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Critical success factors and implementation of public private partnership projects in the energy sector in Kenya

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CRITICAL SUCCESS FACTORS AND IMPLEMENTATION OF PUBLIC PRIVATE PARTNERSHIP PROJECTS IN THE ENERGY SECTOR IN KENYA

(A case Study of Eldosol and Garissa Solar Power Plant)

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DECLARATION AND APPROVAL

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

Sign ……  …… **Date** ……28/09/21……..

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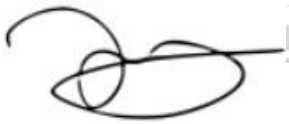
Approval

This Research Project by **Medrine Mueni Ndile** has been submitted for examination with my approval as the University Supervisor.



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PROF. JOHN OSOGO AMBANI

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DEDICATION

I dedicate this work to my family for their support.

ABSTRACT

The aim of this study is to assess the influence of critical success factors on the implementation of public private partnership projects in the energy sector in Kenya. Public Private Partnership projects have been critical for a steady and speedy economic transformation across the globe including in the developing world. Kenya has also not been an exception to PPP projects. This framework has seen tremendous growth in Kenya's infrastructure in sectors such as water, agriculture, energy and transport. The implementation of these projects, however, has not been realized as evidenced by increased cases of project stagnation and slow rate of incompletion. This raises the question on whether critical success factors in project management have been adequately employed in these projects, hence the subject of the study. The study specifically sought to assess the effect of project financing on project implementation, the influence of project risk management on project implementation, the influence of project leadership on project implementation and the effect of project information technology on the implementation of PPP projects. The study was informed by three major theories which are contingency theory of leadership, resource dependence theory, and Frank Knight's theory of project risk management. The target population for this study are Eldosol and Garissa solar power projects. Key project personnel include project managers and supervisors were the units of observation for the study. The study purposively sampled 40 respondents drawn from the two projects. A structured questionnaire was used as the main instrument for the research data collection. This was administered through online platforms. The collected data was analysed through descriptive and inferential statistics using SPSS software. The findings from the study revealed that project financing through adequate budgeting, enhancing accountability and ensuring timely disbursements positively influenced the implementation of the PPP projects. Project risk management through analysis and identification of the risks and employing risk control measures was also found to influence project implementation. The findings revealed that project leadership and adoption of information technology are critical success factors that positively and significantly influence project implementation. The study concludes that project financing, project risk management, project leadership and information technology are critical aspects that influence the implementation of public private partnership projects in the energy sector in Kenya.

Keywords: Critical success factors, Project Financing, Risk Management, Leadership, Information Technology, Project Implementation, Public Private Partnership Projects

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The Public Private Partnership (PPP) concept denotes the public sector and the private sector getting into partnership, putting together their resources in terms of human capital, ideas, funding and implementing their outlined goals in the partnership for the purpose of achieving a common goal which ultimately benefits the general public (Willems, 2014). PPPs are driven by the growing need of governments and local authorities to meet citizens' needs. Lack of funds by the government is the main driver behind worldwide efforts to involve private companies in the provision of public services. According to Osmanli (2014) successful PPPs require a careful balance between public benefit and private gain. Nederhand and Klijn (2017) state that majority of corporations in some countries have started to channel funds through PPPs.

Critical Success Factors (CSF) have been described as the key aspects in an organization that when focused on, enable the business to thrive and enhance effectiveness (Raravi, Bagodi & Mench, 2013). These aspects are limited and their mix in an organization as well as the extent to which the firm gives them the required attention determines their ability to steer performance and competitiveness. According to Raravi *et al.* (2013), CSFs comprise of features revolving around the project team's financial plan, management of risks associated with the project, integration of information technology in project implementation, socio-economic factors and the leadership competency of the project management. These factors determine how well a project is

successfully implemented and the sustainability of the project after implementation (Jabbour, Jabbour, Foropon, & Godinho, 2018).

1.1.1 Critical Success Factors

In project management, the success of a project tells the effectiveness of the entire process and whether it positively contributes to the overall benefit of the firm or not (Yang, Chen & Chang, 2016). CSFs therefore, as highlighted by Yang *et al.* tells how best the project team is prepared to focus on the most crucial aspects of a project (critical) and how these factors are aligned to contribute to the achievement of the set goals (success).

Globally, Chuang, Liu and Chen (2017) contemplated that most of the organizations in China upheld CSFs such as project risk management and use of the appropriate information technology as a way of enhancing success of their projects. According to Chuang *et al.* (2017), the main CSFs in a construction project include the ability of the project management team to embrace the appropriate risk management strategies and employ the right technology in the implementation of the project. For an aspect in the project to qualify to be a critical success factor, it ought to have the ability to determine how well the project will be successful. In the modern era, every project utilizes very strong use of technology and the extent to which this technology is embraced in the project determines the success of the project. This is the same case with risk management. Projects in the 21st century are surrounded by risks and having these risks managed appropriately is a move towards enhancing the success of the project (Chuang et al., 2017 & Perker, 2016).

In Malaysia, Azlan and Ismail (2016) argued that CSFs were subject to both internal and external factors that influenced the success of the project. The authors identified resource mobilization including project financing and having the appropriate skills, effective leadership styles and project monitoring as the main CSFs that play a significant role in enhancing project performance. According to Azlan and Ismail, when the project management has access to adequate financial resources and the stakeholders are supportive, there is a high likelihood of the project to succeed hence identified the two as the major critical success drivers. They further contend that project financing comes as a key project success driver in all the stages of the project including project planning stage, implementation and monitoring stages; thus it is one of the key CSFs that play a critical role in enhancing the success of a project.

Regionally, several CSFs have been linked with project performance. In Zimbabwe for instance, Nwachukwu and Emoh (2018) indicated that the critical success factors in a project were several but mainly determined by the specification of the project as well as other external aspects outside the control of the project management. Nwachukwu and Emoh (2018) however indicated effective management of risks as the main critical success factor in a modern project. The authors argue that projects exist in an uncertain environment just like any other phenomenon. This means that despite the financing that may take pace, the planning and other aspects of ensuring the success of the project will require analysis and management of the associated risks.

Elsewhere in Nigeria, Nzekwe, Oladejo and Emoh (2015) contemplated that risk management is a core agenda in any project and it requires the full attention of the project management team. The authors indicated that in the context of project management, risk

management is a CSF that focuses on analysing the risks and uncertainties in a project and develops ways to reduce the severity of the risks thus enabling the implementation of the project to be successful. According to Nzekwe *et al.* (2015), most of the projects by organizations in Nigeria have failed to meet their mandate as a result of poor methods of managing risks or the project management team not upholding risk management as one of the critical success factors that should be incorporated in the project management.

Locally, some researchers have pointed out aspects that they attribute to be critical success factors for project performance. Kariungi (2014) indicated that completion of projects in Kenyan state corporations was affected by lack of critical success factors; one of them being availing of funds to the projects timely and adequately. The author argued that project financing was one of the undisputed critical success factors that every project would require to attain the set objectives. According to Kariungi (2014), project success is built upon the inputs required in the latter that include human skills, construction materials, and other consumables. All these require adequate financing for effective and reliable supply. This shows the criticality of project financing in enhancing the success of the project.

Chesiyna and Wanyoike (2016) on the other hand, established that involvement of stakeholders and information communication played a critical role in enhancing the success of the project. They suggested that in the 21st century, technology is the sole aspect that plays a major role in every angle of human life. According to Chesiyna and Wanyoike (2016), information technology sets the pace of project implementation and it is one of the CSFs that make the work of project management teams easy and effective. Wilkina (2017) also suggests that project managers should

embrace information technology as one of the drivers of project success in that technology is turning to be a backbone of every aspect in the organization that determines how effective and efficient things are done. The bottom line is that while there are so many aspects in a project implementation process, there are only a few that qualify to be critical success factors. These are the aspects that take the lead in contributing and determining the success of the project. As the reviewed background studies have revealed, information technology, project financing, project leadership and project risk management are the main recommended CSFs in the modern world.

1.1.2 Public Private Partnership Projects

Globally, between 1985 and 2008, over 2,700 projects valued over USD 1.1 trillion have been planned and funded through PPPs. Countries like Canada, India, Britain and Australia among other developed countries have used such partnerships to plan, finance, deliver and operate large public infrastructural projects (Sebghatullah & Piroozfar, 2015). Ever since its appearance, the concept of PPP has aroused keen interest. At the international level, the interest for the promotion of public-private partnership is directed towards three main courses: Investing in infrastructure, increasing the efficiency of the financial resources usage and better commercial usage of the invested funds (Tanja & Gerhard, 2017). However, carrying out an investment project of public interest through PPP may generate many problems both for the public authorities, as well as for the private investors (Willems, 2014).

In Africa, countries such as South Africa have upheld PPPs as a strategy towards enhancing the continued expansion of the economy through mega projects that do not only target on earning revenue for the private partners but also provide social amenities and services that are supposed

to be done by the government (Burger & Ianchovichina, 2017). According to Ruiters and Matji (2016), public private partnerships remain one of the mainly preferred strategies to strengthen the collaboration between the government and the private sector and to speed the completion rate of public projects in South Africa. Nell (2013) observes that middle economies are gaining speedy growth and expansion mainly as a result of enhancing public private partnerships. Besant-Jones and John (2014) reported that PPPs constituted 65% of the projects in low-income countries compared with 37% for developed countries, reflecting the low starting base of infrastructure in developing countries.

PPPs have reached nearly all developing countries, especially in Africa, generating more than USD 400 billion in proceeds in 1990-2003. Activity peaked in 1997 then declined but was reactivated in 2001 (eerd, 2013). Proceeds are concentrated in a small group of countries (Marendi, 2015). Infrastructure (telecommunications; electricity, transmission and distribution; natural gas transmission and distribution; transport and water) accounted for half of PPP proceeds in developing countries in 1990-2003 (Trebilcock & Rosenstock, 2013). These sectors were followed by the competitive sectors (manufacturing, services, tourism and other firms), energy (production of oil and gas, other hydrocarbons and petrochemicals), finance and the primary sector (minerals and metals) in terms of revenue generated (Kamau, 2016)

Kenya's recognition of the important role of PPP Projects can be traced in its commitment to achieving the objectives of Kenya's Vision 2030, which sets out a 10% per annum GDP economic growth target through public private sector participation (Vision, 2030). A study by Cambridge Economic Policy Associates (CEPA) in 2015 revealed that though there was an

increase in private sector financing of public infrastructure projects, this was mainly in telecommunication and electricity generation and there was still considerable financing needed in other infrastructure sectors. Moreover, even for projects in relatively stable markets like independent power providers (IPP's) delays were still being experienced in the procurement of the PPP Projects for example the Turkana wind project which was first developed in 2006 but reached financial close in December 2014 (CEPA, 2015). Marendi (2015) posited that budget rules and procedures that support timely procurement are inadequate. It is important to note that the initial PPP Regulations were based on the Public Procurement and Disposal (PPDA)Act, 2005 and that significant progress has been made to shift towards PPP specific procurement framework starting with the PPP Policy statement of 2011 (DFID, 2015; Babatunde, Perera, Udeaja & Zhou, 2013).

1.1.3 Energy Sector in Kenya

The Energy sector in Kenya is managed by the Ministry of Energy and Petroleum (MoEP) which is charged with formulation of policies to create an enabling environment for efficient operation and growth of the sector. It sets the strategic direction for the growth of the sector and provides a long-term vision for all sector players.

Kenya Vision 2030 and the Second Medium Plan 2013-2017 identify energy as one of the infrastructure enablers for transformation into "a newly-industrializing, middle-income country, providing a high quality of life to all its citizens in a clean and secure environment". Access to competitively-priced, reliable, quality, safe and sustainable energy is essential for achievement of the Vision. The institutional structure of the energy sub sector comprises of the Ministry of

Energy and Petroleum (MoEP), Energy Regulatory Commission (ERC), Kenya Electricity Generating Company (KenGen), Kenya Power and Lighting Company, the Rural Electrification Authority (REA), Kenya Electricity Transmission Company (KETRACO), Geothermal Development Company (GDC), Kenya Nuclear Electricity Board (KNEB), Kenya Pipeline Company (KPC), National Oil Corporation of Kenya (NOCK), Kenya Petroleum Refinery Limited, private sector actors and energy service users/customers (MOE &P Website). The energy sector in Kenya is largely dominated by petroleum and electricity, with wood fuel providing the basic energy needs of the rural communities, urban poor, and the informal sector (MOE &P Website). An analysis of the national energy shows heavy dependency on wood fuel and other biomass that account for 68% of the total energy consumption (petroleum 22%, electricity 9%, others account for 1%).

