ISSN 2349-7831

International Journal of Recent Research in Social Sciences and Humanities (IJRRSSH)
Vol. 11, Issue 3, pp: (177-187), Month: July - September 2024, Available at: www.paperpublications.org

Project Planning and Implementation of Power Transmission Line Infrastructure Projects in Uasin Gishu County, Kenya

Stanley Kipkemoi Soi [1*], Dr. Elizabeth Nambuswa Makokha (PhD) [1.2], Marlone Barasa Chemiati [1,3]

[1]College of Human Resource Development, Department of Entrepreneurship and Procurement Leadership and Management. Jomo Kenyatta University of Agriculture and Technology, P.O. Box 62000 - 00200, Nairobi Kenya

[2]College of Human Resource Development, Department of Entrepreneurship and Procurement Leadership and Management. Jomo Kenyatta University of Agriculture and Technology, P.O. Box 62000 - 00200, Nairobi Kenya

[3]School of Business and Entrepreneurship (SOBE), Department of Business. Jomo Kenyatta University of Agriculture and Technology, P.O. Box 62000 - 00200, Nairobi Kenya

DOI: https://doi.org/10.5281/zenodo.13861546

Published Date: 30-September-2024

Abstract: **The purpose of the study was to examine the influence of project planning on implementation of power transmission line infrastructure projects in Uasin Gishu County, Kenya. The study will be guided by the following specific objective; to establish the influence of stakeholder planning on implementation of power transmission line infrastructure projects in Uasin Gishu County, Kenya. The research design was descriptive research design with a target population of 75 comprising of project managers, team leaders, consultants, supervisors and contractors implementing power transmission line infrastructure projects in Uasin Gishu, Kenya. The study conducted a census. A pilot study was undertaken to check the validity and reliability of the data collection instrument. A questionnaire was used to collect primary data and consisted of both structured and open-ended questions to give qualitative and quantitative data. Qualitative data was analyzed by the use of content analysis. Quantitative data was analyzed using descriptive and inferential statistics in which frequencies and percentages was used. SPSS was used to analyze the data and to determine whether the independent variables are related to the dependent variable. The study adopted a regression analysis at 0.05 level of significance to determine strength and direction of the relationship of the variables under study. Data was presented in tables. Based on the findings, the study demonstrated that stakeholder planning process plays a crucial role in the successful implementation of power transmission line infrastructure projects in Uasin Gishu County, Kenya. Overall, the relationship between the dependent and independent variables were considered significant and this underscores the importance of comprehensive project planning strategies in enhancing the effectiveness of infrastructure projects in Uasin Gishu County, Kenya. The study came up with the following recommendations; the power transmission line infrastructure project managers should enable proper stakeholder planning to avoid project failure as progressive projects pivot their success on involvement of stakeholders in the project life cycle. Power transmission line infrastructure projects managers should involve all stakeholders in formulation of strategies and decision making matters concerning implementation of the project through provision of stakeholder communication framework.**

Keywords: **Stakeholder Planning Process, Implementation of the Project, Infrastructure.**

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1. INTRODUCTION

The business of the twenty first century irrespective of its size is going to be part of the global business community affecting and being affected by social change, events and pressures from around the world. This is so because the business environment is changing, dynamic, turbulent, discontinuous and highly competitive that calls for proper planning (Wasike, Namusonge & Nambuswa, 2024). Planning is a very important part of a project regarding project performance and project success. It is a continuous process throughout the delivery of a project. (Idoro, 2018). Numerous empirical studies of project management success factors suggested planning as one of the major contributors to project success (Murphy et al., 2017; Slevin & Pinto, 2018; Aronson, & Lechler, 2019). All the project managers are required to prepare a solid project plan and follow this plan all the way to success. (Dvira, Razb & Shenharc, 2022).

