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PROJECT PLANNING PRACTICES AND PERFORMANCE OF PUBLIC-PRIVATE-PARTNERSHIP PROJECTS IN KENYA ENERGY SECTOR

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ABSTRACT

According to a report from the World Bank Group, PPP usage has surged across the globe and is currently implemented in over 134 developing nations, accounting for approximately 15-20% of overall infrastructure investment. Kenya is also facing subdued economic growth due to infrastructural constraints, with an overall infrastructure need estimated at approximately USD 59.176 billion. Energy and transport are the two infrastructure constraints that weigh most heavily on Kenyan firms. The Kenya Vision 2030 recognizes energy, among other sectors, as a key enabler for sustained economic growth, development, and poverty reduction. To fully finance the total infrastructure needs for the energy sector, which stands at 19.8 billion or 34% of the infrastructure budget, the government of Kenya has initiated and developed several power projects in Kenya through PPP under Build-Operate-Transfer (BOT) with the aim of achieving the ambitious target of universal access to electricity by 2030. Since there is limited research work carried out in Kenya on BOT projects, this research study aimed to fill this gap by assessing the impact of Project Planning practices on the performance of Public-Private Partnership (PPP) projects in the Kenyan energy sector. By addressing this objective, the research provided insights into the effectiveness of Project Planning practices in enhancing the performance and success of PPP projects in the energy sector of Kenya. The study employed a descriptive research methodology to elucidate the influence of Project Planning practices on the performance of PPP in the Kenya energy sector. The study targeted 7 major energy projects in Kenya, and 120 respondents were administered with questionnaires through census. A pilot study was conducted where 10% of the sample was used to check for validity and reliability. The study analysed descriptive and inferential statistics. Quantitative data was analysed using measure of central tendency while thematic analysis was used to analyse the qualitative data. The inferential analysis used regression analysis to establish the relationship between the independent variables and the dependent variable. The study established that the joint variables explained 54.2% of variation of project performance in the energy sector. The joint variables also had strong correlation with project performance (r =.749). Project Risk planning, and Project Cost planning had positive significant influence on performance of PPP projects in the Kenya Energy Sector. The study recommended for implementation of project plans in projects to ensure there is improved project performance. The study also recommended a similar study to ascertain the variation of project performance and also the insignificance of Regulatory framework on project performance. The findings were presented in table and figures and later discussed. The study is useful to project practitioners, policy makers, and scholars.

Key words: Project Cost Planning, Project Risk Planning, performance

Background of the Study

Governments worldwide are facing a persistent challenge of limited financial resources to finance, expand, and modernize their public infrastructure and services (OECD, 2019). To address this issue, governments are increasingly seeking investments for public projects from the private sector through public-private partnerships (PPP). While the initial purpose of using PPP was to allow the government to tap a pool of finance, there are now many reasons why governments prefer PPP.

According to recent studies by the European Investment Bank (EIB, 2021) and Grimsey & Lewis (2017), the primary reason for preferring PPP is to improve service delivery by leveraging the private sector's capacity to efficiently deliver quantity and quality. According to the World Bank Group's recent report (2021), Public-Private Partnerships (PPPs) are becoming increasingly popular because they offer the potential to bridge the infrastructure gap by utilizing limited public funding and incorporating private sector technology and innovation. This results in better quality public services, improved operational efficiency, and ultimately, a more sustainable infrastructure. Other reasons for government involvement in PPP include limited resources, the need for new infrastructure and replacement of old, fiscal rules requiring debt reduction, and progress with PPP in other parts of the world (Abdul-Aziz et al., 2019).

Public-private partnerships involve some form of risk sharing between the public and private sectors (OECD, 2019). One of the most widely recognized forms of PPP is the Build-Operate-Transfer (BOT) concession. As per this agreement, the private sector undertakes the responsibility of constructing and managing an infrastructure project for a specific period, and subsequently hands it over to the public authorities upon completion of the contract duration. During this period, the private company (concessionaire) is expected to operate the project to recover its investments with an expected level of profit through project revenues, and the transferred project should be in operational condition at no cost to the public authority (Huang et al., 2020). The BOT concession does not lead to increased sovereign debt.

As per a report published by the World Bank Group (2021), public-private partnerships (PPP) have experienced a worldwide surge in the past two decades, with over 134 developing nations adopting PPPs to account for around 15-20% of the overall infrastructure investment. The report also highlights that while PPP investments reached their zenith in 1997 with $60 billion they remained steady at an average of $30 billion per year during FY02-06, and subsequently climbed to an average of $79 billion per year during FY07-11. The global financial crisis led to a greater need for private investment in international projects. Despite doubling its annual infrastructure investment from USD.17 billion to USD.35 billion, Africa is still experiencing massive infrastructure underdevelopment, particularly in the power subsector. The continent's overall infrastructure need is estimated at about USD.93 billion (African Public-Private Partnerships Network, 2021). However, due to positive economic growth during the last decade, Africa has become the new frontier of global economic development. According to the African Public-Private Partnerships Network, relying solely on annual budgetary allocations will not achieve the infrastructure development goal; hence PPPs have emerged as a viable option for African countries to attract significant private investments to scale up their physical infrastructure (African Public-Private Partnerships Network, n.d.). Between 2018 and 2020, Kenya’s economy experienced an average annual growth rate of 5.7 percent, a notable improvement from the previous decade's 4.3 percent. Despite this improvement, sustained growth of 7 percent per annum is required to meet the Millennium Development Goals (MDGs). Infrastructure constraints are responsible for about 35 percent of the productivity handicap faced by Kenyan firms, with power being the infrastructure constraint that weighs most heavily, followed by transport. Power demand is projected to increase approximately 20 times by 2050, propelled by

population growth and rising GDP per capita. Both the buildings and industry sectors, which currently account for almost all electricity demand, are expected to experience significant growth up to 2050.Population with electricity access will grow from 77% in 2020 to 100% in 2030. The cost of meeting Kenya's infrastructure targets would be $6.2 billion per year for the years through 2020 (Briceño-Garmendiaand Shkaratan, 2011).