Electricity access in Kenya is low despite the government's ambitious target to increase electricity connectivity from the current 15% to at least 65% by the year 2022 (MOE &P Website). In the electric power sub-sector, total installed capacity expanded by 18.2% from 1885MW in 2013/14 to 2299MW in 2014/15 mainly due to increased geothermal capacity. Total electricity generation expanded by 5% to 9,280GWh in 2014/15. Hydro and geothermal power accounted for the bulk power with a total share of 79.4% during the period.

Domestic demand for electricity registered a growth of 5.6% to 7,615GWh in 2014/15 from 7,205GWh in 2013/14. The demand for electric power continued to rise significantly over the last five years driven by a combination of normal growth, increased connections in urban and rural areas as well as the country's envisaged transformation into a newly industrialized country

as articulated in Vision 2030. However, the power market remains unbalanced with this demand not fully met by supply. This is mostly due to system constraints and weather challenges. The peak demand rose from 1468MW in 2013/14 to 1512MW in 2014/15. The supply of electricity showed a 6.8% increase from 8,839GWh in 2013/14 to 9280GWh in 2014/15. The recorded total consumption also demonstrated a significant increase, recording a total of 7655GWh compared to 7244GWh in 2013/2014.

As part of its long-term energy plan, the Government of Kenya intends to increase generation and expand transmission and distribution networks. Particularly, the Government has set out to - increase generation to 33,000+ MW by 2030, add 8,500 km of new lines, increase access to 100 percent of the population by 2020 and build out of infrastructure cost at $14-18Billion. Evidently, Kenya's power plan is aggressive and the capital expenditure implications for accomplishing the plan, are colossal. Kenya has consistently and persistently experienced budget deficits and there's little hope that this will change in the coming years. Unless Kenya adopts an alternative option to public sector financing, attaining the Vision 2030 power goals will be a pipe dream.

In this regard, the government can opt for Public Private Partnerships (PPPs). PPPs are various forms of collaborations between the public and private sectors for the provision of public services or public infrastructure in the public interest. PPPs are a variant of privatization in the sense that a public function is deputed to the private sector. With PPPs, however, the government continues to participate in some way (GOK, 2019). PPPs offer a veritable alternative to traditional financing while also presenting opportunities for technology and expertise leveraging.

Whilst their benefits may seem apparent, PPPs are delicate and complex and if not structured properly can easily become a ball and chain.

1.1.4 Eldosol and Garissa Solar Power Plants

Electricity has been a major economic driver in Kenya. In pursuit of more affordable and sustainable energy as pointed out in the SDGs, The Kenyan Government has been committed to enhance the tapping of green energy and connecting it to the national grid. To achieve this, the government has majorly upheld PPPs which have been at the core of green energy projects. Some of the major projects initiated by the Kenyan Government through PPP in the energy sector include Eldosol and Garissa solar power plants. These projects have been pointed out to be key boosters of the country's electricity supply once effectively implemented.

Eldosol solar power plant is a 40MW net output solar photovoltaic (PV) power plant located in Eldoret, Kenya. Launched in the year 2018, the project is developed as an independent power producer (IPP) under the feed-in tariff regime in Kenya. The project is projected to supply electricity to the national grid once completed. The project is financed jointly by Frontier Investment Management, Selenkei Investment Limited, Cedate Limited, Interpro International LLC, Paramount Bank and the Government of Kenya. The project has two phases with phase 1 expected to produce 40MW of electricity to the main grid and phase 2 also expected to produce 40MW once complete. The two phases are projected to cost Kshs.25.3 billion. The Eldosol project is amongst the first to generate utility-scale solar power in East Africa and its completion would diversify Kenya's electricity supply away from both rain-dependent hydro and fossil fuels

thus contributing to improved grid stability in Western Kenya and cater for expected increased in energy use in the coming years.

The Garissa Solar Power Plant on the other hand is a 50MW solar power project located in Garissa County, North-Eastern region in Kenya. The project commenced in December 2017 and commissioned in December 2019. The plant consists of 200,200 solar panels connected to inverters and installed on an area of 85 hectares. The project is a public private partnership between the Kenyan government through the Kenyan Rural Electrification Authority and the Exim Bank of China at a cost of Sh13 billion. The project is expected to lower the cost of electricity while benefiting more than 70,000 households and 350,000 individuals (GOK, 2020).

An overview of the two projects shows that while Garissa Solar Power Plant has been completed and commissioned at the planned timeframe, the Eldosol Solar Power Plant is yet to be completed despite the lapse of the planned completion times. It would therefore be appropriate to establish the critical success factors behind the completion of one project and whether they have been applied in the other project or what could be the cause of the delayed implementation as far as CSFs are concerned.

According to the World Bank Economic Report (2019), the energy sector is one of the major economic development enablers in the developing countries especially Sub-Saharan Africa including Kenya. The Kenya Vision 2030 (GOK, 2010) also considers the energy sector as one of the main pillars towards achieving the country's vision 2030. This makes the sector a key area of focus for this study since it addresses the underlying issues in the sector. On the content scope, the study focused on four major critical success factors which are: project financing, project risk

management, project leadership and adoption of Information Communication Technology. These four CSFs have been specifically chosen in line with the objectives of the study after evaluation of all the CSFs determined that the four CSFs adequately covered PPP projects. The study focused on Eldosol and Garissa solar power plants. These are two major energy projects that are projected to provide the country with one of the core commodities of development (electricity) at a lower rate and sustainably. Focusing on the two projects allows a room for comparison as far as CSFs and implementation of the projects is concerned since one (Garissa SPP) has been successfully implemented while the other one (Eldosol SPP) has not been completely implemented despite having been officially commissioned and the set timelines having elapsed. The two projects give two different scenarios as far as project implementation is concerned. Focusing on the two projects also helped the study to establish whether the CSFs used in one project were available in the other and whether there were any disparities in the CSFs that could have led to the disparities in the rate of implementation. The project managers in these projects were surveyed in the study.

1.2 Statement of the Problem

In a move to ensure speedy completion of government projects and effective service delivery as well as promoting local businesses and industrialization, the Kenyan government has embraced PPPs (Government of Kenya, 2017). However, despite the continued investment by the government and the private investors on PPPs, the energy sector projects under PPP such as the Eldosol solar power plants, dualling of Nairobi-Nakuru Highway, 980 Megawatt Coal Plant; a two-phase Geothermal Development Project to generate a total of 1,200 megawatts (GOK, 2018) among others, record low rate of implementation, low rate of completion, and poor quality of the

implemented projects (KBA, 2018). According to the Public Private Partnership Unit (PPPU) there were projections of an expenditure of Kshs. 6.2 trillion in over 25 PPPs across the country between 2012 and 2020 with 90% of these projects being in the energy and construction sector. This has not been the case with evidence showing that only 20% of these projects have been implemented with projects such as the 140MW Olkaria Geothermal PPP project, 35MW Menegai Phase 1 (Sosian), the Transmission Grid Expansion programme, dualling of the Nairobi-Mombasa Highway, the construction of the Mombasa Convention Centre and the construction of a dual-carriage from Nakuru to Nairobi still stuck at the feasibility study stage eight years down the line (KETRACO, 2018; KENGEN, 2019; KAM, 2015; GOK, 2018; ICPAK, 2016). While the available evidence shows that the PPPs play a critical role in enhancing economic growth and development (World Bank, 2014), this remains unattainable in Kenya due to low rate of implementation of these projects. The problem being addressed by this study therefore is the influence of critical success factors on the implementation of the projects under PPP in energy sector in Kenya. The study focused on Eldosol and Garissa Solar Power Plant projects.

1.3 Objectives of the Study

1.3.1 General Objective

The main aim of this study was to establish the influence of critical success factors on implementation of the PPPs in the energy sector in Kenya.

1.3.2 Specific Objectives

The study sought to fulfil the following specific objectives;

i. To examine the effect of project financing on implementation of PPPs in the energy sector in Kenya

ii. To establish the influence risk management plays on implementation of PPPs in the energy sector in Kenya

iii. To analyse the effect of project leadership on implementation of PPPs in the energy sector in Kenya

iv. To determine the effect of information communication technology on implementation of PPPs in the energy sector in Kenya

1.4 Research Questions

The study sought to answer the following research questions;

i. What is the effect of project financing on implementation of PPPs in the energy sector in Kenya?

ii. What is the influence risk management plays on the implementation of PPPs in the energy sector in Kenya?

iii. What is the effect of project leadership on implementation of PPPs in the energy sector in Kenya?

iv. What is the effect of Information Communication Technology on implementation of PPPs in the energy sector in Kenya?

1.5 Significance of the Study

The study aimed at unveiling the influence of critical success factors on the implementation of the Public Private Partnerships Projects in the energy sector in Kenya. The findings from the study will be significant to a number of parties including the managers of PPPs in the energy sector in Kenya, private organizations, government and policy makers as well as future scholars and academicians.

1.5.1 Management of PPPs in the Energy Industry

The managers of projects under PPPs in the energy industry will benefit from the study findings in that they will identify the critical aspects of project management that ought to enhance the implementation and performance of the projects under PPP model. Based on the fact that these projects are very crucial in Kenya's economic growth and development, the findings will enable the management to identify where to tap in order to enhance the success of such projects. The findings will be of importance to organizations such as NGOs and others in the private sector that will identify the need to focus on critical success factors as a way of promoting the implementation and success of their projects.

1.5.2 Government and Policy Makers

The projects under PPP model directly connect with the government mandate of service delivery to the people. The findings from the study will form a basis for the government agencies to

establish the major aspects to focus on in order to steer the implementation of PPPs. The policy makers will also identify the prospects to consider when regulating projects under PPP model. This will ensure that the management of the state corporations are enshrined from getting into PPP partnerships without considering the ability of the projects to be successful.

1.5.3 Future Academicians and Scholars

The study addresses a key and critical area in the field of business performance, which is project management. The findings will provide a reference material to the future academicians on the critical success factors and how they affect implementation of projects under PPP model. Future academicians will also identify gaps which they will seek to fill in their future endeavors.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents the review of previous studies on the influence of critical success factors on the implementation of PPPs in the energy sector in Kenya. The chapter summarizes the information gathered from other researchers who have conducted the same type of research in the same field of study. The chapter presents a theoretical background, empirical review, research gap as well as the conceptual framework.

2.2 Theoretical Review

Several theories were reviewed in this study based on the study variables. The theories include; Contingency theory, Resource Dependency theory, and Frank Knight's Risk Bearing Theory.

2.2.1 Contingency Theory of Leadership

Contingency theory of leadership was first introduced by Woodward (1958). The theory extensively focuses on organization leadership as well as emphasizing on how organization managers can grow to global leaders full of leadership capabilities in all business sectors. According to Robbins, Judge and Campbell (2010), contingency theory of leadership contemplates that the methods of leadership and tactics used to provide leadership by a certain leader depends on the contextual situation that the leader experiences.

In a clearer view, the theory states that the traits and the methods of leadership that are exercised in one sector of an organization may not fit in the same way in another sector or another organization. This is as of influence on the various changing factors such as advancement of

technology, dynamic change of market, environmental vitality as well as change of the organization size. Therefore, in this perspective, when a leader is dealing with a different organization from the previous one, or there have been changes in the organization's management, the leader should embrace these changes as well as the strategies of leadership to accommodate and be able to cope with the resulting new changes (Aver & Cadez, 2009).

Robbins *et al.* (2010), suggest that as most organizations expand, change is inevitable. However, other organizations start using new operational methods that may result due to changes in technology and innovations. Therefore, for the organizations manager to ensure the firm succeeds, he or she needs to adopt new methods of leadership as well and change the direction of management so as to enhance success of the organization.