Project planning in power transmission lines is the process of deciding ideal strategies, arrangement and timing of project exercises, and obliged assets to boost the possibility for a successful project. Extend planning viability can be conceptualized as the degree to which a power transmission project accomplishes its arranged targets (Banda & Pretorius, 2016). Choices taken amid the planning procedure have been found to affect the plausible result of a power transmission project (Arditi, 2019; Clayton, 2018; Syal et al., 2022). Access to electricity is important for development due to its linkages to agriculture, education and health. Limited access and use of energy significantly slows down economic and social transformation (Pall, Bridge, Skitmore, & Gray, 2016). Transmission lines provide infrastructure that is used to evacuate high voltage power from generation plants to the national grid for eventual use by consumers. The Government of Kenya established Kenya Electricity Transmission Company Ltd (KETRACO) to manage the high voltage transmission grid infrastructure to cope with growth in energy demand. It is a creation in 2008 of as an investment vehicle for new transmission assets (RoK, 2021). The inadequate energy infrastructure has been identified as a major constraint to accessing electricity. Improving access and use of electricity requires increasing both the geographical coverage of the grid and the number of households connected to it (Islam, Nepal, & Skitmore, 2019).

The energy sector has been identified as a priority sector Kenya as laid in the National Development Plan (2010/2011-2014/2015). Accordingly, the Government of Kenya with the support of development partners prioritized investments in the country's electricity sector, to strengthen and expand transmission capacity in order to meet the energy needs of the country. Specifically, the rehabilitation and upgrade of the transmission system is a key focus of the government electricity sector strategy. To address the challenge of limited access to the grid, power shortages and thereby enhance industrial and business growth, Government made significant investments of Ksh. 117.6 billion and Ksh. 121.65 billion towards the implementation of transmission interconnection lines during 2019/2020 and 2021/2022 respectively (RoK, 2021).

Despite the criticality of power transmission (PT) projects, the research on the PT projects' planning management is embryonic and has not revealed all the key factors involved. More precisely, Banda and Pretorius (2016) comprehensive literature review revealed that PT projects have their own unique causes of delay beyond power generation, power distribution, and other non-power linear construction projects, and recommended an empirical investigation into the project planning as one of the causes of delay and relationships between them. The PT projects characteristically cross many different owners land and, hence, new transmission line (TL) construction is usually contrasting by local people and landlords (Xu, 2017). It is noticed that the main causes of delays in construction of new TL/TLs are authorization processes, project stakeholders' agreement, and public and political support (Islam, Nepal, & Skitmore, 2019). Power lines crossing environmentally and culturally sensitive areas frequently cause delays in PT project implementation (Upreti, Sunder, Dalei, & Garg, 2018). PT projects face social, political, environmental, management, and technical risks (Pham, et al., 2020; Kate & Patil, 2020). Moreover, in a complicated restructured electricity market, the planning processes of new TLs usually take an extended time (Idoniboyeobu, Bala, & Blue-Jack, 2017). In response to Pall et al., (2016) recommendation, an updated review of the latest literature still shows that there are scanty empirical studies on the causes of delay in implementation of PT projects especially in the emerging economies.

Globally, implementation of any project requires proper involvement. According to a report issued at Boston, Massachusetts in the United States of America (CHAOS summary 2019 report) power transmission projects have been failing to meet the stakeholders' satisfaction. According to the report, 32% of power transmission projects were successful because they were able to be delivered on time, within budget and with expected performance of degree of quality, 44% of projects were delivered late, over budget and with less features and functions and a result were challenged and 24% of

projects were also cancelled before they were delivered because they failed. In China, of the seven priority areas, ultra-high voltage (UHV) transmission projects and electric vehicle (EV) charging networks are opportunities for power sector investors and equipment suppliers. State-owned power transmission utilities viz. State Grid Corporation of China (SGCC) and China Southern Power Grid (CSG) will be owners and developers of these UHV projects. SGCC and CSG are the two largest transmission monopolies in China with a market share of 60% and 14% respectively. The two utilities had identified 14 projects for development in 2020, which shall employ High Voltage Alternating Current (HVAC) and High Voltage Direct Current (HVDC) technologies. The total size of investments in these UHV projects estimates to be $26.8bn in 2020; roughly, 1.2% of the total scheduled infrastructure investments in 2020 in the entire country.

Japan is not alone in making advances in superconducting power transmission technology. China's state-owned transmission company in November installed a 1.2-km superconducting line in Shanghai. In Germany, the Ministry of Economy and Energy leads a project that in 2020 began laying a 12-km superconducting transmission line under Munich. Japan has strengths in materials for power lines, as companies like SWCC Showa Holdings manufacture power lines used for superconducting power transmission. The Linear Chuo Shinkansen, a high-speed maglev train line between Tokyo and Nagoya that Central Japan Railway is working on also uses superconductivity, and the know-how cultivated there has become the technological foundation for the power transmission field.