Kenya's infrastructure spending needs are high in absolute terms and relative to GDP. At $4 billion, the country's needs are among the highest in Africa, amounting to a staggering 21 percent of 2006 GDP. Kenya currently spends 9 percent of its GDP on infrastructure, equivalent to other non-fragile low-income countries, translating into just $22 per capita per year in infrastructure spending. Although Kenya invests as much in infrastructure as other low-income countries in Africa, its investments differ, with the public sector investing substantially more in power but less in ICT, water, and sanitation than its African peers. The infrastructure funding gap in Kenya is $2.1 billion per year, or about 11 percent of GDP. To address Kenya's infrastructure deficit, sustained expenditures of approximately $4 billion per year (20 percent of GDP) over the next decade are required (World Bank, 2018).

According to the Public Private Partnership Unit, Kenya's overall infrastructure need is estimated at USD 59.176 billion, but due to budgetary constraints, the government can only finance USD 15 billion, equivalent to 25% of the total investment requirement. This budget can hardly fully finance the total infrastructure needs for the energy sector, which stands at 19.8 billion or 34% of the infrastructure budget**.** Efficiency gains can help Kenya reach the identified infrastructure targets in 18 years while holding spending at current levels, achieving the targets by 2026. PPP is an alternative way of addressing the infrastructure deficit, as it is increasingly pursued to leverage private sector financing to help close the gap. Private sector participation in infrastructure can bring experience, efficiency, and finance, providing quality infrastructure services at better value for money than traditional government procurement. Public-private partnerships have been established for several infrastructure projects, including the Mtwapa and Nyali Bridge concessions signed in 1959, the Port of Mombasa Grain Terminal on a BOT awarded in 1998, the 90 MW Rabai Independent Power Project signed in 2006, and the Concession of Kenya Railway Freight Services for 25 years and passenger service for 5 years in 2006 (SADC PPP, 2012).

Planning is important in a project in relation to project success and performance. It is continuous process that takes place throughout the entire project cycle (Naeem, Khanzada, Mubashir, & sohail, 2018). In project management, a plan is developed at the beginning and is followed throughout the entire project to ensure its success. Though planning doesn't guarantee project success, lack of planning definitely guarantees failure (Kerzner, 2017). Project planning practices are crucial in the project management globally for mapping and organizing of project goals, schedules, tasks, and resources before assigning roles to the project team and beginning of execution of plan (Mukeshimana, Dushimimana, Mutabazi, & Gamariel, 2022). Project managers have a big responsibility of planning for the project and that role is well understood by them. Thus, a carefully planned project considers all the necessary aspects of project to provide a plan to be used by the project team during implementation.

In project delivery, project objectives are the focal point of every effort and activity. Project objectives are important in planning because project plans are derived from them. In project planning, project objectives are first defined; thereafter the strategies to achieve them are formulated and presented as project plans and these are used in evaluating the achievement of the objectives. Project planning can therefore be regarded as the process of defining project objectives, determining the framework, methods, strategies, tactics, targets and deadlines to

achieve the objectives and the techniques of communicating them to project stakeholders (Kerzner, 2017). In this study project planning practices will be operationalized under scope planning, risk planning, regulatory framework, and cost planning.

Statement of the Problem

The Kenya Vision 2030 recognizes Energy amongst other sectors such as Infrastructure and Information, Communication and Technology (EII) sector as a key enabler for sustained economic growth, development and poverty reduction (GOK, 2018). A large portion of the population in Kenya still lacks access to electricity, with only 35% currently able to enjoy this service. As a result, various power generation initiatives have been implemented, including hydroelectric, geothermal, coal, and nuclear projects aimed at achieving the ambitious goal of providing universal access to electricity by 2030.

Kenya has implemented important institutional reforms in the power sector in recent years, resulting in efficiency gains of 1 percent of GDP. The national power utility was unbundled into a generation and transmission utility (KenGen) and a distribution utility (KPLC). Prior to the adoption of a management contract, hidden costs associated with the distribution utility, such as under-pricing, collection losses, and distribution losses, amounted to 1.4 percent of GDP (Maria Shkaratan et al, 2018). However, revenue collection improved substantially, and power-pricing reforms allowed tariffs to rise in line with escalating costs, leading to the reduction of hidden costs to 0.4 percent of GDP by 2016 and ultimately eliminated by 2018. This has saved Kenya more than 1 percent of its entire GDP and improved the financial stability of the sector.