2.2.2 Resource Dependence Theory

The Resource dependence theory (RDT)was established by Pfeffer and Salancik (1978) in an attempt to publish the need for resources in an organization to propel performance and growth. The theory states that all organizations depend on resources for them to keep their operations on-going and effective. Therefore, on this basis, the organizations have to invest on the organization resources in order to ensure that they sustain their daily operations (Yeo, 2013). According to Ullah (2013), Pfeffer refers to resources as the basis of power to any organization thus, the needed resources for one organization are sometimes held by another organization. This therefore shows the need for the organization to seek these resources and allocate them to its operations.

According to Pfeffer and Salancik's (1978), independent organizations will at some point also be in need of resources for some of its operations and should therefore maintain a good relationship with the neighbouring organizations. Smerek and Denison (2007) cite Pfeffer and Salancik and state that resources and power go hand in hand thus any organization that seeks to be powerful in an organization will eventually seek resources for sustaining itself as a powerful organization.

2.2.3 Frank Knight's Risk Bearing Theory

The risk bearing theory by Frank Knight consists of one of the most effective theories on risk management that has gained attraction from various researchers and scholars globally. The theory configures the need for organizational managers to take risks while on the other hand considering the way in which they can mitigate the risks in case they turn to be severe (Rejda, 2013). Frank Knight first introduced the dimension of risk-taking as a central characteristic of entrepreneurship. Knight adopts the theory of early economists such as Richard Cantillon and Say, and adds the dimension of risk-taking. This theory considers uncertainty as a factor of production, and holds the main function of the project manager as acting in anticipation of future events. According to Wenk (2011) Knight states that risk taking aspects enhance the possibility of realization of bigger opportunities and grabbing such opportunities before the competition increases.

When carrying out a project, many risks are encountered by the project while others are encountered by the project manager in an attempt of ensuring the productivity of the projects. These risks therefore call for management techniques in order to reduce the severity of such risks and in turn convert them to project opportunities (Knight, 1921; and Zakari, Poku & Owusu-

Ansah, 2013). According to the risk bearing theory, the ability of the manager to withstand risks and maintain proper mechanisms of keeping track on them, enhances the manager's ability of realising more outdoors for the opportunities hence promoting enhanced project performance. When managing a project, the aspects undertaken may not be familiar to the project manager or the contractor. Therefore, as a practice of enhancing proper care of such scenarios, the aspect of risk bearing is essential to such managers (Sant, 2010).

2.3 Empirical Review

2.3.1 Project Financing and Implementation of PPPs

Project financing is mainly the process of availing funds to the projects from the first stage to the final stage and ensuring that the finances are effectively used as intended (McCarthy & Zald, 2012). It also involves the act of making better use of financial resources as well as maximizing the existing financial resources in a project. Studies have been carried across the globe on the relationship between project financing and project success. A study by Yalegama, Chileshe and Ma (2016) on critical success factors for community-driven development projects focused on Sri Lankan community projects. The study sought to establish the influence of project financing and project monitoring as the main critical success factors on the success of community projects. An exploratory research design was used while the study targeted project managers in selected community projects in Sri Lanka. Their findings revealed that through appropriate financing, the success of the projects was enhanced. According to Yalegama *et al.* (2016), availing enough finances to projects serves as a critical success factor in which the projects are pulled to effective implementation and completion.

Carvalho, Patah and Bido (2015) studied the effect of project financing on project success. The study was empirical-based and the scholars carried out a cross-country and cross-industry comparison. This is to mean that they surveyed studies from different industries and from different countries to come up with conclusions and recommendations. Their study established that the main role of project management was to ensure that the projects were effectively and adequately financed as a way of keeping the operations of the projects running. Through adequate financing and accountability of the funds allocated to the projects (which is ensured by the project management team) the projects are able to continue without being disrupted by lack of workforce or materials that require funds to acquire (Carvalho et al., 2015).

Haysom (2016) carried out a study on resource mobilization and sustainability of rural water supplies in 38 villages in Tanzania on local financing and cost recovery. The study applied cross-sectional survey design to guide the research process. A direct correlation between local contributions and project functionality was established in the study. Whereas some communities had established water saving accounts in which communities deposited local contributions for operation and maintenance others did not. The study found that over 85% of projects in which communities deposited local contributions into a water account were regularly operating and repairing their water systems. However, none of the communities with a failed system had a water account. This is indicated that a lack of local contribution of funds led to system failure. This underscores the importance of the role played by funds contributed by the community in the sustenance of community projects.

Further, an empirical study relating community resource mobilization and sustainability of community water was carried out by Okungu (2011) in Kisii County in Kenya. The study examined the influence of community driven projects, participatory appraisal and resource mobilization on sustainability of donor funded projects. The study involved 50 villages where by for each village 2 to 3 members were interviewed. It was established that community participation in donor funded projects was high during implementation but waned in the post project period.

2.3.2 Project Risk Management

Risk management is the process of identifying the unprecedented circumstances that may occur and taking keen measures to ensure that the circumstances are controlled to minimize their severity. In project management, project risk management entails coming up with key measures to mitigate the identified risks in a project and coming up with ways and strategies to curb the situations for them not to severely affect the project's success (Williams & Heins, 2014). Risk management entails establishing or identifying objectives, gathering of information that is relevant in regard to the nature of the problem as well as the environment, evaluating the costs and benefits of alternatives using modern analytical techniques, and choosing the alternative that is most consistent with the goals and objectives of the project. According to Embrechts and Straumann (2012), one of the most important function of managing risk is the identification process. Failure in recognizing the existence of the organization potential event may result to financial disaster.

Fisayo and Nwankwo (2014) conducted a study on risk management techniques and project performance in manufacturing firms in Nigeria. The study aimed at establishing the relationship between risk management strategies and project completion. The study adopted an experimental research design and had a sample of 118 respondents from projects in manufacturing firms in Nigeria. The study established that risks were part and parcel of most projects in manufacturing firms in Nigeria and thus the project managers needed risk management strategies to curb the impacts. The study concluded that risk management was essential in project completion through identification of the flaws in a project and coming up with strategies to mitigate the flaws early enough.

Kpodo and Kofi (2016) conducted a study on the effects of risk management on project performance. The scholars focused on financial institutions in Ghana. Among their objectives was to find out the influence of risk management on performance of financial institutions. Kpodo and Kofi (2016) adopted a descriptive research design and had a sample of 202 respondents from selected financial firms in Ghana. Among their findings was that organizations mostly relied on risk assessment measures to forecast on the uncertainty of several operations and thus kept track **o**f the essentiality of the risks to affect the performance of their projects (Kpodo & Kofi, 2016).

2.3.3 Project Leadership

Leadership has been recognized as one of the key aspects that determine the extent to which a project ought to be successful. The project leader is an individual who is tasked to ensure that the day to day activities of a project are effectively run and every individual in the project is doing

the assigned roles towards achieving the project goal. The leadership qualities and capabilities of the project leader mark the beginning of the project success (Zaccaro & Klimoski, 2013).

Bergh and Aguinis (2016) conducted a study on the impact of team leadership on the growth of an organization. The study involved 10 organizations in the United States of America. In each organization, 5 members were involved in the study. A functional approach to team leadership used interviews and filling of questionnaires to obtain the data. According to their findings, it was established that team leadership must meet obligations such and building of trust and inspiration to other team members, must facilitate and support the team decision and expand the capability of the team. In addition, the author emphasized that other factors such as creation of team identity, making of team differences as well as foreseeing and influence of change must be considered.

Manz and Sims (2016) studied the impact of the role of a leader in an organization in Brazil. The study was carried out among 15 organizations whereby for each organization, 8 respondents were picked. The study adopted a descriptive research design and the data was collected through use of structured interviews. From the study findings, it was established that in order to promote self-management, leaders must encourage rehearsal, self-goal-setting, self-criticism, self-reinforcement, self-expectation, and self-observation/evaluation among the team members.

Adrian and Transt (2017) in their research on the influence of project leadership on the organization growth established that good governance within an organization contributes highly to revenue generation as well as increased customer loyalty. The study involved 10 companies in Moldavia. For each company, 5 members were considered and picked to respond to the study

questions. From the study findings, it was established that almost 50% of any organizations income was as a result of the influence of the organization leaders and their relationship with other work members. Further, the study established that some leaders governing criteria such as awarding of the most performing employees as well as duty negation in the organization facilitated to high performance in the organizations.

2.3.4 Information Communication Technology

Information Communication technology (ICT) refers to technologies that provide access to information through telecommunications. In the past few decades ICT has provided society with a vast array of new communication capabilities. Li-Ren (2012) in their research on the impact of ICT on project success, established that adoption of ICT has a positive effect on project performance in terms of schedule and cost success and as well as quality and safety performance.

Louis (2008) conducted a study on the impact of project management ICT systems and their impact on project managers and project performance. This was an empirical assessment and the study analysed questionnaire data from project managers. It was observed that advantages obtained from ICT use are not only limited to manager's performance but also to project performance. ICT systems were found to have direct impact on project success by contributing to improving budget control and meeting project deadlines as well as fulfilling technical specifications.

Marzagão and Carvalho (2016) analysed the effect of critical success factors for Six Sigma projects in Malaysia. The study sought to analyse the effect of information technology adoption, risk management and planning on the success of six-stigma projects where quality control

through a six-step model is upheld. The study utilized a cross-sectional research design and targeted 23 projects in Malaysia. The findings revealed that adoption of Information Communication Technology was one of the CSFs that significantly influenced the completion and success of six-sigma projects. According to Marzagão and Carvalho (2016), upholding technology enhances the ability to monitor the progress of the projects while increasing efficiency and effectiveness in the implementation process.

Mavi and Standing (2018) studied the influence of critical success factors on sustainability of project in energy projects in Nigeria. The study specifically sought to assess the role played by ICT and project team commitment as the main CSFs on project sustainability. The study targeted 118 projects with the project managers as the main respondents. The findings portrayed that information technology was a critical success factor adopted by most of the leading projects in the energy sector in Nigeria through which accuracy and responsiveness in the implementation process was enhanced. Mavi and Standing (2018) noted that using the modern technology in the energy project was one of the drivers of success to the projects that could be a game changer if adopted by more projects.

Carvalho, Poleto, and Seixas (2018) analyses the impact of Information technology outsourcing and integration as a critical success factor on the success of projects in South Africa. The study sampled 99 respondents and established that project implementation and success highly relied on how well the project management was committed towards embracing the modern technology. Carvalho et al. (2018) indicated that information technology in the modern project world was a key requirement for any project to achieve the projected results. Yadav and Singh (2020) support

this by indicating that ICT is one of the CSFs that determine the ability of effective communication, innovation and coordinated monitoring in a project.

2.4 Research Gap

The empirical studies reviewed have shown compelling arguments on the influence of Critical Success Factors on the project implementation. Most of the studies focus on different contexts with studies such as Yalegama *et al.* (2016) focusing on community driven projects, Fisayo and Nwankwo (2014) on projects by manufacturing companies and Adrian and Transt (2017) on the overall organization performance. This implies that little has been done as far as the CSFs and energy projects are concerned. Most of the studies address varied CSFs with no study focusing on the four CSFs (financing, risk management, leadership and information technology) at a go. Most of the studies have addressed the effect of CSFs in different types of projects which may not be duplicated in the case of Public Private Partnerships (PPPs) while others focused on developed countries where systems and frameworks of PPPs are more advanced than in developing countries,-specifically Kenya. This therefore paves way for this study to address the influence of Critical Success Factors on the implementation of energy projects under PPP in Kenya.

The research gaps are as shown in Table 2.1.