The Nigeria government has up-scaled several transmission power infrastructure projects such as Transmission Expansion Project – phase 1 (NTEP 1) is part of the national Transmission Rehabilitation and Expansion Programme (TREP). This programme aims to support the rehabilitation and upgrade of Nigeria's electricity transmission substations and lines, to increase power transmission network and allow distribution companies to improve supply to consumers. NTEP 1 is composed of brownfield and Greenfield projects, and aims at strengthening and improving the grid wheeling capacity where the transmission lines are the most constrained. It involves; the reconstruction of two (2) 330kV double circuit quad transmission lines, 138km Alaoji–Onitsha and 125km Delta–Benin; the construction of one (1) 330kV double circuit quad transmission line, 204km Kaduna–Kano; the construction of two (2) 330/132kV, 2 x 150MVA Sub stations at Zaria and Millennium City; (iv) The construction of two (2) 132/33kV, 2x 60MVA Sub stations at Rigasa and Jaji respectively. The three components included in NTEP 1 are; strengthening and improvement of the electricity transmission system; impact mitigation and compensation; and capacity building and technical assistance.

In South Africa, the power transmission projects where the World Bank approved a USD 375 million under the non-sovereign window. The project will construct 436km of 400Kv and 116km of 132Kv transmission lines and upgrade substation equipment at four substations which will provide additional evacuation paths for electricity from Kusile, Majuba, Drakensburg and Ingula power stations comprises the construction of transmission lines and the rehabilitation of substations in Mpumalanga and Kwazulu-Natal (KZN) provinces. The lines are required to (i) provide additional power evacuation paths for new generation capacity, (ii) ensure the availability of capacity for future load growth, (iii) reduction of network losses; and (iv) safety during network operations to ensure compliance to the Grid Code. The outcome is increased availability of electricity supply and improved efficiency of the power transmission system through a reduction in the level of technical losses.

The East African country of Tanzania, with a population of around 62 million and an electrification rate of only 30 per cent, continues to struggle with providing electricity access to its population. However, the government is making concerted efforts to improve its electric infrastructure, which is critical to advance the country's economic growth. It has set ambitious targets to reach a per capita electricity consumption of 490 kWh per annum and build an industrial-led economy to become a higher middle-income country by 2025. Tanzania has also set a target to ensure 100 per cent universal access to modern energy by 2030. Tanzania also plans to establish power interconnections with neighboring countries to create new power corridors to support industrial development and improve energy security. The projects include; Zambia–Tanzania–Kenya (ZTK) Interconnector; Malawi–Tanzania Interconnector; Masaka (Uganda)–Mwanza (Tanzania) Transmission Line; Tanzania (Shinyanga–Mwanza–Musoma)–Kenya (Kilgoris) 400 kV Interconnection Project; Burundi–Tanzania Interconnector.

Locally, implementation is the key to any project success. According to the Kenya National Electrification Strategy (2018 - 2022), KETRACO (as the main body mandated to develop transmission lines) planned to develop a total of 5,821 kilometers of power transmission lines and 65 high voltage substations by 2022 at a cost of US 4.1 billion. However, the utility has limited funding, with less than 25% of the investment cost currently secured from the government and development finance institutions. With increased pressure on exchequer funding, KETRACO may need to consider other options if it will deliver its transmission line development programme on target. In order to improve access to electricity,

the Government of Kenya (through the implementing Agency, Kenya Electricity Transmission Company) has embarked on the Kenya Power Transmission System Improvement Project. Funded by the African Development Bank and the Government of Kenya, the objective of this project is to strengthen the transmission network in Kenya by installing 132/33kV substations. The project comprises the strengthening of 431 km of 132 kV transmission lines, the extension of six substation bays and construction of eight new 132/33 kV substations.

