance, researchers have developed several measurement models for various types of projects. However, none of these models has considered public participation as one of fundamental aspect in evaluating participatory development projects that are financed by decentralized funds such as CDF, as discussed in chapter two herein.

1.2 Problem statement

The National Government Constituencies Development Fund, formerly Constituencies Development Fund, was established in Kenya through the Constituencies Development Fund Act 2003. The Act was later reviewed by the Constituencies Development Fund (Amendment) Act 2007, and repealed by Constituencies Development Fund Act 2013, which was subsequently succeeded by the current National Government Constituencies Development Fund (Amendment) Act 2016. The fund aims to control imbalances in regional development and targets all constituency-level development projects, particularly those aiming to combat poverty at grassroots to be put up in all constituencies throughout the country. These projects have had a significant influence on the socio-economic lives of Kenyans and included schools, health facilities, cattle dips, markets, feeder roads, water projects, and police stations, among others.

To provide public accountability, maximize benefits and feedback for future improvements, it is critical that the CDF projects are assessed to establish their levels of performance. Indeed, the CDF Act allows up to 3% of the total annual fund allocation in every constituency be used for monitoring and evaluation of projects that have been implemented. However, the Act does not provide the framework to be followed in the evaluation of performance, and this has led to a problem whereby the method for evaluating these projects executed through the CDF remains vague. This situation has led to individuals and organizations giving their evaluations based on diverse criteria, as observed in various published reports by Gikonyo (2006), the National Taxpayers association (NTA), the Institute of Economic Affairs (IEA-Kenya) and Kenya National Commission on Human Rights (KNCHR), among others.

Since 2006, the National Taxpayers NTA has conducted annual evaluations of CDF construction projects in selected constituencies and report findings through their publication dubbed *'Citizen's Constituency Development Fund Report Card.'* Gikonyo (2006) developed *'The CDF Social Audit Guide'* that was meant to guide communities to

carry out monitoring and evaluation of CDF projects. The Institute of Economic Affairs (IEA-Kenya) and Kenya National Commission on Human Rights (KNCHR) published a report in September 2006 titled *'Kenyans' Verdict: A Citizens Report Card on Constituencies Development Fund'* which was an outcome of the evaluation of CDF construction projects. These evaluation reports were not based on the same criteria, and it is thus possible that two different stakeholders on the same project can give conflicting assessments of a project's performance! This confusion can only be addressed if the same evaluation framework is applied to measuring the performance of the projects by all stakeholders.

Evaluation frameworks are useful in measuring the extent to which a project has performed in meeting its objectives. They thus help to measure the performance level of a project within a given set of criteria. However, there is still disagreement among project management researchers as to what constitutes project performance since project stakeholders view success or failure factors differently (Shahrzad & Hamidreza, 2011). It follows that there cannot be a universal evaluation framework that can effectively be used to measure the success of all construction projects, given that projects are specific regarding objectives and characteristics. An evaluation framework that is sensitive to the specific elements of a project and is in tandem with the stakeholders' point of view is the most appropriate for measuring the project's performance. Therefore, this calls for a specific framework for evaluating CDF construction projects.

1.3 Aim and Objectives

1.3.1. General objective

This study aims to develop a standardized post-project review model that can be used to evaluate the performance of construction projects initiated by CDF in Kenya and identify the project management practices (performance factors) that are critical for the success of the projects.

1.3.2. Specific objectives

The specific objectives of the study that will assist in attaining the above aim are:

1. To describe performance criteria for construction projects initiated by CDF.
2. To describe the determinants of performance for the construction projects.
3. To explain the relationship between project performance and its determinant factors.
4. To develop a regression model for evaluating project performance.

1.4 Study Hypothesis

The study hypothesis is that the performance of CDF projects is significantly influenced by: (i) the Project Manager; (ii) Project planning; (iii) Monitoring and Control; (iv) Financial Resource; (v) Communication; (vi) Stakeholder Management; (vii) Community Involvement; (viii) Feedback Capabilities; and (x) Knowledge of CDF Management Guidelines.

In algebraic terms, the hypothesis can be tested using a statistical model as follows:

$$Y = \propto + \sum_0^n \beta_i \times_i + \varepsilon$$

Where, Y - project's level of performance

α - constant

β_i - regression coefficient

$\beta_i \neq 0$, for at least one β

X_i - independent variables

ε - regression error

The research hypothesis is that $\beta_i \neq 0$, for at least one β, while the null hypothesis is that $\beta_i = 0$, for all β_i.

1.5 Justification of the Study

The establishment of the CDF has a great impact on the construction industry in Kenya. Since inception in 2003 to 2018, approximately 264 billion Kenya Shillings allocated to the fund with the bulk of the amount (68%) spent on construction projects (National Government Constituencies Development Fund Board, 2003-2018). These huge allocations have prompted construction activities to spread all over the nation, thereby encouraging the private sector initiatives in the rural areas too. Professionals, contractors and material suppliers continue to set up offices in smaller towns and centers as the workload increases. Therefore, having a multiplier effect on businesses in other sectors such as financial services, transportation, and hospitality in rural areas.

The lives of rural communities are bound to improve from growth in the industry through employment creation and improved facilities. These benefits are because of expenditure of public funds that the citizenry contribute in the form of taxes, fees, and levies. It is therefore important that evaluation of projects be carried out using a common methodology to eliminate subjective or biased judgments on benefits for public investment in CDF. This study will go a long way in making sure that the public gets value for money in the construction projects initiated through CDF and provide the critical management practices for improving the performance of the projects.

It is the researcher's hope that the outcome of this study will initiate thinking in the public and private sectors to adopt management systems that will improve the performance of construction projects in general.

1.6 Significance of the Study

The findings of this study will benefit different categories of individuals in the society. Firstly, policymakers will benefit from the findings by enriching the law and regulations governing the operation of CDF projects by incorporating provisions that result from work of research, and not from personal intuitions or feeling. Thus, enabling them to incorporate policy on evaluation criteria and providing guidelines on managerial practices that will assist in improving CDF construction project performance without resistance from the various stakeholders.

Secondly, the project implementers as described in the CDF Act will benefit by having prior knowledge of the criteria to be used in evaluating the projects they superintend over, and the success factors to keep monitoring. The move will lead to improved performance of the projects and satisfaction to the implementers, who include project administrators, consultants, and contractors.

Thirdly, members of public who are mandated by CDF Act to participate in all aspects of the project including monitoring and evaluation (Odhiambo & Anyembe, 2005) will be better informed through the findings of the study and make them be more constructively when executing their mandate. It is essential to note that the intention of setting up CDF is to spur local development and encourage local communities in their development. Therefore, the information that this study will generate will help to develop the requisite capacity in the citizenry to be able to participate in monitoring and evaluation of the projects effectively.

Finally, the reserach will positively impact the academia. As an academic endeavor, this research seeks to contribute to the body of knowledge in the field of construction project management. Students and researchers in this discipline will find the outcome of the research useful, and possibly provide the basis for further research.

1.7 Scope of the Study

The evaluation of performance of the projects will be limited in scope to the pre-contract and post-contract stages of the projects and will consider nine variables as described in Chapter three. Several other variables can indicate performance as established in theoretical frameworks in Chapter two, but the research only considered the nine variables presented in the conceptual framework.

The effectiveness of management was limited to project planning, control and feedback practices employed, and this taken as a function of projects performance. There are nine performance factors (determinants) that were identified in Chapter three as being critical, and these were the only variables to be considered in measuring managerial factors.

Only projects completed within the last one year were considered at the time of collecting data, since the relevant issues under study were still fresh, and data collected deemed realistic. It was not practical to consider the whole country regarding geographical coverage, and for practical reasons the study area was confined to the six constituencies with Siaya county.

1.8 Assumptions of the Study

One of the assumptions of the study is that the CDF policy (the CDF Act and Regulations) are well formulated, and the only factors that come into play are managerial practices which vary from project to another. It is these managerial practices that are considered to determine the performance of a project as successful or not. The study was also based on the assumption that all the performance criteria for CDF construction projects have equal weighting. The last assumption was that the continuous variables are obtainable from the rankings of the variables and are pragmatic for this study. The data produced from the rankings is, therefore, continuous numerical data.

1.9 Limitations of the Study

The study had several limitations. First, the respondents were found to be uncooperative in responding to the questionnaires administered. This phenomenon was associated with fear of freely giving information. This limitation was addressed through research permit and a letter of introduction which was issued to the respondents to assure them that the information provided was to be used for academic purposes and would thereby be treated with confidentiality.

The second limitation was the study area. The study focused on only one county; Siaya County, out of the forty-seven counties in Kenya. This move was due to the high financial cost of researching in all the counties. However, the researcher exhaustively sampled CDF projects in all the constituencies in the county.

Thirdly, the study was limited to projects that had been completed in not more than a year at the time of data collection. An ideal situation would be to cover the entire project life from inception to obsolescence. However, this wouldn't have been possible as none of the existing CDF construction projects had reached obsolescence stage.

1.10 Operational definitions of terms

Project performance: this is a tangible measure of the number of projects completed within a given time given a certain amount of budget allocation in making sure that the project contributes to the strategy of the organization and further achieves customer satisfaction.

Performance evaluation: this is an objective and systematic assessment of either a completed or an ongoing project with the aim of determining the level of achievement and relevance of the objectives of the project, efficiency, developmental effectiveness, sustainability, and its impact.

Performance criteria: is the standard upon which to judge the project at the tail end to determine if the project itself was successful or not in the eyes of the stakeholders.

Determinants of performance: these are a combination of factors needed in accomplishing the desired outcome of the organizational goals.

Statistical model: this is a mathematical notation that represents a set of assumptions in statistical information concerning sample data generation and similar data from a larger population.

Evaluation framework: it is sometimes called the Monitoring and Evaluation framework provides an overall framework for project evaluations across diverse programs or even different evaluations of a single program.

Product success: this is defined as an achievement or a positive return on the investment as a result of either increased sales and or increased market share. In this case, the achievement of a facility constructed through CDF in meeting its intended objective and can only be considered during post-occupancy period.

Project management success: this refers to the achievement of the objectives of the project within the set criteria from inception to end of the construction period.

1.11 Organization of the Study

The study is organized into five parts. Chapter one gives a general introduction, which includes problem background and statement, study objectives, study hypothesis, justification of the study, the significance of the study, the scope of the study, limitations of the study, operational definitions of terms and organization of the study.

Chapter two forms the theoretical basis of the study and provides the basis of evaluation of the primary data to make research conclusions. This chapter reviews previous studies

carried out by scholars in the study area and their relevance to the research at hand. Similarities and differences among the various models identified in the literature review for measuring the performance of construction projects are highlighted for a better understanding of the study problem.

Chapter three outlines the study methodology. The chapter explains the type of research design adopted for the study, the type of sampling method, data collection method and sampling tools, and data presentation and analysis techniques used.

The chapter contains the actual data from the survey, their compilation, analysis, presentation, and interpretation. It provides findings and analysis related to the problem under study. This chapter critically evaluates facts from the survey, and their imports noted.

Chapter five is the final part and contains conclusions, recommendations, and areas for further research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature related to the evaluation of the performance of construction projects. The chapter is divided into three main sections, namely: decentralized funds, evaluation of project performance, and policy framework for performance measurement.

The chapter begins with a brief introduction of decentralized funds and the nature of the National Government Constituencies Development Fund (CDF) in Kenya. An overview of the historical background of both the decentralized funds and CDF is included in this part.

The second part dwells on the concept of project performance, its indicators, and determinants. In this part, contemporary performance measurement frameworks in construction are reviewed. The importance of performance in construction management is underpinned, and performance level factors relevant to the CDF construction projects are also identified in this part.

In the third part, policies on decentralized funds are reviewed with emphasis on formulation and implementation. Measurement of performance for public/government sponsored projects is generally expected to follow a defined system of policy or legislative guidance, which will be reviewed in this part.

The last part is the conclusion on the chapter and provides an overview of the aspects discussed, and more importantly, provides the literature gap that this study endeavors to fill, the theoretical framework upon which the study is grounded and propose a conceptual framework to guide the research work.

2.2 Decentralised Funds

2.2.1 Decentralization Concept

Decentralization is the redistribution of decision-making responsibility between the center and the lower levels of an organization. It has come to be widely regarded as an important instrument for supporting the factors needed to create good governance and promote local development. According to (Parker, 2001), there is a growing recognition that central governments cannot do it all and that active involvement of both communities and representative local governments is required for successful development.

Decentralization can take two broad models; de-concentration and devolution. Parker & Serrano (2000) distinguishes these two forms of decentralization by stating as follows:

> "De-concentration involves redistribution of power from the center to the subordinate levels within the same organization. It is effected through internal and administrative procedures and does not involve legislation. It can, therefore, be reversed without the need to change or breach the law. Devolution, on the other hand, involves redistribution of decision-making power and authority through legislation (an act of parliament or constitution) and characteristically involves the creation of political making units, mostly elected councils.

Decentralization is complex and encompasses a wide range of elements, but evidence from many countries suggests three important conditions that are necessary if decentralization is to lead to improved governance (Manor, 1999):

1. Significant powers and responsibilities for local service delivery should be devolved to representative local authorities in line with their capacities (political decentralization),

2. Sufficient resources, through a combination of local taxes and grants from higher-level governments, must be provided to enable local government to fulfill their responsibilities (fiscal decentralization), and
3. Proper channels for accountability are needed to encourage strong accountability between bureaucrats and elected representatives and their electorates (institutional decentralization).

Decentralized funds are the face of fiscal decentralization, and have benefits and challenges associated with their implementation. Several studies on fiscal decentralization in various countries have been carried out; however, the verdict on whether the benefits of fiscal decentralization outweigh the costs has not been made (Institute of Economic Affairs, 2006). This, therefore, calls for focus in this broad area particularly for those countries that had made a policy shift towards decentralization, like Kenya did when a new constitution was ushered in August 2010.

2.2.2 Decentralized Funds in Kenya

Fiscal decentralization in Kenya has not followed a systematic approach over time, though the government has shown commitment in its development strategy as attested to by the numerous existing funds and extensive structures (Kibua & Mwabu, 2008). There were previously several decentralized funds existing in Kenya, whose key intervention was to disburse financial resources directly to the districts and constituencies before August 2010 when the current constitution was promulgated. However, the resources are now channeled to the counties and constituencies, as districts have now been abolished.

The current decentralized funds include: Local Authority Transfer Fund; Road Maintenance Levy Fund; Constituency Development Fund; Secondary School Fund; Free Primary Education Fund; Rural Electrification Programme Levy Fund; Community Development Trust Fund; Water Services Trust Fund; Constituency HIV/AIDS Control Fund; National Fund for the Disabled People, Youth Enterprise Fund and Women

Enterprise Fund. Among these funds, CDF has attracted most of public concern and debate as evidenced over time in the local media and is, therefore, the focus of this study.

2.2.3 Constituencies Development Fund schemes

Constituencies Development Fund in practice was first adopted in India in 1993 but gained prominence when Kenya established its own in 2003 (Tshangana, 2010). Based on perceived success of the Kenyan model and various political and historical drivers, the trend has spread to other African countries and across the world in recent years, with the following countries adopting some form of a Constituency Development Fund: Southern Sudan, Philippines, Honduras, Nepal, Pakistan, Jamaica, Solomon Islands, Tanzania, Malawi, Zambia, Uganda, Ghana, Malaysia, and India.

Despite the variety of forms and approaches in different countries, there are essential elements identified which help to distinguish CDFs from other decentralized initiatives or Community-Based Programmes. First, funds are raised by national government and disbanded at the local level. Second, funds are allocated per constituency, and members of Parliament (MPs) have some degree of control over the spending (this is a key feature of CDF schemes). Lastly, funds are intended for development projects which reflect the localized needs and preferences.

According to Tshangana, (2010), there are other critical features of CDFs which vary from country to country and which have a direct bearing on the performance of the programme. These are:

1. Quantum of funding available per constituency:
2. Methods of allocating funds between constituencies (degree of targeting),
3. Legislative framework,
4. Governance institutions and systems used to select, implement and monitor projects,

5. Checks on corruption,
6. Public access to information, and
7. Community participation in project prioritization and implementation.

From the preceding, the CDF schemes can be described as decentralized initiatives which send funds from the central government to each constituency for expenditure on development projects intended to address local needs.

2.2.4 National Government Constituencies Development Fund in Kenya

The National Government Constituencies Development Fund, formerly Constituencies Development Fund, was established in Kenya through the Constituencies Development Fund Act 2003. The Act was later reviewed by the Constituencies Development Fund (Amendment) Act 2007, and repealed by Constituencies Development Fund Act 2013, which was subsequently succeeded by the current National Government Constituencies Development Fund (Amendment) Act 2016. The fund aims to control imbalances in regional development and targets all constituency-level development projects, particularly those aiming to combat poverty at grassroots. Since 2003/2004, the fund supported projects mainly in the areas of education, health, agriculture, roads, security, environment, and sports. However, the National Government Constituencies Development Fund (Amendment) Act 2016 introduced a major shift in the scope of projects eligible for funding. Under this Act, only projects falling within the functions of the National Government as outlined in the constitution of Kenya will be funded. This effectively means that moving forward, the fund will concentrate primarily on education, security, sports, environmental sectors, and other national government residual functions. The implementation of the fund is guided by the CDF Act, as well as regulations and circulars released by the relevant ministry from time to time to streamline the operations of the fund.

The CDF Act provides that at least 2.5% of the ordinary revenue collected by the government is allocated to the fund. Parliament has since increased this allocation to 7.5% of government's revenue and as at June 2018, and over Ksh. Two hundred sixty-four billion had been allocated to the 290 constituencies in Kenya, throughout sixteen (16) financial years as tabulated on table 2.1.

Table 2.1: CDF allocations, 2003-2018

Financial Year	Amount Allocated (in Kshs.)
2003/2004	1,260,000,000.00
2004/2005	5,431,999,997.00
2005/2006	7,028,619,994.00
2006/2007	9,736,860,002.00
2007/2008	9,796,999,949.00
2008/2009	9,797,000,000.00
2009/2010	11,959,421,004.00
2010/2011	13,854,510,000.00
2011/2012	16,989,550,000.00
2012/2013	21,293,004,690.00
2013/2013	21,293,004,469.00
2013/2014	21,973,900,000.00
2014/2015	31,564,500,000.00
2015/2016	33,452,350,000.00
2016/2017	23,749,999,998.00
2017/2018	25,174,999,760.00
Total	**264,356,719,863.00**

Source: Developed from CDF Website, www.ngcdf.go.ke

The bulk of CDF allocations (68%) have been used for infrastructural development projects such as schools, roads, health centers, markets, cattle dips, dams and police posts. It is these constructed facilities whose performance is the subject of this study.

2.3 Evaluation of Project Performance

Neely, Gregory, and Platt (1995) proposed that performance should be defined as the efficiency and effectiveness of action, where measurement is the process of quantification and action correlates with performance. From this definition, it is critical that performance of all types of projects be evaluated to maximize benefits and for future improvements. Evaluation of project performance entails measuring the level of performance (success or failure) of a project in comparison with the planned targets, an exercise that enables identification of potential for doing things better (Office of Government Commerce, 2007).

From the preceding, performance evaluation can also be referred to as performance measurement and is an important aspect of construction project management discipline. It is essential to measure performance in construction projects to determine whether planned improvements in the efficiency and quality of facilities are being achieved or not and to learn lessons for improving future projects: a clear application of the principle of control in construction project management.

Tangen (2004) adopted the following three definitions within the concept of performance that have also been considered in this study:

1. Performance management is the process of quantifying the efficiency and effectiveness of action,
2. A performance measure is a metric used to quantify the efficiency and/or effectiveness of an action, and

3. The performance management system is the set of metrics used to quantify the efficiency and/or effectiveness of action.

For objective measurement of performance, frameworks and systems are essential. In the past years, remarkable progress has been made in the design of performance frameworks and systems. The following are some of the performance measurement/management systems that have been developed for business organizations, including those within the construction industry (Toni & Tonchia, 2001):

1. Activity-Based Costing (ABC),
2. Sink and Tuttle model,
3. Balanced Scorecard,
4. The Performance Pyramid,
5. Theory of Constraints;
6. The Performance Prism, and
7. Medori and Steeple's Framework.

These new approaches have solved some of the limitations of the traditional way of measuring performance. However, many organizations still primarily rely on the traditional financial performance measures (Tangen, 2003). This traditional approach to performance measurement has a single focus view on profitability, which is limiting in scope.

Tangen (2004) established that the various approaches and frameworks do provide guidance on how a company should design its unique performance management system, but rarely help with the practical realization with specific measures at an operational level. He also suggests that not all performance measurement problems have been solved. This implies that to select appropriate measures and design a suitable performance management system for a particular organization, some factors must be considered, and the choice of a suitable measurement technique depends on several factors, including (Tangen, 2002):

1. The purpose of measurement,
2. The level of details required,
3. The time available for the measurement,
4. The existence of available predetermined data, and
5. The cost of measurement.

From the preceding it is apparent that each business organization needs to develop its own unique performance measurement system to meet its goals, and this also applies to those business organizations within the construction industry.

2.3.1 Policy for public sector performance measurement in Kenya

Kenya has adopted performance management from the New Public Management (NPM) models that were advocated by the World Bank and other donor agencies after the failure of the Structural Adjustment Programmes (SAPS) in developing nations in the 1980s. The New Public Management concept incorporates the application of private sector management systems and managerial techniques into public service, thus shifting the emphasis from the traditional public administration to public management and entrepreneurship (Farnham & Horton, 1993). As part of New Public Management, performance measurement is fundamental to the delivery of improved services and helps to define outcomes and appropriate benchmarks to measure the outcomes.

The current Kenyan reform model can be traced back to 2004 when the Government introduced Performance Contracting in its policy framework paper, 'Economic Recovery Strategy for Wealth and Employment Creation between 2003-2007. This strategy outlined the Government's commitment to improving performance, corporate governance and management in public service, and was to be implemented by (a) creating a competitive market conditions for private sector-led growth; (b) directing resources towards wealth and employment creation; (c) supporting both effective and efficient public-sector performance and service delivery (Government of Kenya, 2003). This shifted managerial

focus from formal process towards speedy results which were measurable, thus the need for performance measurement.

Soon after launching the Economic Recovery Strategy (ERS) in 2004, in the same year, the government introduced Result Based Management (RBM) in public service as a deliberate policy to improve performance. RBM is a participatory and team-based management approach designed to achieve defined results by improving planning, programming, management efficiency, effectiveness, accountability and transparency (CIDA, 2001).

The introduction and institutionalization of RBM concepts and principles in the public service were to help focus attention and resources on the achievement of definite objectives and the targets prescribed in the ERS. Thus, the key elements of RBM were:

1. Performance target setting,
2. Performance planning,
3. Performance monitoring and reporting, and
4. Performance appraisal/measurement.

The adoption of RBM within the public service was expected to enable each ministry/department and public service organizations come up with clear performance objectives in line with ERS targets, delineate the activities to help in the achievement of such objectives and determine the role to be played by each staff member involved in the service process (Obong'o, 2009). Eventually leading to the introduction of Performance Contracting which was a government policy of staff performance measurement.

However, the government has not yet developed a similar policy framework for projects/programmes, even though RBM concepts and principles can be applied for the same. Donor agencies such as the World Bank and CIDA have successfully used the RBM to develop performance measurement frameworks for projects/programmes under their

jurisdiction. Of great concern for noting is the emphasis these frameworks put on stakeholder participation throughout the life-cycle of the projects/programmes, a situation that fits well with projects that are anchored on participatory development approach such as the CDF projects.

2.3.2 Performance measurement policy for CDF projects

As earlier discussed, implementation of CDF projects is guided by an act of parliament, the CDF (Amendment) Act of 2016. However, it is important to note that CDF implementation is constantly evolving through the issuance of new circulars, regulations, and revisions to the implementation guidelines and law. Currently, the following are the documents that guide in the implementation of CDF projects:

1. The CDF (Amendment) Act 2016 (revised sections of CDF Act 2013),
2. The CDF Act 2013,
3. CDF Regulations,
4. Circulars released by the ministry of finance from time to time,
5. Public Procurement and Asset Disposal Act 2015,
6. Public Procurement and Asset Disposal Regulations, and
7. CDF Implementation Guidelines prepared by the Board of Management of CDF.

The CDF Act and Implementation Guide place great emphasis on Monitoring and Evaluation (M&E) of CDF money (financial audit), but with no framework for evaluating the performance of the projects. And even though the CDF Act and Implementation Guide reorganize monitoring and evaluation as one of the stages in a CDF project cycle and provides that 3% of the funds be allocated for the same, M&E is not effective. Gikonyo (2008) captures this scenario by stating as follows:

> "Unfortunately, at present, the monitoring systems instituted under the CDF Act are not thorough enough. Most CDF monitoring exercise entails visits to the project site and a verbal report on the project, which gives a very superficial picture.

For the process to be effective, monitoring must ask the right questions, investigate the real issues and generate relevant information to enable those monitoring the project to make an accurate assessment of the project (Gikonyo, 2008). In CDF, the responsibility of M&E is placed upon various stakeholders: The Board, CDFC, DDO, relevant departments, committees or other designated persons. As a result, weakening the function of M&E since there is no clear separation of powers and responsibilities. Besides, there is no structure or guidance on how the monitoring should be carried out. As a response to this, various community-based organizations, NGO's and other institutions may suggest what in their understanding would the community members need to benefit most from CDF. For instance, Open Society Initiative of East Africa (OSIEA) developed a handbook for assisting communities to conduct social Audit for CDF projects. However, this guide mainly focuses on how members of the public can monitor CDF expenditure.

It is worth noting that it is not only the M&E framework that is weak in the Act and Guidelines. While inaugurating the task force on CDF amendment Act on 22nd June 2009, the Minister for Planning, National Development and Vision 2030 outlined several challenges that face the implementation of the CDF due to some loopholes in the Act that needed to be fixed. However, he did not mention the evaluation problem. However, the task force's mandate was wide enough and could cover the evaluation issue. The task force handed over its report to the Minister, on 26th July 2012, which attempted to identify the evaluation problem.

Of concern to this study is not the continuous monitoring and evaluation during the project's implementation, but the post-project review type of evaluation carried out after the project is complete. The reviewed literature reveals that, on this evaluation, the Acts, regulations, guidelines, and circulars on CDF are silent and do not provide a framework to measure the success or failure of the projects.

The Institute of Economic Affairs (IEA-Kenya) and Kenya National Commission on Human Rights (KNCHR) recommended the need to incorporate the M&E of CDF with

the national M&E system, with clear indicator/target, and earmarking of adequate funds for the M&E of CDF (IEA-Kenya & KNCHR, 2006). This study is at a level of determining the details for the evaluation and how it will be conducted.

2.3.3 Contemporary performance measurement frameworks in construction

A performance measurement framework is a complete set of performance measures and indicators derived consistently according to a set of rules or guidelines (Brown & Devlin, 1997). With the development of performance measurement, the frameworks have become more and more comprehensive and practicable.

For a long time, a framework for measuring performance depended on financial measures until Keegan, Eiler, and Jones (1989) developed Performance Matrix. Additionally, Maskell (1989) advocated the use of performance measures based on Wold-Class Manufacturing (WCM). Performance Matrix promoted the classification of performance measures into the cost and non-cost measures, and WCM advocated for measures such as quality, time, process, and flexibility. Other early performance frameworks that followed in the footsteps of the two that have been mentioned by Basioni, Price, and Hassan (2004) are:

1. Performance Pyramid, developed by Cross and Lynch in 1989,
2. Performance Measurement Questionnaire (PQM), developed by Dixon, Nanni and Vollman (1990),
3. Balance Scorecard (BSC), developed by Kaplan and Norton in 1992, and
4. Performance Prism developed by Neely and Adams in 2001.

In addition to the above, there exist other frameworks. For instance, Takim, Akintoye and Kelly (2003) group the frameworks into four categories. When considering projects that are national and have been internationally recognized for use in the construction industry, the following frameworks fit the standards set by the researchers:

1. Construction projects performance measurement frameworks;

i. Integrated Performance Index (IPI), and
ii. Key Performance Indicators (KPI)

2. Construction Productivity measurement frameworks;

    i. Caliber Approach.