Table 2.1: Research Gaps

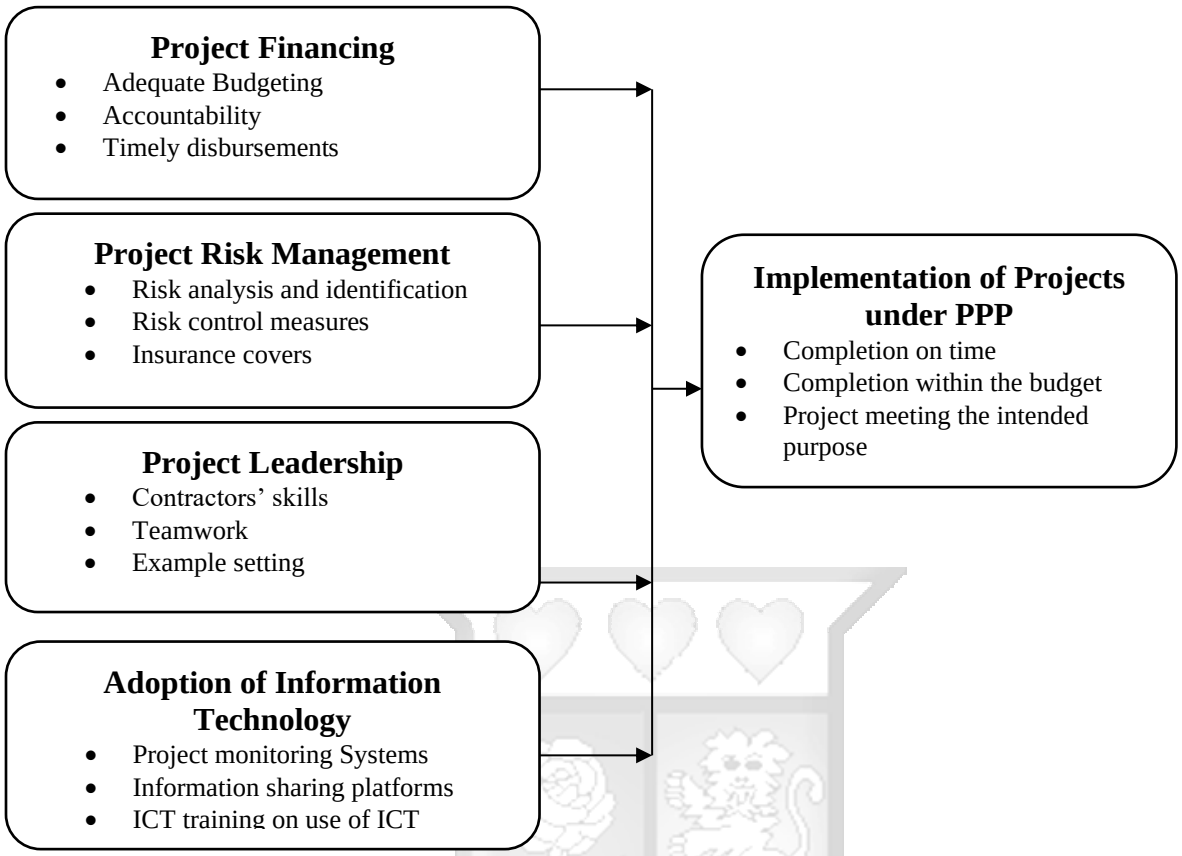
Study	**Research Gap**
Yalegama, Chileshe and Ma (2016)	The study focused only on two CSFs i.e. project financing and project monitoring.

Carvalho, Patah and Bido (2015)	The study focused only on one CSF i.e. project financing.
Haysom (2016)	The study focused only on one CSF i.e. project financing in the water sector in Tanzania.
Okungu (2011)	The study focused only on one CSF i.e. project financing in the water sector in Kisii.
Fisayo and Nwankwo (2014)	The study focused only on one CSF i.e. project risk management in the manufacturing sector in Nigeria.
Kpodo and Kofi (2016)	The study focused only on one CSF i.e. project risk management in the financial sector in Ghana.
Bergh and Aguinis (2016)	The study focused only on one CSF i.e. project leadership in ten organizations in various sectors in the United States of America.
Manz and Sims (2016)	The study focused only on one CSF i.e. project leadership in fifteen organizations in various sectors in Brazil.
Adrian and Transt (2017)	The study focused only on one CSF i.e. project leadership in ten organizations in

	various sectors in Moldavia.
Marzagão and Carvalho (2016)	The study focused only on one CSF i.e. project ICT in six sigma projects in Malaysia.
Carvalho, Poleto, and Seixas (2018)	The study focused only on one CSF i.e. project ICT in various projects in South Africa.

2.5 Conceptual Framework

Kellstedt and Whitten (2013) define a conceptual framework as the systematic representation of variables of a study in a flowing structure that clearly shows the relationship between the independent and the dependent variables. It is the tool researchers use to guide their inquiry; it is a set of ideas used to structure the research, a sort of a map (Kothari, 2011). In this study, the conceptual framework is as shown in Figure 2.1. The independent variables are project financing, project leadership, adoption of information technology and project risk management. The dependent variable is project implementation.



Independent variables **Dependent Variable**

Figure 2.1: Conceptual Framework

The conceptual framework for this study shows how the critical success factors lead to the success of PPP project management process. Identifying critical success factors and pitfalls early enough during the assessment of projects is a vital start for ensuring successful PPP projects completion. This is with the belief that there are certain major factors whose influences are considerable to PPP project performances such that they will enhance the successful completion of projects. Identifying critical success factors and potential pitfalls will help PPP project teams to minimize fire-fighting and intuitive approach in managing uncertainties and changes

encountered during project implementation. The aim is not the avoidance of problems but knowing how to respond to them when they arise.

Critical success factors in a project, such as project risk management, are important for a project to be successful (chrysostome & Diawara, 2019). A study on critical success factors for community-driven development projects established that critical success factors in a project such as adoption of information technology, project leadership, project financing, and project risk management had a positive and significant influence on project success (Yalegama & Ma, 2016). This was also revealed by (Besteiro, 2015), (Carvalho, 2015) and (Ofori, 2013).

It is thus postulated that the presence of critical success factors leads to successful PPP project implementation with the net outcome being completion on time, completion within the budget and the project meeting the intended purpose.

2.6 Summary of the Chapter

In this chapter, a conceptual framework to guide the study was developed and used to analyse the relationship between critical success factors and implementation of PPP projects. In conclusion, the literature reviewed suggests that there is a positive relationship between PPP projects

implementation and critical success factors, that is; project financing, risk management, project leadership and ICT. Some of Kenya's PPP projects are failing due to lack of the critical success factors discussed herein. The next chapter will present the methodology that will be used for this study. The chapter begins by introducing the research design. This is then followed by target population and sampling, data collection techniques, data collection procedure, reliability of the research instruments and finally ethical considerations.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter focuses on the methods and design that was used to carry out the study. The target population, sampling, data collection methods, research quality and data analysis were captured in the chapter.

3.2 Research Design

Taylor (2007) defines research design as the guide that contains instructions and framework of implementing a study to achieve the desired results. Descriptive research design was considered appropriate for the study at hand based on its ability to incorporate and provide a detailed description of the study variables. According to Kumar (2010), descriptive research design also offers other new ideas on the study variables thus giving the study a more understandable and reliable perspective. Descriptive research design in this context was therefore, helped in revealing the specific answers to the critical success factors and implementation of PPP projects. By the virtue of incorporating both qualitative and quantitative data, the descriptive research design helped in getting deeper and more detailed information regarding the use of CSFs and how they have influenced implementation of the projects.

3.3 Target population and Sampling

The target population for this study comprised Eldosol and Garissa Solar Power Plants in Eldoret and Garissa. This is a PPP project under the government of Kenya financed by European

Investment Bank and the Dutch Entrepreneurial Development Bank. The project personnel and the representatives of the project financiers were the units of observation. According to the data from the Rural Electrification Authority and the Eldosol and Garissa Solar Power Plants head offices, Garissa Solar Power Plant project has 59 personnel in the managerial and supervisory capacity while Eldosol Solar Power Plant has 74 personnel in managerial and supervisory capacity. The study therefore targeted a total of 133 respondents from the two projects.

Sahin and Anil (2017); and Chen, Xu, Zhu, Yuan, and Yu (2019) suggest that based on the size of the target population, a sample size of 30% is adequate for a study to be representative of the population. Nielsen, Eden, and Verbeke (2020) also suggest that in a population where most of the respondents are likely to repeat the same information, a sample size of 30% is adequate for an effective representation of the population. This is backed by Rutberg, and Bouikidis (2018) who suggest that in a population where the characteristics of the respondents could mean repetition of the responses, narrowing down the sample size to a lower number is appropriate. Based on the nature of the targeted respondents in this study (the respondents are in managerial positions and have the same information regarding the implementation of the projects and the CSFs), therefore, 30% of the target population as the sample size. This will give 18 respondents from the Garissa Solar Power Plant project and 22 respondents from the Eldosol Solar Power Plant project. The total sample size for the study will therefore be 40 respondents. The study purposively picked the respondents in managerial positions specifically those attached to financial docket, risk management, information technology and the overall management of the projects. These were more knowledgeable on the specific CSFs focused on in the study.

3.4 Data Collection Techniques

Bagaka and Kobia (2010) define data collection as a means by which information is obtained from the selected subjects of an investigation. The study utilized primary data. The data was obtained by use of a structured questionnaire. The questionnaire was self-administered to the 20 sampled respondents drawn from the employees of the two projects.

3.5 Data Analysis

The data obtained by use of questionnaires was organized, cleaned, sorted, and analysed using SPSS Version 25. Qualitative data obtained from the open-ended questions on the questionnaire was aggregated by content analysis and presented in form of themed survey reports. This facilitated the analysis of respondents' opinions on the critical success factors and implementation of PPPs. Descriptive statistics computed from the primary data were analysed to obtain mean, standard deviation, frequencies and percentages. This data was presented in form of carts and frequency tables. Multiple regression analyses was conducted to establish the statistical relationship between independent variables and the dependent variable. Multiple regression analysis allows for the examination of relationships between several independent variables and one dependent variable. In addition to the independent variables' collective prediction of the dependent variable, this statistical method determines the individual contribution of each of the individual variables to the dependent variable (Wiid & Diggings, 2015). The model adopted in the study was of the form;

$Y = ß_0 + ß_1X_1 + ß_2X_2 + ß_3X_3 + ß_4X_4 + e$

Where:

Y = Implementation of Public Private Partnership Projects (dependent variable)

X_1 = Project Financing

X_2 = Project Risk Management

X_3 = Project leadership

X_4 = Adoption of Information Technology

e = Error term

$ß_1$, $ß_2$, $ß_3$ and $ß_4$ are the coefficients for the independent variables

The variables in the study were measured as shown in Table 3.1.

Table 3.1: Measurement of the Variables

Variable	Indicators	Measurement Scale	Research Approach	Data analysis technique	Tools of data analysis	Test conducted
Project Financing	• Adequate Budgeting • Accountability • Timely disbursements	Ordinal	Qualitative and Quantitative techniques	Descriptive Statistics	Mean, standard deviations, measures of central tendency, measures of dispersion	Regression coefficients, ANOVA, t-test

Project Risk Management	• Risk analysis and identification • Risk control measures • Insurance covers	Ordinal	Qualitative and Quantitative techniques	Descriptive Statistics	Mean, standard deviations, measures of central tendency, measures of dispersion	Regression coefficients, ANOVA, t-test
Project Leadership	• Contractors' skills • Teamwork • Example setting	Ordinal	Qualitative and Quantitative techniques	Descriptive Statistics	Mean, standard deviations, measures of central tendency, measures of dispersion	Regression coefficients, ANOVA, t-test
Adoption of Information Technology	• Project monitoring Systems • Information sharing platforms • ICT training on use of ICT	Ordinal	Qualitative and Quantitative techniques	Descriptive Statistics	Mean, standard deviations, measures of central tendency, measures of dispersion	Regression coefficients, ANOVA, t-test
Implementation of Projects under PPP	• Completion on time • Completion within the budget • Project meeting the intended purpose	Ordinal	Qualitative and Quantitative techniques	Descriptive Statistics	Mean, standard deviations, measures of central tendency, measures of dispersion	

3.6 Research Quality

A pilot test was carried out to ensure that the research instrument meets the required quality in addressing the research questions. This was done through use of 20% of the sample size (4 respondents) who were drawn from other PPP projects. The data from the pilot study was not included in the actual study.