This Project is divided into 3 Lots as follows: Lot 1-Construction of 132 kV transmission lines with a total length of 245 km; Lot 2- Construction of 132 kV transmission lines with a total length of 186 km; Lot 3-Construction of 132/33 kV substations and 132 kV extensions. This project will help to improve voltage levels, power quality and reliability, and reduce technical losses. The benefits intended for the developments according to KNBS (2021), energy industry contributed 3.8%, 4.1% towards Gross domestic product (GDP) for the years 2018, 2019, 2020 and 2021 respectively. This is an average of 4.1% as compared to the 10% for the developed economies. The electrification ratio in Kenya is low with only 20% of the population having access to electricity and a per capita consumption of 130 kWh against 550 kWh on average for Sub-Saharan Africa. Outside the main centres, access to electricity is much lower, 7 - 8%, with low reliability in some areas. There is also an additional challenge of reinforcing the power supply to already electrified areas/towns/regions aiming at least-cost technical solutions that offer a combination of increased capacity, improved reliability and better voltage control. The Government of Kenya (GoK) has translated its vision for the sector into the Energy Access Scale-Up Program under which the country will make investments in transmission infrastructure to the tune of USD 1,096 million by 2020.

Based on the available information on implementation of power transmission projects, they have not realized the stakeholders' expectations in terms of their implementation and quality (Idoniboyeobu, Bala, & Blue-Jack, 2017). Even though various electricity power generation expansion and transmission projects are still ongoing (Pall, Bridge, Gray, & Skitmore, 2020), power rationing, low connectivity in rural and urban areas and power outages is still experienced. Delays in power transmission line projects have negatively impacted on both the social and economic benefits in Kenya that would have accrued if the projects were completed on time (World Bank, 2019) (Pham, Luu, Kim, & Vien, 2020). According to Hyvai (2016) over 60% of substantive power projects fail to meet targeted goals due to ineffective project planning issues. This leads to project being delivered over budget, behind schedule and time frame thus affecting quality and power projects implementation (Abdi & Sang, 2020).

Further, in a bid to enhance electricity transmission and power connectivity across the country, the government of Kenya through the ministry of energy formed KETRACO in 2008 which was mandated to strengthen and expand the national grid. However, despite the expectations that KETRACO would spearhead the expansion of transmission infrastructure, very little has been achieved as compared to the set targets. Currently, the company has completed only 1,800KM of transmission lines against a targeted 16,000KM under the 2031 Transmission Master Plan and the Kenya Vision 2030 (KETRACO Technical Division, 2019). Notably, Kenya continues to highly rely on importation of power from neighboring countries such as Uganda and Ethiopia and the main cause has been due to inadequate transmission from the generation sites to the remote areas. Power projects implementation still remains a major challenge in the country, for example World Bank (2019) reported that about 39% of the executed power transmission project fails to meet their objectives

Moreover, several studies agree that project planning is a driver of project implementation (Prabhaar 2018; Ian et' al 2018; Chin 2018; Yusuff et' al 2017). The project implementations in terms of cost overrun, time delay, quality deficiency are caused by poor project planning (Onditi, 2019). According to Sitienei (2020) adoption of project planning practices in power transmission lines projects is poor. This is experienced in terms of misuse of resources, risk planning, and conflict of interest due to poor stakeholder planning and poor scope planning meeting obligatory requirements; hence failing to deliver results that don't meet stakeholders expectations (World Bank, 2019). The existing scanty studies have majorly tried to specifically focus on electricity generation and distribution with no attention paid on transmission despite this being a critical process in the GoK' s agenda. This clearly depicts a need to bridge the knowledge gap in the Kenyan context. It is with this in mind that the study sought to establish the influence of stakeholder planning process on implementation of power transmission line infrastructure projects by project managers in Uasin Gishu County, Kenya.

2. STAKEHOLDER PLANNING

Project Stakeholder management is a critical component of the project management phase, that if not properly handled, may lead to project failure. Globally, progressive projects pivot their success on involvement of stakeholders in the

project life cycle (Mutuku 2024). A study by (Gladysz & Gurtner, 2021) indicated that stakeholder planning is a key segment that influences the performance of the projects. Stakeholder planning is the process used by a project to engage relevant stakeholders for a purpose to achieve accepted outcomes (Edelenbos & Klijn, 2016). They further indicate that effective stakeholder planning helps translate stakeholder needs into project goals and creates the basis of effective strategy development. Karlsen et al., (2015) assent that stakeholder planning is increasingly becoming part of project practice in order to deliver excellent project outcomes. A well-managed stakeholder planning process helps the project stakeholder to work together to increase comfort and quality of life, while decreasing negative environmental impacts while boosting the economic sustainability of the project.