3. Project viability measurement frameworks;

    i. Analytical Hierarchy Process (AHIP).

4. Project quality measurement framework;

    i. Project Quality Performance (PQP),
    ii. Blueprint,
    iii. Quality Assessment System in Construction (QLASSIC), and
    iv. European Foundation for Quality Management Excellence Model (EFQM).

The first category of frameworks fit this study because it applies to measure the overall performance of a project.

2.3.4 Measurement of Performance of Construction Projects

The concept of project success

Measurement of performance of a project is simply to determine the level of success or failure of the project. The concept of success is rather elusive as the term may have a different meaning to different individuals in the same project. Guru (2008) notes that neither the practitioners nor the academicians seem to agree on what constitutes project success. However, project success is a crucial aspect of management, and the importance of defining and measuring success was identified as long ago as 1986 by the Project

Management Institute (PMI). In that year they devoted their Annual Seminar and Symposium to this topic (Baccarini, 1999).

Success remains ambiguously defined even within the construction industry despite efforts of some researchers who have worked to explore the concept. Chan and Chan (2004) argue that project success means different things to different people, and the criteria of project success are enriched as time goes by. Freeman and Beale (1992) capture an interesting example of the different perception of people: "An Architect may consider success in terms of aesthetics, an Engineer in terms of technical competence, an accountant in terms of dollars spent under budget, a human resource manager in terms of employee satisfaction, and chief executive officers rate their success in the stock market." The technique may have informed attempts by various researchers to define the concept of project success.

Parfitt and Sanvido (1993) considered success as an intangible perceptive feeling, a measure criterion that varies with management expectations and varies among persons and with the phases of the project. Explaining why various stakeholders in a project will have different project objectives and criteria for measuring success. For example, while it is known that an Architect will view aesthetics and functionality as the main criterion, the Quantity Surveyor will view the building costs as the main criterion, while the client may think differently. It is also possible that an individual's perception of success may change from project to project.

Despite the different definitions provided by various writers, Guru (2008) acknowledges that there is a high level of agreement among researchers with the definition provided by Barker, Murphy, and Fisher (1988). According to the researchers, "project success is a matter of perception, and a project will most likely be perceived to be an 'overall success' if the project meets the technical performance specifications, and/or mission to be performed, and if there is a high level of satisfaction concerning the project outcome among key people on the project team, and key users or clientele of the project effort". To

date, this definition can be considered as the most agreed upon by researchers, who have proceeded to develop various models of measuring project success as discussed elsewhere in this chapter.

Stages of performance measurement in construction projects

It is essential to measure performance level (success or failure) in construction projects to determine whether planned improvements in the efficiency and quality of facilities are being achieved and to learn lessons for future projects, as earlier mentioned. Measuring of performance is an activity that should be carried out throughout the life of a construction project as discussed below (OGC, 2007):

1. Project evaluation: This is an ongoing check of how well the project is performing, and it entails both formal and informal reviews carried out on a continuous basis as part of the normal project and contract management procedures. These reviews include assessments of how well members of the integrated project team perform, how well the facility is performing regarding realizing identified benefits, progress against quality, cost and time, assessment of the client's capability and seeking opportunities to improve over time.
2. Post project review: A post-project review is carried out after construction is completed and focuses on how well the project was managed. It must include the views of suppliers and specialists who are at the point of actual delivery. It considers how well the project was the construction project performed against Client's goals such as cost and time predictability, safety, defects, and client satisfaction. It also considers lessons learned from the team-working/partnering approach taken; these lessons should be documented in a report and fed back into the client organization's standards for managing projects.
3. Post-implementation review: this is also known as Post Occupancy Evaluation and should be carried out when the facility has been in use for long enough to determine whether the business benefits have been achieved (typically twelve

months after completion and while the change is still recent enough for users to be aware of the impact of the change). There should be regular post-implementation reviews over the operational life of a facility. According to OGC (2007), the fundamental part of the project review and feedback is to make sure that lessons learned on one project are transferred effectively to other projects, not just within the same organization, but to other projects across the government.

This study anchors on post-project review. The review should be carried out relatively soon after construction has been completed to ensure that views are collected from members of the project team before they disperse.

2.3.5 Contemporary Models for Measuring Performance of Construction Projects

In an attempt to define and measure performance or the level of success/failure of construction projects, several researchers have come out with various models. The models can be traced back almost three decades ago when Cleland (1986) suggested that project success is meaningful only if considered from two vantage points: the degree to which the project's technical performance objective was attained on time and within budget; and the contribution that the project made to the strategic mission of the enterprise.

This revelation led to further studies on aspects of project's performance level and two years later, De Wit (1988) distinguished between *Project's* performance level *(*success) (measured against the overall objectives of the project) and *Project Management* success (measured against the widespread and traditional measures of performance against cost, time and quality). He also made a second distinction which is also important: the difference between *success criteria* (the measure by which success or failure of a project or business will be judged) and success factors (those inputs to the management system that lead directly or indirectly to the success of the project or business). These can also be referred to as performance indicators and performance determinants, respectively.

In addition to the work done by the earlier researchers, 1990s and 2000s saw the development of some of the more dynamic models of measuring project performance. Some of these models are discussed hereunder.

1. The Traditional View Model

The basic dimensions of cost, time and quality have been traditionally used as project criteria for measuring project management success. Atkinson (1999) identified the three dimensions as the 'Iron Triangle' as illustrated in figure 2.1.

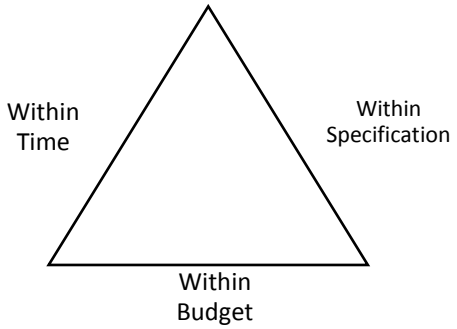

Figure 2.1: Traditional view of project management success

Source: Danie and Edmond (2005)

While several definitions have been developed for project success, it is worth noting that the three criteria (cost, time and quality) remain, and are included in every definition, though they are no longer considered as providing a comprehensive model. Evident from the many attempts by various researchers in the last two decades to come up with better models. Angus (2005) opined that the new models that were introduced over the years were meant to overcome the perceived inadequacies of the Traditional View Model, and can be grouped into two different approaches: one is to add more dimensions into the basic criteria while the other is to abstract to fewer dimensions. Some of the new models that have varied from the traditional view model are discussed below.

2. Shenhar's Model

Shenhar, Levy, and Dvir (1997) proposed that project success is divided into four dimensions as shown in Figure 2.2. The four dimensions in the model are time independent, with the first dimension occurring during the period of project execution and right after project execution. The second dimension can be assessed after a short time when the project has been delivered to the customer. The third dimension can be assessed after a significant level of sales has been achieved (one to two years). Finally, the fourth dimension can only be assessed three to five years after project completion.

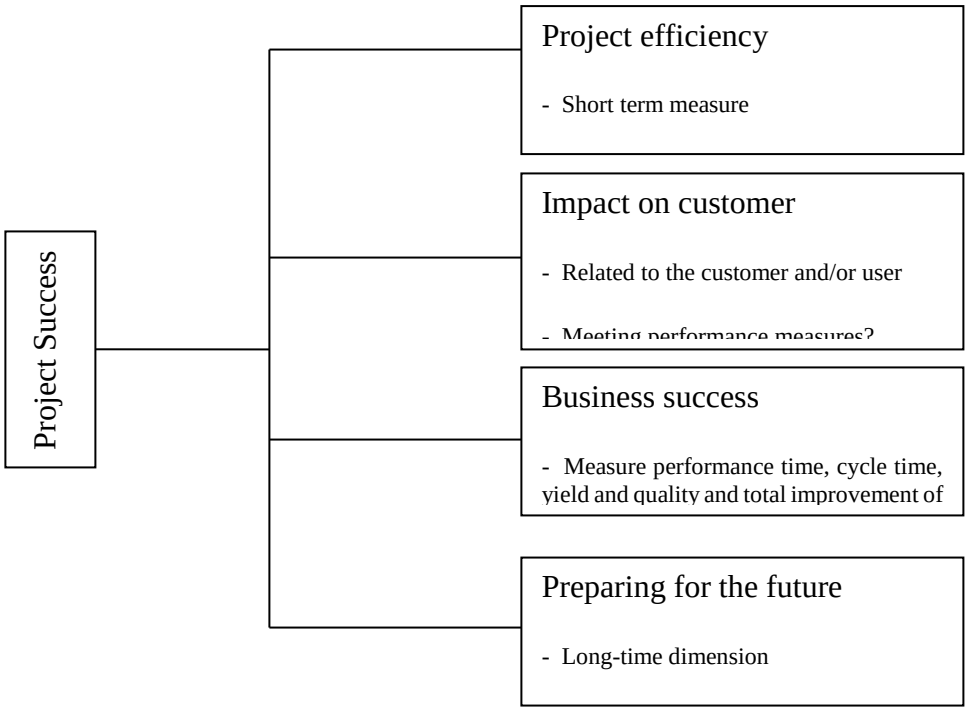

Figure 2.2: The four dimensions model of measuring project success

Source: Shenhar et al. (1997)

The Shenhar's model is expansive, and it is easy for the managers of the project to assess the progress of the project at different stages. Time is a dimensional factor at every of the

four stages, just like in Baccarini's model. However, the model is suited for the long-term projects.

3. Atkinson's Model

Atkinson (1999) derived a similar model of measuring project success in two stages: the delivery stage and the post-delivery stage. The first stage is 'the process of doing it right' and can be measured regarding cost, time, quality and efficiency of the project. The second stage has been divided into 'the system' and 'the benefits.' 'The system' deals with the benefits of the various stakeholders involved in the project and project resultant system, while 'the benefits' measures the impact on customer and business success.

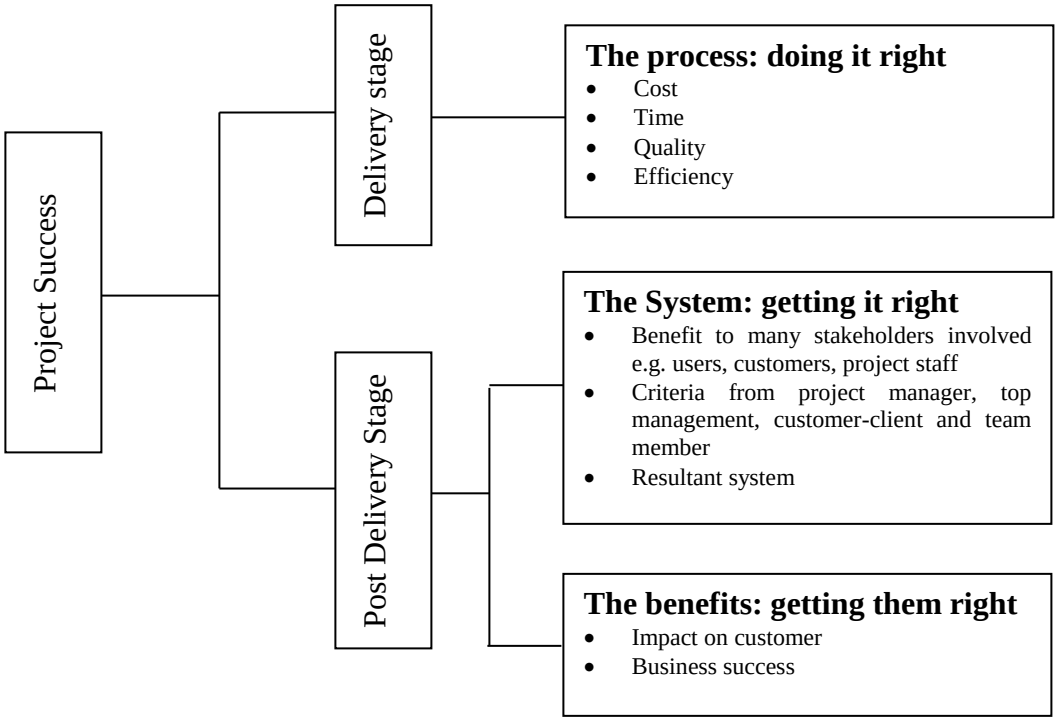

Figure 2.3: Atkinson's model of measuring project success

Source: Atkinson (1999)

The project is all-encompassing and comprehensive as it involves both the delivery and the post-delivery stages of the project development. However, the expansive nature of the model makes it susceptible to the exclusion of the project's fine details.

4. Lim and Mohamed Model

Lim and Mohamed (1999) viewed project success from the different perspective of the individual owner, developer, contractor, user, and the general public, etc. They proposed to evaluate the project from the micro and macro viewpoints as shown in figure 2.4 below.

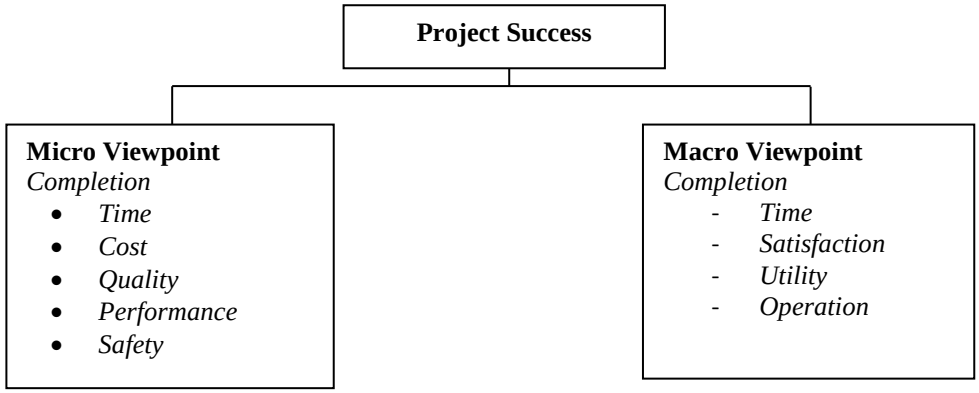

Figure 2.4: Micro and Macro Viewpoints of project success

Source: Lim and Mohamed (1999)

Lim and Mohamed Model can enhance faster deployment and client adoption. However, the model is met with challenges of market competitions and resources and this is linked to the Baccarini's model since it encompasses both the Micro and Macro project success view points

5. Baccarini's Model

Baccarini (1999) identified two distinct components of project success: Project Management success and Product success. Project Management success focuses upon the

project management process and, in particular, the successful accomplishment of the project about cost, time, and quality. The three dimensions have come to be recognized as indicative of the degree of the efficiency of project execution (Pinkerton, 2003). Product success deals with the effects of the project's final product and has three components; to satisfy the project goal, project purpose, and project stakeholders.

Although product success is distinguishable from project management success, the successful outcomes of both of them are inseparably linked (Danie, 2003). This view is also supported by Pinkerton (2003) who puts it that "if the venture is not a success, neither is the project." Therefore, to properly define and assess project success, the model proposes that a distinction should be made between product success and project management success. Thus, Baccarini's model of measuring project success can be summarised as presented in figure 2.5.

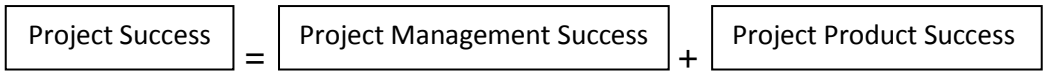

Figure 2.5: Baccarini's model of measuring project success

Source: Danie and Edmond (2005)

Baccarini's model is similar to Atkinson's concept, and in both cases time, cost and quality are the three main variables in measuring the success of project management. One of the limitations of this model is that there are projects where the success of the project is linked to the management of the same project.

6. The Success Dimensions and Measures Model

Sadeh, Dvir, and Shenhar (2000) divided project success into four dimensions as shown in table 2.2. The first dimension, meeting design goals, applies to a contract that is signed by the customer. The second dimension, the benefit to users, refers to benefit to customers

from the end products. The third dimension, the benefit to the developing organization, refers to the benefit gained by the developing organization as a result of executing the project. The last dimension is the benefit to the technological infrastructure of the country and firms involved in the development process of the project. The combination of the four dimensions provides the overall assessment of project success as indicated in table 2.2.

Table 2.2: Success dimensions and measure

Success Dimension	Success Measure
Meeting design goals	1. Functional specifications 2. Technical specifications 3. Schedule goals 4. Budget goals
The benefit to the end user	1. Meeting acquisition goals 2. Answering the operational need 3. Product entered service 4. Reached the end user in time 5. The product has a substantial time for use 6. Meaningful improvement of user operational level 7. The user is satisfied with the product
The benefit to the developing organization	1. Had relatively high profits 2. Opened a new market 3. Created a new product line 4. Developed a new technological capability 5. Increased positive reputation
The benefit to the defense and national infrastructure	1. Contributed to critical subjects 2. Maintained a flow of updated generations 3. Decreased dependence on outside sources 4. Contributed to other projects
Overall Success	**A combined measure for project success**

Source: Sadeh, Dvir, and Shenhar (2000)

The model comes with the advantages of breaking down the whole project into constituent stakeholders and then apportions the advantages that accrue to every group for their tasks and responsibilities. However, the overall combined measure of the project might be good, but there are certain parts where the project is performing extremely poorly and if it is to the organization itself, then definitely, the ultimate casualty is the organization's profitability.

7. Chan and Chan Model

Chan and Chan (2004) proposed a model of measuring the performance of construction projects using Key Performance Indicators (KPIs), based on the United Kingdom's construction industry's performance measurement model. The model presents a range of KPIs for measuring the performance of a construction project. These measures are grouped into two: subjective and objective measures as shown in figure 2.6.

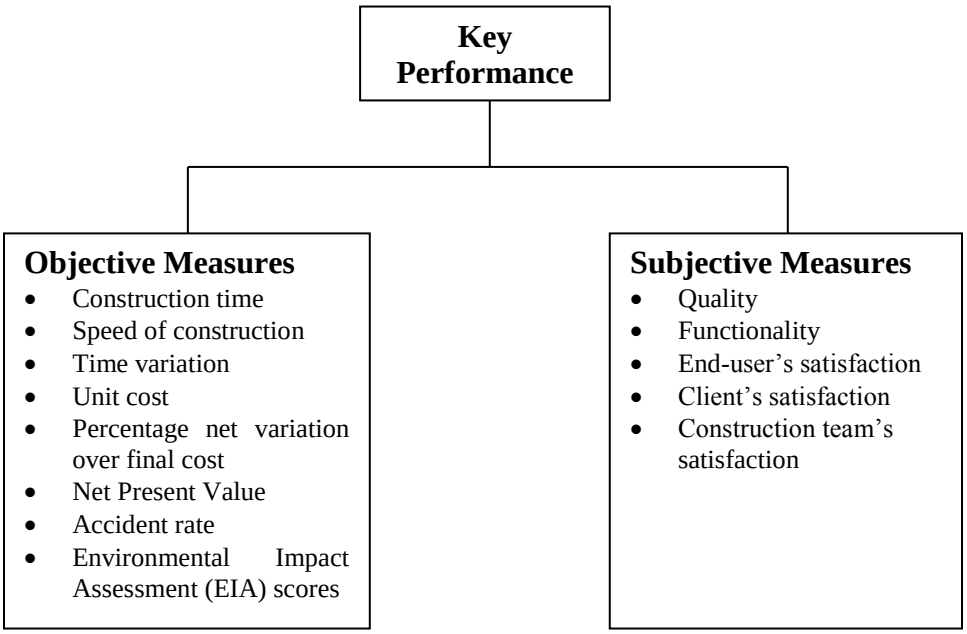

Figure 2.6: Key Performance Indicators for measuring project success

Source: Chan and Chan (2004)

Chan and Chan provided practical approaches to measuring the proposed KIPs, with mathematical formulae for calculating values of the subjective measures and a seven-point scale of a scoring system for the subjective measures. The model requires a structured and straightforward project where a mathematical formula can be used to generate the possible success. However, this model might not work for complex projects involving a lot of diverse information. This project comes forth with a measure of complexity diversity especially in project management and for that's why Baccarini's model is preferable.

8. Danie and Edmond Model

Danie and Edmond (2005) proposed a model of measuring project success, which incorporated the traditional definitions of project success into the DeLone and McLean model of Information System Success. This more comprehensive model incorporates both

the project management success and product success components of project success as viewed by Baccarini's model. The model presents the following eight dimensions for measuring success:

1. Quality of project management process,
2. Time,
3. Budget,
4. Specified information quality,
5. Specified service quality,
6. User satisfaction, and
7. Net benefit.

However, in an attempt to contain complexity, the Danie and Edmond Model has left out the difference in the perceptions of stakeholders and different system types. It is worth noting that some projects may hold vital one or both of the dimensions in the measurement of their success.

9. Construction Project Success Survey (CPSS) Model

Shawn, Donald, and Warren (2004) proposed the CPSS as a tool for measuring project success, taking into account the subjective and objective factors. The factors that this model uses for measurement are Cost, time, quality, performance, safety, and operating environment.

In addition to being a post-project evaluation tool, CPSS has the potential of providing a means of identifying attributes that are important to success at the onset of projects so that better planning can be done. This model can be of much benefit to the project managers who can use it as a planning tool to for good results, having known in advance the parameters for evaluation.

The model attempted to provide flexibility to account for the fact that every project is different from the rest. However, the researchers acknowledge that it is difficult to have a standard model for all types of projects due to the subjective factors in the evaluation, which vary with one's perception. The model is based on the measurement of large engineering projects and with the perception of experienced construction managers.

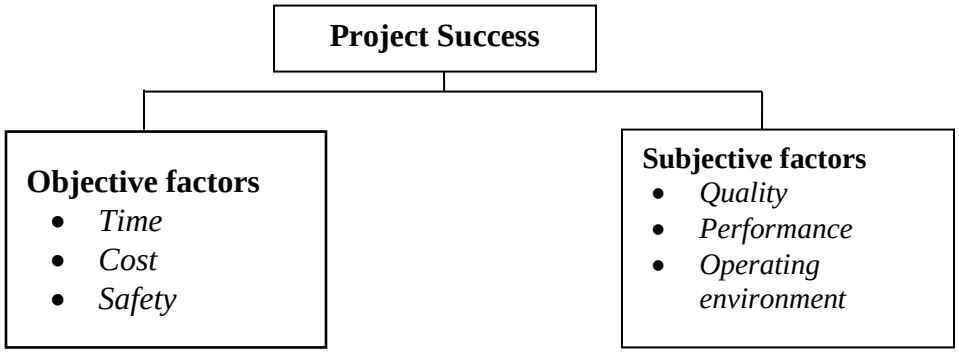

Figure 2.7: Construction Project Success Survey (CPSS) model

Source: Shawn, Donald, and Warren (2004)

One of the limitations of this model is that it is a post-project model and therefore, there is a possibility of not capturing the whole project in totality and its necessities. However, a post-project model as it is, has the mechanisms to identify some critical attributes at the beginning point of the project that is critical to the project's success.

10. Shahrzad and Hamidreza Model

Shahrzad and Hamidreza (2011) developed a model that would provide a basis for measuring of construction project success in Mapna Special Projects Construction & Development Co. (MD-3). MD-3 is a project-based company which mostly operates in the fields of power plant, utilities, and cogeneration construction industries. The model was proposed specifically for the MD-3 projects to enable the organization generally to compare the finished projects and establish a benchmark for its current and future projects.

The model is based on five project success criteria and applies a weighting system for the project success criteria to consolidate different success measures to just one stand-alone measure for the general consumption of the project. The five criteria are time performance, cost performance, quality performance, HSE (Health, Safety & Environment of the project) and client satisfaction. However, it is worth to note that this model is from the viewpoint of a performing organization but could be developed for other stakeholders' point of view. The model is linked to the Baccarini's model because it encompasses the three-dimensional factors in Baccarini's model which are time, quality and costs.

The model is presentedd in the form of an equation for calculating project success index, and the researched opined that the model can be used as a guideline for other project-based organizations to initiate their models.

The above models are not conclusive in the area of project performance measurement. There are some models which have been considered less useful for this study or relate very closely with other models already discussed. Examples of such models include the proposals by Patanakul and Milosevic (2009). However, the models presented above provide sufficient indication of the level of agreement and disagreement on the definition and measurement of project performance. When comparing all the models, one of the agreed issues is on using the basic criteria of cost, time and quality as part of project success/failure.

However, it is important to note that project performance goes beyond the performance of project management as projected by the three basic criteria. Pinto and Slevin (1988) after extensive research on project management concluded that:

> "Project success (or failure) is something much more complex than simply meeting cost, schedule, and performance specifications. Client satisfaction with the final result has a great deal to do with the perceived success or failure of projects."

Further, Barker, Murphy, and Fisher (1988) conclude that:

> "In the long run, what matters is whether the parties associated with and affected by a project are satisfied. Good schedule and cost performance means very little in the face of a poor performing end product".

And in the words of Barker *et al.* (1983):

> "Instead of using time, cost and quality performance as measures for project success (or failure), perceived performance should be the measure."

From the above assertions, it can be deduced that it is important to consider stakeholders' views when measuring the success of a given project.

2.3.6 Preferred Evaluation Model for CDF Construction Projects

One of the expected outcomes of this study is to develop a model for measuring the success of construction projects initiated by CDF in Kenya. The model will help in providing an objective method of establishing the success of the projects, thus meeting part of the first objective of the study.

From the reviewed literature, and given the aim of the study, a modification of Baccarini's Model offers the most suitable tool for measuring the performance of the projects in question. Baccarini's model fits in because it provides a clear distinction between project management performance and product performance and recognizes the importance of both in measuring the overall performance of a project. The model provides the following criteria for measuring project management performance:

1. Time,
2. Cost,
3. Quality, and

4. Project Team satisfaction (related to the project management process).

For measuring project product performance, the model identifies the following as criteria:

1. Project goal (meeting owner's strategic organizational objective), and
2. User Satisfaction (Project purpose, measured regarding how well the product satisfies users' needs).

The model incorporates the measures of stakeholders' satisfaction which has been a pertinent issue to projects under study and will assist to focus more on the hosting community members for the CDF projects who are usually the beneficiaries.

The component of project management success (or failure) in the Baccarini's model indicates the degree of efficiency of project execution (Pinkerton, 2003), and is crucial for this study because project management is the core discipline upon which this research is anchored. Furthermore, identification of the element of project management performance also helps in establishing project planning and control practices that can improve the performance of the projects.

The project product performance relates to the effects of the project's end-product and incorporates the measures of stakeholders' satisfaction which focuses on the customer who in this study will be represented by members of the communities hosting the project. It has been these same beneficiaries of the project who have constantly questioned the performance of various projects, thereby prompting the need for this research.

However, as mentioned earlier, modification to the Baccarini's Model will take care of the specific nature of the projects under study. This is an appreciation that each project type is unique, and there cannot be a single model that is suitable for measuring all types of projects. This situation is caused by the existence of subjective factors in evaluation which varies with one's perception (Shawn, Donald, and Warren, 2004). Therefore,

modification of the Baccarini's model was undertaken to suit the measuring of the performance of public construction projects funded by decentralized or devolved funds.

The model was modified to make it suitable for the projects under study by adding three criteria within the component of project management success. These are environmental impact, safety, and community participation. The relevance of each of the suggested criterion is discussed below.

1. Environmental performance

Environmental issues have now become a global concern, and the construction industry is a major contributor to environmental impact. For example, in Australia, 44% of the 14million tonnage of waste putt in landfills annually is attributed to the construction industry (Songer & Molenaar, 1997). It was because of such alarming statistics that the International Organization for Standards (ISO) developed the ISO 1400 series which contains 21 standards and guidance document on environmental management. The document provides a benchmark for proper environmental practice.

The importance of environmental performance has grown over time. The United Nations (UN) and some economic blocks such as the European Union and ASEAN have introduced environmental protection laws or directives to member countries (Wong & Chan, 2000). And the East African Community (EAC) is the latest to move with the development of a catalogue of standards in 2010. The catalogues include one on environmental protection and management to be observed by member countries, which include Kenya (East African Community, 2012).