3.6.1 Reliability of the Research Instrument

Reliability is the extent to which data collection techniques or analysis procedures will yield consistent findings (accuracy and precision of a measurement procedure) (Creswell, 2014). It establishes if the measure is able to yield the same results on other occasions, similar observations are reached by other observers and transparency in the data. The data from the pilot study was analysed to establish the Cronbach's Alpha coefficient. A threshold of 0.70 was used (Daniel, 2017).

The results of the pilot test as reported in Table 3.2 indicate that that all the variables in the study had reliable coefficients of more than 0.70. The first variable which is project financing had a Cronbach's (α) of 0.897 which implies that 89.7% of the variance in the scores is reliable and only 10.3% (100%-89.7%) is not reliable. The second variable which is project risk management had a cumulative Cronbach's (α) of 0.876 indicating that 87.6% of the variance in the scores is reliable and only 12.4% is not reliable hence all the 6 questions were maintained in the questionnaire for the actual study. Under the third variable – project leadership, the Cronbach's Alpha was 0.899 which is an implication that all the 6 items were reliable to a variance of 89.9% which is higher than the threshold of 0.70 hence all the items were reliable. Information

technology had a Cronbach's Alpha of 0.931 implying that the variable had a reliability variance of 93.1% while project implementation (dependent variable) had a Cronbach's Alpha of 0.887 hence the questions under this variable were reliable.

Table 3.2: Reliability Results

Variable	Coefficient (α)	Number of Items	Comment
Project Financing	0.897	5	Reliable
Project Risk Management	0.876	6	Reliable
Project Leadership	0.899	5	Reliable
Information Technology	0.931	6	Reliable
Project Implementation	0.887	5	Reliable

3.6.2 Validity of the Research Instrument

Validity was tested to ensure that the research instruments answer the research questions in the anticipated framework. Content validity and construct validity were used. For these two types of validity, experts' opinion was used whereby two experts on PPPs and the supervisor was given the questionnaire to read through and give any recommendations/observations. To verify content validity, a thorough literature review was conducted to identify necessary items to measure the variables of the study as shown in the conceptual framework. The questionnaire was further subjected to supervisors and two experts in the field of project management for scrutiny in order to ascertain face validity, coherency and comprehensiveness of the suitability of the survey items. This was meant to assess the clarity of the instrument items so that those items found to be

inadequate in measuring the variables were either discarded or modified to improve the quality of the research instrument thus increasing its validity.

3.7 Ethical Considerations

The study protected the confidentiality of the respondents. This was done through assuring the respondents of their confidentiality and asking them not to include any personal information of the questionnaire. They were also informed on the use of the study and the data they provide (academic). Moreover, permission from the university was sought as well as the ethical review committee. A research permit was obtained from the National Commission of Science, technology and Innovations (NACOSTI). These permits/letters were attached on the questionnaire to assure the respondent on the use of the information provided. Scientific integrity was adhered to by avoiding plagiarism, forging data and also acknowledging those who contributed to the study during the desk reviews.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents the findings of the study on the influence of project critical success factors on the implementation of public private partnership projects in the energy sector in Kenya. The chapter covers the response rate of the research instrument, the pilot study results, the presentation of the demographic results, and presentation of the main findings. The main findings are presented in two phases; the descriptive and inferential analysis which is done systematically as per the study objectives.

4.2 Response Rate

According to Young (2013), a response rate analysis is essential to determine whether a study obtained a threshold of participants required to make it valid and effective as well as to be a representative of the targeted population. The study had a sample of 40 respondents drawn from the two projects. Questionnaires were distributed to these respondents and 37 respondents returned the fully filled questionnaires for analysis. This represented a response rate of 92.5% which was considered adequate for analysis. According to Mulei (2016), a response rate of between 60% and above is appropriate for a study to make conclusion and recommendations, an implication that this study met the threshold. Table 4.1 shows the summary of the response rate.

Table 4.1: Response Rate

Sample Size		Response		Non-response	
Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
40	100%	37	92.5%	3	7.5%

4.3 Analysis of Demographic Data

Finchman (2008) argues that no population has homogeneous characteristics and hence it's important to assess their demographic characteristics. This sub-section presents the descriptions of the respondents in terms of their project, length of service in their respective projects, and their current position at the projects.

4.3.1 Project Attached To

The study sought to find out the specific project that the respondents were working for between the two projects. As the findings in Figure 4.1 portray, 61.1% of the respondents were attached to the Eldosol power plant project while 38.9% were working at the Garissa power plant project.

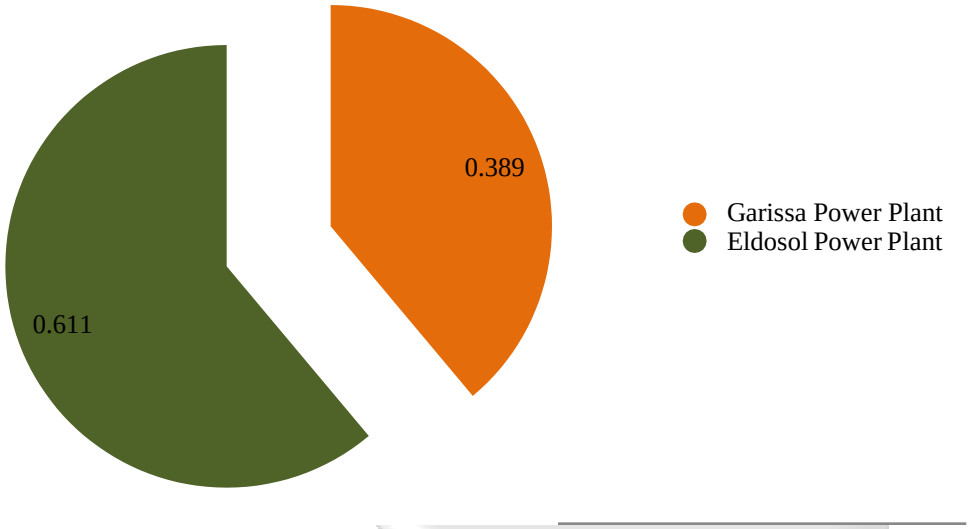


Figure 4.1: Distribution by the Project

4.3.2 Distribution of the Respondents by Period Worked

The study sought to find out the period in years that the respondents had been working at their respective projects. The findings as shown in Figure 4.2 revealed that most of the respondents (50.0%) had been working in their respective projects for a period of between 1 and 2 years, 33.3% had been working in the projects for less than a year while 16.7% of the respondents had been in their respective projects for a period of more than 2 years. The findings imply that the retention of workers at the projects is relatively low provided that they have been in operation for over 2 years and only 16% of the respondents have been there for this period.

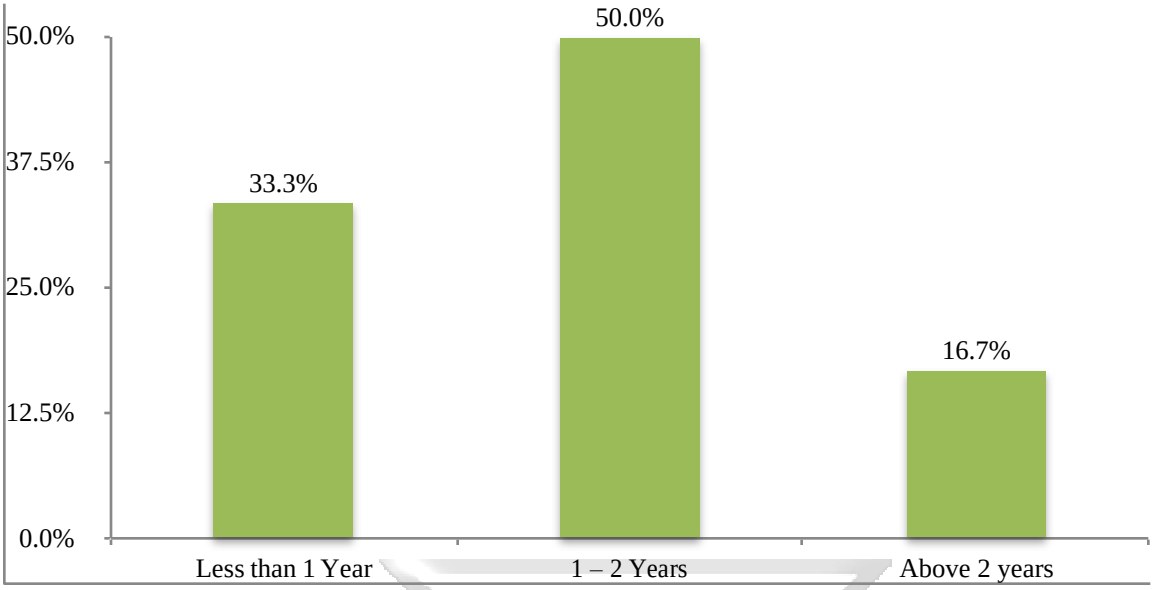


Figure 4.2: Period Worked at the Projects

4.3.3 Distribution of the Respondents by Position Held at the Projects

The study sought to find out the position held by the respondents in their respective projects. The findings as shown in Figure 4.3 revealed that 44.4% of the respondents were project managers managing different sub-sections of the projects, 38.9% were assistant project managers, 11.1% were team leaders while 5.6% of the respondents were supervisors. The findings imply that the study cut across different positions hence there could be diverse views on the adoption of project critical success factors in the projects.

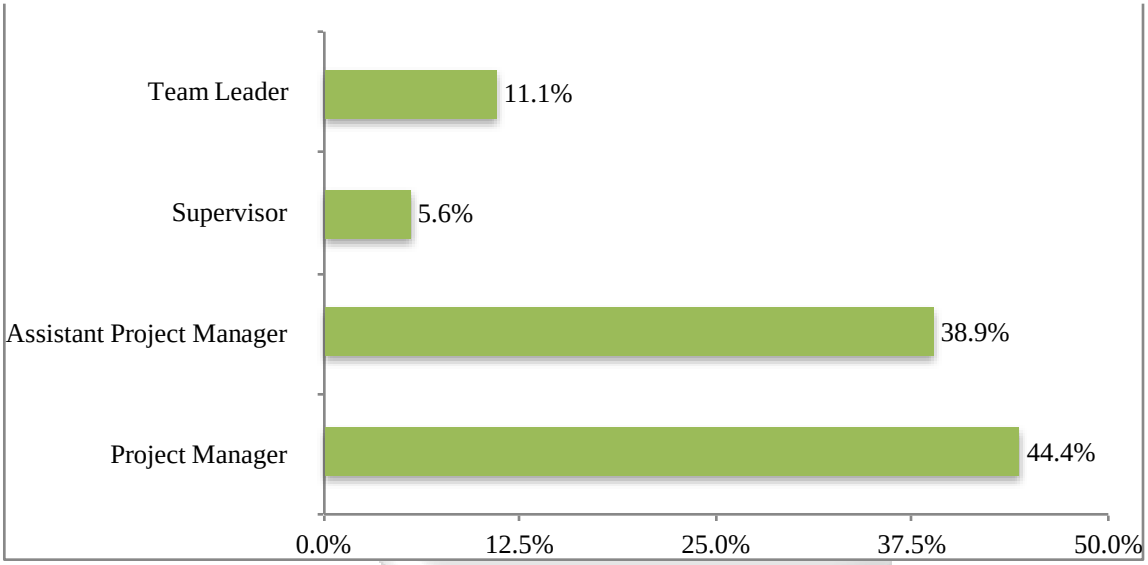


Figure 4.3: Position Held at the Project

4.4 Descriptive Analysis of the Study Variables

This sub-section covers the descriptive analysis of the data based on the specific study objectives. Descriptive analysis according to Young (2014) helps describe things the way they are in a study through means, standard deviation, frequencies and percentages. The analysis herein is done systematically as per the study's specific objectives.

4.4.1 Project Financing

The first objective of the study was to assess the influence of project financing on the implementation of public private partnership projects in the energy sector in Kenya. The main aspects of project financing focused on in this study included adequate budgeting, accountability and timely disbursement of funds. The respondents were asked to indicate their level of

agreement or disagreement on specific statements drawn from these aspects based on a five-points Likert's scale. The findings are as shown in Table 4.3.

