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ROLE OF PUBLIC-PRIVATE PARTNERSHIPS IN THE PERFORMANCE OF SMALL ENERGY PROJECTS IN KENYA: A CASE OF SMALL HYDROPOWER PROJECTS IN BUNGOMA COUNTY

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Abstract: *The study explored the role of public-private partnerships in the performance of small energy projects in Kenya. The specific objectives were: community participation, training of the stakeholders, project management practices and institutions' capacity. This project sought to assess the role of public-private partnerships in the performance of small energy projects in Kenya. The target population consisted of employees from energy ministry Bungoma county, community members, employees from private developing companies from the small hydropower projects covering the following areas: Sakhala, Maresi and Sitikho. This study therefore sought to explore what past scholars had said on the influence of public–private partnership in the performance of small energy projects in Kenya and tested viability of best projects practices and its long-run relationship to their impact and its performance. Therefore from the foregoing, this study concludes that public-private partnerships have broadly impacted on Performance of small Energy projects in Kenya. The findings conclude that modern institutions should drive to embrace the best practices towards Performance of small Energy projects. That from the foregoing, this study recommends that public –private partnership should strive to be proactive on how to perform better to retain all stakeholders and improve the standards of living in the county.*

Keywords: *Independent Power Producers, Public-Private Partnerships, Small Hydropower Project, Infrastructure, Vision 2030, Kenya, Small hydropower projects*

INTRODUCTION

The provision of energy services through renewable energy is capital intensive and requires significant upfront costs compared to conventional energy technology. In most of cases,

government investments and public budgets have proved insufficient to expand access to electricity and modern energy in rural areas in a sustainable manner (Sovacool, 2013).

There is a great need for mobilizing financial resources to expand local energy services delivery in the developing world. Pro-poor public private partnerships are one of the best mechanisms to supplement and overcome government budgetary constraints for widening access to energy services, especially to the poor, as they can allocate project-risks between the public and private sector (Sovacool, 2013). Public Private Partnerships involve contracts between a private party and the public sector. There are two main drivers of public-private partnerships. Firstly, PPPs are believed to allow the public sector access the efficiencies and expertise that the private party provides that were delivered and procured by the public sector (Ngugi et al., 2013).

Secondly, the structure of PPPs ensures that the public sector pursuing a capital investment is void of financial debts (Hart, 2003). Rather, the debts are incurred by the private party while conceptualizing the project. In the event when the cost of services provided by the partnership is exclusively by the end user, the public sector's perspective considers the PPP as "an off-balance sheet" (Poullikkas, 2001). In contrast, the public sector may intend to compensate the private party through availing funds once the project is established or refurbished. The mode of financing in this case from the perspective of the public sector is referred to as an "on-balance sheet" (Poullikkas, 2001). Conversely the public sector benefits regularly through deferred cash flows.

Multi-sectorial partnerships are experienced through a continuum of the private sector to public in divergent degrees of implementation depending on the goals, time constraints, and the issues at hand (Poullikkas, 2001). Although these partnerships are widespread in most regions such as the Latin America, Asia, and Sub-Saharan Africa, it is normal for both the public and private sectors to be critical about other's methods and approaches (Munyu, 2009). A merger of the two sectors has immediate ramifications for the development of local communities through the provision of cheap and reliable sources of energy.

The most common division of responsibility in a PPP is to have the public partner set service standards (including determining who receives that service, and at what level or price) and monitor performance whereas the private partner raises capital and assumes responsibility

for building and operating the project (UNDP, 2005). However, a new type of PPP has emerged in recent years involving governments as well as private companies, microfinance institutions, multilateral development banks, and nonprofit organizations (including NGOs) in expanding access to energy services (Felsinger, 2010). A pro poor public private partnership model, usually indicated by the abbreviation "5P," has evolved to explicitly target the provision of services to poor communities, which are often ignored by traditional PPPs since supplying the poor can involve substantial business risk (Felsinger, 2010). The 5P model views the poor not only as consumers that receive benefits, but also as partners in programs are beyond the principle of external funding (Pattberg, 2010).

In Sub-Saharan Africa, private equity investors have embraced the investment opportunities in the energy sector. The growth of this awareness stems from the tremendous growth of the economy as well as the rise of the middle-class population (Siegel & Kamara, 2000). Through the efforts of Economic Commission for Africa (ECA) the public sector has joined hands with private investors to improve the production and distribution processes (Mwakubo & Ikiara, 2007). The Commission has estimated that about US$35 billion is required in the private sector to improve yearly infrastructural funding gap. The aim of this budget is to increase the 3% growth in Sub-Saharan energy capacity annually to 80% growth rates experienced in Latin America and 50% in South Asia (Akampurira & Shakantu, 2012).