Kenya, which boasts of hosting the headquarters of the environmental arm of the UN, the United Nations Environmental Programme (UNEP), has gone further and developed the framework to protect and manage her environment through the constitution and legislation. Under the Environmental Management and Co-ordination Act, it is now mandatory to undertake an Environmental Impact Assessment (EIA) before commencing

any construction work. It is therefore not practical to wish away environmental issues when dealing with construction projects within the jurisdiction of Kenya. The enforcement of EIA provides a good measure of environmental performance, and the EIA score can be used as an indicator to reflect the environmental performance of a given project (Shahrzad & Hamidreza, 2011).

This is not the first time that environmental performance is being considered as a criterion for measuring project success of failure. Kumaraswamy and Thorpe (1996), Chan and Chan (2004), and Shahrzad and Hamidreza (2011) are some of the previous researchers who include environmental performance as part of project evaluation criteria. This study is borrowing from these previous researchers.

2. Safety

Health and safety are defined as the degree to which the general conditions promote the completion of a project without major accidents of injuries (Bubshait & Almohawis, 1994). Construction sites being workplaces must adhere to set standards that protect the health and offer safety of workers.

The International Labour Organisation (ILO), an agency of the United Nations, is the organization responsible for drawing up and overseeing international labor standards. ILO estimates that there are 270 million occupational accidents, 160 million work-related diseases and 2.2 million work-related deaths each year (International Labour Organization, 2012). To reverse these statistics, ILO has developed a programme on Safety and Health at Work and the Environment (Safework) which is based on the principle that 'Decent Work Must be Safe Work.'

According to ILO, Safework aims to create worldwide awareness of the dimensions and consequences of work-related accidents and diseases; to place Occupational Safety and Health (OSH) on the international and national agendas; and to provide support to the national efforts for the improvement of OSH systems and programmes in line with

relevant international labour standards. In line with the aims, ILO developed an instrument of ratification for Safework, the Promotional Framework for Occupational Safety and Health Convention 2006 (No. 187), which Kenya has since ratified. Kenya domesticated the ILO instrument by enacted the Occupational Safety and Health Act 2007, which regulates the health and safety of workers in all workplaces including construction sites.

Safety as a criterion for measuring performance of construction projects has been raised for a long time by several researchers (Sanvido *et al*., 1992; Parfitt & Sanvido, 1993; Kometa *et al*., 1995; Atkinson, 1999; Lim & Mohammed, 1999; Chan & Chan, 2004; Shawn, Donald & Warren, 2004: Shahrzad & Hamidreza, 2011). And in applying Key Performance Indicators (KIPs) to develop a benchmarking model for evaluating performance of construction projects in Hong Kong, Yeung el al. (2012) established that safety performance was the most important among the top ten KIPs ranked as follows: (1) safety performance; (2) cost performance; (3) time performance; (4) quality performance; (5) client's satisfaction; (6) effectiveness of communication; (7) end-user satisfaction; (8) effectiveness of planning; (9) functionality; and (10) environmental performance.

Therefore, indicating that safety performance has come of age and in some quarters, is being ranked more important a criterion than even the traditional 'iron triangle' criteria of cost, time and quality. It is therefore crucial that any current research in the evaluation of the performance of construction projects recognizes this important criterion.

3. Community Participation

Community participation has been defined by Heller (1984) as a process in which people take part in decision making in their institutions, programmes, and environments that affect them. The concept of people's participation in the community development projects has been talked and written about since the 1950s or even before (Guijt and Shah, 1998; Nelson and Wright, 1995). Many authors and development agencies argue that genuine people's participation can increase the efficiency, effectiveness, self-reliance, coverage,

and sustainability of development projects and programmes (Kumar,2002; Oakley,1991). Thus, people's participation becomes an important consideration in measuring the success of failure of community development projects like those financed through National Government Constituencies Development Fund (CDF) in Kenya.

The CDF is one of the devolved funds and was established under the CDF Act 2003 (repealed). Its purpose was, and still is, to take development to the citizens at the local levels or the grassroots, within the shortest time, to alleviate poverty. This calls for greater citizen participation at the local level to achieve the intended goals, as provided for in the CDF guidelines. However, since the inception of the CDF numerous criticisms have come up in the media and public forums over the way the fund is being managed and utilized. One of the key areas of policy concern that has emerged is the question as to whether there is local participation in the project cycle by the pressing needs identification, project identification, project planning, project management and implementation, and participation in operation and maintenance (Mapesa & Kibua, 2006). This concern qualifies the level of community participation to be considered as a criterion when evaluating the performance of CDF construction projects.

In evaluating performance CDF projects, a project may perform well in other criteria but be perceived a failure due to poor community participation. For example, according to a study undertaken by Kinyoda (2008), there was a low level of community participation in CDF projects in Makadara constituency which led to a high level of dissatisfaction and poor project ownership by the constituents. The study found that constituents had not been completely involved in decision making, identification, selection, prioritization and implementation of the projects and thus regarded the projects as belonging to the area member of parliament. Even though these projects were completed on budget and time, they failed on community participation and ownership which could lead to problems in sustainability.

Participation can be distinguished in a seven-step ladder for analysis (Pretty, 1995) as detailed on table 2.3. The strength of participation moves from level one to level seven in ascending order as presented on the table below. Interactive participation could produce the best level of community participation in CDF projects or other projects financed through devolved funds, given the nature of search funds. However, it may not be able to achieve the highest level of community participation because the level of participation is influenced by community awareness, availability of constituents to attend meetings, level of education of constituents and accessibility of the CDF (Mapesa & Kibua, 2006).

Table 2.3: Typology of participation

Level	Characteristic of each type
1. Passive Participation	People participate by being told what is going to happen or has already happened. It is a unilateral announcement by leaders or project management without listening to people's responses or even asking their opinion.
2. Participation in information giving	People participate by answering questions posed by extractive researchers using questionnaire surveys or similar approaches. People do not have the opportunity to influence proceedings as the findings of the research are neither shared nor checked for accuracy.
3.Participation by consultation	People participate by being consulted, and external people listen to views. These external professionals define both problems and solutions and may modify these in light of people's responses. Such a consultative process does not concede any share in decision making and professionals are under no obligation to take on board people's views.
4.Participation for material incentives	People participate by providing resources, for example, labors, in return for food, cash or other material incentives. It is very common to see this called participation, yet people have no stake in prolonging activities when the incentives end.
5.Functional participation	People participate by forming groups to meet predetermined objectives related to the project which can involve the development or promotion of externally initiated social organization. Such involvement does not tend to occur at the early stages of project cycle or planning, but rather after major decisions have been made. These institutions tend to be dependent on external initiators and facilitators but may become self-dependent.
6.Interactive participation	People participate in joint analysis, which leads to action plans and the formation of new local institutions or the strengthening of existing ones. It tends to involve interdisciplinary methodologies that seek multiple perspectives and make use of systematic and structured learning process. These groups take control over local decisions and so people have a stake in maintaining structures or practices.
7.Self-mobilization	People participate by taking initiatives independent of external institutions to change systems. They develop contacts with external institutions to change systems. They develop contacts with external institutions for resources and technical advice they need but retain control over how resources are used. Such self-initiated mobilization and collective action may challenge existing inequitable distribution of wealth and power.

Source: Adapted from Pretty (1995, pp. 1252) and Kumar (2002, pp.24-25)

2.4 Determinants of Project Performance

2.4.1 Project Performance Factors

Performance factors or determinants are the inputs to the management system that lead directly or indirectly to the success or failure of the project. Since success (or failure) is more of perception, Guru (2008) concludes that several factors may have a bearing on project performance and which may differ from one project to another.

Research in project performance factors on projects was aimed at identifying those levers that project managers can pull to increase the likelihood of achieving a successful outcome for their projects. Initial research on the critical performance factors of a project was primarily focused on the control aspects of the project. Later studies concluded that the initial research on critical performance factors was too narrowly directed towards developing standard tools and techniques for project management. A new approach emerged, consisting of large studies on the critical success/failure factors for projects, which ended up showing that there are other factors to be taken into account in managing a project successfully other than scheduling alone.

In the 1990s comments started to appear on the methods used in research on critical performance factors. A response came from Belassi and Tukel (1996) who stated that sound research on critical performance factors has to:

1. Distinguish between performance factors and success criteria; and
2. Distinguish performance factors within the control of the project manager and factors outside the control of the project manager.

Table 2.4 shows lists of critical performance factors proposed by various researchers, as developed in literature tabulated by Belassi and Tukel (1996).

Table 2.4: Seven lists of performance factors developed by initial researchers

Martin (1976)	Locke (1984)	Cleland and King (1983)	Sayles and Chandler (1971)	Baker, Murphy, and Fisher (1983)	Pinto and Slevin (1989)	Morris and Hough (1987)
Define goals	Make project commitments known	Project summary	Project manager's competence	Clear goals	Top management	Project objectives
Select project organizational philosophy	Project authority from the top	Operational concept	Scheduling	Goal commitment of project team	Client consultation	Technical uncertainty innovation
General management support	Appoint competent project manager	Top management support	Control systems and responsibilities	On-site project manager	Personnel recruitment	Politics
Organize and delegate authority	Set up communications and procedures	Financial support	Monitoring and feedback	Adequate funding to completion	Technical tasks	Community involvement
Select the project team	Set up a control mechanism (schedules, etc.)	Logistic requirements	Continuing involvement in the project	Adequate project team capability	Client acceptance	Schedule duration urgency
Allocate sufficient resources	Progress meetings	Facility support		Accurate initial cost estimates	Monitoring and feedback	Financial contract legal problem
Provide for control and information mechanisms		Market intelligence (who is the client)		Minimum start-up difficulties	Communication	Implement problems
Require and review		Project schedule		Planning and control techniques	Trouble-shooting	

	Executive development and training	Task (vs. Social orientation)	Characteristics of the project team leader
	Human resources and organization	Absence of bureaucrac y	Power and politics
	Acquisition		Environment events urgency
	Information and communicatio n channels		
	Project review		

Source: Belassi and Tukel (1996)

From the literature review, Belassi and Tukel (1996) developed a framework for critical performance factors for projects which takes external factors influencing success into account. The framework developed does not provide a single list of success factors but defines groups of success factors. They grouped the factors into four areas:

1. Factors related to the project
2. Factors related to the project manager and the team members
3. Factors related to the organization
4. Factors related to the external environment

The various success factors falling in the four groups are presented in table 2.5.

Table 2.5: Grouping of project performance factors by Belassi and Tukel (1996)

Factor Group	Success Factors
Factors related to the Project	1. Size and value 2. The uniqueness of project activity 3. The density of a project 4. Lifecycle 5. Urgency
Factors relating to the Project Manager and	1. Ability to delegate authority 2. Ability to trade-off 3. Ability to coordinate 4. Perception of his role and responsibilities 5. Competence 6. Commitment
Project Team Members	1. Technical Background 2. Communication skills 3. Trouble shooting 4. Commitment
Factors related to the Organisation	1. Top management support 2. Project organizational structure 3. Functional manager's support 4. Project champion
Factors related to the External Environment	1. Political environment 2. Economic environment 3. Social environment 4. Technological environment 5. Nature 6. Client 7. Competitions 8. Sub-contractors

Source: Belassi and Tukel (1996)

Belassi and Tukel (1999) further came out with some important relationships between critical performance factors and project characteristics. For example, they found that when project size and value are critical factors, then the project has a matrix organizational form. Similarly, when the time is used to measure project success, then a project manager's

skills and communication between the team members become critical. This finding informs that it is important to identify the critical performance factors for every project characteristic and concentrate efforts in the right direction to maximize on the success of the project.

Several researchers in the field of critical performance (success or failure) factors after that seem to agree with a grouping of performance factors as introduced by Belassi and Tukel. Chua *et al.* (1999) grouped sixty-seven performance factors into four main project aspects, namely project characteristics, contractual arrangements, project participants, and interactive processes in a hierarchical model for project success. These success factors are presented in table 2.6 below.

Table 2.6: Grouping of project performance factors by Chua et al. (1999)

Project Aspect	**Success-related Factors**
Project Characteristics	(1)political risks; (2)economic risks; (3)impact on public; (4)technical approval authorities; (5)adequacy of funding; (6)site limitation and location; (7)constructability; (8)pioneering status; (9)project size
Contractual Arrangements	(10)realistic obligations/clear objectives; (11) risk identification and allocation; (12) adequacy of plans and specifications; (13)formal dispute resolution process; (14)motivation/incentives
Project Participants	(15)PM competencies; (16)PM authority; (17)PM commitment and involvement; (18)capability of client key personnel; (19)competency of client proposed team;(20)client team turnover rate;(21)client top management support;(22)client track record;(23)client level of service;(24)Capability of contractor key personnel;(25)competency of contractor proposed team;(26)contractor team turnover rate;(27)contractor top management support;(28)contractor track record;(29)contractor level of service;(30)capability of consultant key personnel;(31)competency of consultant proposed team;(32)consultant team turnover rate;(33)consultant top

	management support;(34)consultant track record;(35)consultant level of service;(36)capability of subcontractors key personnel;(37)competency of subcontractors proposed team;(38)subcontractors team turnover rate;(39)subcontractors top management support;(40)subcontractors track record;(41)subcontractors level of service;(42)capability of suppliers key personnel;(43)competency of suppliers proposed team;(44)suppliers team turnover rate;(45)suppliers top management support;(46)suppliers track record;(47)suppliers level of service
Interactive processes	(48)Formal design communication;(49)informal design communication;(50)formal construction communication;(51)informal construction communication;(52)functional plans;(53)design complete at construction start;(54)constructability program;(55)level of modularization;(56)level of automation;(57)level of skill labours required;(58)report updates;(59)budget updates;(60)schedule updates;(61)design control meetings;(62)construction control meetings;(63)site inspections;(64)work organization chart;(65)common goal;(66)motivational factor;(67)relationships

Source: Chua et al. (1999)

Abdullah and Ramly (2006) grouped performance factors into four groups as shown in table 2.7:

Table 2.7: Grouping of project performance factors by Abdullah and Ramly (2006)

Factor Group	Performance Factors
Human Management	1. Team and leadership 2. Project manager 3. Communication 4. Stakeholder management
Process	1. Control and Monitoring 2. Quality management 3. Risk management 4. Learning organization 5. Performance management
Organization	1. Scheduling 2. Planning 3. Organization 4. Financial resources 5. Policy and strategy 6. External environment
Contractual and Technical	1. Contracting 2. Contractor 3. Innovation

Source: Developed from Abdullah and Ramly (2006)

Abdullah and Ramly (2006) established in their research that out of the above eighteen (18) performance factors, ten (10) were the most critical in the following order:

1. Team and Leadership,
2. Project Management,
3. Communication,
4. Stakeholder Management,
5. Planning,
6. Scheduling,
7. Organization,

8. Control and Monitoring,
9. Financial Resources, and
10. Quality Management.

The research (Abudullah and Ramly, 2006) further established that based on the categorization of the critical performance factors, the criticality is ranked as follows: Human, Organisation, Process, and Contractual. This outcome was important as it helped to identify the most important group of critical success factors to consider for a successful project. This is supported by Guru (2008) who opined that 'it is impossible to come up with all possible critical factors that might affect outcome due to the diversity of projects but identifying the groups to which the critical factors belong would be sufficient for better evaluation of projects.'

However, this was not the first time that performance factors were grouped. In 2004, Chan et al. grouped success factors for a construction project in five categories: Project Management Actions, Project Procedures, Project-Related Factors, Human-related Factors, and External Environment Factors. This was later echoed by Saqib et al. (2008). In both studies, the three Project Management Factors (Planning, Control, and Feedback) that form part of the hypothesis in this study were identified for analysis.

The preceding discussion is based on projects, generally, with a bias to private projects. It is also important that a specific critical success (or failure) factors relating to public projects, for which the CDF projects under this study belong, are also reviewed.

2.4.2 Performance level (Success/Failure) Factors for Public Projects

The above literature review has perceived the project performance framework as a universal tool. The outcome of the studies reviewed therein is less applicable to public construction projects because they focus on generic construction projects. Given the distinct objectives and characteristics of public construction projects, it is expected that

their success factors would not be the same as those associated with private sector projects or even Private Public Partnership (PPP) projects. This is why some researchers have perceived the project performance framework in a context-specific tool and proceeded to carry out specific studies on critical performance factors for public sector construction projects. The outcomes of some of such studies and mentioned here below.

Torp, Austeng, and Mengesha (2005) established eleven performance factors for public projects in Norway as follows:

1. Project organization,
2. Contract strategy,
3. Project planning and control,
4. Stable framework conditions,
5. Stakeholder management,
6. Technical factors,
7. Nature and market conditions,
8. Objective management,
9. Top management support,
10. Interface towards surrounding projects, and
11. Management of decisions.

Hussain, Hunjra, and Rashid (2011) established the following eight performance success factors for public sector construction projects in Pakistan:

1. Project management tools,
2. Organization/client's commitment,
3. Project Manager,
4. Contract strategy,
5. Environment (internal and external),
6. Risk identification,

7. Project related factors, and
8. Top management support.

Using Factor Analysis, Tabish and Jha (2011) found the following four factors as critical to the performance of public construction projects in India:

1. Awareness and compliance with rules and regulations,
2. Pre-project planning and clarity in scope,
3. Effective partnering among project participants, and
4. External monitoring and control.

An exploratory research by Wai *et al* (2013) on Social Infrastructure Projects (SIP) in Malaysia reduced a set of forty-one (41) performance factors to six dimensions using Principal Component Analysis. These dimensions are based on the idea of project life-cycle and are as follows:

1. Pre-construction factor,
2. Construction factor,
3. Post-construction factor, and
4. Internal factors, which comprises; (a) organizational factor, (b) information management factor, and (c) change management factor.

In Nigeria, a survey by Amade *et al.* (2015) identified a set of six (6) critical performance factors for public sector construction projects, after subjecting sixteen (16) of their initial variables to factor analysis. The six critical factors were:

1. An efficient and effective procurement process/method
2. Effective communication management
3. Adequate planning
4. Leadership skills of the project manager
5. Weather conditions

6. Effective coordination of the project activities

The above studies have shown that even within the context of public projects, the critical performance factors vary from one country to another, though with some common factors cutting across. For this study, the success factors being sort out are not just for the general public projects, but more specifically for the CDF funded construction projects. It's therefore important to review any work carried out in this specific area.

2.4.3 Performance Factors for CDF Projects

As discussed earlier in this chapter, the CDF system in Kenya is the most established worldwide, and the majority of nations with similar schemes have borrowed heavily from it. A current check indicates a lack of studies on success/failure factors for CDF projects in the other countries. However, in Kenya, some studies have been conducted on CDF projects from which some performance factors can be derived.

From the outcome of a study carried out by Ochieng and Tubey (2013) aimed at exploring performance factors that influence the management of CDF, the following factors can be derived to influence the performance of a project:

1. Knowledge of CDF management rules by the Project Management Committee (PMC),
2. Adequate financing during construction, and
3. Involvement of the local community.

Earlier on, effective monitoring and evaluation (M&E) were also advanced as one of the factors that lead to the success of CDF projects in a study carried out by Ochieng *et al.* (2012). Another research by Nyaguthii and Oyugi (2013) identified the involvement of the community as one of the factors critical to the performance of a CDF project.

So far, the above five mentioned factors are the only ones identified but were not the only ones that could be considered as having influence on the performance of CDF projects. As such, a study to identify the other factors was timely. Also, a study to identify the critical factors among all the factors influencing the performance of CDF projects was yet to be carried out.

2.5 Literature Gap

From the literature reviewed, there is no evaluation model that has been developed to measure the performance of CDF construction projects. None of the studied contemporary evaluation frameworks considers the aspects of community participation, which is a key factor in the management of CDF projects. This is so because CDF is a participatory fund that can only succeed if members of the public and community groups are involved in all its stages (Gikonyo, 2008). This, therefore, calls for the development of an appropriate model that includes community participation as one of the performance indicators.

Since there is no framework for evaluation, it follows that critical success factors for CDF projects are yet to be developed. The critical performance factors (or determinants of project performance) can be developed from the existing factors that have been established in the reviewed literature.

This study seeks to fill the two gaps by providing a statistical model for evaluating construction project initiated by CDF and establishing the critical performance factors for the projects.

2.6 Theoretical Framework

This study is guided by the Theory of Construction Management whose proponents were Radosavljevic and Bennett (2012). The theory focusses on the efficiency of construction projects and involves creating a model of construction management that utilizes the differentiated methods to ensure the success of construction projects.

This theory was founded on Toyota production system, and development of Lean Construction in Japan, and the others present Japanese construction industry as the most advanced (in providing total service) as per the parameters of the theory. The theory contains twenty-five propositions that are intended as a guide in decision making to improve the performance of construction projects. The authors aimed to provide a 'rigorous theory' based on a 'toolkit of concepts and relationships' that would improve the efficiency and quality of construction products. Similarly, this study is aimed to develop a statistical model that explains the relationship between performance and its determinant factors for CDF construction projects.

The theory of construction management is employed here to emphasize the importance of establishing the critical factors that influence the performance of the projects under study, and the relevant contemporary frameworks and models have been reviewed to identify the study variables. This led to the establishment of nine-factor that this study hypothesized as determinants of performance of CDF construction projects as illustrated in the conceptual framework in figure 2.8.

2.7 Conceptual Framework

A conceptual framework is an analytical tool with various contexts and variations. It helps in organizing the project ideas and distinctions of the conceptual tools. A good conceptual framework is easy to read and is representative of the literature therein, and so it becomes easy in preceding processes especially in the implementation of the project. The success of the project must be judged by the factor considerations that together necessitate the project success and its subsequent implementation.

Despite the lack of agreement concerning the criteria by which success is judged in a project, it remains a major concern and a recurring theme in the field of project management. Crawford (2002) opined that project success is an important project management issue and remains one of the frequently discussed topics. And in this review,

pertinent issues have come up, and of more relevant to this study are performance factors and performance criteria. The factors that contribute to the success/failure of a project are known as *performance factors,* and the success or failure of projects is judged by *performance criteria***.**

2.7.1 Performance Criteria for the Proposed Framework

Performance criteria are the measures by which the success or failure of a project will be measured. Early work on the performance criteria assumed that the main criteria for performance were the so-called 'golden triangle' of time, budget and quality. However, according to Westerveld (2003), the issue of project performance turned out to be far subtler than this, and there are more criteria than can be identified. He further states as follows:

> "Not only is there a basket of potentially competing criteria, but the judgement is also made by a wide range of potential stakeholders, over different time horizons. Van Atek (1996) even defines project success as 'the satisfaction of all stakeholders."

It is this 'the satisfaction of all stakeholders' endeavor that has led to modification of Baccarini's model to try and measure project performance in the most comprehensive, but practical way. The modification has added three new criteria to and eliminated one from the Baccarini's model, and the preferred model, therefore, has a total of nine criteria listed below:

1. Time
2. Cost
3. Quality
4. Project Team Satisfaction
5. Environmental Performance

6. Safety
7. Community Participation
8. Project goals
9. User Satisfaction

2.7.2 Performance Factors for the Proposed Framework

The three factors that form a hypothesis of this study, together with the four performance factors so far identified in studies carried out on CDF projects all form part of the proposal. The study also borrowed from the ten most critical success factors for construction projects in general as established by Abdullah and Ramly (2006), and the performance factors identified in studies involving public construction projects. From the preceding frameworks, the following nine factors have been identified for consideration in this study:

1. Project Manager
2. Planning
3. Control and monitoring
4. Communication
5. Financial Resources
6. Community involvement
7. Stakeholder management
8. Knowledge of CDF management guidelines
9. Feedback capabilities

It is the above factors that this study hypothesis as determinants of the level of performance of the CDF construction projects as measured against the identified criteria herein.

2.7.3 Diagrammatic Presentation of the Proposed Framework

The preferred model illustrating the relationship between the performance criteria and performance factors is diagrammatically presented in figure 2.8.

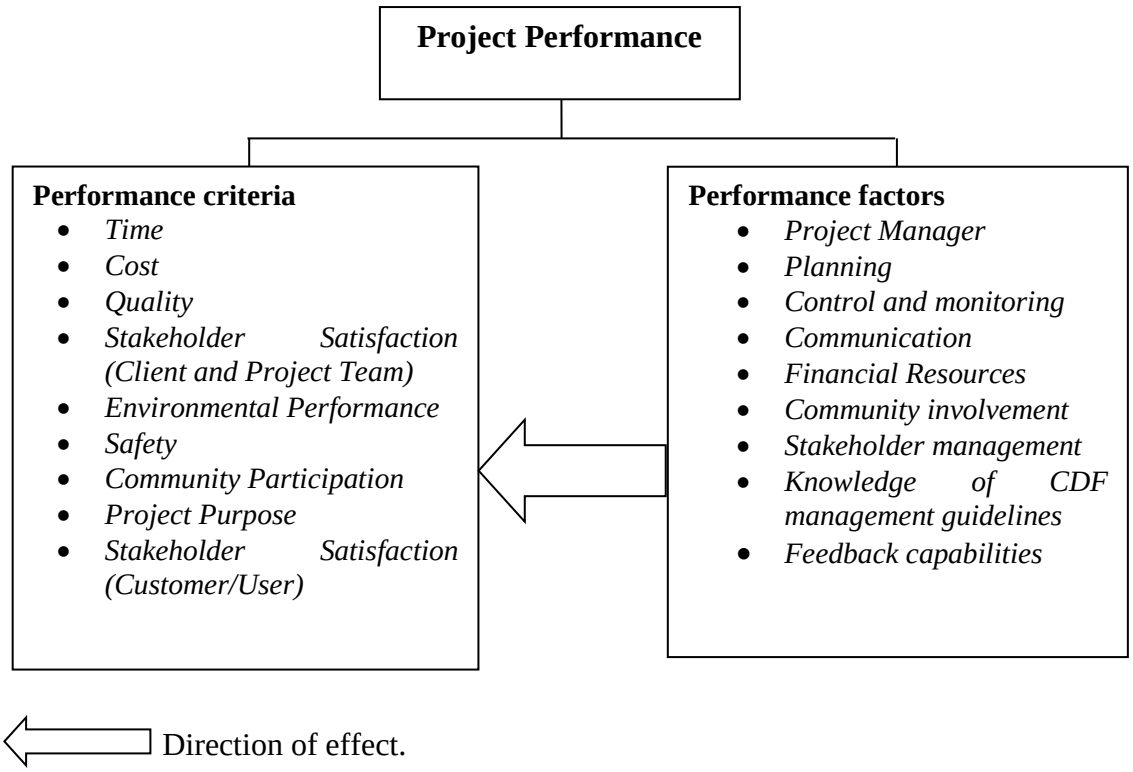

Figure 2.8: Proposed conceptual framework for performance criteria and performance factors

Source: Developed for this study by the Researcher, 2019

The above conceptual framework provides the concepts that were transformed into variables, and for which data was collected and analysed to achieve the aim of this study.

2.8 Summary

This study aimed at developing a standardized post-project review model that could be used to evaluate the performance of construction projects initiated by the National Government Constituencies Development Fund in Kenya (CDF), and identify the project management practices (performance factors) that are critical for the success of the projects.

This chapter reviewed the literature relating to the performance of construction projects. The chapter discussed and reviewed literature, identified the literature gaps and also discussed the theoretical and presented the conceptual framework. The next chapter will discuss the research methodology and will include: study design, target population, the operationalization of variables, sample size determination and how the data was analysed.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The previous chapter, the review of the literature, helped to identify the various variables that were to be considered for measurement to enable the main objective of the study to be achieved. The parameters include developing a model for measuring the performance of construction projects initiated by CDF in Kenya. Thus, resulting to the reviewing of the existing frameworks and for measuring construction projects and establishing both the *performance criteria* (success/failure indicators) and *performance factors* (success/failure determinants).

This chapter, therefore, sought to elaborate on the process of planning on how the relevant data was collected and analyzed to achieve the objectives of the study. The chapter covers research strategy, research site and target population, sample design, data collection, variables in the study, data analysis, and ethical issues.

3.2 Research Strategy and Design

The research strategy adopted is the quantitative approach, which the researcher considered to be most adequate in addressing the study objectives, which called for statistical data analysis.