As the findings portray, majority of the respondents (Agree = 11.1%, strongly agree = 44.4%; mean = 3.50) agreed that their respective projects had adequate budget to cater for their financial needs and material needs until their completion. They also agreed that there had been accountability on the use of funds allocated to the projects to ensure effective implementation as evidenced by a mean of 3.22 and a standard deviation of 1.73. However, 38.9% of the respondents disagreed with this statement an indication that there could be some incidences of lack of accountability among the projects on the use of allocated funds. The respondents further disagreed that the funds allocated to the projects were disbursed on time to ensure efficient operations at the projects (Disagree = 27.8%, strongly disagree = 21.1%; mean = 2.08). This is an indication that while there could be an adequate budget for the projects' operations, lack of timely disbursement could derail the operations thus affect project implementation.

The findings further revealed that majority of the respondents agreed that the use of funds allocated to their respective projects affected the effective implementation of the projects as evidenced by a mean of 3.88 and a standard deviation of 1.07. The respondents further agreed that the findings of their respective projects had been a concern among the project management team as shown by a mean of 3.78 and a standard deviation of 1.00. The findings imply that project financing is a key factor in the implementation of the public private projects in the energy sector hence there is need for the stakeholders to uphold this aspect through timely disbursement of funds and embracing accountability on the use of the allocated funds.

Table 4.3: Descriptive Results on Project Financing

Statement	Disagree	Neutral	Agree	Mean	Std. Dev.
The project had adequate budget to cater for its financial and material needs to completion	27.8%	16.7%	55.5%	3.50	1.65
There has been accountability on the use of funds allocated to the implementation of the project	38.9%	11.1%	50.0%	3.22	1.73
The funds allocated to the project have been timely disbursed to ensure efficient operation of the project operations	48.9%	17.8%	33.4%	2.08	1.13
The use of funds allocated to this project have affected its effective implementation	24.5%	11.1%	74.5%	3.88	1.07
The financing of the project has been a concern among the project management	38.9%	3.3%	57.8%	3.78	1.00

4.4.2 Project Risk Management

The second objective of the study was to assess the influence of project risk management on the implementation of public private partnership projects in the energy sector in Kenya. Project risk management was assessed through risk analysis and identification, risk control measures and insurance covers. The respondents were asked to indicate their level of agreement or disagreement with specific statements drawn from these aspects. A five-points Likerts scale was adopted where 1 = strongly disagree; 2= disagree, 3= neutral; 4= agree and 5= strongly agree. Table 4.4 shows the findings.

As the results portray, the respondents disagreed that the project management had been keen on assessing the risks that could be encountered in the project implementation process as shown by a mean of 2.77 and a standard deviation of 1.16. The respondents further disagreed that the procedure of assessing risks in their respective project had been objective towards achieving the project goals as evidenced by a mean of 2.33 and a standard deviation of 1.02. They also disagreed that there were risk control measures in their respective projects put across by the project management to reduce losses in the project and this is as shown by a mean of 2.61 and a standard deviation of 1.19. The respondents further disagreed that the project team in their respective projects was trained on risk management strategies and practices as shown by a mean of 2.72 and a standard deviation of 1.22. This is an indication that the employees at the projects could be unaware of the right strategies and skills to avoid and mitigate risks.

The findings further revealed that majority of the respondents agreed that the projects through the management had insurance covers for their property to minimize losses associated with risks as shown by a mean of 3.11 and a standard deviation of 1.32. The respondents further agreed that the management of risks in their respective projects played an important role in enhancing the project success as evidenced by a mean of 3.94 and a standard deviation of 0.91. The findings imply that while some aspects of risk management have been upheld such as insurance cover, there is still a huge gap in upholding risk management due to poor efforts in risk assessment and control measures to reduce the occurrence of risks.

Table 4.4: Descriptive Results on Project Risk Management

Statement	Disagree	Neutral	Agree	Mean	Std. Dev.
The project management has been keen on assessing the risks that could be encountered in the project implementation process	44.5%	16.7%	38.9%	2.77	1.16
The assessment procedure of risks in the project has been objective towards achieving the project goals	61.1%	22.2%	16.7%	2.33	1.02
There are risk control measures put across by the project management to reduce losses in the project	55.6%	16.7%	27.8%	2.61	1.19
The project team is trained on risk management strategies and practices	38.9%	33.3%	27.8%	2.72	1.22
The project through the management has an insurance cover for its property to minimize losses associated with risks	27.8%	33.3%	38.9%	3.11	1.32
The management of risks in the project plays an important role in enhancing the project success	23.4%	7.8%	68.9%	3.94	0.91

4.4.3 Project Leadership

The third objective of the study was to assess the influence of project leadership on the implementation of public private partnership projects in the energy sector in Kenya. In order to assess the project leadership as applied in the surveyed projects, key specific aspects of leadership were adopted. These included: contractors' leadership skills, teamwork and example setting of the project leadership team. Specific statements were drawn from these aspects and the

respondents required to indicate their level of agreement or disagreement based on a five-points Likert' scale. The findings are as shown in Table 4.5.

As the findings show, majority of the respondents disagreed that the contractors in their respective projects had the right leadership skills to steer the success of the projects as evidenced by a mean of 2.66 and a standard deviation of 1.18. The findings further revealed that most of the respondents were of the opinion that the project management team did not uphold teamwork among the project personnel as shown by a mean of 2.38 and a standard deviation of 1.28. One of the qualities of a good leader is to encourage teamwork and uphold the essence of employees working as a team. However, in this case it was established that most of the leaders in the projects were not effectively upholding teamwork and this could affect the projects' performance and implementation.

The findings further revealed that most of the respondents were of the opinion that teamwork was not encouraged hence the work was not done effectively (mean – 2.22; standard deviation 1.16). They also indicated that the project team followed examples set by the team leaders as shown by a mean of 3.55 and a standard deviation of 0.94. The respondents further disagreed that the leadership of their respective projects had been at the forefront of enhancing the implementation of the projects as shown by a mean of 2.05 and a standard deviation of 1.39. The respondents further agreed that the leadership of their respective projects was always committed towards achieving the goals of the projects as shown by a mean of 3.66 and a standard deviation of 1.01. The findings imply that through project leadership, the projects are effectively

implemented due to embrace of teamwork and adequate involvement of the employees in the project through showing them by example rather than only commanding them on what to do.

Table 4.5: Descriptive Results on Project Leadership

Statement	SD	D	N	A	SA	Mean	Std. Dev.
The project contractor in the project has key leadership skills	22.2%	22.2%	22.2%	33.3%	0.0%	2.66	1.18
The project management upholds teamwork among the project personnel	33.3%	22.2%	22.2%	16.7%	5.6%	2.38	1.28
Through teamwork encouraged by project leaders the work is done more effectively	33.3%	33.3%	11.1%	22.2%	0.0%	2.22	1.16
The project team follows examples from the team leaders	12.2%	7.8%	22.2%	37.8%	20.0%	3.55	0.94
The leadership of the project has been at the forefront of enhancing the implementation of the project	55.6%	11.1%	11.1%	16.7%	5.6%	2.05	1.39
The leadership of the project always shows commitment towards achieving the goals of the project	10.2%	12.2%	20.2%	33.3%	24.0%	3.66	1.01

4.4.4 Information Technology

The fourth objective of the study was to establish the influence of information technology on the implementation of public private partnership projects in the energy sector in Kenya. Information technology was assessed through project monitoring systems, information sharing platforms and Training on use of ICT. The respondents were asked to indicate their level of agreement or

disagreement on statements drawn from these aspects. A five-points Likert's scale was adopted. The findings are as shown in Table 4.6.

As the findings show, the respondents disagreed that there were project monitoring systems to ensure effective management of their respective projects as shown by a mean of 2.72 and a standard deviation of 1.31. The respondents however agreed that the project team in their respective projects had information sharing platform to enhance communication among the project personnel as evidenced by a mean of 3.72 and a standard deviation of 0.97. The respondents further disagreed that the personnel in their respective projects were trained frequently on the use of technology in project implementation processes as shown by a mean of 2.88 and a standard deviation of 1.56. Lack of effective and frequent training on the use of ICT implies that the staff may not be well-conversant with technology hence applying it in the operations of the project may not be effective.

The findings further revealed that majority of the respondents were of the opinion that the management of their respective projects did not effectively emphasize on the use of technology in performing given project activities as shown by a mean of 2.83 and a standard deviation of 1.50. The respondents further indicated that as a result of advanced technology use in their respective projects, carrying out the operations of the projects had been easier and this is as shown by a mean of 3.38 and a standard deviation of 1.08. The respondents also agreed that use of technology in the implementation of their respective projects had been enhanced as shown by a mean of 3.72 and a standard deviation of 1.01. The findings imply that technology is a crucial project critical success factor that enhances the communication and flow of operation in the project thus enhancing the implementation process.

Table 4.6: Descriptive Results on Information Technology

Statement	Disagree	Neutral	Agree	Mean	Std. Dev.
There are project monitoring systems to ensure effective management of the project	55.6%	11.1%	33.3%	2.72	1.31
The project team has an information sharing platform to enhance communication among the project personnel	14.4%	13.3%	72.3%	3.72	0.97
The personnel in the project are trained frequently on the use of technology in project implementation processes	50.0%	0.0%	50.0%	2.88	1.56
The management of the project emphasizes on the use of technology in performing given project activities	50.0%	0.0%	50.0%	2.83	1.50
Advanced technology has made it easier in carrying out operations at the project	41.1%	2.2%	56.7%	3.38	1.08
Through use of technology the implementation of the project has been enhanced	16.6%	13.1%	70.3%	3.72	1.01

4.4.5 Project Implementation

The study sought to establish the implementation of the projects under the public private partnerships in the energy sector in Kenya. This was the dependent variable of the study. Project implementation was assessed through project completion through the set time, completion within the set budget and ability of the project to meet the set goals and objectives. A five-points Likert's scale was used where the respondents were asked to indicate their level of agreement on specific statements drawn from the aspects of project implementation. Table 4.7 shows the findings.

As the findings portray, majority of the respondents disagreed that their respective project had been completed within the set timelines for the Garissa project while for the Eldosol project, majority of the respondents indicated that the project would not be completed within the set timelines. This compares with the actual situation on ground where the Eldosol project is yet to be completed despite the elapse of the set timelines while Garissa project was completed after the elapse of the timelines. The findings further revealed that the projects had seen adjustments of expected completion timelines due to inability to meet the initially set deadlines as shown by a mean of 3.73 and a standard deviation of 0.98. The findings further revealed that most of the respondents disagreed that the project implementation was within the set budget at the project initiation stage as shown by a mean of 2.88 and a standard deviation of 1.27. They also agreed that their respective project management team had sought other external funding for the project to facilitate its completion as shown by a mean of 3.72 and a standard deviation of 0.97. The respondents however disagreed that their respective projects would produce the expected amount of electricity to the national grid an indication that the projects may not meet the expected quality and production capacity. This could be attributed to ineffective use of the project success factors as it has been portrayed in the previous analysis.

Table 4.7: Descriptive Results on Project Implementation

Statement	Disagree	Neutral	Agree	Mean	Std. Dev.
The project has been/will be completed on the set timeline	61.1%	22.2%	16.7%	2.33	1.18
There has been adjustment of the timelines for the project completion	24.6%	7.8%	67.7%	3.73	0.98
The project implementation is within the budgeted costs at the initiation	27.8%	44.4%	27.8%	2.88	1.27
The project management has sought other extra funding for the project	50.0%	22.2%	27.8%	3.72	0.97
The project is/will produce the amount of electricity projected to the national grid	50.0%	38.9%	11.1%	2.38	0.97

4.5 Factor Analysis

4.5.1 Project Financing

Factor analysis was carried out to reduce the number of questions in the variable as a way of ensuring that only factors with stronger variance of the variable are used in the inferential analysis. This was done using Principal Component Analysis (PCA). As the findings in Table 4.8 portray, the least scored item had a factor loading of 0.564 while the highest scored item had a factor loading of 0.612. This implies that all the factors met the 0.40 threshold, hence at this level, none of the items was removed.