Despite these achievements, Kenya's power supply remains unreliable due to stretched generation and transmission capabilities. The installed generation capacity of the country is only 33 megawatts per million of population, which is only one-tenth of the average in Africa's middle-income countries. As demand grows and droughts reduce the supply of hydropower, power interruptions have become frequent, with the burden of power outages on the economy estimated to be as high as 2 percent of GDP (Cecilia M. et al 2018). To overcome these challenges, Kenya needs to double its current installed capacity and install an additional 1,000 megawatts of generation capacity over the next decade. Long-term investments in cost-effective power sources will help bring down supply costs to around $0.13 per kilowatt-hour. Over the past decade, several energy projects have been initiated and developed in Kenya under the Build-Operate-Transfer (BOT) structure, with contractual periods ranging from 15 to 30 years, aimed at modernizing energy infrastructure networks, increasing the share of energy generated from renewable energy sources, and providing affordable and reliable energy to businesses and households. The plan aims to increase the installed capacity for electricity generation by 5,538 MW in 2017 (Kenya Vision 2030, 2014).

Project managers utilize most of their time figuring out how to meet the objectives of the projects they are carrying out, most of these water projects within Makueni County are completed but not operational (Kennedy, 2018). Majority of the project managers concentrate their financial and time resources in handling the immediate problems thus unable to anticipate and prepare for the next challenges. Time spend on planning helps increase chances of success for the project while lessening risks associated with the project (Wang & Gibson, 2019). Muute (2019) examined project planning practices and performance of construction projects in Nairobi County Kenya. Eliab and Kisimbii (2020) examined the determinants of performance of water projects in urban centre in Kenya in Mji wa Kale in Mombasa County. Kioko and Muchelule (2023) examined the relationship between stakeholder management and performance of borehole water project in Makueni County. The aforementioned study provide gaps as some focus on constructions (Muute, 2019; Mwanza, Namusonge, & Makokha, 2020), others water projects but in different

region (Eliab & Kisimbii, 2020; Muriuki, 2021; Ndegwa, 2020; Rutto, 2017), while those done in Kenya in general differ in context (Kioko & Yusuf, 2023; Muriuki, 2021). Thus, this study sought to fill the gap by looking at project planning practices and performance of PPP projects in the Kenya energy sector.

General Objective of the Study

To establish the influence of Project Planning Practices on Performance of PPP projects in the Kenyan energy sector.

Specific Objectives

i. To establish the impact of the Project Cost Planning on performance of PPP projects in the Kenyan energy sector.
ii. To determine the impact of the Project Risk Planning on performance of PPP projects in the Kenyan energy sector.

Theoretical Review

Bargaining-Game Theory

The Bargaining-Game Theory is a subfield of game theory that explores the negotiation process between two or more parties to reach an agreement (Ghobakhloo & Sabouri, 2021). The application of bargaining-game theory has been widespread in diverse fields, including Public-Private Partnerships (PPPs) financing. PPPs are agreements that establish long-term partnerships between the public and private sectors to offer public infrastructure services. Effective PPPs require the development of mechanisms that permit equal distribution of costs and risk-sharing (Shang & Li, 2021). In PPP financing, the negotiation process between the private and public sectors can be analyzed using the bargaining-game theory as a framework.

The bargaining-game theory has been applied to the financing of PPPs in several ways. One of these is using the theory to model the negotiation process between the public and private sectors and predict the outcomes of those negotiations, which can identify factors that influence PPP financing success, such as the bargaining power of the parties, contract structure, and risks involved (Ghobakhloo & Sabouri, 2021). Another approach is using the theory to design mechanisms that promote cooperation, equitable risk-sharing, and sustainable financing, such as incentive schemes (Shang & Li, 2021). In conclusion, the bargaining-game theory is a valuable framework for analyzing the negotiation process between the public and private sectors during PPP financing, helping to identify factors that impact success and design mechanisms that promote cooperation, equitable risk-sharing, and sustainable financing. The theory will be useful in explaining the Project risk and Project cost in Project planning process and how they influence performance of PPP in the Kenya Energy Sector.

The Agency Theory

Agency theory is a significant theoretical perspective in understanding the financing of PPPs. The theory focuses on the relationship between two parties in a contract, the principal and the agent, where the agent acts on behalf of the principal. According to the agency theory by Eltigani and Merna (2015), the agent aims to maximize their own interests, whereas the principal strives to ensure that the agent acts in their best interest. In PPPs, the government serves as the principal, while the private sector partner serves as the agent. The government entrusts the private sector partner with the task of constructing, operating, and maintaining public infrastructure, with the responsibility of completing the project within the agreed-upon terms and conditions. In exchange, the private sector partner is entitled to a portion of the project's revenue over a specified period.

Another method of aligning incentives is through risk-sharing arrangements that distribute risks based on the government and the private sector partner's capacity to handle them. This reduces the private sector partner's incentive to engage in opportunistic behaviour, as they are exposed to the risks associated with the project. In summary, the Agency theory provides a framework for understanding the principal-agent relationship in PPPs. By designing appropriate contractual arrangements that align the incentives of both parties, the government can mitigate the moral hazard problem and ensure that the private sector partner acts in their best interest. The theory will be useful in explaining the variables of regulatory framework, Project Risk Planning, and Project Cost planning and their influence on Performance of PPP in the Kenya Energy Sector.