In regard to the kind of problem under this study, the most suitable research design adopted was survey research within a case study. According to The Kenya Institute of Management (2009), a research design seeks to provide answers to research questions and control variables. Therefore, the appropriate type of research design should be identified for the problem under study before other methodological procedures are considered.

The survey design attempts to quantify social phenomena issues, conditions, and problems that are prevalent in the society (Mugenda, 2008). The problem under this study had a social dimension with the vast population to be observed directly. Besides, there was more than one variable to be measured as outlined in the study objectives, and the survey design enabled the researcher to assess the relationships between these variables. The design was also handy as the problem was an existing phenomenon whose relevant information could be easily gathered through interviews or direct observation.

Similarly, the survey design took the form of cross-sectional study as opposed to case-control study. In this regard, the research sought to establish whether there was a significant relationship between the variables identified in the hypothesis statement.

3.3 Research Site and Target Population

3.3.1 Research Site

The study was carried out in constituencies within Siaya County in the Republic of Kenya. Kenya is a country in East Africa that lies on the equator. Its capital and largest city are Nairobi. Kenya borders the Indian Ocean to its south-east, Tanzania to the south, Uganda to the west, South Sudan to the north-west, Ethiopia to the north and Somalia to the north-east. Kenya has a land area of 580,000 km^2 and a population of a little over 43 million residents (Kenya National Bureau of Statistics (KNBS), 2010). It lies between latitudes 5°N and 5°S, and longitudes 34° and 42°E. From the coast on the Indian Ocean, the low plains rise to central highlands. The highlands are bisected by the Great Rift Valley; a fertile plateau lies in the east (Rough Guides Ltd, 2006).

Kenya's climate varies from tropical along the coast to temperate inland to arid in the north and northeast parts of the country. The "long rains" season occurs from March/April to May/June. The "short rains" season occurs from October to November/December. The

hottest period is February and March, leading into the season of the long rains, and the coldest is in July and August.

Although Kenya is the biggest and most advanced economy in east and central Africa and a minority of the urban population often lives a misleading impression of affluence, Kenya is still a poor developing country with a Human Development Index (HDI) of 0.509, putting the country at position 143 out of 185 with half of the population living in absolute poverty (United Nations, 2012). The important agricultural sector is one of the least developed and largely inefficient, employing 75 percent of the workforce compared to the less than 3 percent in the food secure developed countries.

Administratively, Kenya is divided into 47 semi-autonomous counties headed by governors who are elected for a five-year term, renewable once as per the current constitution which came in force in March 2013. Under the previous constitution, Kenya comprised eight provinces each headed by a Provincial Commissioner (centrally appointed by the President). Each of the eight provinces comprised some constituencies as an electoral subdivision, each represented by a Member of Parliament (MP). However, after the promulgation of the current constitution in August 2010, the provinces were replaced by the 47 counties, and the number of constituencies was increased from 210 to 290 (Library of Congress- Federal Research Division, 2012).

All the 210 constituencies that existed in the inception of CDF Act have received, and continue to receive funds every financial year, and it's expected that all have used portions of the funds for constructing public facilities as directed by the CDF Act and regulations. Therefore, any of the 210 constituencies, a group of some or all of them can be considered as the location of the study.

Due to the impracticality of covering the entire country and the need to reduce the travel distances between sites in constituencies located far apart in different counties, all the six

constituencies within Siaya County formed the geographical location of the study. These constituencies were: Bondo, Rarieda, Gem, Alego-Usonga, Ugenya, and Ugunja.

Figure 3.1: A map for Siaya County, Kenya

Source, Google maps, 2019

Siaya County is one of the counties in the former Nyanza Province in the southwest part of Kenya. It covers an area of approximately 2530km^2 with a population of approximately 842,304 distributed within the six constituencies as follows: Ugunja, 93,372; Ugenya,

108,934; Rarieda, 134,558, Bondo, 157,522; Gem, 160,675; Alego-Usonga, 187,243 (www.softkenya.com).

3.3.2 Target Population

For the purposes of the survey, the target population consisted of all completed CDF construction projects (buildings only) in Siaya County within the last one year after expiry of the Defects Liability Period (DLP), together with all individuals associated with them as clients, consultants, contractors and beneficiaries (users and customers). There were 51 projects in Siaya County that had been completed over the last one year at the time of data collection. However, the accessible population consisted of those units within the 6 constituencies selected to form the research site as explained in 3.3.1 above. The list of the accessible population (sampling frame) was compiled from the Board of Management of CDF and also verified with the National Government Constituency Development Fund Committees (CDFCs) of the selected constituencies.

Table 3.1: Projects completed within the last one Year in Siaya County, Kenya

Constituency	No. of projects
Rarienda	10
Gem	10
Alego-Usonga	10
Ugenya	10
Ugunja	11
Total	**51**

3.4 Sample Design

3.4.1 Sample Size Determination

The decision about sample size is not definite. Because, it depends on some considerations (Bryman, 2008). In the end, the sample size, like all aspects of research, is subjected to peer review, consensual validation, and judgment (Patton, 1990). However, it is necessary

that a researcher provides a basis for choosing a particular sample size, as an explanation and justification upon which the users or peer reviewers can judge the sample size.

In this study, all the 51 projects were used as the sample size. In each project, seven questionnaires were administered to seven different individuals namely: Fund Manager, CDF Committee Member, Project Manager/Lead Consultant, Contractor, Facility User, Local Opinion Leader and Community Member who provided information about the project.

3.4.2 Sampling Procedure

All the 51 projects in all the six constituencies within Siaya County were considered for data collection.

3.5 Data Collection

3.5.1 Data collection procedure and instruments

Primary data from the field was collected by the researcher. Most of the data collected were in quantitative form to ease statistical analysis. Qualitative nature of the data collected was also recorded for the purpose of decoding to fulfill the requirements of statistical analysis.

Six research assistants were selected, one for each of the six constituencies that constituted Siaya County. They were trained in the contents of the survey instruments. Simultaneously, all the categories of respondents, together with the target projects were identified. The contact numbers (telephone, email, postal address) of the key informants comprising Fund Managers, Local Opinion Leaders, CDF Committee Members, Contractors, Facilities Users, and Project Managers/Lead Consultants spread over the six constituencies was collected from the database maintained by CDF Nyanza region office in Kisumu. The key informants were contacted to seek appointment along with the date,

time and venue from them. Based on the appointment, the field investigators visited the designated venue in person with a hard copy of the questionnaire to eliciting responses from them through face-to-face interviews.

Interviews were the methods of data collection of this study, while the instruments were questionnaires. The questionnaires were administered to the people associated with the sampled projects: clients, consultants, contractors and beneficiaries (users and customers). Through the questionnaires, data associated with cost, construction period, quality, public involvement (participation) and stakeholder satisfaction was collected. Data associated with the type of performance factors (management practices employed during the implementation of the project) was also collected through the same questionnaires.

3.5.2 Pilot Study

A pilot study was carried out on all the six constituencies to confirm the reliability and validity of the survey instruments, from which one complete project from each constituency was taken to form the sample. The results of the pilot study were used to fine tune the data collection instruments to ensure that the final data collected from the field was reliable and valid for the study. For the reliability, Cronbach alpha test was used where a threshold of 0.7 was applied. Under validity, Content validity (appropriateness of the instruments) was ensured by taking representative questions from each section and evaluating them against the desired outcome.

3.6 Study Variables

3.6.1 Performance Level

The dependent variable, performance level (**Y**) was measured through nine surrogates listed and discussed below:

1. Time
2. Cost
3. Quality
4. Project Team Satisfaction
5. Environmental Impact
6. Safety
7. Community Participation
8. Project Goals
9. User Satisfaction

The above-listed surrogates were measured, and their levels were combined to give a composite measure of performance level (**Y**) for the correlation and multiple regression analysis. The details of how each of the surrogates was measured are discussed here below.

(1) Time performance (Y_1): Time refers to the duration for completing the project from commencement date to practical completion date. Time in construction projects is usually measured in days or weeks. Since this study is based on a post-project review, the variable of time performance will be measured by comparing planned and actual construction periods, which results in *time variation*. Time variation was calculated using the following formula:

$$Time\ variation = \frac{actual\ construction\ time - planned\ construction\ time}{plannned\ construction\ time}$$

Time variation (TV) indicated the level of performance using a 1-5 Likert scale as follows:

≤0.00 = 5 (high)

>0.00≤0.10 =4

>0.10≤0.20 =3

>0.20≤0.30 =2

≤0.30 =1 (low)

(2) Cost performance (Y_2): Cost refers to the financial resources that a project incurs from start to completion, measured in monetary terms. For this study, the monetary measure of cost was in Kenya Shillings (Ksh). Cost is not only confined to the tender (or contract) sum, it is the overall cost that a project incurs from inception to completion, which includes any costs arising from variations, modification during the construction period and the cost arising from legal claims, such as litigation and arbitration (Chan & Chan, 2004). It is desirable that the final account is within the contract sum.

Cost performance in this study was measured by *cost variation*, which is a ratio of net variations to original contract sum. Cost variation was calculated as follows:

$$Cost\ variation = \frac{final\ account - contract\ sum}{contract\ sum}$$

Cost variation (CV) indicated the level of performance using a 1-5 Likert scale as follows:

≤0.00 = 5 (high)

>0.00≤0.10 =4

>0.10≤0.20 =3

>0.20≤0.30 =2

≤0.30 =1 (low)

(3) Quality performance (Y_3): Quality can be considered as the guarantee of a product that convinces the customers or end-users to purchase or use it. In the construction industry, quality is defined as the totality of features required by a product or service to satisfy a given need; fitness for a purpose (Parftt & Sanvido, 1993). In this study, quality was measured by assessing the extent to which the project meets the technical specifications provided in drawings and the Bills of Quantities.

Performance of quality was measured subjectively using a 5-point scale from 1(very dissatisfied) to 5(very satisfied).

(4) Project team satisfaction (Y_4): Stakeholder includes both participants in the construction process and users (beneficiaries) of the final product. Key participants in a typical construction project include design team leader and construction team leader. At this stage, the project team during construction (design team leader and construction team leader) will provide data pertaining to their satisfaction with the project implementation (the design and construction stages).

The level of satisfaction was measured by a 5-point scale from 1(very dissatisfied) to 5(very satisfied).

(5) Environmental impact (Y_5): Since construction projects affect the environment in numerous ways during their life cycles especially during the construction phase, environmental impact has become an important criterion in evaluating project performance (Ahadzie, Proverbs, & Olomolaiye, 2008). In Kenya, routine inspection of construction sites is undertaken by NEMA officials to ensure compliance with environmental requirements. Under the Environmental Management and Coordination Act (EMCA) 1999 (section 117/119), proponents of projects are required to provide NEMA inspectors access to sites and necessary information to enable them to assess environmental compliance.

According to Chan and Chan (2004) application of ISO14000 series developed by the International Organization for Standards (ISO), Environmental Impact Assessment (EIA) Score, and the total number of complaints received during construction can be used as an indicator to reflect the environmental performance of a given project. In Kenya, environmental complaints are supposed to be reported to the NEMA offices for action, and this study will engage the same offices to measure the environmental performance of the CDF projects. The performance was measured on a scale of 1 to 5 as follows:

1. Site closed at one incidence for whatever reason = 1 point
2. The site was not approved by NEMA, and there were complaints = 2 points
3. The site was not approved by NEMA, and there were no complaints = 3 points
4. The site was approved by NEMA, but there were complaints = 4 points
5. The site was Approved by NEMA, and there were no complaints at all = 5 points

(6) Safety performance (Y_6): Safety is an important criterion for measuring project performance especially in a developing country, such as Kenya, where the construction industry is mainly labor intensive, and the workforce on sites is unskilled. According to Zuo (2011), these unskilled workers are usually exposed to risk and health hazards inherent in construction sites and, therefore, require adequate safety provisions.

For this research, safety is referred to as general conditions on site that promote the completion of a project, without death and/or injuries on site. The measurement of safety variable focused on the construction phase of the project. This was done through enumeration of the number and nature of reportable accidents from project progress reports covering for the construction period. Nature was categorized in three; death accidents, heavy injuries accidents, and minor injuries accidents. Heavy injuries accidents are those that cause prompt admission in hospital or absence from duty. Minor injuries accidents are those that are managed on site by first aid procedures and do not lead to absenteeism from work. A 5-point scale was used to measure safety performance as follows:

1. At least one death accident; or more than 30 cases of heavy and minor injuries = 1point
2. At least one heavy injury but no death; or 20 - 30 cases of minor injuries =. 2points
3. 10 - 20 minor injuries accidents; and no heavy injuries or death accidents =. 3points
4. 1 - 10 minor accidents; and no heavy injuries or death accidents =. 4points
5. No accident occurred = 5points

(7) Community participation (Y_7): Involvement of stakeholders affected by the CDF projects is critical to the success of the projects. The most important stakeholder in this sense is the community for whose benefit the project is conceived, and was considered geographically as the Ward within which a project falls. The CDF Act stipulates that projects under the Act shall be community-based, and this is designed to guarantee ownership and a high chance of sustainability. The Act also provides for community participation, directly and through elected representatives, in project identification, implementation, monitoring, and evaluation.

A 5-point rating was used to measure the level of community participation, from very poor (1) to very good (5).

(8) Project goals (Y_8): According to Baccarini (1999) project goal is the overall strategic orientation to which the project will the project will contribute and should be consistent with the strategic plans of an organization. The project purpose, therefore, provides the rationale behind the project and describes its long-term objectives. In CDF projects, projects of similar nature, e.g. medical facilities or schools will have the same objectives, i.e., to provide more spaces for treatment for the sick or learning. If the facility is not utilized for the intended purpose, then the project does not meet its intended goal.

In measuring project goal in this research, a 5-point scale was applied as follows: 1 point to be accorded to a completely unutilized project, 2 points to a project being utilized for the unintended purpose, 3 points to a neutral response, 4 points to a project being partially

utilized for the intended purpose and 5 points to a project being completely used for the intended purpose.

(9) User satisfaction (Y_9): The achievement of the project's purpose can be measured regarding how well the project's product satisfies user's needs (Baccarini, 1999). Users are the beneficiaries of the projects who work or are served in the final product, which is the constructed facility. If these end-users are satisfied, then the project can be considered as completed in the long run (Tobica & Stroh, 2001). Response from these stakeholders on the performance of the constructed facility is, therefore, crucial feedback in the evaluation process.

The level of satisfaction was measured by a 5-point scale from poor (1) to excellent (5).

3.6.2 Performance (Success/Failure) Factors

From the study hypothesis, the study sought to establish a relationship between the management factors and performance level of the projects. The management factors, which are also referred to as *performance factors* or *performance determinants*, were identified in the literature review and were represented by the following ten independent variables:

1. Project Manager,
2. Planning,
3. Monitoring and Control,
4. Communication,
5. Financial Resources,
6. Community Involvement,
7. Stakeholder Management,
8. Feedback Capabilities, and
9. Knowledge of CDF Management Guidelines.

All of the above factors can be influenced by the Project Manager's action, and fall within the category of project management factors as described by Saqib et al. (2008). By using the correct project management tools, the Project Manager can plan and direct actions that maximize on the above factors and thereby driving a project to success. For this study, these factors are considered as the independent variables and measurement of each is explained here below.

(1) Project Manager (X_1): A project manager is an individual who puts his efforts to push the project towards its objectives. His managerial tasks include: ensuring that the project objectives are clear, planning the available resources, organizing the resources, co-ordinating with the team members and other stakeholders, and controlling the activities (Hussain, Hunjra, & Rashid, 2011).

According to Ejaz *et al.* (2013) the decision of the project manager, while performing his tasks, has a great influence on the project performance. The decisions made by the project manager are largely influenced by his technical capability and experience in construction projects. Therefore, this research measured the competency or effectiveness of project manager through a combination of his technical skills and relevant experience on a 5-point scale as follows:

1. Degree with over ten years' experience in construction = 5points.
2. Degree with 5-10 years' experience in construction = 4 points.
3. Degree with less than five years' experience, or diploma with over ten years' experience = 3points.
4. Diploma with 5-10 years' experience, or certificate with over ten years' experience = 2points.
5. Others = 1point.

(2) Planning (X_2): Planning is the first principle of management and is vital for the success of projects. Planning in construction projects mainly revolves around three parameters of

time, cost and quality (specifications). And to guarantee project success, project planning tools on these three parameters should be kept uncomplicated, with the right level of details that can encourage a project to be reviewed and implemented easily (Clarke, 1999).

This study restricted the measurement of planning on the availability of the necessary planning tools for time, cost and quality before the commencement of construction works. A 4-point Likert scale was used for measurement as follows:

1. Availability of (a) Drawings and Specifications, (b) Bills of Quantities, (c) Work Programme/Schedule = 4points.
2. Availability of only two of the above = 3points.
3. Availability of only one of the above = 2points.
4. None of the above available = 1point.

(3) Monitoring and Control (X_3): The PMBOK Guide by Institute of Project Management (2013) states that monitoring and control of a project is 'the process of tracking, reviewing, and regulating the progress to meet the performance objectives defined in the project management plan.' It further explains that monitoring includes status reporting, progress measurement, and forecasting. This puts monitoring and control at the center of ensuring that the project keeps within the planned path of performance; a project which is completed within planned time, budget and quality is considered a success.

Monitoring requires planned and regular site inspections and meetings to review the three main aspects on time, cost and quality. Control involves the action taken to contain or accommodate any deviations observed or proposed during monitoring. Therefore, to monitor and control, measurement of achieved progress and forecasting of future achievements regularly, are mandatory and the procedure and tools for doing so must be part of the project management plan.

This study measured the adequacy of monitoring and control through the availability of the following on a project: (a) Planned regular site inspections/meetings, (b) Regular update of work programme/schedule, (c) Cost updates through financial appraisals, and (d) Updates on drawings and specifications. A 5-point scale was used for measurement as follows;

1. Availability of all the above four during construction = 5points.
2. Availability of only three of the above during construction = 4points.
3. Availability of only two of the above during construction = 3points.
4. Availability of only one of the above during construction = 2points.
5. Availability of none of the above during construction =. 1points

(4) Communication (X_4): Effective communication during project implementation is important for the success of a project. To have an effective communication, Andersen et al (2006) concluded that the following are to be ensured: Project participants have an open and efficient way of informing each other as necessary; in project meetings, there is a good and efficient flow of information; the project has well-established information and communication routines; the project has a clear and well-planned agenda of meetings for all participants; and project stakeholders are well informed on project progress as necessary. Failure to these provisions will therefore result in ineffective communication that can cause misunderstanding or delays that that affect the successful completion of a project.

For the purpose of this study, the project participants and stakeholders were required to rank the effectiveness of communication during project implementation in a scale of 1-5, whereby 1=poor and 5=Excellent.

(5) Financial Resources (X_5): Availability of sufficient funds (adequacy of funding) throughout the implementation of the project to pay contractors, consultants, and other service providers is crucial to the success of a project. For the CDF projects under study,

projects allowances for the CDF committee members engaged in monitoring are also provided under regulations.

To measure the availability of financial resources, delay or promptness in paying the contractor, consultants, CDF committee member's allowances and relevant statutory fees/levies relating to the project was considered. The variable was measured as a binary whereby if there was no delay in making the payments a value one was accorded to it while a value two was accorded to the projects found to make delayed payments.

(6) Community Involvement (X_6): For community-based projects, such as those funded by CDF, community involvement in identifying, implementing, monitoring and evaluation is necessary to boost the success of the projects. The CDF Act itself provides for mandatory community involvement for all CDF projects. Research by Nyaguthii and Oyugi (2013) supports community involvement in CDF projects to curb corruption and misappropriation of funds and improve in stakeholder satisfaction.

Measurement of community involvement at each of the four stages of a project was through a 5-point scale where **one** was for very poor, and **5** was very good. An average score was then taken to represent the total score for the attribute.

(7) Stakeholder Management (X_7): Successful completion of construction projects is dependent on meeting the expectations of stakeholders throughout the project lifecycle (Cleland, 1995), and failure by the project management team to address the concerns of the construction project stakeholders has resulted in countless project failures (Bourne & Walker, 2005).Hence making stakeholder management a critical role for a project management team, especially for public and community-based projects like those sponsored by CDF.

Stakeholders in a project come with various interests and expectations, and they require to be understood before the best solutions can be reached that can enhance the

achievement of project goals and objectives. For this reason, to understand the various interested parties in the project, all types of stakeholders should be identified and represented during the early stages of the project (Kelly, Males, & Graham, 2004). Beyond identification of stakeholders, Yu *et al.* (2006) state that the elements that are vital to stakeholder management include: selection of a briefing team; clarity of roles of the stakeholders; sufficient consultation with the stakeholders; the experience of stakeholder group; and, the balance of the needs/requirements of different stakeholders.

The CDF Act identifies several stakeholders in CDF projects, and these include: Client (CDF Committee); Financier (Fund Manager); Consultants (Project Manager/Design Team Leader); Contractor (Contractor's Representative); Users (the in-charge of services offered at the completed facility); and, Local Community/Beneficiaries (elected representatives/opinion leaders). Other stakeholders include the local authority and statutory bodies such as the National Environment Management Authority (NEMA) and National Construction Authority (NCA).

Measuring stakeholder management was through a 5-point Likert scale based on satisfaction with the level of consultations from inception to post-occupancy phases of the projects. This took the range between 1 point (poor) and 5 points (excellent).

(8) Feedback Capabilities (X_8): Experience can be valuable input, and it is important that the project management team provides a structure through which feedback from completed projects can be tapped to enhance the performance of new projects. All identified stakeholders with experience in similar projects should be provided an opportunity to share their experiences at the stakeholders briefing or consultative meetings.

The project management team should also learn from best practices from similar past projects. However, since the performance of a project includes both project management

performance and product performance, best practices of experiences should only be considered from the post-occupancy evaluation of a project as opined by Yu *et al.* (2006).

Feedback capabilities must be in-built in the project management process from inception. And for this study, this was measured by the extent to which the stakeholders were provided with a platform through which they could share their past experiences to aid in the success of the projects. A 5-point Likert scale from **1** point (never had the opportunity) to **5** points (always had the opportunity) was used.

(9) Knowledge of CDF management guidelines (X_9): Since CDF projects are for the benefit of community members, Owuor and Tubey (2012) recommend that the community/public should be sensitized on the functions and operations of CDF, and their role in project identification and forward management. It is important that the community members are well informed on the framework for implementing the CDF projects; an enlightened people will always push for a higher bar of success, thereby improving on the performance of the projects.

The CDF management guidelines are provided for in the CDF Act and regulations issued by the relevant Cabinet Secretary/Minister from time to time. For this study, a 5-point Likert scale was used to measure the level of understanding of the management guidelines, from **1** point (no knowledge) to **5** points (full knowledge).

3.7 Data Analysis

For quality control purposes, questionnaires were counterchecked by the investigators for completeness of information during the data collection exercise. The questionnaires were then put in envelopes and stored in a securely locked cabinet where only the investigators would have access.

Data from completed questionnaires were coded and entered in IBM SPSS Statistics version 21 for statistical analysis. Univariate analysis (frequencies, mean, etc.) was done to describe the various study variables.

Data was then analyzed through both descriptive and inferential statistics. For inferential statistics, Pearson's correlation and stepwise linear regression analysis were used to determine the relationship between the performance level of the projects and the project management practices and establish a predictive model. This was because the data collected was continuous especially the dependent variable. Being parametric tests, the two models were preferred as the data was found to meet the assumptions which include normality of residuals, no-multicollinearity assumption, homoscedasticity and linearity.

Pearson's correlation coefficient (**r**) was used to establish the significance, direction, and strength of the linear relationship between the performance level of the projects and the project management practices. The strength of the relationship was indicated by the Pearson's correlation value where an absolute value of 0.1 – 0.29 indicates a weak linear relationship, 0.3 – 0.49 indicates a moderate linear relationship, while above 0.5 indicates a strong linear relationship between the variables of interest (Kothari, 2011). Again, the sign of the correlation coefficient value indicates the direction of the relationship. Finally, the p-value was used to determine the significance of the relationship. Since this was social research, a significance level of 0.05 was be applied in testing the hypothesis. According to Bryman (2008), 5% is the maximum level of risk that is conventionally taken in social research.

Stepwise regression was applied to establish a predictive model between the performance level of the projects and the project management practices. Stepwise regression was preferred because the choice of predictive variables is carried out by an automatic procedure. Addition of predictor or independent variables to the model in each step is based on a pre-specified criterion. In this case, the adjusted coefficient of determination (R^2) criterion was used. The model used in the study was as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9$$

Where, **Y** - project Performance Level

α - constant

β_i - regression coefficients (model parameters)

X_i - independent variable

ε - regression error term,

X_1 - Project Manager's Competency

X_2 - Planning

X_3 - Monitoring and Control

X_4 - Communication

X_5 - Financial Resource

X_6 - Community Involvement

X_7 - Stakeholder Management

X_8 - Feedback Capabilities

X_9 - Knowledge of the CDF Management Guidelines

Correlation analysis and regression analysis are parametric regressions and make various assumptions. If the assumptions are not met, performing the tests leads to invalid results. Therefore, the study tested for various assumptions, namely: Normality,

Homoscedasticity, linearity, and No-multicollinearity. The nature of the variables was also observed. The dependent variable is assumed to be continuous measured in scale level of measurement.

Under normality, the residuals are assumed to be normally distributed with a zero mean and a constant variance. This assumption was tested using a normal probability plot. According to Pallant (2007), if all the values tend to lie on the straight line cutting across the diagonal, then the residuals are assumed to be normal. The dependent variable is also assumed to be normally distributed, and this was tested using the Shapiro Wilk test of Normality.

In regression analysis, the error terms are assumed to be the same across all values of the independent variables (Long & Ervin, 1998). A residual scatter plot for predicted scores and standardized residual values also known as errors of prediction was used to test for homoscedasticity.

Finally, on multicollinearity, it is assumed that the independent variables should not be highly correlated (Kothari, 2011). Variance Inflation Factors (VIF) and tolerance values were used to test for multicollinearity. According to Belsley, *et al.* (2004), a tolerance with a value close to **1** means there is little multicollinearity, whereas a value close to **0** suggests that multicollinearity exists, while a VIF of more than **10** (VIF $\geq$ 10) indicates a problem of multicollinearity according to Gujarati (2007). Again, Pearson's correlation analysis among the independent variables was used to examine multicollinearity. A high Pearson's correlation coefficient value of 0.9 and above is considered to indicate the presence of multicollinearity (Kothari, 2011).

Hypothesis Testing

The study Hypothesis was stated as summarized in Table 3.2.

Table 3.2: Summary table for the hypothesis testing

Objective of the study	Hypothesis	Decision
1. To assess the relationship between Project Manager's competency and the project's level of success.	H_0: $\rho_1 = 0$ H_1: $\rho_1 \neq 0$	reject H_0 if p-value is < 0.05
2. To assess the relationship between Planning and the project's level of success.	H_0: $\rho_2 = 0$ H_1: $\rho_2 \neq 0$	reject H_0 if p-value is < 0.05
3. To assess the relationship between Monitoring and Control and the project's level of success.	H_0: $\rho_3 = 0$ H_1: $\rho_3 \neq 0$	reject H_0 if p-value is < 0.05
4. To assess the relationship between Communication and the project's level of success.	H_0: $\rho_4 = 0$ H_1: $\rho_4 \neq 0$	reject H_0 if p-value is < 0.05
5. To assess the relationship between Financial Resource and the project's level of success.	H_0: $\rho_5 = 0$ H_1: $\rho_5 \neq 0$	reject H_0 if p-value is < 0.05
6. To assess the relationship between Community Involvement and the project's level of success.	H_0: $\rho_6 = 0$ H_1: $\rho_6 \neq 0$	reject H_0 if p-value is < 0.05
7. To assess the relationship between Stakeholder Management and the project's level of success.	H_0: $\rho_7 = 0$ H_1: $\rho_7 \neq 0$	reject H_0 if p-value is < 0.05
8. To assess the relationship between Feedback Capabilities and the project's level of success.	H_0: $\rho_8 = 0$ H_1: $\rho_8 \neq 0$	reject H_0 if p-value is < 0.05

9. To assess the relationship between Knowledge of National Government CDF Management Guidelines and the project's level of success.	H_0: $\rho_9 = 0$ H_1: $\rho_9 \neq 0$	reject H_0 if p-value is < 0.05
10. To develop a regression model for evaluating project performance ($Y = \propto + \sum_0^n \beta_i \times_i + \varepsilon$)	H_0: $Bi = 0$ H_1: $Bi \neq 0$	reject H_0 if p-value is < 0.05

3.8 Ethical Issues

A research permit together with a letter of authorization to collect data from the study location was obtained from the relevant government institution, the National Commission for Science, Technology, and Innovation, as required by law.