Table 4.8: Factor Loadings for Project Financing

Items	Factor loadings
The project had adequate budget to cater for its financial and material needs to completion	.564
There has been accountability on the use of funds allocated to the implementation of the project	.612
The funds allocated to the project have been timely disbursed to ensure efficient operation of the project operations	.571
The use of funds allocated to this project have affected its effective implementation	.606
The financing of the project has been a concern among the project management	.611

Extraction Method: Principal Component Analysis

Further the factor analysis results showed the total variance explained by each of the items under the project financing. The findings as shown in Table 4.9 revealed that three components had eigenvalues of greater than 1 where the first component had Eigenvalue of 5.645, the second component had Eigenvalue of 1.92 and the third component had Eigenvalue of 1.182. The three components had a cumulative variance of 82.83%, thus implying that they will be computed to represent the variable. These components are; “There has been accountability on the use of funds allocated to the implementation of the project” with a factor loading of 0.612, “The financing of the project has been a concern among the project management” with a factor loading of 0.611 and “The use of fund allocated to this project have affected its effective implementation” with a factor loading of 0.606

Table 4.9: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.186	35.398	56.454	5.645	56.454	56.454
2	1.192	13.245	69.699	1.192	13.245	69.699
3	1.182	13.136	82.835	1.182	13.136	82.835
4	.886	9.843	92.678			
5	.659	7.322	100			

Extraction Method: Principal Component Analysis.

4.5.2 Factor Analysis for Project Risk Management

The factor analysis as shown in Table 4.10 revealed that the factor loadings ranged from 0.437 to 0.544. Since all the factors met the threshold, none was removed at this stage.

Table 4.10: Factor Loadings for Project Risk Management

Items	Factor Loadings
The project management has been keen on assessing the risks that could be encountered in the project implementation process	.469
The assessment procedure of risks in the project has been objective towards achieving the project goals	.544
There are risk control measures put across by the project management to reduce losses in the project	.455
The project team is trained on risk management strategies and practices	.526
The project through the management has an insurance cover for its property to minimize losses associated with risks	.445

The management of risks in the project plays an important role in enhancing the project success	.437

Extraction Method: Principal Component Analysis

The findings on the total variance explained are as shown in Table 4.11. As the results portray, only two components had Eigenvalues greater than 1. The first component had an Eigenvalue of 6.265, while the second component had a Eigenvalue of 1.097. The two components a cumulative variance of 72.62%. Thus, they were the only items computed to represent the project risk management variable. From the factor loadings, there factors are the "The assessment procedure of risks in the project has been objective towards achieving the project goals" with a factor loading of 0.544 and "The project team is trained on risk management strategies and practices" with a factor loading of 0.526.

Table 4.11: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.265	62.650	62.65	6.265	62.650	62.650
2	1.097	9.970	72.62	1.097	9.970	54.640
3	.900	8.185	80.805			
4	.755	6.866	87.671			
5	.708	6.434	94.105			
6	.649	5.901	100.00			

Extraction Method: Principal Component Analysis

4.5.3 Factor Analysis for Project Leadership

To reduce the number of items representing the skills development variables, factor analysis through Principal Component Analysis was carried out. The findings as shown in Table 4.12 revealed that the factor loadings ranged from 0.461 to 0.665. All the factor loadings met the 0.40 threshold.

Table 4.12: Factor Loadings for Project Leadership

Items	Factor Loading
The project contractor in the project has key leadership skills	.665
The project management upholds teamwork among the project personnel	.627
Through teamwork encouraged by project leaders the work is done more effectively	.592
The project team follows examples from the team leaders	.461
The leadership of the project has been at the forefront of enhancing the implementation of the project	.554
The leadership of the project always shows commitment towards achieving the goals of the project	.572

Extraction Method: Principal Component Analysis

Factor analysis also included the analysis of the variance explained by each of the items. As the findings on Table 4.12 show, only two components had Eigenvalues of greater than 1. The first component had an Eigenvalue of 5.707 while the second component had an Eigenvalue of 1.508. The two explained a total variance of 72.15%. They were computed and represented the project leadership variable.

Table 4.12: Total Variance Explained

Component	Initial Eigenvalues	Extraction Sums of Squared Loadings

	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.7071	57.071	57.071	5.707	57.707	57.707
2	1.508	15.079	72.150	1.508	15.079	72.150
3	.894	8.942	81.092			
4	.688	6.883	87.975			
5	.616	6.164	94.139			
6	.587	5.871	100.01			

Extraction Method: Principal Component Analysis.

4.5.4 Factor Analysis

Factor analysis was carried out to minimize the number of items and retain only those that had greater variance on the variable. The findings as shown in Table 4.13 revealed that the factor loadings ranged from 0.895 to 0.577. This means that all the items met the 0.40 threshold.

Table 4.13: Factor Loadings for Information Technology

Items	Factor Loadings
There are project monitoring systems to ensure effective management of the project	.607
The project team has an information sharing platform to enhance communication among the project personnel	.857
The personnel in the project are trained frequently on the use of technology in project implementation processes	.895
The management of the project emphasizes on the use of technology in performing given project activities	.864
Advanced technology has made it easier in carrying out operations at the project	.577

Through use of technology the implementation of the project has been enhanced	.677

Extraction Method: Principal Component Analysis

Total variance explained by each of the items under the variable was further used to assess which factor could be retained and those to be deleted. As the results in Table 4.14 reveal, only 1 component had the Eigenvalue of greater than 1. The Eigenvalue for the component was 7.737 which explained a cumulative variance of 77.376%. The item was used to represent information technology in the inferential analysis.

Table 4.14: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.737	77.376	77.376	7.737	77.376	77.376
2	.625	6.251	83.627			
3	.583	5.831	89.458			
4	.445	4.453	93.911			
5	.327	3.273	97.184			
6	.291	2.916	100.1			

Extraction Method: Principal Component Analysis.

4.6 Correlation Analysis

A correlational analysis was carried out to establish the extent to which the independent variables (project financing, project risk management, project leadership and information technology) correlated with the dependent variable (project implementation). As the findings on Table 4.15 show, the correlation between project financing and project implementation was at 0.613 which

is significant with a P-value of 0.000<0.05. The correlation between project risk management and project implementation is 0.515 at a significant level of 0.000<0.05. Project leadership correlates with project implementation at a Pearson correlation coefficient of 0.591 at a significant level of 0.000<0.05. Lastly, Information Technology correlates with project implementation at a Pearson correlation of 0.597 which is significant at 0.000<0.05. The findings imply that project financing, project risk management, project leadership and information technology positively and significantly correlates with project implementation.

Table 4.15: Correlation Analysis Result

		Project Implementation	Project Financing	Project risk management	Project Leadership	ICT
Project Implementation	Pearson Correlation	1	.613**	.515**	.591**	.597**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	37	37	37	37	37
Project Financing	Pearson Correlation	.613**	1	.639**	.613**	.604**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	37	37	37	37	37
Project risk management	Pearson Correlation	.515**	.639**	1	.627**	.563**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	37	37	37	37	37
Project Leadership	Pearson Correlation	.591**	.613**	.627**	1	.634**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	37	37	37	37	37
ICT	Pearson Correlation	.597**	.604**	.563**	.634**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	37	37	37	37	37

4.7 Inferential Analysis of the Regression Model

Inferential analysis is the process of deducing the statistical relationship between observations or variables in a study. Through inferential analysis, the researcher is able to understand the underlying issues in the observed population and how specific properties that define these observations. In this case, inferential analysis was carried out to establish whether the aspects of project critical success factors (project financing, project risk management, project leadership and information technology) influence completion of public private partnership projects or not based on the collected data. A regression model was adopted and multiple regression analysis was carried out. The main output considered herein included ANOVA results, model summary and regression coefficients. The adopted model was of the form:

$$Y = ß_0 + ß_1X_1 + ß_2X_2 + ß_3X_3 + ß_4X_4 + e$$

The model summary results are as shown in Table 4.16. The findings revealed that the R^2 for the model was 0.779 which implies that 77.9% of the variation in project implementation is as a result of the combined effect of project information technology, project risk management, project financing, and project leadership.

Table 4.16: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.882[a]	.779	.711	.24957

a. Predictors: (Constant), Project Information Technology, Project Risk Management, Project Financing, Project Leadership

The ANOVA results for the overall model are as shown in Table 4.17. As the results portray, the F-value for the overall model is 11.442 at a significant level of 0.000. This implies that the model

significantly predicts the relationship between project critical success factors (project information technology, project risk management, project financing, and project leadership) and the project implementation.

Table 4.17: ANOVA Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.851	4	.713	11.442	.000[b]
	Residual	.810	33	.0245		
	Total	3.660	36			

a. Dependent Variable: Project Implementation
b. Predictors: (Constant), Project Information Technology, Project Risk Management, Project Financing, Project Leadership

Table 4.18 shows the regression coefficients for the model. Based on the regression coefficients shown in Table 4.18, the model now becomes:

$Y = -1.050 + 0.302X_1 + 0.178X_2 + 0.281X_3 + 0.460X_4 + e$

From the model, it can be deduced that, project financing had a Beta (β) coefficient of 0.302 at a significance level of 0.005. This implies that a unit change in project financing would influence the project implementation by 30.2%. The Beta (β) coefficient for project risk management was 0.178 at a significance level of 0.004. This implied that a unit change in project risk management would influence project implementation by 17.8%. Project leadership and Information Technology had Beta (β) coefficient of 0.281 and 0.460 respectively. This implied that a unit change in project leadership would influence the project implementation by 28.1% while a unit change in information technology would influence project implementation by 46.0%.

Table 4.18: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.050	.804		-1.306	.214
	Project Financing	.302	.150	.295	2.015	.005
	Project Risk Management	.178	.095	.265	1.870	.004

Project Leadership	.281	.128	.332	2.193	.007
Project Information Technology	.460	.124	.546	3.714	.003

a. Dependent Variable: Project Implementation

CHAPTER FIVE

DISCUSSION OF THE FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter covers the discussion of the findings on the influence of critical success factors on implementation of private public partnership projects in the energy sector in Kenya. The section also presents the conclusion of the study as well as recommendations and suggestions of areas for further studies. These are presented systematically based on study objectives.

5.2 Discussion of the Findings

The study aimed at assessing the effect of critical success factors on the implementation of the public private partnership projects in the energy sector. The study specifically sought to assess the effect of project financing, project risk management, project leadership and information communication technology on project implementation. The study targeted Eldosol and Garissa solar power plant. Out of the sampled respondents, the study obtained an adequate response rate which was considered a good representative for the targeted population hence the analysis was carried out. Eldosol power plant had most of the respondents while Garissa power plant had the least. The demographic results revealed that most of the respondents had worked in their respective projects for a period of two years and below. Project managers and assistant projects managers were the majority.

5.2.1 Project Financing and Project Implementation

The first objective of the study was to assess the influence of project financing on the implementation of PPP projects in the energy sector. The results from the study revealed that among the issues experienced in the projects as far as project financing was concerned included: inadequate budget to cater for the financial and material needs of the projects, lack of accountability on the use of funds allocated to the projects, and lack of timely disbursement of the allocated funds to the projects. These factors were the main detailers of the implementation of the projects thus affecting the effectiveness and timely completion of the projects. The respondents agreed that the financing of the projects was a major concern that affected the implementation of the projects. The inferential results confirmed this by revealing that project financing had a positive and significant impact on the sustainability of the PPP projects in the energy sector. These findings concur with those by Yalegama et al. (2016) who established that one of the critical success factors of modern projects is project financing. The authors considered financing in three major dimensions which are adequacy, accountable use and planning on the use of funds. Verburg et al. (2013) on the other hand considered project financing as a critical success factor that determines the ability of the projects to deliver the expected results through effective operations of the project.