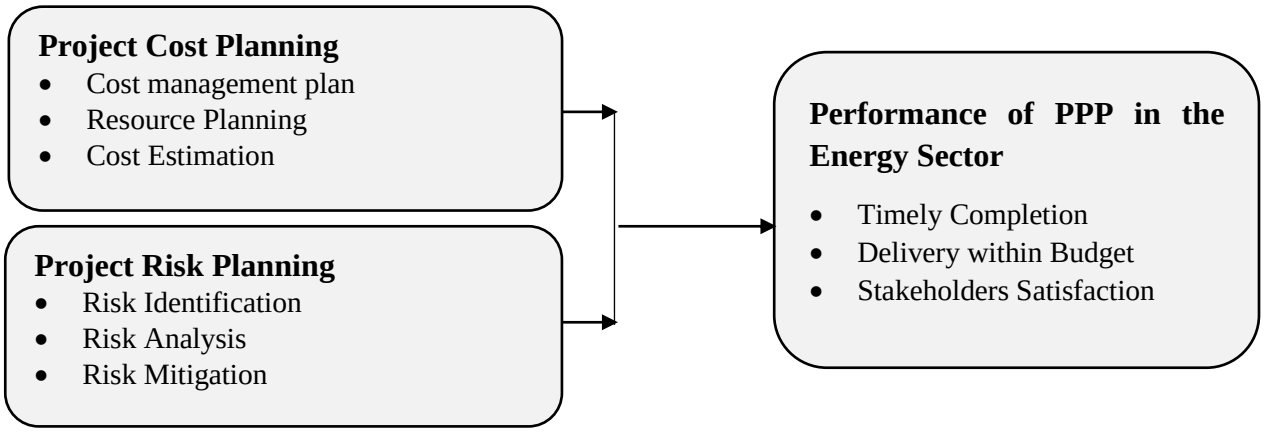
Theory of Change

The term "Theory of Change" first emerged in the 1990s and was popularized by Carol Weiss in 1995. Its purpose was to address some of the problem's evaluators faced when trying to assess the impact of complex social development programs. These included poorly articulated assumptions, a lack of clarity about how change processes unfolded, and insufficient attention being given to the sequence of changes necessary for long-term goals to be reached (O´Flynn & Moberly, 2015). The Theory of Change method is an outcomes-based, participatory approach that applies critical thinking to the design, implementation, and evaluation of an initiative, such as a project, a program, or transformative change (Serrat, 2017).

The Theory of Change approach can help develop a joint understanding of an initiative and surface differences, limitations and bridging the gaps on the changes, and uncover assumptions, design plans of actions that are strong, point up ineffective interventions, identify resources and check for their adequacy, and build a suitable framework for monitoring and evaluation (Serrat, 2017). The theory of Change approach to planning and evaluation is increasingly being considered an essential practice for many programs and projects. In identifying how change happens you seek to answer the following questions: which factors help or hinder change externally? Who can influence the change both negatively and positively? What needs to change? What is the timeframe for the changes? Regular monitoring of change forms an important part of Theory of Change thinking. Many organizations choose to link their monitoring and evaluation systems to their Theories of Change, either by setting indicators at each level of change on their conceptual pathway or by attempting to assess change directly (James, 2011). The theory of change will useful in explaining how scope planning influences performance of PPP projects in the Kenya Energy Sector.

Conceptual Framework

The conceptual model developed identifies the independent variables, which include the Project Scope Planning, Project Cost Planning, Project Risk Planning, and Regulatory Framework. The dependent variable is Performance of PPP projects in the Kenya Energy Sector.



Cost planning is an essential part of the project management process where project managers need to know where the costs fall in their schedule to manage demand of resources. All the resources that consume costs will include a resource optimized schedule which is essential in cost planning to help develop a picture of planned cost (Association for Project Management, 2018). Cost planning is an integral component of project management. To manage demand for resources, project managers must comprehend where costs lie inside their timetable. Typically, a resource optimized schedule will include all resources that incur expenditures. This form of timetable is vital for cost planning, since it assists in constructing a picture of anticipated costs over time (Konior & Szóstak, 2020).

According to PMI (2017) the risk management plan defines how the risk activities will be carried out in the project. It deals with the plan, approach and execution of risk management activities. During risk management planning a detailed is produced to explain how the project team will approach the risk management activities in the project. This process aims at informing various stakeholders of the risks and for establishing for a commitment for clear strategy on risk management. This step is not crucial for ensuring success of projects and if it is done extensively the project is less likely to fail. The step should start after finalization of project planning and to be completed before the project initiation (Rahman, 2018).

Project performance can be measured by successful execution of the project objectives such as social goal, economic goal and environmental goal. These objectives can be determined by triple constraint. Triple constraint is a triangle of time, cost and scope that bounds the project environment (Association for Project Management, 2018). PPP projects have multiple stakeholders with different views on the project's purpose and different expectations of what the project must achieve. These stakeholders might include the people who originally identified the need for the project, those who fund the project and those who stand to benefit from the project, the people who are impacted by the project and its outputs, the project team members and the people who have to oversee the project (Kerzner, 2017). Each has a vested interest in the project's outcome, with different expectations and perceptions. Generally, among the most used measures of evaluating project performance include achievement of objectives, timely completion, cost of the project and user satisfaction (Doval, 2019).