Study participants were clearly informed that their participation in the study was voluntary, anonymous and confidential, and that non-participation would not affect them in any way. Furthermore, they would be informed that even when they consent to participate, they would be free to withdraw their participation at any time during the study, without any consequences. All aspects of the research were explained to the participants.

Information obtained from, on and about a participant during this research was treated with confidentiality. To achieve anonymity of the data gathered from respondents, personal data (like names) were left out of the data collection instruments.

3.9 Summary

This chapter discussed the research strategy and design for this study, detailing the research methods to be used. The chapter also discussed the research site of the study, the target population, the sample size determination as well as the instruments of data collection: how they were pretested, how the variables were measured and how the data

were analysed. Again, a discussion has been done of how the reliability and validity of the data collected through the given instruments were ensured. Lastly, the ethical considerations for this research have also been discussed. The next chapter presents data analysis, interpretation, and presentation.

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION

4.1 Introduction

This chapter covers data analysis, presentation, interpretation, and discussion. This study is divided into five sections as follows: response rate and background information, descriptive statistics for project performance, descriptive statistics for determinants of project performance, correlation analysis, and regression analysis. Finally, it is concluded that project performance can be explained by Monitoring and Control, Financial Resources, Community Involvement, Stakeholder Management, and Feedback Capabilities.

4.2 Response Rate

In this study, a total number of 357 questionnaires were administered to 357 respondents in 51 projects. The respondents were divided into different categories namely, CDF Committee Member, CDF Fund Manager, Contractor, Project Manager/Lead Consultant, Facility User, Local Opinion Leader, and Community Member. Each of these respondents was issued with a tailor-made questionnaire to obtain accurate and reliable data relevant to their knowledge and experiences. The questionnaires were evenly distributed to the respondents, and a total of 340 questionnaires were returned properly completed. However, the respondents responded to all the 51 projects sampled indicating a 100% response rate. According to Kothari (2007), a response rate of 50% is acceptable to analyze and publish, 60% is good, 70% is very good and beyond 80% is an excellent response rate. Therefore, the response rate in this study was excellent and sufficient for analysis.

4.3 Demographic Characteristics of the Respondents

From the research findings in table 4.1 below, for the respondent's details, there was an equal number of the CDF Fund Managers and Project Managers, Facility Users and Community Members while the minority were Contractors who responded to the questionnaires as indicated by 15.0%, 14.7%, and 12.1% respectively. On the working years of the respondents, the majority of the respondents at 39.1% had 5 to 10 years of experience, 27.7% had experience of fewer than five years, 15.7% had 10 to 15 years' experience, and 17.5% had over 15 years' experience. On education level, the majority of the respondent at 33.5% had National Diplomas, 32% had Craft Certificates, 15.4% had Bachelor's degrees, 2.1% had Higher National Diplomas, 5.7% had Trade Test certificates, and 7.6% had Master's degrees. On the area of technical training, the majority of the respondents at 29.3% were those with building skills while the minority, 0.4% were those with Architectural, Estate Management, and Statistics skills. 9.6% of the respondents had Engineering skills, 6.1% had Business Administration skills, 29.3% had Building skills, 6.6% had Project Management skills, 24.0% had Accounting skills, 14.4% had IT skills and those with Economics and Teaching skills stood at 4.4%. Finally, on the services offered by a facility, majority of the respondents at 58% said the facilities were offering education, 16% said the facilities were offering police services, 14% said they were offering health services while minority at 6% said they were offering agriculture services and office spaces.

Table 4.1: A Frequency Table for the Respondents Characteristic

Characteristics		Frequency	Percent
Respondents	CDF Committee Member	49	14.4
	CDF Fund Manager	51	15.0
	Contractor	41	12.1
	Project Manager / Lead Consultant	51	15.0
	Facility User	50	14.7
	Local Opinion Leader	48	14.1
	Community Member	50	14.7
	Total	**340**	**100.0**
Working years	less than 5 years	90	27.7
	5-10 years	127	39.1
	10-15 years	51	15.7
	over 15 years	57	17.5
	Total	**325**	**100.0**
Education level	Trade test	19	5.7
	Certificate	106	32.0
	National Diploma	111	33.5
	Higher National Diploma	7	2.1
	Bachelor's Degree	51	15.4
	Masters	25	7.6
	Others	12	3.6
	Total	**331**	**100.0**
Area of technical training	Architecture	1	0.4
	Engineering	22	9.6
	Business Admin	14	6.1
	Building	67	29.3
	Project Management	15	6.6
	Estate Manager	1	0.4
	Accounting	55	24.0
	IT	33	14.4
	Economics	10	4.4
	Teacher	10	4.4
	Statistician	1	0.4
	Total	**229**	**100.0**
Services Offered	Education	29	58.0
	Health	7	14.0
	Police post/station	8	16.0
	Offices	3	6.0
	Agriculture	3	6.0
	Total	**50**	**100.0**

Source: Researcher, 2019

4.4 Descriptive Analysis for the Performance Criteria (Ys)

The first objective in this study aimed at describing performance criteria for construction projects initiated by CDF. This was achieved through an extensive literature review where nine indicators were identified. Table 4.2 shows descriptive statistics for performance indicators namely cost, quality, time, project team satisfaction, environmental impact, safety performance, community participation, project goals, and user satisfaction. The table also shows the descriptive statistics for the overall performance level (**Y**). The findings reveal that the project's performance level for all the projects responded to, had an average of 3.81 and a standard deviation of 0.35. This indicated that the projects were successful on average. On-time performance, the findings reveal that the projects were unsuccessful while on community participation the respondents said it was fair as indicated by a mean value of 2.61 and 2.28 on average respectively. On cost and safety performance, the projects were very successful as indicated by a mean value of 4.69 and 4.89 respectively. Finally, on quality, project team satisfaction, environmental impact, project goals, and user satisfaction, the projects were found to be successful on average as indicated by mean values of 3.70, 3.71, 4.15, 4.31 and 3.73 respectively.

Table 4.2: Descriptive statistics of the performance indicators and the project's performance level

	N	Minimum	Maximum	Mean	Std. Deviation
Time performance	38	1.00	5.00	2.61	1.82
Cost performance	49	1.00	5.00	4.69	.80
Quality Performance	51	2.67	4.33	3.70	.37
Project team satisfaction	51	2.00	4.60	3.71	.44
Environmental impact	48	4.00	5.00	4.15	.36
Safety Performance	45	4.00	5.00	4.89	.32
Community participation	50	1.00	5.00	2.28	1.30
Project goals	50	3.00	5.00	4.31	.57
User satisfaction	51	2.80	4.33	3.73	.31
Performance level (Y)	**34**	**3.23**	**4.56**	**3.81**	**.35**

Source: Researcher, 2019

4.5 Descriptive Analysis of the Factors affecting Performance of CDF Projects (Xs)

The second objective of this study aimed at describing determinants of performance for the construction projects funded by CDF. This was achieved through an extensive literature review where nine determinants were identified. Table 4.3 shows descriptive statistics for the nine performance determinants of different projects namely: Project manager's competency, planning, monitoring and control, communication, financial resources, community involvement, stakeholder management, feedback capabilities and knowledge of CDF management guidelines. The findings show that Project Manager's competency had a mean of 2.62 and standard deviation of 0.94, meaning that on average the project manager had bachelor's degree with less than 5 years' experience or diploma with over 10 years' experience. Planning had a mean of 3.69 and a standard deviation of 0.58 implying that drawings and specifications, bills of quantities and work programme/schedule were available during the construction stage. Monitoring and control

had a mean of 3.88 and a standard deviation of 0.43 indicating that there was the availability of planned regular site inspection, regular update of work programme/schedule, and updates on drawings and specifications. Communication had a mean of 3.52 and a standard deviation of 0.53, an indication that the level of communication between the stakeholders was very good. Financial resources had a mean of 1.27 and a standard deviation of 0.45 showing that there was no delay in payments to contractors, consultants, CDF committee members, and relevant statutory bodies. Community involvement had a mean of 2.54 and standard deviation of 1.36 indicating that the community was involved in any three of the following: identification/selection of the project, design and planning stage, implementation of the project, monitoring the progress of the project and evaluation of the project on completion. Stakeholder management had a mean of 3.44 and a standard deviation of 0.41 showing that the stakeholder management was very good. Feedback capabilities had a mean of 3.75 and a standard deviation of 0.48 meaning that the respondents had the opportunity to share their past experiences many of the times. Finally, knowledge of CDF management guidelines had a mean of 3.41 and a standard deviation of 0.41 indicating that the respondents had a good level of knowledge of project management guidelines as stipulated by the CDF Act and Regulations.

Table 4.3: A summary table for the performance determinants

	N	Minimum	Maximum	Mean	Std. Deviation
Project manager's competency	45	1	5	2.62	.94
Planning	51	1.00	4.00	3.69	.58
Monitoring and control	51	2.00	4.00	3.88	.43
Communication	51	2.50	4.75	3.52	.53
Financial resources	51	1.00	2.00	1.27	.45
community involvement	51	.00	5.00	2.54	1.36
Stakeholder management	51	2.60	4.42	3.44	.41
Feedback capabilities	51	3.00	5.20	3.75	.48
Knowledge of CDF management guidelines	51	2.33	4.00	3.41	.41

Source: Researcher, 2019

4.6 Correlation Analysis

The third objective aimed at explaining the relationship between project performance and its determinant factors. This was achieved through performing a bivariate Pearson's correlation analysis where significance, direction, and strength of the relationship between project manager's competency, planning, monitoring and control, communication, financial resources, community involvement, stakeholder management, feedback capabilities, knowledge of CDF management guidelines and the project's performance level were established. According to Kothari (2011), an absolute Pearson's correlation value of 0.5 indicates a strong linear relationship between variables while a value below 0.5 indicates a weak linear relationship between the variables of interest. The sign of the correlation coefficient value indicates the direction of the relationship. Finally, the resultant p-value less than 0.05 at 95% confidence level indicates that the linear relationship between variables of interest is statistically significant.

According to the research findings in Table 4.4 indicates that there was a statistically significant positive linear relationship between Monitoring and Control (X_3), r = 0.349; p-

value = 0.043. Secondly, Financial Resources (X_5) and project's Performance Level (Y) had a positive significant linear relationship, r = 0.457; p-value = 0.007. Thirdly, there was a positive and significant relationship between Community Involvement (X_6) and project's Performance Level (Y), r = 0.406, P value = 0.017. There was also a positive and significant relationship between Stakeholder Management (X_7) and project's Performance Level (Y), r = 0.528; P-value = 0.001. There was a positive and significant relationship between Feedback Capabilities (X_8) and project's Performance Level (Y), r = 0.621; P-value <0.001. Finally, there was a positive and significant relationship between Knowledge of CDF Management Guidelines (X_9) and the project's Performance Level (Y), r = 0.370; P-value = 031. However, Project Manager's Competency (X_1), Planning (X_2), and Communication (X_4) were found to have a statistically insignificant linear relationship with project's Performance Level (Y) as indicated by insignificant p-values (P-value>0.05).

Table 4.4: Pearson's correlation coefficient between the performance level and the various determinants

		Y	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9
Y	*R*	1	.047	.015	.349*	.240	.457*	.406*	.528*	.621*	.370*
	p		.813	.934	.043	.171	.007	.017	.001	.000	.031
	N		28	34	34	34	34	34	34	34	34
X_1	*r*		1	.273	.304*	.142	.037	.063	.091	.036	.009
	p			.069	.042	.351	.810	.681	.551	.814	.955
	N			45	45	45	45	45	45	45	45
X_2	*r*			1	.248	.003	-.106	-.035	-.065	-.116	-.062
	p				.079	.983	.459	.805	.651	.418	.664
	N				51	51	51	51	51	51	51
X_3	*r*				1	.038	.139	.090	.007	.125	.115
	p					.791	.330	.532	.960	.382	.423
	N					51	51	51	51	51	51
X_4	*r*					1	-.199	-.210	.412*	.282*	.187
	p						.162	.139	.003	.045	.189
	N						51	51	51	51	51
X_5	*r*						1	.082	.097	.057	-.141
	p							.565	.499	.690	.323
	N							51	51	51	51
X_6	*r*							1	.101	.224	.202
	p								.480	.113	.155
	N								51	51	51
X_7	*r*								1	.555*	.553
	p									.000	.000
	N									51	51
X_8	*r*									1	.429*
	p										.002
	N										51
X_9	*r*										1
	p										
	N										51

Notes: p refers to the p-value

r is the Pearson's correlation coefficient

** Means p< 0.05*

Source: Researcher, 2019

From table 4.4, Y = project Performance Level

X_1 = Project Manager's Competency

X_2 = Planning

X_3 = Monitoring and Control

X_4 = Communication

X_5 = Financial Resources

X_6 = Community Involvement

X_7 = Stakeholder Management

X_8 = Feedback Capabilities

X_9 = Knowledge of CDF Management Guidelines

4.7 Confirmation of Assumptions of Parametric Test

4.7.1 Normality test for the dependent variable

This section shows the normality test of the dependent variable and the residuals. Linear regression analysis assumes that the dependent variable and the residuals should assume normality.

First the dependent variable, the performance level was subjected to Shapiro Wilk's tests of normality. The findings revealed in Table 4.6 and figure 4.1 showed that there was no violation of the normality assumption as indicated by an insignificant *p* value, p=0.305, at 5% level of significance.

Table 4.5: Normality test for the performance level

	Statistic	df	Sig.
performance level	.963	34	.305

Source: Researcher, 2019

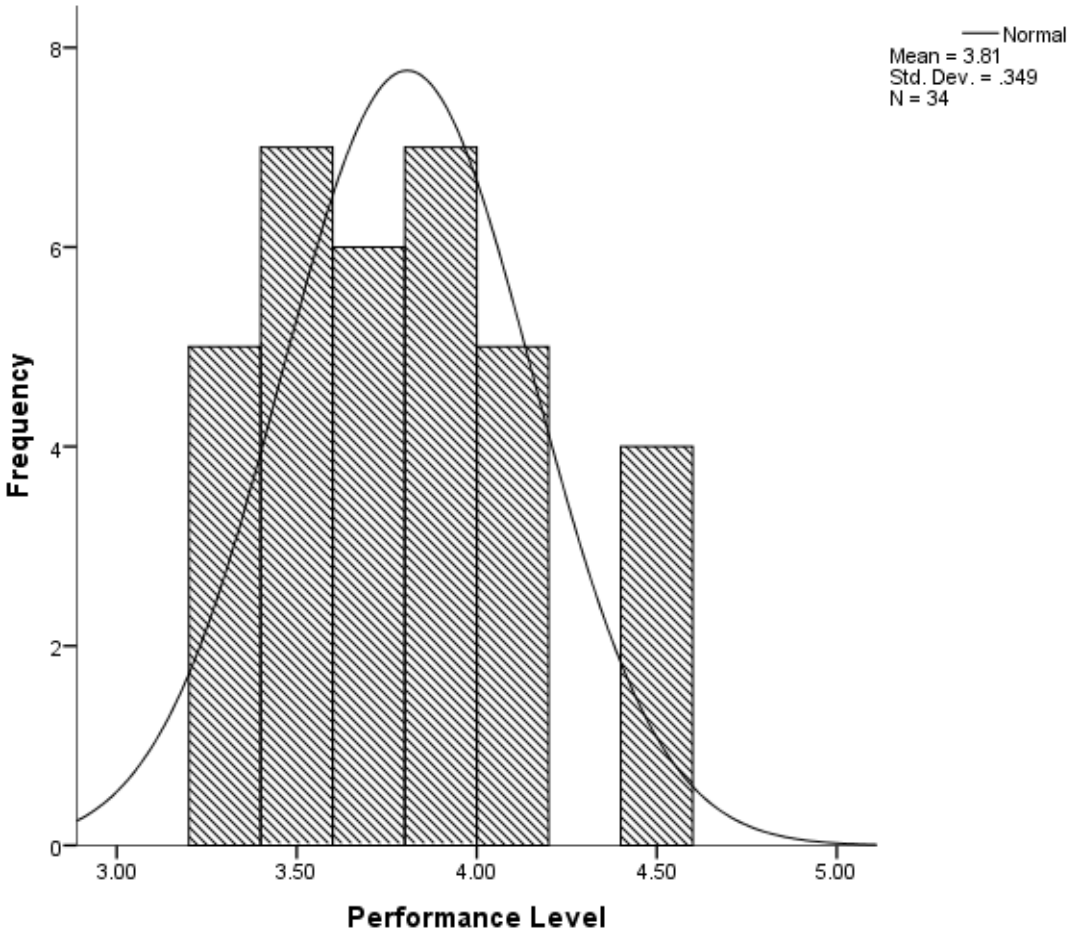

Figure 4.1: A histogram and a normality plot for project performance level

Source: Researcher, 2019

Secondly, the residuals were tested using a normal probability plot. If all the values tend to lie on the straight line cutting across the diagonal, then the residuals are assumed to be

normally distributed. Research findings in figure 4.2 show that the points tend to lie on the diagonal line indicating that there was no violation of normality assumption.

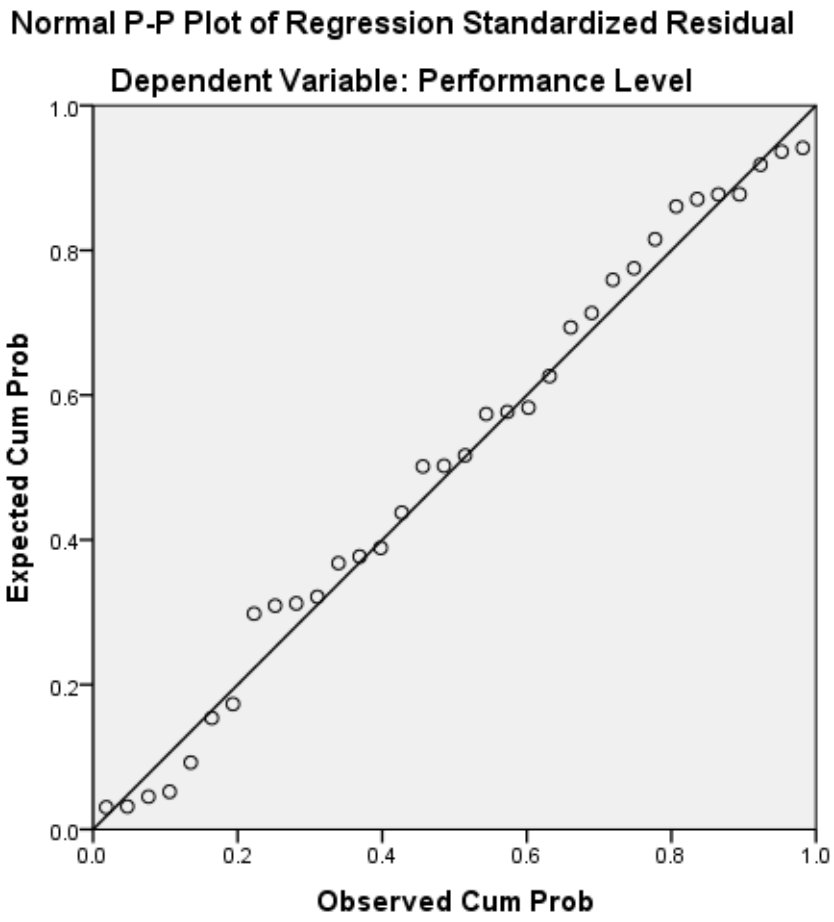

Figure 4.2: Normal P-P plot of Regression standardized residual

Source: Researcher, 2019

4.7.2 Normality test for the residuals

Normality assumptions for residual terms explains that the error terms should be normally distributed or follows a normal distribution. This means that the mean, mode and median values all lie on the same point. This assumption was tested using Kolmogorov Smirnov

and Shapiro Wilk test of normality. The null hypothesis of the normality tests states that the residuals are normally distributed. This is indicated by an insignificant p-value at a given significance level. A normal Q-Q plot was also used and the results presented below.

Table 4.6: Normality test for the residuals

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	.151	34	.059	.950	34	.123

a. Lilliefors Significance Correction

Source: Researcher, 2019

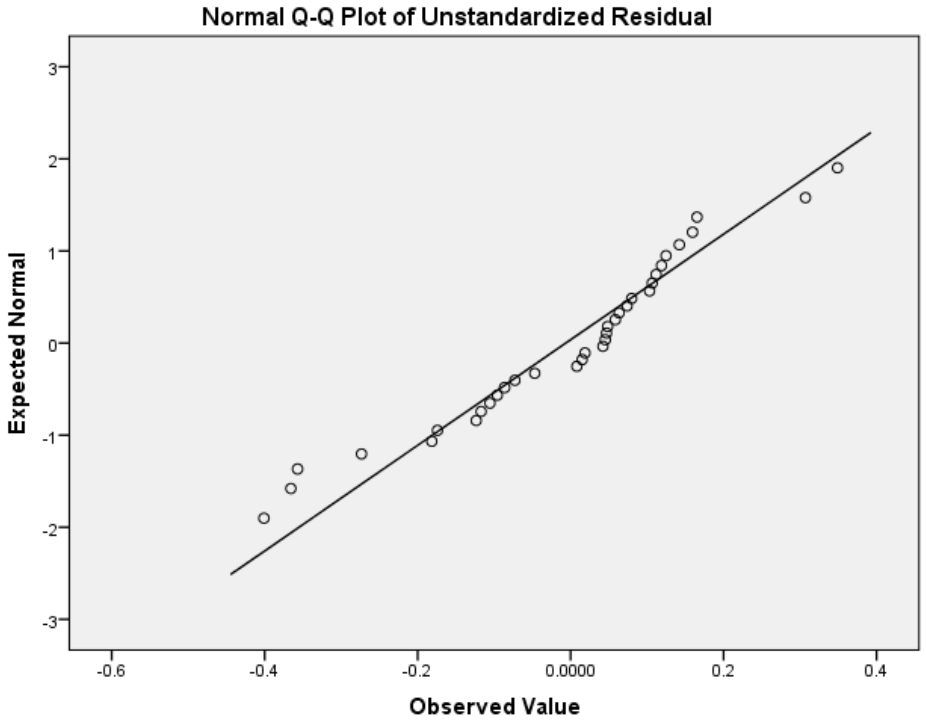

Figure 4.3: A Normal Q-Q plot of residuals of a regression model for project performance level

Source: Researcher, 2019

The results showed that the residuals were normally distributed as indicated by p-values of 0.059 in Kolmogorov Smirnov test and 0.143 in Shapiro Wilk test. Therefore, the null hypothesis was not rejected concluding that there was no violation of the assumption as the residuals were normally distributed. This was also confirmed in Figure 4.2 where the data values seemed to lie along the diagonal line.

4.7.2: Linearity test

Linearity refers to the consistent slope of change that represents the relationship between an independent variable and a dependent variable. There are several ways of testing for linearity. The test most commonly used is the deviation from linearity test. If the significant value for deviation from linearity is less than 0.05, the relationship between independent and dependent variables is non-linear. This has already been done in correlation analysis, and thus linearity of variables is assumed in this case.

4.7.3: Homoscedasticity

Homoscedasticity refers to the constancy of variance. In regression analysis, the error terms are assumed to be the same across all values of the independent variables. A residual scatter plot for predicted scores and standardized residual values also known as errors of prediction was used to test for homoscedasticity. This assumption is met if the scores are concentrated about the **0** point and distributed in a rectangular pattern, or the scores are randomly scattered about a horizontal line. According to the findings in the plot in Figure 4.3 below, the scores appear to be evenly distributed and concentrate about the horizontal line. This indicates that the homoscedasticity assumption was not violated.

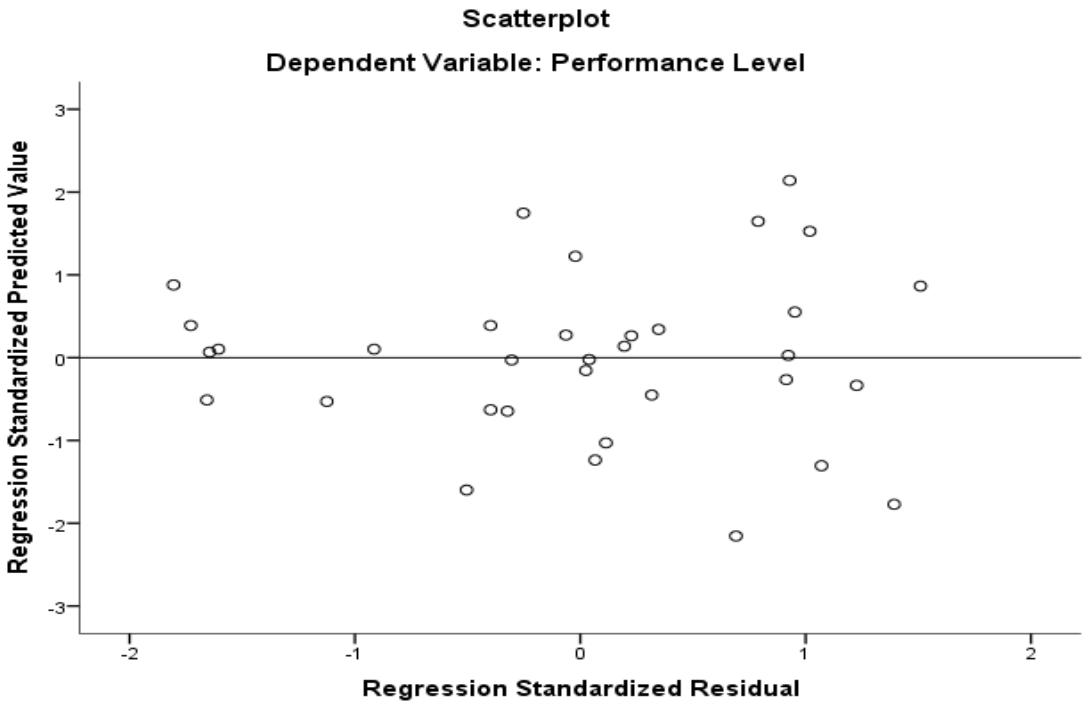

Figure 4.4: A scatter plot for the predicted values and residuals of the project's performance level

Source: Researcher, 2019

4.7.4: No multicollinearity

Multicollinearity means a strong correlation between the predictor variables. Parametric tests like regression analysis assume that there should not be a strong correlation between the independent variables. Variance Inflation Factors (VIF) and tolerance values were used to test for multicollinearity. According to Belsley, *et al.* (2004), a tolerance with a value close to 1 means there is little multicollinearity, whereas a value close to **0** suggests that multicollinearity exists, while a VIF of more than 10 (VIF $\geq$ 10) indicates a problem of multicollinearity according to Gujarati (2007). Again, Pearson's correlation analysis among the independent variables is used to examine multicollinearity. A Pearson's

correlation coefficient value of 0.9 and above is considered to indicate the presence of multicollinearity.

According to the research findings in Table 4.7, there was no multicollinearity since the average VIF values were less than 10, and tolerance values were closer to 1, greater than 0.2. Again, the Pearson's correlation coefficients in Table 4.6 were found to be less than 0.9 indicating absence of multicollinearity. Therefore, it can be concluded that there the no multicollinearity assumption was not violated.

Table 4.7: Multicollinearity test

Variable	Tolerance	VIF
Project Manager's Competency	.895	1.118
Planning	.732	1.366
Monitoring and Control	.764	1.309
Communication	.683	1.463
Financial Resources	.629	1.589
community Involvement	.819	1.222
Stakeholder Management	.453	2.206
Feedback Capabilities	.572	1.749
Knowledge of NG-CDF Management Guidelines	.438	2.283

Source: Researcher, 2019

According to Osborne & Waters (2002), if these assumptions are not met, the results tend not to be valid and may result to Type **I** error, Type **II** error, over-estimation or under-estimation of significance. Therefore, having confirmed that there was no violation of the assumptions made by the tests, the findings were then taken to be valid.