Stakeholder planning can take different level and forms during the project execution. This can line up along with the project predefinition and initiation requirements, the organization strategic objectives through negotiation, consultation, partnership and project final goal Achterkamp & Vos, 2015). According to Olander and Landin (2017) planning of stakeholder in project is a valuable concern for project managers to address the time, costs and quality constraints associated with project portfolio management. Therefore, for a project manager, to carry out a successful project and to meet users' and project requirement, stakeholder planning is the key to determine whether a project fails or succeeds.

Stakeholder involvement plays an important and critical role in project performance. First of all, project stakeholders are groups, individuals or organizations that are actively involved in a project or whose have a vested interest in project execution, completion or results and may as well exert influence over the project objectives and outcomes. Stakeholders have a stake in the outcome of the project. It could be an interest, a right or ownership. Rights can either be legal or moral ownership in a circumstance (Carol, Cohen and Palmer, 2004). Stakeholders take advantage for having their expectations understood and managed through appropriate open communication line on one hand and ensuring that the stakeholders understand and provide support to the project on the other hand.

Projects implemented by government agencies have reasonable prospects for financial sustainability because such agencies are able to cover recurrent project costs from their budget (Antonio and Barry, 2008). Effective development project implementation is looked at in a number of ways to comprise of a big selection of criteria. Nonetheless, effectiveness of initiative implementation can be considered as combining four key facets. Successfully implemented program is usually thought be come in on-schedule (time criterion), comes in on-budget (monetary criterion), accomplishes essentially all the originally set objectives for its (effectiveness criterion), and is consented and utilized by the clients for whom the initiative was planned (client satisfaction criterion). Project consists of comprehensive time frame to end, a restricted budget, as well as a detailed arrangement of performance features (Adeleke et al., 2018). Additionally, the initiative is normally targeted by clients for use, either internal or external to the firm and its program team. It appears practical hence; that any evaluation of effectiveness of project implementation ought to at least comprise of these four processes among others. Ajelabi and Tang (2020) observed that management for programs by management, or certainly for any implementation, has been for long considered of great significance in differentiating between their eventual success or failure.

3. METHOD

The study adopted a descriptive survey design with a target population of 75 comprising of project managers, team leaders, supervisors, consultants and contractors implementing power transmission line infrastructure projects in Uasin Gishu County, Kenya (KETRACO, 2021). Since the target population was small, the study worked with entire population which is census. The data collection instrument was questionnaire. For this study, primary data was collected from the respective respondents (consultants, contractors and team leaders) using a questionnaire. Common sources of secondary data includes censuses, information collected by KETRACO departments, organizational records, review of published research journals, published theses/projects, textbooks, magazines, annual reports of the projects. Piloting was done to test the validity and reliability of the data collection instrument. Once data is collected, it was cross-checked and verified for errors, completeness and consistency. It was then coded, entered and analyzed descriptively using IBM Statistical Package for Social Sciences (SPSS 28). Pearson correlation analysis was used to test the relationship between variables. ANOVA and multiple linear regression analysis were adopted and computed to determine the statistical relationship between the independent variable and the dependent.

4. DISCUSSIONS

4.1 Influence of Stakeholder Planning Process on Implementation of Power Transmission Line Infrastructure Projects in Uasin Gishu County, Kenya

The first specific objective of the study was to determine the influence of stakeholder planning on implementation of power transmission line infrastructure projects in Uasin Gishu County, Kenya. The respondents were requested to indicate their level of agreement on statements relating to the stakeholder planning process on implementation of power transmission line infrastructure projects in Uasin Gishu County, Kenya. A 5 point Likert scale was used where 1 symbolized strongly disagree, 2 symbolized disagree, 3 symbolized neutral, 4 symbolized agree and 5 symbolized strongly agree. The results were as presented in Table 4.1.

From the results, the respondents agreed that Project Stakeholder management is a critical component of the project management phase that if not properly handled, may lead to project failure as progressive projects pivot their success on involvement of stakeholders in the project life cycle. This is supported by a mean of 4.671 (std. dv = 0.943). In addition, as shown by a mean of 4.862 (std. dv = 0.876), the respondents agreed that stakeholder planning is a key segment that influences the performance of the projects. Further, the respondents agreed that the there should be adequate document reviews for identification of all stakeholders with interests in the project. This is shown by a mean of 3.831 (std. dv = 0.944).