RESEARCH METHODOLOGY

This research study adopted the descriptive survey research design as it aims to describe project planning practices and their influence on public-private-partnership projects in the Kenyan energy sector. Bryman and Bell (2022) define descriptive research as a non-experimental research design used to observe (and measure) a variable when little conceptual background has been developed on specific aspects of the variables under study.

In this research, the study targeted the PPP projects in the energy sector as shown in Appendix IV. They include 400MW Menengai Phase I Geothermal Development Project, 800MW Menengai Phase 2, 800MW Bogoria-Silali Phase 1 GDC, 800MW Liquefied Natural Gas power plant at Dongo Kundu, 560MW Geothermal Pipeline at the Olkaria Field, 310MW Lake Turkana wind Power Project, and 50MW Garissa Soale Power Project (PPP Unit, 2024). The target population included 7 projects under PPP in the energy sector and as well as 120 respondents from the various agencies involved in the PPP in the energy sector.

Table 1: Target Population

Establishments	Target Population
Public Private Partnerships Unit, National Treasury (K)	10
Ministry of Energy and Petroleum (MoE&P)	10
Energy and Petroleum Regulatory Authority (EPRA)	10
Rural Electrification and Renewable Energy Corporation (REREC)	10
Kenya Electricity Transmission Company (KETRACO)	10
Kenya Power and Lighting Company (KPLC)	10
Geothermal Development Company (GDC)	10
Kenya Nuclear Electricity Board (KNEB)	10
KENGEN	10
Lake Turkana Wind Power Project (LTWP)	10
OrPower 4 Inc.	10
Independent Power Producers Association of Kenya (IPP)	10
Total	**120**

Source: PPP Unit (2024)

Since the population is small but adequate for study, the study used a census survey to study all the 7 PPP projects in the Kenya Energy Sector. A census studies every single unit in a population. Mugenda and Mugenda (2018) acknowledge that by using the census survey, the results of the study can still be generalized to the entire population since the study used a 100% total population and thus, accurate conclusions can be deduced. Thus, this study targeted all 120 respondents representing the various agencies involved in the PPP projects in the Kenya Energy Sector. Thus, purposive sampling was used to identify the individuals with the needed information.

Primary data was collected by administering open and close-ended questionnaire to the respondents. The questionnaire was personally administered by research assistants who possess the necessary skills and understanding of the questionnaire's content to collect relevant information. Self-administered questionnaires were preferred due to their high response rate and appropriateness for survey research (Gaskin et al., 2018).

The researcher carried out a pilot study to pre-test the validity and reliability of data collected using the questionnaire. To evaluate the dependability of the research tool in this study, we carried out a pilot study and conducted a reliability analysis using Cronbach's alpha to determine whether the data gathered on each variable had a significant relationship on the Performance of PPP projects in the Kenyan energy sector. In assessing reliability of the data, internal consistency method using Cronbach's alpha was used whose alpha values obtained indicated a coefficient of approximately 0.7 and which is considered acceptable (Russell, 2013). Content validity of an instrument is improved through expert judgment (Thompson & Yang, 2021). As such, I sought the assistance of my supervisor, who, as expert in research, helped me to improve content and face validity of the instruments. Construct validity was achieved by the use of factor analysis.

In this study, SPSS version 25 software was utilized for data analysis and tabulation to enhance clarity. This software contains an array of formulas that make statistical presentation and interpretation easy. Descriptive and inferential statistics were adopted for the study. The quantitative data was analyzed by using descriptive statistics which included frequency distribution tables and measures of central tendency (the mean), measures of variability (standard deviation) and measures of relative frequencies. The inferential statistics included a regression model which established the relationship between the dependent variable and the independent variable.

FINDINGS AND DISCUSSIONS

A total of 120 questionnaires were distributed to respondents identified in this study. A total of 98 questionnaires were dully filled and returned representing a response rate of 81.7%. Creswell and Creswell (2018) and Mugenda and Mugenda (2018) noted that a response rate above 70% is considered to be appropriate for conducting analyses, making conclusions and making deductions and inferences about a population.

Pilot Study

Reliability is the degree of consistency of the findings even after several trials. Cronbach's Alpha coefficient of 0.7 and above is within accepted rule of thumb thus, it depicts good reliability (Creswell & Creswell, 2018). The findings from the pilot study indicated in Table 2 showed that Project Cost Planning (α = .843), Project Risk Planning (α =.860), and Performance of PPP projects in the Energy Sector (α =.793). Thus, all the study variables had Cronbach alpha coefficients > 0.7 and therefore met the reliability criteria and were all retained.

Table 2: Reliability Test Results

Variable	Cronbach's Alpha	Interpretation
Project Cost Planning	.843	Reliable
Project Risk Planning	.860	Reliable
Performance of PPP Projects	.793	Reliable

Descriptive Statistics

Project Cost Planning

Cost planning is an essential part of the project management process where project managers need to know where the costs fall in their schedule to manage demand of resources. All the resources that consume costs will include a resource optimized schedule which is essential in cost planning to help develop a picture of planned cost (Association for Project Management, 2018). Project cost planning in this study was measured by Cost management plan, resource planning, and cost estimation indicators. The variable had an average response of 3.48 and standard deviation of .799 indicating slight agreement on the project cost planning activities.