4.8 Regression Analysis

The fourth objective aimed at developing a regression model for evaluating project performance of construction projects funded by the CDF in Kenya. A Stepwise regression was conducted with the Performance Level (Y) as the dependent variable and Project

Manager's Competency (X_1), Planning (X_2), Monitoring and Control (X_3), Communication (X_4), Financial Resources (X_5), Community Involvement (X_6), Stakeholder Management (X_7), Feedback Capabilities (X_8) and Knowledge of the CDF Management Guidelines (X_9) as the independent variables. An optimal model was established with only the significant variables and a coefficient of determination (R^2) value of 0.733 meaning that the variables explained 73.3% of the variation in the level of project performance.

Stepwise regression is defined to be a method of fitting regression models in which the choice of predictive variables is carried out by an automatic procedure. Addition of predictor or independent variables to the model in each step is based on a pre-specified criterion. In this case, the adjusted coefficient of determination (R^2) criterion was used.

The results in Table 4.5 presents stepwise regression analysis. The independent variables were selected and presented based on their significance in the model predicting project performance level.

Table 4.8: Linear regression Analysis

Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**R^2**	**F**
		B	**Std. Error**	**Beta**				**(P-value)**
1	(Constant)	1.782	.463		3.851	.001	0.407	19.56
	Feedback capabilities	.515	.116	.655	4.422	.000		(0.001)
2	(Constant)	3.421	.707		4.842	.000	0.535	16.513
	Feedback capabilities	.462	.105	.588	4.411	.000		(0.001)

	Financial Resource	.304	.107	.380	2.849	.009		
	(Constant)	3.523	.662		5.322	.000	0.594	14.153
	Feedback capabilities	.384	.104	.489	3.675	.001		(0.001)
3	Financial Resource	.347	.102	.435	3.417	.002		
	community involvement	.113	.053	.284	2.152	.042		
	(Constant)	1.667	.870		1.916	.068	0.687	15.847
	Feedback capabilities	.344	.093	.438	3.709	.001		(0.001)
4	Financial Resource	.317	.090	.396	3.529	.002		
	community involvement	.141	.047	.354	2.994	.006		
	Monitoring and control	.450	.157	.321	2.863	.009		
	(Constant)	1.292	.822		1.572	.130	0.733	15.823
	Feedback capabilities	.232	.099	.295	2.327	.030		(0.001)
	Financial Resource	.303	.083	.379	3.642	.001		
5	community involvement	.143	.044	.357	3.266	.004		
	Monitoring and control	.445	.145	.318	3.066	.006		
	Stakeholder management	.221	.100	.265	2.218	.037		

a. Dependent Variable: performance level

Source: Researcher, 2019

The findings revealed that a total number of 5 variables were included in the optimal model. These are Monitoring and Control, Financial Resource, Community Involvement, Stakeholder Management, and Feedback Capabilities. The model was found to be good in predicting the performance level of a project, F=15.823; p=<0.001, as captured in table 4.5.

From table 4.5 the optimal regression equation can be written as:

$$\mathbf{Y = 1.292 + 0.445\ X_3 + 0.303\ X_5 + 0.143\ X_6 + 0.221\ X_7 + 0.232\ X_8}$$

Where, Y - project Performance Level

X_3 - Monitoring and Control

X_5 - Financial Resources

X_6 - Community Involvement

X_7 - Stakeholder Management

X_8 - Feedback Capabilities

From the results, the standardized coefficients showed the Independent variables with more impact on the dependent variable and it was found that Financial Resource (0.379) had more effect on project performance level followed by community involvement (0.357), followed by Monitoring and Control (0.318), followed by Feedback capabilities (0.295) and finally Stakeholder Management (0.265).

The constant term was found to be 1.292. This implied that holding all other factors constant, project performance increases by 1.292 units.

4.9 Summary

In conclusion, nine determinants of the project's performance level namely: project manager's competency, planning, monitoring and control, communication, financial resource, community involvement, stakeholder management, feedback capabilities and knowledge of NG-CDF management guidelines were identified from the literature review. Out of these nine determinants, it was found that five of them (Monitoring and Control, Financial Resource, Community Involvement, Stakeholder Management and Feedback Capabilities) had an explanatory power and significantly affected the project's performance. Finally, a predictive model was derived that includes the five variables as presented below.

$$\mathbf{Y = 1.292 + 0.445\ X_3 + 0.303\ X_5 + 0.143\ X_6 + 0.221\ X_7 + 0.232\ X_8}$$

Where, Y - project Performance Level

X_3 - Monitoring and Control

X_5 - Financial Resources

X_6 - Community Involvement

X_7 - Stakeholder Management

X_8 - Feedback Capabilities

The model revealed that there was a significant positive linear relationship between the project's Performance Level and Monitoring and Control, Financial Resources, Community Involvement, Stakeholder Management, and Feedback Capabilities: a unit increase in the Feedback Capabilities increases the level of Project Performance by 0.232 units; a unit increase in the Financial Resources increases project Performance level by

0.303 units; a unit increase in Community Involvement increases project Performance Level by 0.143; a unit increase in Monitoring and Control increases project Performance Level by 0.445 units; and, a unit increase in Stakeholder Management increases project Performance Level by 0.221 units.

The next chapter, chapter five, presents the conclusions and recommendations made from the foregoing observations, and suggests potential areas for further research.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of findings, conclusions, and recommendations. In summary of the findings, the results and remarks of each of the objectives are presented. The conclusions are guided by the research objectives and informed by the findings from data analysis and interpretation in the study. Recommendations based on the outcome of the study as well as areas for further research are also included.

5.2 Conclusions on the Research Objectives

The current study stemmed from the realization of the research problem in the literature review that there is no standardized evaluation framework that has been developed to measure the performance of CDF construction projects adequately. It has been observed that none of the studied contemporary evaluation frameworks considers the aspects of community participation, which is a key factor in the management of CDF projects. Among the several studies that had been done, there was no framework for evaluation that was developed specifically for the CDF construction projects, and therefore the study sought to address this gap.

The researcher's primary aim was to develop a standardized post-project review model that can be used to evaluate the performance of construction projects initiated by CDF in Kenya and identify the project management practices (performance factors) that are critical for the success of the projects. To achieve this aim, the study sought to describe performance criteria for construction projects initiated by CDF, describe the determinants of performance for the construction projects, explain the relationship between project performance and its determinant factors, and develop a regression model for evaluating project performance.

The study adopted a quantitative strategy and survey research design to meet the above objectives. All the fifty-one (51) that met the criteria for sampling from the six constituencies in Siaya County in Kenya were considered for data collection.

Descriptive analysis such as frequency, percentage, mean and standard deviation was used to analyze the data which was summarized in Tables 4.1, 4.2 and 4.3 in the previous chapter. Correlation analysis was used to examine the strength and direction of the relationships between the determinants of performance and the performance level of the projects. Before regression analysis, test for various assumptions made by linear regression analysis was carried out. These tests included: test for normality which was carried out using the Shapiro-Wilk test, test for linearity which was conducted using correlation analysis, test for homoscedasticity test which was conducted using a residual scatter plot for predicted scores and standardized residual values, and test for multicollinearity which was carried out using Variance Inflation Factors (VIF) and tolerance values. The findings of the study demonstrated that monitoring and control, financial resources, stakeholder management, and feedback capabilities significantly predicted the performance level of construction projects initiated by CDF in Kenya.

The following are discussions on the findings on the study objectives.

5.2.1 Description of performance criteria for construction projects initiated by CDF

The first objective in this study was to describe performance criteria for construction projects initiated by CDF. From the literature review, the study identified nine (9) project performance indicators, namely: the cost of the project, quality of the project, the time is taken to complete a project, project team satisfaction, environmental impact, safety, community participation, project goals, and user satisfaction. The indicators were then combined to form one overall variable, the project Performance Level (**Y**). Descriptive statistics for the indicators as well as the project performance level were obtained and

presented in Table 4.2. From the findings, the performance level for all the projects was found to be successful on average. Similalrly, breaking the project performance level, time and cost performance was found to be within the range of success meaning that majority of the projects were executed within the stipulated time and cost. The communities participated fairly in the projects. The quality, project team satisfaction, environmental impact, project goals, and user satisfaction were found to be satisfactory, indicating that projects performed well on average.

5.2.2 Description of the determinants of performance for the construction projects

The second objective of this study was to describe determinants of performance for the construction projects. From the literature review, nine (9) determinants of project Performance Level (**Y**) were identified, and these are project manager's competency, planning, monitoring and control, communication, financial resource, community involvement, stakeholder management, feedback capabilities and knowledge of CDF management guidelines. Table 4.3 shows the determinants' descriptive statistics. The findings revealed that the project manager's competency was good, as all the project managers on average had at least a Bachelor's degree with less than 5 years' work experience or a Diploma with over 10 years' experience. On planning, it was found that drawings and specifications, bills of quantities and work programme/schedule were available during the construction stage. On monitoring and control, there were the availability of well-planned regular site inspections, regular update of work programme/schedules, and updates on drawings and specifications. The communication level among the stakeholders was found to be very good. On financial resource, the findings showed that on average, there were no delays in payments of contractors, consultants, CDF committee members, and relevant statutory bodies. The findings also revealed that community involvement was good in the identification/selection of the projects, designing and planning, implementation of the project, monitoring the progress of the projects, and evaluation of the projects on completion. On stakeholder management, the findings revealed that it was very good, while on feedback capabilities, the respondents

had the opportunity to share their experience from past projects many of the times. On the knowledge of CDF management guidelines, the respondents had a good level of knowledge as stipulated by the CDF Act and Regulations.

5.2.3 Explanation of the relationship between project performance and its determinant factors

The third objective of this study was to explain the relationship between project performance and its determinant factors. The findings are explained here below.

5.2.3.1 To assess the relationship between monitoring and control, and the project performance level

The study sought to assess the relationship between monitoring and control and the project performance level. Table 4.4 on the Pearson's correlation coefficient (**r**) between monitoring and control, and the project performance level (r = 0.349) indicates that there was a positive significant linear relationship between monitoring and control and the project performance level. Again, the results on table 4.8 show that monitoring and control is a significant predictor on the project performance level. There was a significant relationship between monitoring and control, and the project performance level.

5.2.3.2 To assess the relationship between financial resource and the project performance level

The study sought to assess the relationship between financial resource and the project performance level. Using correlation analysis, the study findings in Table 4.4 indicated that there was a positive statistically significant linear relationship between financial resource and the performance level, (r = 0.457). Thus, implying that a unit change in financial resources increases the project performance level by 45.7%. In Table 4.8, the

findings reveal that financial resource had a significant influence on the performance level of the projects.

5.2.3.3 To assess the relationship between community involvement and the project performance level

The study sought to examine the relationship between community involvement and the performance level of the projects. Descriptively, as shown on table 4.3, community involvement had a mean of 2.54 and standard deviation of 1.36 indicating that the community was well involved in the identification/selection of the project, design and planning stage, implementation of the project, monitoring the progress and evaluation of the project on completion. Using Pearson's correlation analysis, the study findings in Table 4.4 show that there was a positive and statistically significant liner relationship between community involvement and the project performance level. This implies that a unit change in community involvement increases the level of project performance by 40.6%. Results on Table 4.8 show that there was a positive and statistically significant linear relationship between the level of project performance and community involvement. A unit increase in community involvement increases the project performance level by 0.143 units.

5.2.3.4 To assess the relationship between stakeholder management and project performance level

The study hypothesized that there was no relationship between stakeholder management and level of project performance. Using correlation analysis, the study findings depicted in Table 4.4 showed that there was a positive and significant relationship between stakeholder management and the project's performance level. This implies that a unit change in stakeholder management increases a project's performance level by 52.8%. Results on Table 4.8 show that there was a positive and significant relationship between stakeholder management and project's performance level. This implied that a unit increase

in stakeholder management increases the project's performance level by 0.221 units. Descriptively, in Table 4.3, stakeholder management had a mean of 3.44 and a standard deviation of 0.41 showing that the stakeholder management was very good.

5.2.3.5 To assess the relationship between feedback capabilities and project performance level

The study sought to determine the relationship between feedback capabilities and the project performance level. The results in Table 4.3 show that feedback capabilities had a mean of 3.75 and a standard deviation of 0.48 indicating that the respondents had the opportunity to share their experience from past projects many of the times. The results in Table 4.4 show that there was a positive and statistically significant linear relationship between feedback capabilities and the project performance level. Thus, a unit change in feedback capabilities increases the project performance level by 62.1%. Simple linear regression results represented in Table 4.8 showed that there was a positive and statistically significant linear relationship between the project performance level and feedback capabilities. A unit increase in feedback capabilities increases the project performance level by 0.232 units.

5.2.3.6 To assess the relationship between knowledge of CDF management guidelines and project performance level

Descriptively, as shown in Table 4.3, knowledge of CDF management guidelines had a mean of 3.41 and a standard deviation of 0.41, meaning that the respondent had a good level of knowledge of CDF management guidelines as stipulated by the CDF Act and Regulations. Using correlation analysis, the study findings shown in Table 4.6 indicates that there was a positive and significant linear relationship between knowledge of CDF management guidelines and project performance level. Therefore, a unit change in knowledge of CDF management guidelines increases the project performance level by 37.0%.

5.2.4 Development of a project performance evaluation model using the multiple linear regression

The fourth objective sought to develop a regression model for evaluating project performance. Stepwise regression was conducted with the project Performance Level (**Y**) as the dependent variable and Project Manager's Competency, Planning, Monitoring and Control, Communication, Financial Resources, Community Involvement, Stakeholder Management, Feedback Capabilities and Knowledge of CDF Management Guidelines as the factors. An optimal model with significant factors was identified, and the model developed as follows:

$$\mathbf{Y = 1.292 + 0.232\ X_1 + 0.303\ X_2 + 0.143\ X_3 + 0.445\ X_4 + 0.221\ X_5}$$

Where, Y – project Performance Level

X_1 - Feedback Capabilities

X_2 - Financial Resources

X_3 - Community Involvement

X_4 - Monitoring and Control

X_5 - Stakeholder Management

The model revealed that there was a significant positive linear relationship between the project performance level and Monitoring and Control, Financial Resources, Community Involvement, Stakeholder Management, and Feedback Capabilities. A unit increase in the feedback capabilities increases the project performance level by 0.232 units; a unit increase in the financial resources increases the project performance level by 0.303 units; a unit increase in community involvement increases the project performance level by

0.143 units; a unit increase in monitoring and control increases the project performance level by 0.445 units; and, a unit increase in stakeholder management increases the project performance level by 0.221 units.

5.3 Conclusion

The following are the conclusions drawn from the study findings:

1. The first research objective sought to describe performance criteria for construction projects initiated by CDF. The nine identified indicators for the project performance level are; Time, Cost, Quality, Project Team Satisfaction, Environmental Impact, Safety, Community Participation, Project Goals, and User Satisfaction. Measurements for these indicators were combined to give a composite measure of project Performance Level. The overall performance level for all the projects was good.
2. The second objective sought to describe the determinants of performance for the construction projects. The nine determinants/factors identified in the literature review to affect the project performance level are; Project Manager's Competency, Planning, Monitoring and Control, Communication, Financial Resources, Community Involvement, Stakeholder Management, Feedback Capabilities and Knowledge of CDF Management Guidelines. Their behavior towards the project Performance Level is discussed in conclusion of the third research objective herein.
3. The third research objective sought to explain the relationship between project performance and its determinant factors. The study revealed that there was no significant relationship between the project performance and each of the following factors; Project Manager's Competency, Planning, and Communication. However, there was a positive and statistically significant linear relationship between the project performance and each of these factors; Monitoring and Control, Financial

Resources, Community Involvement, Stakeholder Management, Feedback Capabilities, and Knowledge of CDF Management Guidelines.

4. It is therefore concluded that Monitoring and Control, Financial Resources, Community Involvement, Stakeholder Management, Feedback Capabilities, and Knowledge of CDF Management Guidelines are critical factors for performance (success/failure) of construction projects initiated by CDF in Kenya.
5. The fourth research objective sought to develop a regression model for evaluating the performance of the project under study. This was achieved by regressing project performance level with the determinants of project performance identified in the literature review. Monitoring and Control, Financial Resources, Stakeholder Management, Community Involvement, and Feedback Capabilities had explanatory power in predicting the project performance level. These factors were found to explain 73.3% of the variation in the project performance level and, therefore, the model was suitable for predicting performance levels for construction projects initiated by CDF in Kenya. However, Project Manager's Competency, Planning, Communication and Knowledge of CDF Management Guidelines were found not to affect project performance level significantly.

Implications of the Research Findings

The current study sought to develop a standardized post-project review model that can be used to evaluate the performance of construction projects initiated by CDF in Kenya and identify the project management practices (performance factors) that are critical for the success of the projects. The research results present theoretical as well as policy implications both of which are discussed below.

5.4.1 Theoretical Implications

Project performance criteria in this study were based on a framework developed by David Baccarini (1999). However, this study has added three new criteria and eliminated one to

give a total of nine criteria, namely: time, cost, quality, project team satisfaction, environmental impact, safety, community participation, project goals, and user satisfaction.

The findings in this study provide support for the hypothesized relationship between performance of CDF construction project and the factors that are critical to the performance of a project. The findings have established five factors as critical to the performance of CDF construction projects, and these are; monitoring and evaluation, financial resource, community involvement, stakeholder management, feedback capabilities, and knowledge of CDF management guidelines.

Abdullah and Ramly (2006) in a study to establish performance factors for projects identified 18 factors of which 10 were the most critical. In agreement with the study are monitoring and control, financial resources and stakeholder management. According to Nyaguthii and Oyugi (2013) community involvement, which agrees with this study, is a key factor in the peformance of a CDF construction project as it helps to curb corruption and misappropriation of funds leading to stakeholder's satisfaction. The study is also in agreement with Yu et al. (2006) who opined that best practices from experiences (feedback capabilities) should be considered for post-occupancy evaluation of a project as it is a key factor in determining the project performance level.

5.4.2 Policy Implications

Concerning the research objectives and findings of the study, the following are the implications of the research on policy:

1. Evaluation of construction projects initiated by CDF should consider the following criteria in measuring performance level of a project; time, cost, project team satisfaction, environmental, safety, community participation, project goals, and user satisfaction.

2. To achieve a high-performance level for construction projects initiated by CDF, greater focus should be on monitoring and control, financial resources, community involvement, stakeholder management, feedback capabilities and knowledge of CDF management guidelines. More efforts should be directed towards involving the beneficiary communities in project identification/selection, project design and planning stage, project implementation, and monitoring and evaluation on completion. From inception to completion of the projects, great focus should also be geared towards consultations among the project stakeholders who include; client (CDF committee members), Financier (CDF Fund Manager), consultants (project manager and design team), contractor(s), users (those to run the facility), beneficiaries (local community members), local authorities and statutory bodies, among others. Also, enough room should be created for the inflow of experiences gained from past projects, by the various stakeholders, towards a project at hand. This feedback capability will enable the project implementers to avoid actions that may negate the success of the project, and only implement proposals that have been tried, tested and confirmed to be successful elsewhere. Advocacy and education to enhance knowledge of the CDF management guidelines among project participants should be encouraged to create a common understanding of the project processes and minimize the time for consultations and decision making, thereby leading high-performance levels.

3. For evaluation of the performance of construction projects initiated by CDF in Kenya, the following model is recommended for use;

$$\mathbf{Y = 1.292 + 0.232\ X_1 + 0.303\ X_2 + 0.143\ X_3 + 0.445\ X_4 + 0.221\ X_5}$$

Where Y = project's performance level

X_1 = Feedback capabilities

X_2 = Financial Resource

X_3 = community involvement

X_4 = Monitoring, and control

X_5 = Stakeholder management

The above model is meant for evaluation of projects after completion. It incorporates both evaluations of the project management performance during project execution and evaluation of the product performance after project completion, and the facility is in use. It is advisable to carry out the evaluation within 12 months after the expiry of the Defects Liability Period while information on the project is still fresh in the minds of the respondents and to accommodate the aspect of product evaluation. There are seven questionnaires attached as an appendix to this study, each meant for a specific respondent that can be adopted or adapted for collecting data during project evaluation.

5.4 Areas for Further Research

1. The developed model in this research included a portion of the factors believed to affect the level of project performance based on the literature reviewed. These factors have been found to account for 73.3% of the project's performance level. Therefore, a further study should be done to identify and include the other factors that account for the remaining 26.7% of the project performance level.
2. One of the assumptions of this study is that the project performance criteria applied have equal weighting in defining the project performance level. Further study should be conducted to determine the actual weighting for each of these criteria.

5.5 Summary

This chapter has presented the summary of findings, conclusions, implication on theory and policy of the findings (recommendations), and areas for further research. The information that follows includes the references and appendices relevant to this study.

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APPENDICES

Appendix I: Summary table for the hypothesis testing

#	Objective of the study	Hypothesis	P-value	Decision
1	To describe performance criteria for construction projects initiated by CDF	No hypothesis	NA	Descriptive analysis
2	To describe the determinants of performance for the construction projects	No hypothesis	NA	Descriptive analysis
3	To assess the relationship between Project Manager's competency and the project's level of success.	H_0: $\rho_1 = 0$ H_1: $\rho_1 \neq 0$	0.813	Fail to reject H_0
	i. To assess the relationship between Planning and the project's level of success.	H_0: $\rho_2 = 0$ H_1: $\rho_2 \neq 0$	0.934	Fail to reject H_0
	ii. To assess the relationship between Monitoring and Control and the project's level of success.	H_0: $\rho_3 = 0$ H_1: $\rho_3 \neq 0$	0.043	Reject H_0
	iii. To assess the relationship between Communication and the project's level of success.	H_0: $\rho_4 = 0$ H_1: $\rho_4 \neq 0$	0.171	Fail to reject H_0
	iv. To assess the relationship between Financial Resource and the project's level of success.	H_0: $\rho_5 = 0$ H_1: $\rho_5 \neq 0$	0.007	Reject H_0
	v. To assess the relationship between Community Involvement and the project's level of success.	H_0: $\rho_6 = 0$ H_1: $\rho_6 \neq 0$	0.017	Reject H_0
	vi. To assess the relationship between Stakeholder Management and the project's level of success.	H_0: $\rho_7 = 0$ H_1: $\rho_7 \neq 0$	0.001	Reject H_0
	vii. To assess the relationship between Feedback Capabilities and the project's level of success.	H_0: $\rho_8 = 0$ H_1: $\rho_8 \neq 0$	0.003	Reject H_0

	viii. To assess the relationship between Knowledge of National Government CDF Management Guidelines and the project's level of success.	H_0: $\rho_9 = 0$ H_1: $\rho_9 \neq 0$	0.031	Reject H_0
4	To develop a regression model for evaluating project performance	**$Y = 1.292 + 0.232X_1 + 0.303 X_2 + 0.143X_3 + 0.445X_4 + 0.221X_5$**		

Appendix II: Data values for the indicators of the project performance level (Y)

Project	Y_1	Y_2	Y_3	Y_4	Y_5	Y_6	Y_7	Y_8	Y_9	Y
1	5	5	3.5	3.5	4	5	1.4	4.4	3.57	3.93
2	1	5	2.67	2	4	5	1.6	4.4	3.43	3.23
3	5	5	3.8	3.75	5	5	3.4	5	4	4.44
4		5	3.8	3.75	5		4.4	4	4.33	
5			4.17	4.6			4	3.8	3.5	
6	1	5	4	3.75	4	5	1.2	4.5	3.67	3.57
7	1	5	3.2	3	4	5	1.6	4.25	3.33	3.38
8	1	5	3.6	3.5	4	5	1.4	4.5	3.5	3.5
9	1	5	3.83	3.6		5	1.2	4.4	3.71	
10	5	5	4	4	5	5	4	5	4	4.56
11	5	5	3.6	3.5	4	5	4.2	5	4.33	4.4
12	3	5	3.67	4	4	5	4.6	4.2	4.29	4.2
13	1	5	4.2	4.25	4	5	4	3.25	3.33	3.78
14	1	5	3.83	4.4		5	1.2	3.8	4.14	
15	5	5	3.33	3.2	4	5	1	4	3.67	3.8
16	3	5	4.17	4.2	4	5	1.4	4.4	3.86	3.89
17	1	5	4	3.6	4	5	1.4	4.4	3.57	3.55
18		5	2.86	3.5	4		2.8	4.33	3.57	
19		5	3.29	3.67	4		3.2	4.33	3.29	
20		5	3.57	3.5	4		2	4.33	3	
21	5	1	3.86	3.5	4	5	4.8	4.67	4	3.98
22	5	5	3.83	3	4	5		5	4	
23	4	4	3.86	3.5	4	4	2.6	5	3.71	3.85
24	1	5	3.86	3.33	4	4	2.6	4.33	3.5	3.51
25	1	5	3.14	3.33	4	4	3	3	3.86	3.37
26	1	5	3.71	3.67	4	5	3.6	4.33	4	3.81
27	5	4	3.86	3.5	4	5	3.4	4.67	3.83	4.14
28	5	4	3.29	3.33	4	5	2.6	3	3.86	3.79
29	1	5	3.43	3.67	4	5	3.4	3	3.71	3.58
30			3.29	4	4		3	4.67	4	
31	3	5	4.29	4.17	5	5	5	4.33	4	4.42
32	1	5	3.17	3.83	5	4	3.2	5	3.8	3.78
33	5	3	4	3.8	5	5	3.8	3	4	4.07

34	3	5	4.14	4	5	4	4	3	3.83	4
35	1	3	3.83	4.2	4	5	1	4.8	3.67	3.39
36		5	3.4	3.5	4	5	1	4.4	3.83	
Project	**Y_1**	**Y_2**	**Y_3**	**Y_4**	**Y_5**	**Y_6**	**Y_7**	**Y_8**	**Y_9**	**Y**
37		5	3.2	3.75	4	5	1.2	4.4	3.67	
38		5	3.4	4.25	4	5	1.4	3.8	3.33	
39		5	3.5	3	4	5	1	4.25	3.4	
40		5	4	3.6	4	5	1	4.6	3.57	
41		5	3.5	3.6	4	5	1	4.2	3.83	
42		5	3.5	3.4	4	5	1.4	4.4	3.57	
43	5	5	4	4	4	5	1	4.6	4	4.07
44	1	3	4.33	4.2	4	5	1	4.4	3.86	3.42
45	3	5	3.83	3.8	4	5	1	4.33	4.14	3.79
46	1	5	3.83	4	4	5	1	5	3.57	3.6
47	5	5	3.83	4.2	4	5	1	5	3.71	4.08
48	1	5	4	4	4	5	2		2.8	
49	1	3	3.67	3.8	4	5	1.2	4.6	3.43	3.3
50	1	5	4.33	4.4	4	5	1	5	3.71	3.72
51	1	5	3.4	4	4	5	1	4.6	3.86	3.54
Mean	**2.61**	**4.69**	**3.69**	**3.72**	**4.15**	**4.89**	**2.28**	**4.31**	**3.73**	**3.81**

Appendix III: Data values for the determinants of the Performance level of projects (Y)

Project	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9
1	3	4	4.00	2.75	1	4.40	3.14	4.00	2.86
2	3	4	3.00	3	1	5.00	2.67	3.33	3.5
3	2	4	4.00	4	2	4.40	3.5	4.57	4
4	4	4	4.00	4	2	3.40	3.17	3.43	3.57
5	4	4	4.00	3	1	3.60	3.14	3.00	3
6	3	4	4.00	3.5	1	3.78	2.67	3.60	3
7	3	4	4.00	2.75	1	3.20	3	3.80	3
8	3	4	4.00	3.5	2	.00	3	3.60	3
9	3	4	4.00	3.5	1	2.60	3.14	3.43	3
10	5	4	4.00	3.25	2	4.80	3.83	4.83	4
11	2	4	4.00	4	2	4.00	3.5	4.73	4
12	2	4	4.00	4	2	3.00	4.42	4.33	4
13	1	4	4.00	3	2	3.40	3.16	3.00	3.3
14	3	4	4.00	4.75	1	3.20	4	5.20	3.14
15	3	4	4.00	3.25	1	3.40	3	3.40	2.33
16	3	4	4.00	3.25	1	4.00	3.43	4.00	3
17	3	4	4.00	3	1	3.60	3.29	3.67	2.86
18	1	3	2.00	2.5	1	3.60	3.43	3.71	3.29
19	2	4	4.00	2.5	1	3.00	3	3.33	3.29
20	2	4	4.00	3.75	1	3.20	3.14	3.60	3
21	3	3	4.00	2.5	1	4.00	3.71	4.00	3.86
22	2	4	4.00	4	1	2.80	3.67	3.67	3.83
23	3	3	4.00	4	1	4.00	4	4.00	3.57
24	3	3	4.00	4	1	3.60	3.57	4.40	3.86
25	2	3	4.00	2.5	1	3.40	3.43	4.00	3.71
26	2	3	4.00	3.25	1	4.00	3.57	3.83	3.57
27	2	4	4.00	3.75	1	4.20	3.86	4.80	3.57
28	2	1	4.00	3.75	1	3.80	3	4.17	3.14
29	2	4	4.00	2.5	1	3.40	3.29	4.00	3.86
Project	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9
30	3	4	4.00	3.75	1	4.00	3.14	3.67	3.71
31	2	3	4.00	3.25	1	4.00	4.29	4.30	3.86

32	2	4	4.00	3.67	2	4.00	3.4	3.75	3.6
33	5	4	4.00	4	2	4.10	3.83	3.80	3.83
34	3	4	4.00	4	1	4.00	3.83	3.70	3.5
35		3	4.00	3.8	1	3.40	3.71	4.00	3.86
36	2	3	4.00	3.5	2	1.00	3	4.00	3.17
37	2	3	2.00	4	2	1.00	3.17	3.20	2.83
38	2	4	4.00	4	2	1.00	3.33	3.40	3
39	2	3	3.00	3.67	2	1.40	3.4	3.20	3.8
40	2	3	4.00	4.2	1	1.20	3.43	3.29	3.29
41	5	4	4.00	3.8	1	1.20	3.86	3.60	3.43
42	2	4	4.00	3.2	1	1.20	3.29	3.43	2.71
43		3	4.00	3.8	1	4.10	4.14	3.67	3.29
44	2	4	3.00	4	1	3.50	4	4.20	3.43
45		4	4.00	3.8	1	3.80	3.57	3.57	4
46		4	4.00	3.6	1	3.00	3.57	3.50	3.43
47		4	4.00	3.6	1	4.20	3.71	4.50	3.57
48	2	4	4.00	3	2	1.00	2.6	3.00	3
49	4	4	4.00	3.8	1	3.20	3.29	3.17	3.14
50		4	4.00	4	1	3.80	3.86	3.83	3.86
51	2	4	4.00	3.4	1	2.00	3.43	3.57	3.71
Mean	**2.62**	**3.69**	**3.88**	**3.52**	**1.27**	**2.54**	**3.44**	**3.75**	**3.41**

Appendix IV: Cover Letter to Questionnaires

JAMES OUMA OKAKA,

JOMO KENYATTA UNIVERSITY OF AGRICULTURE & TECHNOLOGY,

P.O BOX 62000
NAIROBI, KENYA.