5.2.2 Project Risk Management and Project Sustainability

The second objective of the study was to assess the effect of project risk management on the implementation of PPP projects in the energy sector. The findings from the study revealed that project risk management was an essential aspect that determined the success of the projects. The respondents, who were mainly project managers, recognised the need for monitoring and

managing risks as a way of ensuring smooth running of the project operations. Among the key aspects of project risk management established to affect the implementation of the projects included: effective risk assessment by the project management team, establishing an objective procedure of assessing risks in the project, putting in place risk control measures, training the project team on key and basic risk management skills and techniques and having insurance covers for the merchandise used in the project and the project itself. The results from the regression model revealed that project risk management significantly and positively influenced the implementation of PPP projects in the energy sector. The findings are in line with those by Willumsen, Oehmen, Stingl, and Geraldi (2019) who found out that the mitigation and management of risks in a project market the beginning of the project's success. According to Willumsen et al., projects are carried out in a volatile and unpredictable environment just like any other form of business. This therefore calls for affective measures to manage and mitigate the expected risks so as to enhance the success of the projects.

5.2.3 Project Leadership and Project Implementation

The third objective of the study was to assess the effect of project leadership on the implementation of projects under t PPP in the energy sector in Kenya. The findings from the study revealed that most of the respondents were of the opinion that indeed leadership was a critical factor in determining the success of a project. They recognised the role of leadership in influencing the project team, encouraging teamwork and spearheading the overall operations of the project in a manner that suites all the project stakeholders. The study revealed that among the critical aspects of project leadership influencing the success of projects were the leadership skills possessed by the projects' contractors, the ability of the project leadership to uphold

teamwork, and the ability of the project leaders to lead by example. Majority of the respondents agreed that the leadership in their respective projects showed commitment towards achieving the goals of the projects. The inferential analysis of the regression model used in the study further revealed that indeed, project leadership had significant and positive influence on the implementation of the PPP projects. The results are in harmony with those by Buba and Tanko (2017) who established that project leaders are the main drivers of the project and the effective implementation of the projects is highly dependent on their commitment, skills and competencies towards enhancing the projects. Leadership is about showing detection and not only instructing what to be done, but by leading through example (Afzal, Khan, & Mujtaba, 2018).

5.2.4 Information Technology and Project Sustainability

The fourth and last objective of the study was to assess the effect of adoption of information technology on the implementation of PPP projects in the energy sector. The results from the study revealed that information technology was essential in enhancing the success and effective implementation of the projects. The respondents agreed that embracing the right systems in managing the projects and making significant use of technology in the projects' operations was essential in enhancing the success of the projects. The main aspects of technology that were found to be essential in promoting the project implementation included: availability of project monitoring systems, embracing information sharing platforms for effective communication, training the project personnel on the use of technology and adoption of information technology. The respondents agreed that as a result of enhanced use of technology in the operations of the projects, project implementation was achieved more efficiently. The inferential analysis on the other hand, revealed that information technology has a significant and positive effect on the

implementation of the projects. The findings concur with those by Walker and Lloyd-Walker (2019) who allude that in the modern era, information technology is key to project implementation in that it enhances effectiveness in communication and delivery of tasks in a project.

5.3 Conclusion of the Study

The study concluded that project financing was a key aspect in enhancing the implementation of the Public-private partnership projects. Through effective budgeting and allocation of adequate funds to the specific aspects of the PPP projects, the operations of the project are enhanced and this is critical on the project implementation and successful completion. It can also be concludedthat accountability is a critical aspect in project financing which ensure proper use of the allocated funds. The study further concluded that while budgeting and accountability were upheld in Garissa solar power plant, in Eldosol, timely disbursement of the funds was the main aspect of project financing upheld. It was established that project financing was a key success factor in Garissa Solar Power plant than it was in the Eldosol power plant and this could explain why Garissa project has seen more success in implementation as compared to Eldosol.

The study concluded that the project risk management is a critical factor that plays a significant role in enhancing the successful implementation of projects under the PPP. Risks arise in any normal working environment and this is the case for PPP projects as well. Through continued assessment of risks and putting across risks control measures, it can be concluded that the projects are most likely to run smoothly and the implementation goals achieved easily. In Eldosol Solar Power Plant (SPP), project risk management through analysis and identification of risks as

well as use of risk control measures was effectively upheld as compared to the Garissa SPP. However, it can be concluded that Garissa SPP had a higher score in project risk management as compared to Eldosol SPP, an aspect that could have steered its enhanced implementation rate.

The study further concluded that project leadership is another critical success factor that significant plays a role in the implementation of the Pubic Private Partnership projects in the energy sector. Leadership in every project or organization is essential in determining the guidance and the strategic direction of the project towards achieving the intended goals. It can therefore be concluded that the success of projects under the PPP highly rely on the ability of the leaders to make critical decisions and provide direction on the project implementation for the success of these projects. The skills of the contractors in Garissa SPP and their ability to embrace teamwork as well as setting examples to the other project team were found to be highly scored than it was in Eldosol SPP. Generally, it can be concluded that project leadership was more effective at Garissa SPP than in the Eldosol SPP, a justification of the disparities in the projects' implementation.

Finally, the study concluded that information technology is one of the critical success factors that significantly influenced the implementation of the projects under PPP. As the modern World turns to a more technology-oriented world, adoption of technology is critical for continued effectiveness. This is also the case for PPP projects for the effective implementation. The results had it that adoption of information technology at Eldosol solar power plant was higher than it was at Garissa SPP. This was evidenced by high score of effectiveness and availability of project monitoring systems at Eldosol than in Garissa SPP, the same applies to the Information

sharing platforms and training of the project team on the use of information technology in the project operations. While Garissa SPP had an average score in training of their project team on use of ICT, it was not as effective as it was for the Eldosol SPP. This is an indication that on the adoption of ICT as one of the critical success factors, Eldosol SPP had effectively embraced this as compared to Garissa Solar Power Plant.

5.4 Recommendations of the Study

The study recommends that for the public private partnership projects to achieve the intended purpose, there is need for enhancing financing of the projects. The management team in these projects ought to uphold effective budgeting and ensure proper monitoring of the funds for their effective use. Accountability on the use of funds in PPP projects is becoming a concern, hence the study recommends that the management of these projects should have mechanisms of enhancing accountability and proper use of finances for the projects. The project management team at Eldosol power plant should embrace effective and adequate budgeting as well as accountable use of funds as it has been embraced in Garissa SPP so as to enhance the success of the project.

The study recommends that the project managers ought to uphold risk management as a way of ensuring smooth implementation process in the public private partnership projects. The management team ought to have clear and proper mechanisms of assessing risks and come up with accurate control measures including insuring of the property and merchandise of the projects. This will reduce losses due to risks in the project. It is recommended that the management team at Eldosol solar power plant borrows a leaf from the Garissa solar power plant

on how to enhance and uphold risk management through insurance covers for the project's merchandise and assets so as to minimize the losses incurred in cases of uncertainties. The Garissa power plant on the other hand should focus on upholding risk analysis and risk control measures, which were found to have lower score as compared to Eldosol solar power plant.

The study recommends that the project teams ought to embrace project leadership strategies as a way of enhancing the successful implementation of the projects. There is need for those in leadership positions in the projects to encourage teamwork and enhance appropriate leadership styles that put the interests of the projects first. The leaders should show direction and lead by example so as to enhance the productivity and commitment of the other project personnel. The leadership at Eldosol solar power plant was found not to be as effective as the leadership in Garissa Solar power plant. It is therefore recommended that the project management team at Eldosol considers embrace of teamwork and enhanced contractor skills as a way of bringing more leadership skills towards effective project implementation.

Finally, the study recommends that there is need for the project managers to uphold information technology in the operational process of the projects. Project personnel ought to be trained on the use of technology in the operations of the project. Embracing key technological platforms such as information sharing systems and project monitoring systems would play a critical role in enhancing the efficiency of the project implementation. Eldosol solar power plant was found to have embraced ICT more than Garissa solar power plant. It is therefore recommended that the project team at the Garissa SPP borrows a leaf from the Eldosol SPP on how to effectively bring in project monitoring systems and information sharing platforms as a way of enhancing effective

information sharing and efficient flow of operations in the projects. This will see the project enhance its implementation and continued service to the target users.

5.5 Limitations of the Study

This study had some limitations. The unit of analysis for this research was drawn from the two power plants (Garissa SPP and Eldosol SPP) and the unit of observation involved only few employees from these projects who only represented a single perception of a member within the project and is not necessarily indicative of other project members' perceptions. They were also not representative of what happens in other projects. The conclusions of this study therefore can only be generalized to the population of power plants under the public private partnership programme in Kenya. Study recommends future research to incorporate users of projects and other stakeholders as well as other projects.

Another limitation is that the study was solely based on specific variables which may skew any attempted generalization where all participants may respond within a particular time frame and they may be given a single opportunity to respond. Therefore, it cannot be reliably established whether such data would hold true over time, especially in an unstable business environment. In particular, different projects have distinct goals in the short-term, such as environmental goals, customer satisfaction, performance and many more.

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APPENDICES

Appendix I: Questionnaire

Section A: Demographic Information

1. Which project are you working in?

   Garissa Power Plant [ ]

   Eldosol Power Plant [ ]

2. How long have you been working at the project?

   Less than 1 Year [ ]

   1 – 2 Years [ ]

   Above 2 years [ ]

3. What position do you hold at the project?

   Project Manager [ ]

   Assistant Project Manager [ ]

   Supervisor [ ]

   Team Leader [ ]

Section B: Project Financing

4. Please indicate your level of agreement on the following statements on project Financing and the implementation of the power plant project. Use a Likert's scale of 1-5 where 1= Strongly Disagree; 2= Disagree; 3= Neutral; 4= Agree; 5= Strongly Agree.

Statement	1	2	3	4	5
1. The project had adequate budget to cater for its financial and material needs to completion					
2. There has been accountability on the use of funds allocated to the implementation of the project					
3. The funds allocated to the project have been timely disbursed to ensure efficient operation of the project operations					
4. The use of fund allocated to this project have affected its effective implementation					
5. The financing of the project has been a concern among the project management					

Section C: Project Risk Management

5. Please indicate your level of agreement on the following statements on project risk management and the implementation of the power plant project. Use a Likert's scale of 1-5 where 1= Strongly Disagree; 2= Disagree; 3= Neutral; 4= Agree; 5= Strongly Agree.

Statement	1	2	3	4	5
1. The project management has been keen on assessing the risks that could be encountered in the project implementation process					
2. The assessment procedure of risks in the project has been objective towards achieving the project goals					

3. There are risk control measures put across by the project management to reduce losses in the project					
4. The project team is trained on risk management strategies and practices					
5. The project through the management has an insurance cover for its property to minimize losses associated with risks					
6. The management of risks in the project plays an important role in enhancing the project success					

Section D: Project Leadership

6. Please indicate your level of agreement on the following statements on project leadership and the implementation of the power plant project. Use a Likert's scale of 1-5 where 1= Strongly Disagree; 2= Disagree; 3= Neutral; 4= Agree; 5= Strongly Agree.

Statement	1	2	3	4	5
1. The project contractor in the project has key leadership skills					
2. The project management upholds teamwork among the project personnel					
3. Through teamwork encouraged by project leaders the work is done more effectively					
4. The project team follows examples from the team leaders					
5. The leadership of the project has been at the forefront of enhancing the implementation of the project					

Section E: Information Technology

7. Please indicate your level of agreement on the following statements on Information Technology and the implementation of the power plant project. Use a Likert's scale of 1-5 where 1= Strongly Disagree; 2= Disagree; 3= Neutral; 4= Agree; 5= Strongly Agree.

Statement	1	2	3	4	5
1. There are project monitoring systems to ensure effective management of the project					
2. The project team has an information sharing platform to enhance communication among the project personnel					
3. The personnel in the project are trained frequently on the use of technology in project implementation processes					
4. The management of the project emphasizes on the use of technology in performing given project activities					
5. Through use of technology the implementation of the project has been enhanced					

Section F: Project Implementation

8. Please indicate your level of agreement on the following statements on implementation of the power plant project. Use a Likert's scale of 1-5 where 1= Strongly Disagree; 2= Disagree; 3= Neutral; 4= Agree; 5= Strongly Agree.

Statement	1	2	3	4	5
1. The project has been/will be completed on the set timeline					
2. There has been adjustment of the timelines for the project completion					

3. The project implementation is within the budgeted costs at the initiation					
4. The project management has sought other extra funding for the project					
5. The project is/will produce the amount of electricity projected to the national grid					

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