The findings revealed that, all the resources that consume costs are included in a resource optimized schedule in development of a cost planning. This was supported by 51% of the respondents as opposed to 35.7% of those who disagreed (M = 3.31, Stdv = 1.365). The study also established that plans for cost management consolidate all project costs, both direct and indirect, in a single location for the PPP projects in the energy sector. This was agreed by 45.9% and disagreed by 36.7% (M = 3.16, Stdv = 1.282). It was agreed by 44.9% that the cost plan is clear and detailed on drawing of specifications of the PPP projects in the energy sector. However, only 27.6% disagreed while 28.6% could not decide on the statement (M = 3.31, Stdv = 1.107). The respondents (56.1%) agreed that the Cost management plan describes how project cost will be managed and control in the PPP projects in the energy sector. This was however contrary to 34.7% of the respondents (M = 2.35, Stdv = 1.560).

The respondents (74.5%) also agreed that cost planning of activities was dependent on the time taken for the activity to be completed (M =3.87, Stdv = 1. 462). The respondents also agreed (73.5%) that estimating the project resources was highly dependent on activity duration, material availability and financial capabilities of the contractors in the PPP projects (M = 3.98, Stdv = 1.243). It was also agreed by 52% of the respondents that the project cost estimates for the PPP energy projects are realistic (M = 3.44, Stdv = 1.227). Finally, the respondents agreed (53.1%)

that the base cost estimate plus risk and inflation estimate are determinants of the cost limit of the PPP projects in the energy sector (M = 3.40, Stdv = 1.258).

Table 3: Project Cost Planning

	SD %	D %	N %	A %	SA %	MN	STDV
All the resources that consume costs are included in a resource optimized schedule in development of a cost planning.	10.2	25.5	13.3	25.5	25.5	3.31	1.365
Plans for cost management consolidate all project costs, both direct and indirect, in a single location for the PPP projects in the energy sector	10.2	26.5	17.3	28.6	17.3	3.16	1.282
The cost plan is clear and detailed on drawing of specifications of the PPP projects in the energy sector.	3.1	24.5	27.6	28.6	16.3	3.31	1.107
Cost management plan describes how project cost will be managed and control in the PPP projects in the energy sector	20.4	14.3	9.2	22.4	33.7	2.35	1.560
The Cost planning of activities is dependent on the time taken for the activity to be completed	16.3	3.1	6.1	26.5	48	3.87	1.462
Estimating the project resources is highly dependent on activity duration, material availability and financial capabilities of the contractors in the PPP projects.	10.2	0	16.3	28.6	44.9	3.98	1.243
The project cost estimates for the PPP energy projects are realistic	3.1	27.6	17.3	26.5	25.5	3.44	1.227
The base cost estimate is added with risk and inflation estimate to determine the cost limit of the PPP projects in the energy sector.	6.1	24.5	16.3	29.6	23.5	3.40	1.258
Average Project Cost Planning						**3.48**	**.799**

Project Risk Planning

According to PMI (2017) the risk management plan defines how the risk activities will be carried out in the project. It deals with the plan, approach and execution of risk management activities. During risk management planning a detailed is produced to explain how the project team will approach the risk management activities in the project. This process aims at informing various stakeholders of the risks and for establishing for a commitment for clear strategy on risk management. Project risk management was measured by various indicators including: Risk identification, risk analysis, and risk mitigation. The variable had an average mean of 3.44 and a standard deviation of .708 indicating to some extent the existence of project risk planning activities in PPP projects in the Kenya Energy Sector.

The findings revealed that, risk management is considered an essential process for PPP projects in the energy sector to ensure a successful project management process. this was agreed by

46.9% of the respondents though 30.6% were indecided on the issue (M = 3.49, Stdv = 1.254). Respondents also agreed (43.9%) that the risks type and their priorities are determined at an early stage of the PPP projects in the energy sector. However, 31.6% disagreed (M = 3.10, Stdv = 1.432). The respondents (42.9%) also agreed that a clear risk management plan is developed to inform the various stakeholders of the risks in PPP projects in the energy sector (M= 3.10, Stdv = 1.454). The risk management plan is shared to the project stakeholders and project team members of the PPP projects in the energy sector. This was agreed by 63.3% of the respondents (M =3.65, Stdv = 1.159).

The study also established that the project team members are involved in identifying every possible risk of the PPP projects in the energy sector. This was opined by 56.1% of the respondents (M = 3.42, Stdv = 1.175). It was also agreed (50%) that the risks in PPP projects in the energy sector are identified based on their impact on time and costs. However, 35.7% disagreed (M =3.08, Stdv = 1.448). it was also agreed by majority of the respondents (70.4%) that risk analysis is useful for uncovering the weaknesses that are found in project plan of PPP projects in the energy sector (M = 3.98, Stdv = .974). Finally, 62.3% agreed that the PPP projects have a well-documented mitigation strategy to ensure the risks are well handled (M =. 3.70, Stdv = 1.123).