Dear Respondent,

I am a student at Jomo Kenyatta University of Agriculture and Technology pursuing a PhD degree in Construction Project Management. I am carrying out a research on the "***Model for Evaluating Performance of Construction Projects Initiated by the Constituencies Development Fund in Kenya: A Case study of Siaya County***" and you have been identified to participate in this study in providing information about the project you are associated with.

I hereby kindly request you to fill the attached questionnaire. The information gathered is meant for this study and will be treated with total confidentiality.

Thank you in advance for accepting to co-operate.

Yours Faithfully,

James Ouma Okaka

Appendix V: Questionnaires

1. QUESTIONNAIRE FOR CDF FUND MANAGER

(A) GENERAL INFORMATION

This section provides information on the project and the CDF Fund Manager to be interviewed. Kindly put a tick (√) in the box next to the selected response.

1. Name of the project: _____
2. Location of the project:
   a) Ward: _____
   b) Constituency: _____
3. Name of the respondent: _____(optional)
4. Please indicate how long you have worked in your current position?

   ☐ Less than 5years ☐ 5-10years ☐ 10-15years

   ☐ Over 15years

5. Kindly indicate highest level of educational qualification attained

   ☐ Trade test ☐ Higher National Diploma ☐ Others (specify)…….

☐ Certificate ☐ Bachelor's degree

☐ National Diploma ☐ Masters

6. Kindly indicate your area of technical training and/or practice.

☐ Architecture ☐ Building

☐ Quantity surveying ☐ Project management

☐ Engineering ☐ Estate management

☐ Land surveying ☐ Accounting

☐ Business administration ☐ Others (please specify):……

(B) PROJECT INFORMATION

1. Kindly provide the following project data:

a) Contract Sum in Kshs. _____

b) Final Account amount in Kshs. _____

c) Planned Contract period in days _____

d) Actual contract period in days _____

e) Construction commencement date _____

f) Construction completion date _____

2. On a scale of 1 to 5 please indicate your level of satisfaction with quality of the facility.

1☐ Dissatisfied ☐ Fairly satisfied ☐3 Highly Satisfied

~~4~~ ☐ ~~4~~ Very satisfied ☐5 Extremely satisfied

3. On a scale of 1 to 5 please indicate your level of satisfaction with project implementation during design and construction stages.

1☐ Dissatisfied ☐ Fairly satisfied ☐3 Highly Satisfied

~~4~~ ☐ ~~4~~ Very satisfied ☐5 Extremely satisfied

4. Select one statement below that correctly explains the utilization of the facility.

1☐ Completely unutilized 2☐ Utilized for the unintended purpose

3☐ Not sure of the facility use 4☐ Utilized for the intended purpose

5☐ Completely utilized for intended purpose

5. During the construction stage of the project were there (Tick YES or NO)

a) Planned regular site inspections/meetings? ☐Yes ☐No
b) Regular update of work programme/schedule? ☐Yes ☐No
c) Revisions to drawings/specifications when necessary? ☐Yes ☐No

6. During the construction stage of the project were there: (Tick YES or NO)

a) Drawings and Specifications? ☐Yes ☐No
b)) Bills of Quantities? ☐Yes ☐No
c) Work Programme/Schedule? ☐Yes ☐No

7. On a scale of 1 to 5 how do you rate the effectiveness of communication among participants during the construction stage of the project

1☐ Poor ☐ Fair ☐3 Good

☐4 Very Good ☐5 Excellent

8. During project implementation, did you at any time make late payments for the following? (Tick YES or NO)

   a) Contractor's interim payments ☐Yes ☐No
   b) Consultants' fees ☐Yes ☐No
   c) CDF committee member's allowances ☐Yes ☐No
   d) Relevant statutory fees/levies in connection with the project ☐Yes ☐No

9. If any of your selection in 7 above is YES, please provide reason(s) why that was so.

   _____
   _____
   _____
   _____

10. In a scale of 1 to 5 kindly rate the level consultation among the stakeholders during project implementation.

    1☐ Poor ☐ Fair ☐3 Good

    ☐4 Very Good ☐5 Excellent

11. Did you have experience in participation in a similar project before? ☐Yes ☐No
12. If your answer to 10 above is YES, how often did you get a chance to share your past experience during the implementation of this project?

    1☐ Never ☐ Rarely ☐3 Many times

    ☐4 Most of the time ☐5 Always

13. On a scale of 1 to 5 kindly rate your level of knowledge of project management guidelines as stipulated by the CDF Act and regulations.

1☐ Poor ☐ Fair ☐3 Good

☐4 Very Good ☐5 Excellent

14. Which of the following factors should be considered in measuring success of a CDF construction project?

☐ Cost of the project ☐ Environmental impact of the project

☐ Construction time ☐ Community participation in implementation

☐ Quality of the project ☐ Satisfaction by the project users

☐ Satisfaction by the project team ☐ Others (please specify)_____

☐ Satisfaction by users of the facility ----------

15. In terms of the criteria you have selected in 13 above, how would you rate the performance of this project?

1☐ Poor ☐ Fair ☐3 Good

☐4 Very Good ☐5 Excellent

Thank you for your time!

2. QUESTIONNAIRE FOR CDF COMMITTEE MEMBER

(A) GENERAL INFORMATION

This section provides information of the project and the CDF committee member to be interviewed. Kindly put a tick (√) in the box next to the selected response.

1. Name of the project: _____
2. Location of the project:
   c) Ward: _____
   d) Constituency: _____
3. Name of the respondent: _____(optional)
4. Please indicate how long you have worked in your current position?

   ☐ Less than 5years ☐ 5-10years ☐ 10-15years

   ☐ Over 15years

5. Kindly indicate highest level of educational qualification attained

   ☐ Trade test ☐ Higher National diploma ☐ Others(specify)…….

   ☐ Certificate ☐ Bachelor's degree

   ☐ National Diploma ☐ Masters

6. Kindly indicate your area(s) of technical training and/or practice.

☐ Architecture ☐ Building

☐ Quantity surveying ☐ Project management

☐ Engineering ☐ Estate management

☐ Land surveying ☐ Accounting

☐ Business administration ☐ Others (please specify):……

(B) PROJECT INFORMATION

1. On a scale of 1 to 5 please indicate your level of satisfaction with quality of the project

1☐ Dissatisfied ☐ Fairly satisfied ☐3 Highly Satisfied

4☐ 4 Very satisfied ☐5 Extremely satisfied

2. On a scale of 1 to 5 please indicate your level of satisfaction with project implementation during design and construction stages

1☐ Dissatisfied ☐ Fairly satisfied ☐3 Highly Satisfied

4☐4 Very satisfied ☐5 Extremely satisfied

3. Select one statement below that correctly explains the utilization of the facility.

1☐ Completely unutilized 2☐ Utilized for the unintended purpose

3☐ Not sure of the facility use 4☐ Utilized for the intended purpose

5☐ Completely utilized for intended purpose

4. During the construction stage of the project were there: (Tick YES or NO)

   d) Planned regular site inspections/meetings? ☐ Yes ☐ No
   e) Regular update of work programme/schedule? ☐ Yes ☐ No
   f) Revisions to drawings/specifications when necessary? ☐ Yes ☐ No

5. On a scale of 1 to 5 how do you rate the effectiveness of communication among participants during the construction stage of the project

   1☐ Poor ☐ Fair ☐3 Good
   ☐ 4 Very Good ☐ 5 Excellent

6. During project implementation, did you at any time make late payments for the following? (Tick YES or NO)

   a) Contractor's interim payments ☐ Yes ☐ No
   b) Consultants' fees ☐ Yes ☐ No
   c) CDF committee member's allowances ☐ Yes ☐ No
   d) Relevant statutory fees/levies in connection with the project ☐ Yes ☐ No

7. If any of your selection in 6 above is YES, please provide reason(s) why that was so.

   _____
   _____
   _____
   _____
   _____

8. On a scale of 1 to 5 kindly rate the level of consultation among the stakeholders during project implementation.

   1☐ Poor ☐ Fair ☐3 Good
   ☐ 4 Very Good ☐ 5 Excellent

9. Did you have experience in participation in a similar project before? ☐ Yes ☐ No

10. If your answer to 9 above is YES, how often did you get a chance to share your past experience during the implementation of this project?

1☐ Never ☐ Rarely ☐3 Many times

☐4 Most of the time ☐5 Always

11. On a scale of 1 to 5 kindly rate your level of knowledge of project management guidelines as stipulated by the CDF Act and regulations.

1☐ Poor ☐ Fair ☐3 Good

☐4 Very Good ☐5 Excellent

12. Which of the following factors should be considered in measuring success of a CDF construction project?

☐ Cost of the project ☐ Environmental impact of the project

☐ Construction time ☐ Community participation in implementation

☐ Quality of the project ☐ Satisfaction by the project users

☐ Satisfaction by the project team ☐ Others (please specify) _____

☐ Satisfaction by users of the facility _____

13. In terms of the criteria you have selected in 12 above, how would you rate the performance of this project?

1☐ Poor ☐ Fair ☐3 Good

☐4 Very Good ☐5 Excellent

Thank you for your time!

3. QUESTIONNAIRE FOR PROJECT MANAGER/LEAD CONSULTANT

(A) GENERAL INFORMATION

This section provides information of the project and the Project manager or Lead Consultant to be interviewed. Kindly put a tick (√) in the box next to the selected response.

1. Name of the project: _____
2. Location of the project:
   e) Ward: _____ _____
   f) Constituency: _____ _
3. Name of the respondent: _____(optional)
4. Please indicate how long you have worked in the construction industry.

   ☐ Less than 5years ☐ 5-10years ☐ 10-15years

   ☐ Over 15years

5. Kindly indicate highest level of educational qualification attained.

   ☐ Trade test ☐ ☐ Higher National diploma Others(specify)…….

   ☐ Certificate ☐ Bachelor's degree

   ☐ National Diploma ☐ Masters

6. Kindly indicate your area(s) of technical training and/or practice.

☐ Architecture ☐ Building

☐ Quantity surveying ☐ Project management

☐ Engineering ☐ Estate management

☐ Land surveying ☐ Accounting

☐ Business administration ☐ Others (please specify)……

(B) PROJECT INFORMATION

1. Kindly provide the following project data:

   g) Contract Sum in Kshs. _____

   h) Final Account amount in Kshs. _____

   i) Planned Contract period in days _____

   j) Actual contract period in days - _____

   k) Construction commencement date _____

   l) Construction completion date _____

2. On a scale of 1 to 5 please indicate your level of satisfaction with quality of the project

   1☐ Dissatisfied ☐ Fairly satisfied ☐3 Highly Satisfied

   ☐ 4 Very satisfied ☐ 5 Extremely satisfied

3. On a scale of 1 to 5 please indicate your level of satisfaction with project implementation during design and construction stages

   1☐ Dissatisfied ☐ Fairly satisfied ☐3 Highly Satisfied

   ☐ 4 Very satisfied ☐ 5 Extremely satisfied

4. Was the project approved by NEMA before commencement of construction work?

   ☐Yes ☐No

5. How many complaints were received from the public regarding the negative environmental impacts of the project during the construction stage? ☐Yes ☐No
6. During construction was the construction site closed for operation at any one time by NEMA officials due to non-compliance with environmental requirements? ☐ Yes ☐No
7. Was there reported accident(s) that led to injuries during construction of the project?

   ☐Yes ☐No

8. From 7 above, indicate under each category the number of accident cases that were reported on a scale of 1 to 4, where; 1 = 0 cases, 2 = 1-10 cases, 3 = 11-20 cases and 4 = 21-30 cases.

   a) Injuries led to death_____
   b) The injuries led to immediate admission to hospital and/or absenteeism from duty _____
   c) The injuries were treated by First Aid on site and did not lead to absenteeism from duty _____

9. During the construction stage of the project were there (Tick YES or NO)

   g) Planned regular site inspections/meetings? ☐Yes ☐No
   h) Regular update of work programme/schedule? ☐Yes ☐No
   i) Revisions to drawings/specifications when necessary? ☐Yes ☐No

10. During the construction stage of the project were there: (Tick YES or NO)

    d) Drawings and Specifications? ☐Yes ☐No
    e)) Bills of Quantities? ☐Yes ☐No

f) Work Programme/Schedule? ☐ Yes ☐ No

11. In a scale of 1 to 5 how do you rate the effectiveness of communication among participants during the construction stage of the project

1 ☐ Poor ☐ Fair ☐ 3 Good

4 ☐ Very Good 5 ☐ Excellent

12. During project implementation, was there a delay in payments for the following? (Tick YES or NO)

j) Contractor's interim payments ☐ Yes ☐ No

k) Consultants' fees ☐ Yes ☐ No

l) CDF committee member's allowances ☐ Yes ☐ No

m) Relevant statutory fees/levies in connection with the project ☐ Yes ☐ No

13. If any of your selection in 11 above is YES please provide reason(s) why that was so.

_____

_____

_____

_____

_____

14. In a scale of 1 to 5 kindly rate the level of consultation among the stakeholders during project implementation.

1 ☐ Poor ☐ Fair ☐ 3 Good

4 ☐ Very Good 5 ☐ Excellent

15. Did you have experience in participation in a similar project before? ☐ Yes ☐ No

16. If your answer to 14 above is YES, how often did you get a chance to share your past experience during the implementation of this project?

1 ☐ Never ☐ Rarely ☐ 3 Many times

4 ☐ Most of the time 5 ☐ Always

17. On a scale of 1 to 5 kindly rate your level of knowledge of project management guidelines as stipulated by the CDF Act and regulations.

1☐ Poor ☐ Fair ☐3 Good

☐4 Very Good ☐5 Excellent

18. Which of the following factors should be considered in measuring success of a CDF construction project?

☐ Cost of the project ☐ Environmental impact of the project

☐ Construction time ☐ Community participation in implementation

☐ Quality of the project ☐ Satisfaction by the project users

☐ Satisfaction by the project team ☐ Others (specify) _____

☐ Satisfaction by users of the facility _____

19. In terms of the criteria you have selected in 17 above, how would you rate the performance of this project?

1☐ Poor ☐ Fair ☐3 Good

☐4 Very Good ☐5 Excellent

Thank you for your time!

4. QUESTIONNAIRE FOR CONTRACTOR

(A) GENERAL INFORMATION

This section provides information of the project and the key informant respondent to be interviewed. Kindly put a tick (√) in the box next to the selected response.

1. Name of the project: _____
2. Location of the project:
   g) Ward: _____ _____
   h) Constituency: _____ _
3. Name of the respondent: _____(optional)
4. Please indicate how long you have worked in the construction industry.

   ☐ Less than 5years ☐ 5-10years ☐ 10-15years

   ☐ Over 15years

5. Kindly indicate highest level of educational qualification attained.

   ☐ Trade test ☐ ☐ Higher National diploma Others(specify)…….

   ☐ Certificate ☐ Bachelor's degree

   ☐ National Diploma ☐ Masters

6. Kindly indicate your area(s) of technical training and/or practice.

☐ Architecture ☐ Building

☐ Quantity surveying ☐ Project management

☐ Engineering ☐ Estate management

☐ Land surveying ☐ Accounting

☐ Business administration ☐ Others (please specify)……

(B) PROJECT INFORMATION

1. Kindly provide the following project data

m) Contract Sum in Kshs. _____

n) Final Account amount in Kshs. _____

o) Planned Contract period in days _____

p) Actual contract period in days _____

q) Construction commencement date _____

r) Construction completion date _____

2. On a scale of 1 to 5 please indicate your level of satisfaction with quality of the project.

1☐ Dissatisfied ☐ Fairly satisfied ☐3 Highly Satisfied

☐ ☐
4 4 Very satisfied 5 Extremely satisfied

3. In a scale of 1 to 5 please indicate your level of satisfaction with project implementation during design and construction stages.

1☐ Dissatisfied ☐ Fairly satisfied ☐3 Highly Satisfied

☐ ☐

4 4 Very satisfied 5 Extremely satisfied

4. Was the project approved by NEMA before commencement of construction work?

☐Yes ☐No

5. How many complaints were received from the public regarding the negative environmental impacts of the project during the construction stage? ☐Yes ☐No
6. During construction was the construction site closed for operation at any one time by NEMA officials due to non-compliance with environmental requirements? ☐ Yes ☐No
7. Was there reported accident(s) that led to injuries during construction of the project?

☐Yes ☐No

8. From 7 above, indicate under each category the number of accident cases that were reported on a scale of 1 to 4, where; 1 = 0 cases, 2 = 1-10 cases, 3 = 11-20 cases and 4 = 21-30 cases.

d) Injuries led to death_____
e) The injuries led to immediate admission to hospital and/or absenteeism from duty _____
f) The injuries were treated by First Aid on site and did not lead to absenteeism from duty _____

9. During the construction stage of the project were there: (Tick YES or NO)

n) Planned regular site inspections/meetings? ☐Yes ☐No
o) Regular update of work programme/schedule? ☐Yes ☐No
p) Revisions to drawings/specifications when necessary? ☐Yes ☐No

10. During the construction stage of the project were there: (Tick YES or NO)

g) Drawings and Specifications? ☐Yes ☐No

h)) Bills of Quantities? ☐ Yes ☐ No

i) Work Programme/Schedule? ☐ Yes ☐ No

11. On a scale of 1 to 5 how do you rate the effectiveness of communication among participants during the construction stage of the project

1☐ Poor ☐ Fair ☐3 Good

4 ☐ 4 Very Good ☐ 5 Excellent

12. During project implementation, was there a delay in paying you at any one time?

☐ Yes ☐ No

13. If your response in 11 above is YES, please provide reason(s) why that was so.

_____

_____

_____

_____

_____

14. In a scale of 1 to 5 kindly rate the level of consultation among the stakeholders during project implementation.

1☐ Poor ☐ Fair ☐3 Good

4 ☐ 4 Very Good ☐ 5 Excellent

15. Did you have experience in participation in a similar project before? ☐ Yes ☐ No

16. If your answer to 10 above is YES, how often did you get a chance to share your past experience during the implementation of this project?

1☐ Never ☐ Rarely ☐ 3 Many times

4 ☐ 4 Most of the time ☐ 5 Always

17. On a scale of 1 to 5 kindly rate your level of knowledge of project management guidelines as stipulated by the CDF Act and regulations.

1☐ Poor ☐ Fair ☐3 Good

☐ ☐

4 4 Very Good 5 Excellent

18. Which of the following factors should be considered in measuring success of a CDF construction project?

☐ Cost of the project ☐ Environmental impact of the project

☐ Construction time ☐ Community participation in implementation

☐ Quality of the project ☐ Satisfaction by the project users

☐ Satisfaction by the project team ☐ Others (specify) _____

☐ Satisfaction by users of the facility _____

19. In terms of the criteria you have selected in 17 above, how would you rate the performance of this project?

1☐ Poor ☐ Fair ☐3 Good

4 4 Very Good 5 Excellent

Thank you for your time!

5. QUESTIONNAIRE FOR FACILITY USER

(A) GENERAL INFORMATION

This section provides information of the project and the Facility User to be interviewed. Kindly put a tick (√) in the box next to the selected response.

1. Name of the project: _____
2. Location of the project:
   a) Ward: _____
   b) Constituency: _____
3. Name of the respondent: _____(optional)
4. Position: _____
5. Please indicate how long you have worked in your current position.

   ☐ Less than 5years ☐ 5-10years ☐ 10-15years

   ☐ Over 15years

6. Kindly indicate highest level of educational qualification attained.

   ☐ Trade test ☐ Higher National diploma ☐ Others(specify)…….

   ☐ Certificate ☐ Bachelor's degree

   ☐ National Diploma ☐ Masters

(B) PROJECT INFORMATION

1. What type of services are you offering at the facility?

   ☐ Education ☐ Health

   ☐ Market ☐ Police post/station

   ☐ Sports ☐ Offices

   ☐ Social events ☐ Others (please specify)……

2. On a scale of 1 to 5 please indicate your level of satisfaction with quality of the facility.

   1☐ Dissatisfied ☐ Fairly satisfied ☐3 Highly Satisfied

   4☐ Very satisfied ☐5 Extremely satisfied

3. Select one statement below that correctly explains the utilization of the facility.

   1☐ Completely unutilized 2☐ Utilized for the unintended purpose

   3☐ Not sure of the facility use 4☐ Utilized for the intended purpose

   5☐ Completely utilized for intended purpose

4. On a scale of 1 to 5 how do you rate the effectiveness of facility in meeting your requirements?

   1☐ Poor ☐ Fair ☐3 Good

   4☐ Very Good ☐5 Excellent

5. On a scale of 1 to 5 kindly rate the level of consultations between the project team and the stakeholders during the project formulation and implementation.

1☐ Poor ☐ Fair ☐3 Good

4☐ Very Good ☐5 Excellent

6. Did you have experience in participation in a similar construction before? ☐ Yes ☐No
7. If your answer to 6 above is YES, how often did you get a chance to share your past experience during the implementation of this project?

1☐ Never ☐ Rarely ☐3 Many times

4☐ Most of the time ☐5 Always

8. On a scale of 1 to 5 kindly rate your level of knowledge of project management guidelines as stipulated by the CDF Act and regulations.

1☐ Poor ☐ Fair ☐3 Good

4☐ Very Good ☐5 Excellent

9. Which of the following factors should be considered in measuring performance of a CDF construction project?

☐ Cost of the project ☐ Environmental impact of the project

☐ Construction time ☐ Community participation in implementation

☐ Quality of the project ☐ Satisfaction by the project users

☐ Satisfaction by the project team ☐ Others (specify) _____

☐ Satisfaction by users of the facility _____

10. In terms of the criterion you have selected in 9 above, how would you rate the performance of this project?

1 Poor Fair 3 Good

4 4 Very Good 5 Excellent

Thank you for your time!

6. QUESTIONNAIRE FOR LOCAL OPINION LEADER

(A) GENERAL INFORMATION

This section provides information of the project and the Local Opinion Leader to be interviewed. Kindly put a tick (√) in the box next to the selected response.

1. Name of the project: _____
2. Location of the project:
   a) Ward: _____
   b) Constituency: _____
3. Name of the respondent: _____(optional)
4. Position: _____
5. Please indicate how long you have worked in your current position.

   ☐ Less than 5years ☐ 5-10years ☐ 10-15years

   ☐ Over 15years

6. Kindly indicate highest level of educational qualification attained.

   ☐ Trade test ☐ Higher National diploma ☐ Others(specify)…….

   ☐ Certificate ☐ Bachelor's degree

   ☐ National Diploma ☐ Masters

7. Kindly indicate your area(s) technical training or practice.

☐ Architecture ☐ Building

☐ Quantity surveying ☐ Project management

☐ Engineering ☐ Estate management

☐ Land surveying ☐ Accounting

☐ Business administration ☐ Others (please specify)……

(B) PROJECT INFORMATION

1. In a scale of 1 to 5 please indicate your level of satisfaction with quality of the project

1☐ Dissatisfied ☐ Fairly satisfied ☐3 Highly Satisfied

☐ 4 Very satisfied ☐ 5 Extremely satisfied

2. In a scale of 1 to 5 please indicate your level of satisfaction with project implementation during design and construction stages

1☐ Dissatisfied ☐ Fairly satisfied ☐3 Highly Satisfied

☐ 4 Very satisfied ☐ 5 Extremely satisfied

3. Select one statement below that correctly explains the utilization of the facility.

1☐ Completely unutilized 2☐ Utilized for the unintended purpose

3☐ Not sure of the facility use 4☐ Utilized for the intended purpose

5☐ Completely utilized for intended purpose

4. How would you rate the level of the community's participation/involvement during the following stages of this project: -

	Poor	Fair	Good	Very Good	Excellent
a) Identification/selection of the project	☐	☐	☐	☐	☐
b) Design and planning stage	☐	☐	☐	☐	☐
c) Implementation of the project	☐	☐	☐	☐	☐
d) Monitoring the progress of the project	☐	☐	☐	☐	☐
e) Evaluation of the project on completion	☐	☐	☐	☐	☐

5. On a scale of 1 to 5, how do you rate the levels of consultations between the project team and other stakeholders?

1☐ Poor ☐ Fair ☐3 Good
☐4 Very Good ☐5 Excellent

6. Did you have experience in participating in a similar project before? ☐Yes ☐No
7. If your answer to 6 above is YES, how often did you get a chance to share your past experience during the implementation of this project?

1☐ Never ☐ Rarely ☐3 Many times
☐4 Most of the time ☐5 Always

8. On a scale of 1 to 5 kindly rate your level of knowledge of project management guidelines as stipulated by the CDF Act and regulations.

1☐ Poor ☐ Fair ☐3 Good
☐ ☐

4 4 Very Good 5 Excellent

9. Which of the following factors that should be considered in measuring performance of construction a CDF construction project?