The respondents also agreed that the relevant stakeholders should be consulted in the formulation of strategies hence assisting project implementation and they should also be involved in decision making on matters concerning implementation of the project. This is shown by a mean of 3.986 (std. dv = 0.935). With a mean of 3.683 (std. dv = 0.854), the respondents agreed that there exists a stakeholder communication framework in project implementation and each stakeholder is managed to ensure their communication needs are being met.

Table 4.1: Influence of Stakeholder Planning Process on Implementation of Power Transmission Line Infrastructure Projects

	Mean	Std. Deviation
Project Stakeholder management is a critical component of the project management phase, that if not properly handled, may lead to project failure as progressive projects pivot their success on involvement of stakeholders in the project life cycle.	4.671	0.943
Stakeholder planning process is a key segment that influences the performance of the projects.	4.862	0.876
There is adequate document reviews for identification of all stakeholders with interests in the project.	3.831	0.944
The relevant stakeholders should be consulted in the formulation of strategies hence assisting project implementation and they should also be involved in decision making on matters concerning implementation of the project	3.986	0.935
There exists a stakeholder communication framework in project implementation and each stakeholder is managed to ensure their communication needs are being met.	3.683	0.854
Aggregate	**3.982**	**0.876**

4.2. Implementation power Transmission Line Infrastructure Projects in Uasin Gishu County, Kenya

The respondents were requested to indicate their level of agreement on various statements relating to implementation power transmission line infrastructure projects in Uasin Gishu County, Kenya. A 5 point Likert scale was used where 1 symbolized strongly disagree, 2 symbolized disagree, 3 symbolized neutral, 4 symbolized agree and 5 symbolized strongly agree. The results were as presented in table 4.2.

From the results, the respondents agreed that with projects should be implemented and completed within expected timeframe and budget and concluded projects meet the required scope and quality projects standard. This is supported by

a mean of 4.084 (std. dv = 0.997). In addition, as shown by a mean of 3.917 (std. dv = 0.831), the respondents agreed that projects delivered normally satisfy our clients/customer. Further, the respondents agreed that before the beginning of any project, all stakeholders must agree on the inputs and outputs of the projects. This is shown by a mean of 3.858 (std. dv = 0.563). The respondents also agreed that seeking project feedbacks from stakeholders improves performance as quality of the project output is acceptable. This is shown by a mean of 3.831 (std. dv = 0.851). With a mean of 3.751 (std. dv = 0.935), the respondents agreed that the organization gives regular project progress reports on its performance e.t.c.

Table 4.2: Implementation Power Transmission Line Infrastructure Projects in Uasin Gishu County, Kenya

	Mean	Std. Deviation
Projects should be implemented and completed within expected timeframe and budget and concluded projects meet the required scope and quality projects standard	4.084	0.997
Projects delivered normally satisfy our clients/customer	3.917	0.831
Before the beginning of any project, all stakeholders must agree on the inputs and outputs of the projects	3.858	0.563
Seeking project feedbacks from stakeholders improves performance as quality of the project output is acceptable	3.831	0.851
The organization gives regular project progress reports on its performance e.t.c.	3.751	0.935
Aggregate	**3.836**	**0.818**

4.3 Inferential Statistics

Inferential statistics in the current study focused on correlation and regression analysis. Correlation analysis was used to determine the strength of the relationship while regression analysis was used to determine the relationship between dependent variable (implementation power transmission line infrastructure projects in Uasin Gishu County, Kenya) and independent variables (stakeholder planning process, scope planning process, resource planning process and risk planning process).

4.3.1 Correlation Analysis

The present study used Pearson correlation analysis to determine the strength of association between independent variables (stakeholder planning process) and the dependent variable (implementation power transmission line infrastructure projects in Uasin Gishu County, Kenya). Pearson correlation coefficient range between zero and one, where by the strength of association increase with increase in the value of the correlation coefficients. The current study employed Taylor (2018) correlation coefficient ratings where by 0.80 to 1.00 depicts a very strong relationship, 0.60 to 0.79 depicts strong, 0.40 to 0.59 depicts moderate, 0.20 to 0.39 depicts weak.