Table 4: Project Risk Planning

	SD %	D %	N %	A %	SA %	MN	STDV
Risk management is considered an essential process for PPP projects in the energy sector to ensure a successful project management process	6.1	16.3	30.6	16.3	30.6	3.49	1.254
The risks type and their priorities are determined at an early stage of the PPP projects in the energy sector.	22.4	9.2	24.5	23.5	20.4	3.10	1.432
A clear risk management plan is developed to inform the various stakeholders of the risks in PPP projects in the energy sector.	23.5	9.2	21.4	25.5	20.4	3.10	1.454
The risk management plan is shared to the project stakeholders and project team members of the PPP projects in the energy sector	6.1	11.2	19.4	37.8	25.5	3.65	1.159
The project team members are involved in identifying every possible risk of the PPP projects in the energy sector.	7.1	17.3	19.4	38.8	17.3	3.42	1.175
The risks in PPP projects in the energy sector are identified based on their impact on time and costs.	23.5	12.2	14.3	32.7	17.3	3.08	1.448
Risk analysis is useful for uncovering the weaknesses that are found in project plan of PPP projects in the energy sector.	0	9.2	20.4	33.7	36.7	3.98	.974
The PPP projects have a well-documented mitigation strategy to ensure the risks are well handled.	3.1	14.3	20.4	33.7	28.6	3.70	1.123
Average Project Risk Planning						**3.44**	**.708**

Performance of PPP Projects in the Energy Sector

Project performance can be measured by successful execution of the project objectives such as social goal, economic goal and environmental goal. These objectives can be determined by triple constraint. Triple constraint is a triangle of time, cost and scope that bounds the project

environment (Association for Project Management, 2018). In this study, project performance was measured by timely completion of projects, delivery within their budgets, and stakeholder satisfaction. The variable performance of PPP projects had an average mean of 3.53 and standard deviation of .802 indicating an agreement on the influence of project planning practices on performance of PPP projects in the Kenya Energy Sector.

The study found that Project Planning practices have helped ensure the PPP energy projects meet deadlines. This was affirmed by 50% of the respondents (M = 3.43, Stdv = 1.414). Project Planning practices have helped ensured PPP energy projects are completed on time as acknowledged by 50% of the respondents (M = 3.44, Stdv = 1.104). The project planning practices have also helped ensured that the PPP energy projects adhere to project budget as affirmed by 71.5% of the respondents (M = 3.95, Stdv = .978). Majority of the respondents (66.3%) agreed that Project Planning practices have ensured the PPP energy projects have minimal cost overruns (M = 3.68, Stdv = 1.359). It was also agreed (51.1%) that through Project Planning practices the PPP energy projects are implemented according to specifications (M = 3.42, Stdv = 1.259). Finally, it was agreed by 43.9% of the respondents that the stakeholders of PPP energy projects are satisfied with how the projects are performed (M =3.29, Stdv = 1.244)

Table 5: Performance of PPP Projects

	SD %	D %	N %	A %	SA %	MN	STDV
Project Planning practices have helped ensure the PPP energy projects meet deadlines	12.2	16.3	21.4	16.3	33.7	3.43	1.414
Project Planning practices have helped ensured PPP energy projects are completed on time.	3.1	19.4	27.6	30.6	19.4	3.44	1.104
Project Planning practices have helped ensured the PPP energy projects adhere to project budget.	3.1	3.1	22.4	38.8	32.7	3.95	.978
Project Planning practices have ensured the PPP energy projects have minimal cost overruns.	13.3	6.1	14.3	31.6	34.7	3.68	1.359
Through Project Planning practices the PPP energy projects are implemented according to specifications.	10.2	12.2	26.5	27.6	23.5	3.42	1.259
The stakeholders of PPP energy projects are satisfied with how the projects are performed	10.2	15.3	30.6	23.5	20.4	3.29	1.244
Average Performance of PPP Projects						**3.53**	**.802**

Correlation Analysis

Correlation analysis is a technique used to determine the association and the strength of a linear relationship between two variables. Table 4.6 below shows the correlation analysis results.

Table 6: Correlation Analysis

		Performance of PPP projects	Project Cost Planning	Project Risk Planning
Performance of PPP projects	Pearson	1		
	Sig.			
	N	98		
Project Cost Planning	Pearson	.550**	1	
	Sig.	.000		
	N	98	98	
Project Risk Planning	Pearson	.523**	.148	1
	Sig.	.000	.073	
	N	98	98	98

Project Cost Planning also had a positive strong significant correlation with performance of PPP projects in the Kenya Energy Sector (r =.550, sig = .000). The study indicated a direct relationship where an increase in Project Cost Planning by .550 units would lead to an increase in project performance by a unit. The findings were supported by Ondiek (2018) who found a strong positive correlation (r = .746, sig = .0043) between project cost planning and performance of road construction projects n Uasin Gishu County. In another study by Kimashara and Ogbe (2022) also found a strong positive correlation (r =.746, sig = .000) between cost planning and performance of Community Development projects in Rwanda. Miringo and Dushimimana (2023) who found a strong positive correlation (r = .548, sig= .000) between project resource planning and project performance of leasing projects in Kigali

Project Risk Planning had a positive strong significant correlation with performance of PPP projects in the Kenya Energy Sector (r =.523, sig = .000). The study depicted a direct relationship where an increase in Project Risk Planning by .523 units would lead to an increase in project performance by a unit. Kimashara and Ogbe (2022) also found a strong positive correlation (r =.521, sig = .02) between risk planning and performance of Community Development projects in Rwanda. It was also affirmed by Ondiek (2018) who found a strong positive correlation (r = .521, sig = .0172) between project risk planning and performance of road construction projects n Uasin Gishu County.

Regression Analysis

Regression analysis is a statistical technique used to estimate the relationships between a dependent variable and one or more independent variables.