☐ Cost of the project ☐ Environmental impact of the project

☐ Construction time ☐ Community participation in implementation

☐ Quality of the project ☐ Satisfaction by the project users

☐ Satisfaction by the project team ☐ Others (specify) _____

☐ Satisfaction by users of the facility _____

10. In terms of the criteria you have selected in 9 above, how would you rate the performance of this project?

1 ☐ Poor ☐ Fair ☐ 3 Good

4 ☐ 4 Very Good 5 ☐ Excellent

Thank you for your time!

7. QUESTIONNAIRE FOR A COMMUNITY MEMBER

(A) GENERAL INFORMATION

This section provides information of the project and the key informant respondent to be interviewed. Kindly put a tick (√) in the box next to the selected response.

1. Name of the project: _____
2. Location of the project:
   a) Ward: _____
   b) Constituency: _____
3. Name of the respondent: _____(optional)
4. Please indicate how long you have a resident of this community?

   ☐ Less than 5years ☐ 5-10years ☐ 10-15years

   ☐ Over 15years

5. Kindly indicate highest level of educational qualification attained

   ☐ Trade test ☐ Higher National Diploma ☐ Others (specify)…….

   ☐ Certificate ☐ Bachelor's degree

   ☐ National Diploma ☐ Masters

(B) PROJECT INFORMATION

1. Select one statement below that correctly explains the utilization of the facility.

   1☐ Completely unutilized 2☐ Utilized for the unintended purpose

   3☐ Not sure of the facility use 4☐ Utilized for the intended purpose

   5☐ Completely utilized for intended purpose

2. How would you rate the level of the community's participation/involvement during the following stages of this project: -

	Poor	Fair	Good	Very good	Excellent
a) Identification/selection of the project	☐	☐	☐	☐	☐
b) Design and planning stage	☐	☐	☐	☐	☐
c) Implementation of the project	☐	☐	☐	☐	☐
d) Monitoring the progress of the project	☐	☐	☐	☐	☐
e) Evaluation of the project on completion	☐	☐	☐	☐	☐

3. On a scale of 1 to 5, how do you rate the levels of consultations between the project team and community members?

   1☐ Poor ☐ Fair ☐3 Good

   4 ☐ 4 Very Good ☐ 5 Excellent

4. Did you have experience in participation in a similar project before this project?

   ☐Yes ☐No

5. If your answer to 4 above is YES, how often did you get a chance to share your past experience during the implementation of this project?

1☐ Never ☐ Rarely ☐3 Many times

☐4 Most of the time ☐5 Always

6. In a scale of 1 to 5, kindly rate your level of knowledge of project management guidelines as stipulated by the CDF Act and regulations.

1☐ Poor ☐ Fair ☐3 Good

☐4 Very Good ☐5 Excellent

7. Which of the following factors should be considered in measuring performance of construction a CDF construction project?

☐ Cost of the project ☐ Environmental impact of the project

☐ Construction time ☐ Community participation in implementation

☐ Quality of the project ☐ Satisfaction by the project users

☐ Satisfaction by the project team ☐ Others (specify) _____

☐ _____

Satisfaction by users of the facility

8. In terms of the criteria you have selected in 7 above, how would you rate the performance of this project?

1☐ Poor ☐ Fair ☐3 Good

☐4 Very Good ☐5 Excellent

Thank you for your time!

Appendix VI: SPSS Print Out

Statistics

		Respective Respondent	working years	Highest education level	Area of Technical Training	What type of Services are being Offered?
N	Valid	340	325	331	229	50
	Missing	0	15	9	111	290

Frequency Table

Respective Respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	CDF Committee Member	49	14.4	14.4	14.4
	CDF Fund Manager	51	15.0	15.0	29.4
	Contractor	41	12.1	12.1	41.5
	Project Manager / Lead Consultant	51	15.0	15.0	56.5
	Facility User	50	14.7	14.7	71.2
	Local Opinion Leader	48	14.1	14.1	85.3
	Community Member	50	14.7	14.7	100.0
	Total	340	100.0	100.0	

working years

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 5 years	90	26.5	27.7	27.7
	5-10 years	127	37.4	39.1	66.8
	10-15 years	51	15.0	15.7	82.5
	over 15 years	57	16.8	17.5	100.0
	Total	325	95.6	100.0	
Missing	System	15	4.4		

Total		340	100.0		

Highest education level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Trade test	19	5.6	5.7	5.7
	Certificate	106	31.2	32.0	37.8
	National Diploma	111	32.6	33.5	71.3
	Higher National Diploma	7	2.1	2.1	73.4
	Bachelor's Degree	51	15.0	15.4	88.8
	Masters	25	7.4	7.6	96.4
	Others	12	3.5	3.6	100.0
	Total	331	97.4	100.0	
Missing	System	9	2.6		
Total		340	100.0		

Area of Technical Training

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Architecture	1	.3	.4	.4
	Engineering	22	6.5	9.6	10.0
	Business Admin	14	4.1	6.1	16.2
	Building	67	19.7	29.3	45.4
	Project Management	15	4.4	6.6	52.0
	Estate Manager	1	.3	.4	52.4
	Accounting	55	16.2	24.0	76.4
	IT	33	9.7	14.4	90.8
	Economics	10	2.9	4.4	95.2
	Teacher	10	2.9	4.4	99.6
	Statistician	1	.3	.4	100.0
	Total	229	67.4	100.0	
Missing	System	111	32.6		
Total		340	100.0		

What type of Services are being Offered?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Education	29	8.5	58.0	58.0
	Health	7	2.1	14.0	72.0
	Police post/station	8	2.4	16.0	88.0
	Offices	3	.9	6.0	94.0
	Agriculture	3	.9	6.0	100.0
	Total	50	14.7	100.0	
Missing	System	290	85.3		
Total		340	100.0		

Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Time performance	38	1	5	2.61	1.824
Cost performance	49	1	5	4.69	.796
Quality Performance	51	2.67	4.33	3.6939	.37288
Project Team satisfaction	51	2.00	4.60	3.7176	.44475
Environmental Impact	48	4	5	4.15	.357
Safety Performance	45	4	5	4.89	.318
Community participation	50	1.00	5.00	2.2840	1.30249
Project Goals	50	3.00	5.00	4.3135	.57331
User satisfaction	51	2.80	4.33	3.7285	.31125
Performance level	34	3.23	4.56	3.8067	.34912
Valid N (listwise)	34				

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DESCRIPTIVES VARIABLES=X1 X2 X3 X4 X5 X6 X7 X8 X9

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Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Project manager's competency	45	1	5	2.62	.936
Planning	51	1.00	4.00	3.6863	.58276
Monitoring and control	51	2.00	4.00	3.8627	.44809
Communication	51	2.50	4.75	3.5164	.52636
Financial Resource	51	1.00	2.00	1.2700	.45071
community involvement	51	.00	5.00	2.5437	1.36073
Stakeholder management	51	2.60	4.42	3.4427	.40710
Feedback capabilities	51	3.00	5.20	3.7995	.49802
Knowledge of CDF Mngt Guidelines	51	2.33	4.00	3.4142	.40885
Valid N (listwise)	45				

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CORRELATIONS

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 /MISSING=PAIRWISE.
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Correlations

Correlations

		Performance Level	Project manager's competency	Planning	Monitoring and control	Coomunication	Financial Resource	community involvement	Stakeholder management	Feedback capabilities	Knowledge of CDF Mngt Guidelines
Performance Level	Pearson Correlation	1	.047	.015	.349*	.240	.457**	.406*	.528**	.621**	.370*
	Sig. (2-tailed)		.813	.934	.043	.171	.007	.017	.001	.000	.031
	N	34	28	34	34	34	34	34	34	34	34
Project manager's competency	Pearson Correlation	.047	1	.273	.274	.142	.037	.181	.091	.036	.009

	Sig. (2-tailed)	.813		.069	.069	.351	.810	.235	.551	.816	.955
	N	28	45	45	45	45	45	45	45	45	45
	Pearson Correlation	.015	.273	1	.215	.003	-.106	.030	-.065	-.090	-.062
Planning	Sig. (2-tailed)	.934	.069		.130	.983	.459	.837	.651	.529	.664
	N	34	45	51	51	51	51	51	51	51	51
	Pearson Correlation	.349*	.274	.215	1	.080	.107	.125	.092	.183	.101
Monitoring and control	Sig. (2-tailed)	.043	.069	.130		.575	.456	.381	.523	.198	.481
	N	34	45	51	51	51	51	51	51	51	51
	Pearson Correlation	.240	.142	.003	.080	1	-.199	-.111	.412**	.253	.187
Coomunication	Sig. (2-tailed)	.171	.351	.983	.575		.162	.437	.003	.073	.189
	N	34	45	51	51	51	51	51	51	51	51
	Pearson Correlation	.457**	.037	-.106	.107	-.199	1	.314*	.097	.031	-.141
Financial Resource	Sig. (2-tailed)	.007	.810	.459	.456	.162		.025	.499	.827	.323
	N	34	45	51	51	51	51	51	51	51	51
	Pearson Correlation	.406*	.181	.030	.125	-.111	.314*	1	.264	.440**	.370**
community involvement	Sig. (2-tailed)	.017	.235	.837	.381	.437	.025		.061	.001	.008
	N	34	45	51	51	51	51	51	51	51	51
	Pearson Correlation	.528**	.091	-.065	.092	.412**	.097	.264	1	.550**	.553**
Stakeholder management	Sig. (2-tailed)	.001	.551	.651	.523	.003	.499	.061		.000	.000
	N	34	45	51	51	51	51	51	51	51	51
	Pearson Correlation	.621**	.036	-.090	.183	.253	.031	.440**	.550**	1	.435**
Feedback capabilities	Sig. (2-tailed)	.000	.816	.529	.198	.073	.827	.001	.000		.001
	N	34	45	51	51	51	51	51	51	51	51
	Pearson Correlation	.370*	.009	-.062	.101	.187	-.141	.370**	.553**	.435**	1
Knowledge of CDF Mngt Guidelines	Sig. (2-tailed)	.031	.955	.664	.481	.189	.323	.008	.000	.001	
	N	34	45	51	51	51	51	51	51	51	51

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

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

Regression

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.655[a]	.429	.407	.28311
2	.754[b]	.569	.535	.25085
3	.799[c]	.639	.594	.23440
4	.857[d]	.734	.687	.20559
5	.885[e]	.782	.733	.19003

a. Predictors: (Constant), Feedback capabilities
b. Predictors: (Constant), Feedback capabilities, Financial Resource
c. Predictors: (Constant), Feedback capabilities, Financial Resource, community involvement
d. Predictors: (Constant), Feedback capabilities, Financial Resource, community involvement, Monitoring and control
e. Predictors: (Constant), Feedback capabilities, Financial Resource, community involvement, Monitoring and control, Stakeholder management

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.567	1	1.567	19.555	.000[b]
	Residual	2.084	26	.080		
	Total	3.651	27			
2	Regression	2.078	2	1.039	16.513	.000[c]
	Residual	1.573	25	.063		
	Total	3.651	27			
3	Regression	2.333	3	.778	14.153	.000[d]
	Residual	1.319	24	.055		
	Total	3.651	27			
4	Regression	2.679	4	.670	15.847	.000[e]
	Residual	.972	23	.042		
	Total	3.651	27			
5	Regression	2.857	5	.571	15.823	.000[f]
	Residual	.794	22	.036		
	Total	3.651	27			

a. Dependent Variable: Performance Level

b. Predictors: (Constant), Feedback capabilities

c. Predictors: (Constant), Feedback capabilities, Financial Resources

d. Predictors: (Constant), Feedback capabilities, Financial Resources, community involvement

e. Predictors: (Constant), Feedback capabilities, Financial Resources, community involvement, Monitoring and control

f. Predictors: (Constant), Feedback capabilities, Financial Resources, community involvement, Monitoring and control, Stakeholder management

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t
		B	Std. Error	Beta	
1	(Constant)	1.782	.463		3.851
	Feedback capabilities	.515	.116	.655	4.422
2	(Constant)	3.421	.707		4.842
	Feedback capabilities	.462	.105	.588	4.411
	Financial Resources	-.304	.107	-.380	-2.849
3	(Constant)	3.523	.662		5.322
	Feedback capabilities	.384	.104	.489	3.675
	Financial Resources	-.347	.102	-.435	-3.417
	community involvement	.113	.053	.284	2.152
4	(Constant)	1.667	.870		1.916
	Feedback capabilities	.344	.093	.438	3.709
	Financial Resource	-.317	.090	-.396	-3.529
	community involvement	.141	.047	.354	2.994
	Monitoring and control	.450	.157	.321	2.863
5	(Constant)	1.292	.822		1.572
	Feedback capabilities	.232	.099	.295	2.327
	Financial Resource	-.303	.083	-.379	-3.642
	community involvement	.143	.044	.357	3.266
	Monitoring and control	.445	.145	.318	3.066
	Stakeholder management	.221	.100	.265	2.218

Coefficients[a]

Model		Sig.
1	(Constant)	.001
	Feedback capabilities	.000
2	(Constant)	.000
	Feedback capabilities	.000
	Financial Resource	.009
3	(Constant)	.000
	Feedback capabilities	.001
	Financial Resource	.002
	community involvement	.042
4	(Constant)	.068
	Feedback capabilities	.001
	Financial Resource	.002
	community involvement	.006
	Monitoring and control	.009
5	(Constant)	.130
	Feedback capabilities	.030
	Financial Resource	.001
	community involvement	.004
	Monitoring and control	.006
	Stakeholder management	.037

a. Dependent Variable: Performance Level

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	Project manager's competency	.063[b]	.421	.677	.084	.999
	Planning	.123[b]	.808	.427	.160	.968
	Monitoring and control	.305[b]	2.190	.038	.401	.988
	Coomunication	.114[b]	.736	.469	.146	.925
	Financial Resource	-.380[b]	-2.849	.009	-.495	.969
	community involvement	.194[b]	1.256	.221	.244	.900
	Stakeholder management	.300[b]	1.759	.091	.332	.699
	Knowledge of CDF Mngt Guidelines	.133[b]	.732	.471	.145	.682
2	Project manager's competency	.043[c]	.318	.754	.065	.996
	Planning	-.013[c]	-.087	.931	-.018	.849
	Monitoring and control	.251[c]	1.986	.059	.376	.963
	Coomunication	.000[c]	.001	.999	.000	.845
	community involvement	.284[c]	2.152	.042	.402	.864
	Stakeholder management	.265[c]	1.751	.093	.337	.694
	Knowledge of CDF Mngt Guidelines	-.018[c]	-.106	.917	-.022	.608
3	Project manager's competency	-.005[d]	-.042	.967	-.009	.964
	Planning	-.022[d]	-.164	.871	-.034	.848
	Monitoring and control	.321[d]	2.863	.009	.513	.921
	Coomunication	.015[d]	.107	.916	.022	.843
	Stakeholder management	.270[d]	1.936	.065	.374	.694
	Knowledge of CDF Mngt Guidelines	-.073[d]	-.450	.657	-.093	.593
4	Project manager's competency	-.034[e]	-.306	.763	-.065	.956
	Planning	.041[e]	.342	.736	.073	.818
	Coomunication	.066[e]	.548	.589	.116	.824
	Stakeholder management	.265[e]	2.218	.037	.428	.694
	Knowledge of CDF Mngt Guidelines	-.030[e]	-.212	.834	-.045	.586
5	Project manager's competency	-.033[f]	-.313	.757	-.068	.956

	Planning	.031[f]	.278	.783	.061	.817
	Coomunication	-.005[f]	-.043	.966	-.009	.755
	Knowledge of CDF Mngt Guidelines	-.206[f]	-1.445	.163	-.301	.463

a. Dependent Variable: Performance Level

b. Predictors in the Model: (Constant), Feedback capabilities

c. Predictors in the Model: (Constant), Feedback capabilities, Financial Resources

d. Predictors in the Model: (Constant), Feedback capabilities, Financial Resources, community involvement

e. Predictors in the Model: (Constant), Feedback capabilities, Financial Resources, community involvement, Monitoring and control

f. Predictors in the Model: (Constant), Feedback capabilities, Financial Resources, community involvement, Monitoring and control, Stakeholder management

```
REGRESSION

 /MISSING LISTWISE

 /STATISTICS COEFF OUTS R ANOVA COLLIN TOL

 /CRITERIA=PIN(.05) POUT(.10)

 /NOORIGIN

 /DEPENDENT Y

 /METHOD=ENTER X1 X2 X3 X4 X5 X6 X7 X8 X9

 /SCATTERPLOT=(*ZPRED ,*ZRESID)

 /RESIDUALS NORMPROB(ZRESID).
```

Regression

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.898[a]	.806	.709	.19837

a. Predictors: (Constant), Knowledge of CDF Mngt Guidelines, Monitoring and control, Project manager's competency, Planning, Communication, community involvement, Financial Resources, Feedback capabilities, Stakeholder management

b. Dependent Variable: Performance Level

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.943	9	.327	8.310	.000[b]
	Residual	.708	18	.039		
	Total	3.651	27			

a. Dependent Variable: Performance Level

b. Predictors: (Constant), Knowledge of CDF Mngt Guidelines, Monitoring and control, Project manager's competency, Planning, Coomunication, community involvement, Financial Resources, Feedback capabilities, Stakeholder management

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t
		B	Std. Error	Beta	
1	(Constant)	1.892	1.258		1.504
	Project manager's competency	-.024	.045	-.058	-.526
	Planning	.006	.066	.012	.097
	Monitoring and control	.422	.161	.301	2.615
	Coomunication	-.021	.088	-.029	-.234
	Financial Resource	-.361	.109	-.451	-3.295
	community involvement	.157	.047	.394	3.313
	Stakeholder management	.307	.126	.367	2.434
	Feedback capabilities	.276	.110	.351	2.499
	Knowledge of CDF Mngt Guidelines	-.188	.133	-.224	-1.406

Coefficients[a]

Model		Sig.	Collinearity Statistics	
			Tolerance	VIF
1	(Constant)	.150		
	Project manager's competency	.605	.891	1.123
	Planning	.924	.749	1.335
	Monitoring and control	.018	.815	1.227
	Coomunication	.818	.707	1.414
	Financial Resource	.004	.575	1.739
	community involvement	.004	.763	1.310
	Stakeholder management	.026	.473	2.115
	Feedback capabilities	.022	.546	1.831
	Knowledge of CDF Mngt Guidelines	.177	.425	2.355

a. Dependent Variable: Performance Level

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	Project manager's competency	Planning
1	1	9.769	1.000	.00	.00	.00
	2	.092	10.331	.00	.83	.00
	3	.054	13.449	.00	.00	.06
	4	.031	17.883	.00	.10	.47
	5	.022	20.883	.00	.00	.11
	6	.015	25.590	.00	.04	.00
	7	.007	37.961	.00	.00	.00
	8	.006	41.621	.00	.00	.04
	9	.005	46.483	.00	.02	.01
	10	.001	119.278	.99	.00	.30

Collinearity Diagnostics[a]

Model	Dimension	Variance Proportions			
		Monitoring and control	Coomunication	Financial Resource	community involvement
1	1	.00	.00	.00	.00
	2	.00	.00	.00	.00
	3	.00	.01	.00	.63
	4	.00	.06	.00	.10
	5	.02	.09	.12	.04
	6	.00	.60	.01	.06
	7	.10	.00	.09	.00
	8	.03	.02	.01	.02
	9	.32	.03	.16	.14
	10	.53	.20	.61	.00

Collinearity Diagnostics[a]

Model	Dimension	Variance Proportions		
		Stakeholder management	Feedback capabilities	Knowledge of CDF Mngt Guidelines
1	1	.00	.00	.00
	2	.00	.00	.00
	3	.00	.00	.00
	4	.01	.01	.01
	5	.01	.00	.01
	6	.03	.03	.10
	7	.49	.22	.00
	8	.07	.64	.40
	9	.31	.09	.25
	10	.08	.00	.23

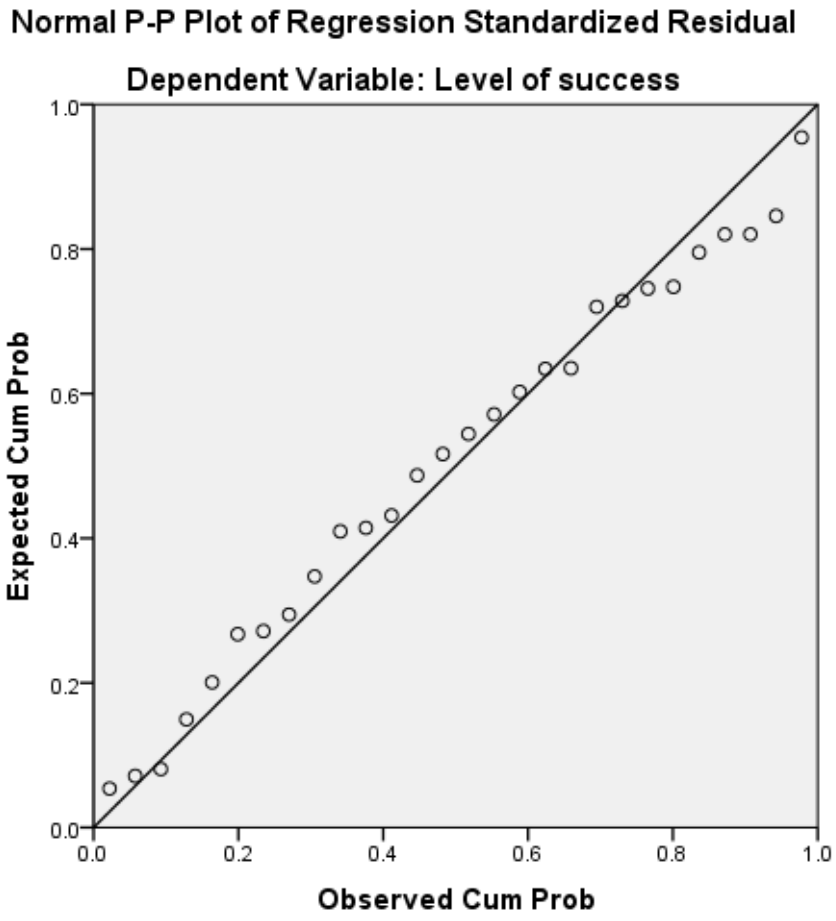
a. Dependent Variable: Level of success

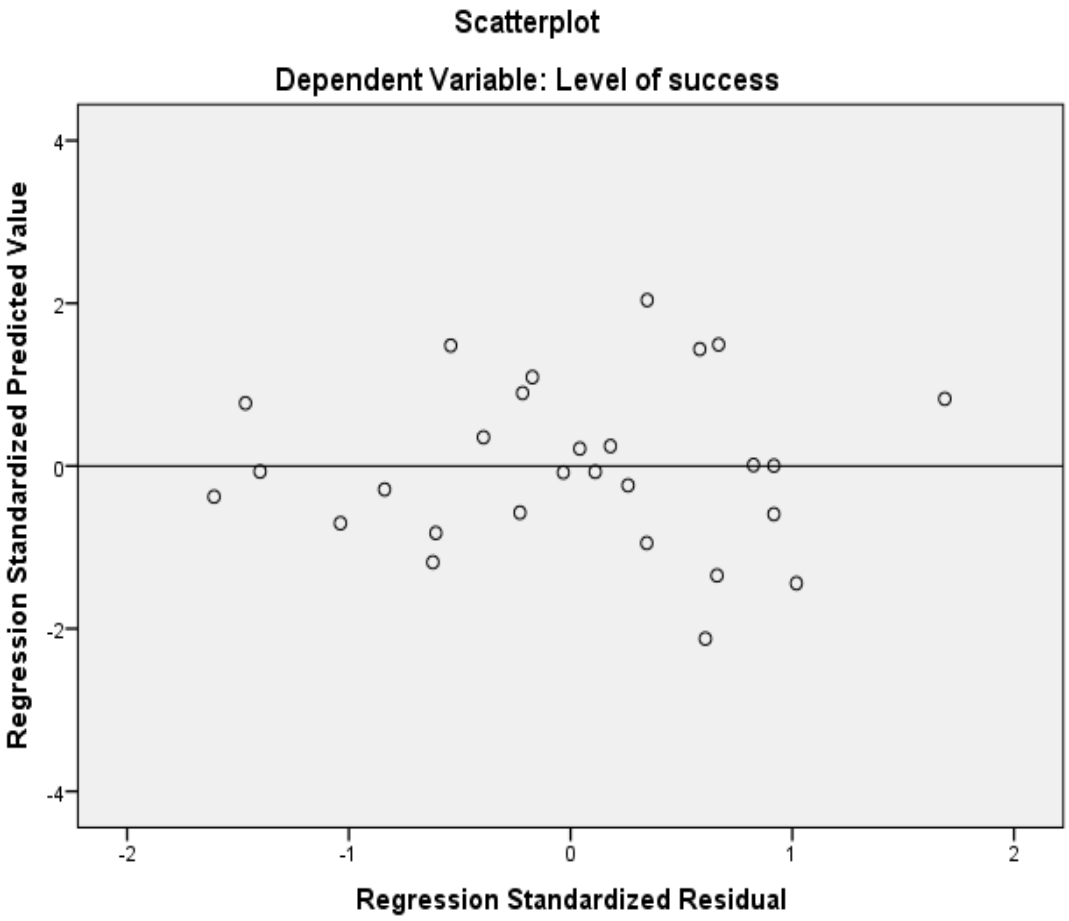
Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	3.1128	4.4870	3.8137	.33016	28
Residual	-.31897	.33478	.00000	.16197	28
Std. Predicted Value	-2.123	2.039	.000	1.000	28
Std. Residual	-1.608	1.688	.000	.816	28

a. Dependent Variable: Performance Level

Charts


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Level of success
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0


Scatterplot
Dependent Variable: Level of success
Regression Standardized Predicted Value
Regression Standardized Residual
4
2
0
-2
-4
-2
-1
0
1
2

Appendix VII: Research Permit

NATIONAL COMMISSION FOR SCIENCE,
TECHNOLOGY AND INNOVATION

Telephone:+254-20-2213471,
2241349,3310571,2219420
Fax:+254-20-318245,318249
Email: dg@nacosti.go.ke
Website : www.nacosti.go.ke
When replying please quote

NACOSTI, Upper Kabete
Off Waiyaki Way
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No. **NACOSTI/P/18/99905/22365**

Date: **19th April, 2018**

James Ouma Okaka
Jomo Kenyatta University of
Agriculture and Technology
P.O. Box 62000-00200
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Developing an evaluation model to enhance performance of CDF construction projects in Kenya,"*** I am pleased to inform you that you have been authorized to undertake research in **Siaya County** for the period ending **19th April, 2019.**

You are advised to report to **the County Commissioner and the County Director of Education, Siaya County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

DR. STEPHEN K. KIBIRU, PhD.
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Siaya County.

The County Director of Education
Siaya County.

National Commission for Science, Technology and Innovation is ISO9001:2008 Certified

THIS IS TO CERTIFY THAT:
MR. JAMES OUMA OKAKA
of JOMO KEYATTA UNIVERSITY OF AGRICULTURE & TECHNOLOGY, 0-100 NAIROBI,has been permitted to conduct research in *Siaya County*

on the topic: *DEVELOPING AN EVALUATION MODEL TO ENHANCE PERFORMANCE OF CDF CONSTRUCTION PROJECTS IN KENYA*

for the period ending:
19th April,2019

.....
Applicant's Signature

Permit No : NACOSTI/P/18/99905/22365
Date Of Issue : 19th April,2018
Fee Recieved :Ksh 2000

.....
Director General
National Commission for Science, Technology & Innovation

CONDITIONS

1. The License is valid for the proposed research, research site specified period.
2. Both the Licence and any rights thereunder are non-transferable.
3. Upon request of the Commission, the Licensee shall submit a progress report.
4. The Licensee shall report to the County Director of Education and County Governor in the area of research before commencement of the research.
5. Excavation, filming and collection of specimens are subject to further permissions from relevant Government agencies.
6. This Licence does not give authority to transfer research materials.
7. The Licensee shall submit two (2) hard copies and upload a soft copy of their final report.
8. The Commission reserves the right to modify the conditions of this Licence including its cancellation without prior notice.

REPUBLIC OF KENYA

National Commission for Science, Technology and Innovation

RESEARCH CLEARANCE PERMIT

Serial No.A 18279

CONDITIONS: see back page