Table 4.3: Correlation Coefficients

		Implementation power transmission line infrastructure projects	Stakeholder Planning Process
Implementation power transmission line infrastructure projects	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	68	
Stakeholder Planning Process	Pearson Correlation	.853**	1
	Sig. (2-tailed)	.002	
	N	68	68

From the results from table 4.3 above indicates that there was a very strong relationship between stakeholder planning process and implementation power transmission line infrastructure projects in Uasin Gishu County, Kenya (r = 0.853, p value =0.002). The relationship was significant since the p value 0.002 was less than 0.05 (significant level).

4.3.2 Regression Analysis

Multivariate regression analysis was used to assess the relationship between independent variables (stakeholder planning process, and the dependent variable (implementation power transmission line infrastructure projects in Uasin Gishu County, Kenya).

Table 4.4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.921	.812	.829	.10120

a. Predictors: (Constant), Stakeholder Planning Process,

The model summary was used to explain the variation in the dependent variable that could be explained by the independent variables. The r-squared for the relationship between the independent variables and the dependent variable was 0.812. This implied that 81.2% of the variation in the dependent variable (implementation power transmission line infrastructure projects in Uasin Gishu County, Kenya) could be explained by independent variables (Stakeholder Planning Process).

Table 4.5: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19.022	1	3.231	52.35	.000[b]
	Residual	6.518	67	.032		
	Total	25.530	68			

a. Dependent Variable: Implementation Power Transmission Line Infrastructure Projects in Uasin Gishu County, Kenya

b. Predictors: (Constant), Stakeholder Planning Process

The ANOVA was used to determine whether the model was a good fit for the data. F calculated was 52.34 while the F critical was 2.412. The p value was 0.000. Since the F-calculated was greater than the F-critical and the p value 0.000 was less than 0.05, the model was considered as a good fit for the data. Therefore, the model can be used to predict the influence of stakeholder planning, on the implementation power transmission line infrastructure projects in Uasin Gishu County, Kenya.

Table 4.6: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	**(Constant)**	0.406	0.038		4.364	0.000
	Stakeholder Planning	0.398	0.099	0.397	3.755	0.004

a Dependent Variable: Implementation power transmission line infrastructure projects in Uasin Gishu County, Kenya

The regression model was as follows:

$Y = 0.406 + 0.398X_1 + \varepsilon$

According to the results, stakeholder planning has a significant effect on implementation power transmission line infrastructure projects in Uasin Gishu County, Kenya β_1=0.398, p value= 0.004). The relationship was considered significant since the p value 0.004 was less than the significant level of 0.05.

5. CONCLUSIONS AND RECOMMENDATIONS

The specific objective of the study was to determine the influence of stakeholder planning process on implementation of power transmission line infrastructure projects in Uasin Gishu County, Kenya. The findings revealed that project stakeholder management is a critical component of the project management phase that if not properly handled, may lead to project failure as progressive projects pivot their success on involvement of stakeholders in the project life cycle. The findings also indicated that stakeholder planning is a key segment that influences the performance of the projects and that there should be adequate document reviews for identification of all stakeholders with interests in the project. The finding also implied that the relevant stakeholders should be consulted in the formulation of strategies hence assisting project implementation and they should also be involved in decision making on matters concerning implementation of the project. Further, the findings showed that there exists a stakeholder communication framework in project implementation and each stakeholder is managed to ensure their communication needs are being met. Based on the findings, the study demonstrated that stakeholder planning process plays a crucial role in the successful implementation of power transmission line infrastructure projects in Uasin Gishu County, Kenya. Overall, the relationship between the dependent and independent variables were considered significant and this underscores the importance of comprehensive project planning strategies in enhancing the effectiveness of infrastructure projects in Uasin Gishu County, Kenya.

The study came up with the following recommendations; the power transmission line infrastructure project managers should enable proper stakeholder planning to avoid project failure as progressive projects pivot their success on involvement of stakeholders in the project life cycle. Power transmission line infrastructure projects managers should involve all stakeholders in formulation of strategies and decision making matters concerning implementation of the project through provision of stakeholder communication framework. The project should have enough skilled workers for smooth operation and that there is adequate expertise supervisors and technical officers. The project managers should ensure that there is no shortage of the construction materials, financial capacity of the contractor to maintain a smooth cash flow and to avoid conflict in payment for the sub-contractor and suppliers and also ensure workers' health and safety conditions.

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