Table 7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.749[a]	.561	.542	.54262

The correlation coefficient denoted as R was .749 indicating a strong relationship between the independent and dependent variables was strong and positive, the independent variables being Project Cost Planning, Project Risk Planning, , and the dependent variable being Performance of PPP Projects in the energy sector in, Kenya. The joint independent variables accounted for 56.1% of the variation in Performance of PPP Projects, as shown by the R Square value of .561. With an adjusted R square of .542, it was determined that after accounting for the variables in the model, the joint variables accounted for 54.2% of the variation in Performance of PPP Projects in the energy sector in, Kenya., while other factors not included in the model explained 45.8% of

the variation in Performance of PPP Projects in the energy sector in, Kenya. The standard error of .54262 indicated the deviation from the line of best fit.

Table 8: ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	35.018	2	8.754	29.733	.000[b]
	Residual	27.382	95	.294		
	Total	62.400	97			

Results show the regression model of independent variables and the dependent variable namely implementation of Project Planning Practices was significant (F (4, 93) = 29.733, p-value = .000), endorsing that the joint independent variables were actual predictors in the model hence the regression model fits the data. The F-calculated $(_{4,93})$ = 29.733 was greater than the Critical $_{(2, 93)}$ = 2.47.

Table 9: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.586	.447		-1.312	.193
	Project Cost Planning	.424	.072	.422	5.897	.000
	Project Risk Planning	.513	.081	.453	6.372	.000

The study also found project cost planning to significantly influence of PPP Projects in the energy sector in, Kenya. The APM (2018) described Cost planning as an essential part of the project management process where project managers need to know where the costs fall in their schedule to manage demand of resources. All the resources that consume costs will include a resource optimized schedule which is essential in cost planning to help develop a picture of planned cost. The findings were also in line with Jongo et al (2019) who found cost estimating as a fundamental tool for successful management of construction projects in Jordan. In a similar study in Rwanda, Mukeshimana *et al (*2022) found financial resource planning to have a positive and signficant contrubution towards performance of construction projects. In another stuyd, Ondiek (2020) also foundg project cost planning to have a signifcant relationship with road construction projects in Uasin Gishu County in Kenya.

Project Risk Planning also had a significant influence on of PPP Projects in the energy sector in, Kenya. According to PMI (2017) the risk management plan defines how the risk activities will be carried out in the project. It deals with the plan, approach and execution of risk management activities. According to Doval (2019) frustrations and overall cost of the project can be reduced through adequate risk analysis process that helps in avoidance of the problems. There is a minimized rework and untimely efforts as the potential root cause of the project problems are identified and the project leaders together with the project team are able to find ways to avoid the unforeseen problems Kunya and Yusuf (2023) found risk planning significantly influence performance of renewable energy projects in Nairobi County Kenya. Similarly, Simon and Mutiso (2021) found risk management plan enabled project managers to identify potential risk during the early stages of the project. Thus, project risk planning significantly influences performance of agricultural projects in Nakuru County. Mwakio et al (2020) also found a project risk planning to significantly influence performance of public housing projects in Mombasa County Kenya.

Conclusion of the Study

On the impact of Project Cost Planning on performance of PPP projects in the Kenya Energy Sector, the study also established that Project Cost Planning had a positive significant relationship with performance of PPP projects in the Kenya Energy Sector. The study therefore concluded that Project Cost Planning significantly influenced performance of projects. The findings were also in line with Jongo et al (2019) who found cost estimating as a fundamental tool for successful management of construction projects in Jordan. In a similar study in Rwanda, Mukeshimana *et al (*2022) found financial resource planning to have a positive and signficant contrubution towards performance of construction projects. In another study, Ondiek (2020) also found that project cost planning had a signifcant relationship with road construction projects in Uasin Gishu County in Kenya.

On how Project Risk planning as project planning practice influence performance of PPP projects in the Kenya Energy Sector, the study found that Project Risk Planning had a positive significant relationship with performance of PPP projects in the Kenya Energy Sector. The study therefore concluded that Project risk planning significantly influenced performance of projects. The findings were in line Kunya and Yusuf (2023) who found risk planning significantly influenced performance of renewable energy projects in Nairobi County Kenya. Similarly, Simon and Mutiso (2021) found project risk planning significantly influenced performance of agricultural projects in Nakuru County. Mwakio et al (2020) also found a project risk planning to significantly influence performance of public housing projects in Mombasa County Kenya.

Recommendations

The first specific objective of the study was to establish the impact of the Project Cost Planning on performance of PPP projects in the Kenyan energy sector. The study established that project cost planning has a significant influence on performance of PPP projects in the Kenya Energy Sector. Cost is affected by many things in the project and also has an effect on many project elements. A thorough cost plan ensures there are clear cost estimates and the overall project budget is well taken care off. The study recommended detailed and accurate cost management plans of PPP projects to ensure there are reduced cases of cost overruns in PPP project in the energy sector.

The second specific objective of the study was to determine the impact of the Project Risk Planning on performance of PPP projects in the Kenyan energy sector. The study established that project risk planning has a significant influence on performance of PPP projects in the Kenya Energy Sector. The study recommended for clear risk management plans that will help deal with the high risks in the PPP projects in the Kenya Energy Sector. There process for risk analysis should be made through to ensure the risks in the projects are clearly identified documented and possible mitigation strategies are in place.

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