Only 20% of the population in the Sub-Saharan has access to electricity. In rural areas that account for more than two-thirds of the total population, only approximately 12% of the households have access to the power from national grids (Akampurira & Shakantu, 2012). The economic costs associated with power outages may sometimes reach 4% of the Gross Domestic Product in some regions since marketing enterprises in rural areas face a mean of 56 days annually without power (Mwakubo & Ikiara, 2007). Additionally, power costs are relatively high in this region due to over dependence on the small scale production patterns. To fill this power and finance gap, the private sector has indulged in the energy sector. In addition, Economic Commission for Africa (ECA) has provided room for the growth of the private sector through strengthening commitments to African governments as well as international partners (Akampurira & Shakantu, 2012). This investment need has been achieved through public-private partnerships. Additionally, the private sectors have

partnered with the national governments to provide public services more efficiently (Mwakubo & Ikiara, 2007).

According to Siegel and Kamara (2000), Kenya has the largest economy in the east and central regions of Africa. An increasing requirement of affordable electric power has the potential to create economic, infrastructural investment opportunities. The country has recorded a tremendous success in the development of mini-grid power projects in different counties. It has been successful in implementing mixes of community owned projects in partnership with the government (Mwakubo & Ikiara, 2007).

In the last decade, the country has demonstrated interests in PPPs infrastructure space. The recent developments in Olkaria III Geothermal Phase II Power Project, the $900 million Lake Turkana Wind Power Projects and the various mini-grid hydropower projects is not only creating tangible impacts, but also acts as pacesetters in the region (Ali, 2014).

The government has estimated that the PPP incentive is estimated to grow from 5.8% to 7% by 2017. The President of Kenya, who was the former Minister of Finance, Uhuru Kenyatta has continually insisted that the government should form an “enabling environment” that boosts private enterprises (Ali, 2014). This will be achieved through a robust institutional and legal environment that will shift services from public to the private sector. The recent PPPs laws seek to address the absence of debt in the market through the upsurge of Kenyan government grants and public debt (Ali, 2014).

Bungoma County has an urbanization rate of 21.7%, literacy rate of 60.5%, poverty rate of 52.9%, and electricity access rate of 4.5% as compared to 16.4% in Kirinyaga County (Ngugi et al, 2013). Majority of the population, 67%, use tin lamps as the main means of lighting in rural areas (Ngugi et al, 2013). Access to electricity is significantly higher in male-headed families at 5% and 4% among female-headed households. Kanduyi Constituency records the highest number of electricity access at 12% while Bumula Constituency is at 11% (Ngugi et al, 2013). As such, the access at Kanduyi is 8% higher the national average. The county relies entirely on Kenya Power for power supply.

The county has improved sources of water such as lakes, numerous streams and rivers, unprotected springs (Njoroge, 2006). Bwake/Luuya Ward had the highest share of water as well as a series of waterfalls. Although the county has high amounts of water that translated

to high energy potential, there is little, if any, exploitation of water resources by private entrepreneurs (Ngugi et al, 2013). Many Independent Power Producers (IPPs) lack interest in investing in power production since it is considered as capital intensive (Siegel &Kamara, 2000).

The few who have shown interest take long to actualize their ideas since energy projects demand enormous terms such as high generation taxes and credit letters that must cover several months of operation for both energy and capital charges (Mwakubo & Ikiara, 2007). The poor road network has hindered the infrastructure for power generation, transmission, and distribution networks which may take inordinately long time from implementation to commissioning.

STATEMENT OF THE PROBLEM

The role of public-private partnerships in the performance of small energy projects in Kenya has been an issue for quite some time now. Njoroge (2006) argues that The Ministry of Energy in Kenya has identified both short and long term challenges affecting the energy sector. Oyuke (2012) also noted that to counter the challenges above, the government has introduced PPPs to increase energy access in rural areas. Although this initiative has benefited some counties such as Nyeri and Kirinyaga, some private projects in Western Kenya are still unaffected. Despite Bungoma County having various small privately-owned hydropower projects such as Sakhala, Maresi and Sitikho Falls along River Nzoia with energy potentials of 5.7MW, 5.6MW, and 10MW respectively there has been little or no progress in planning, implementation and operation of the small hydropower projects. This has led to delayed inefficiencies in integrating production and transmission designs usually financed, operated, and upgraded by the government through Kenya Power. Apart from delayed projects, it has also led to the lack of value-added synergies in terms of public sector knowledge, skills, and experience. The projects have failed to create a value chain and socio-economic development of local communities.

According to Oyuke (2012), most of rural populations in Kenya lack electricity due to over reliance on limited power resources from Kenya Power. In addition, lack of financial assistance from the Kenyan Government has delayed development of community based hydropower projects along River Nzoia. In view of the foregoing, most of the studies

available are from outside the country, hence the need to do a study in the Kenyan context. Therefore the purpose of the study was to examine the role of public-private partnerships in the performance of small energy projects in Kenya.

OBJECTIVES OF THE STUDY

The general objective of the study is to examine the role of public-private partnerships in the performance of small energy projects in Kenya.

The specific objectives of the study will be:

i. To examine how community participation affects the performance of small energy projects in Kenya.
ii. To establish the extent to which training of the stakeholders affects the performance of small energy projects in Kenya.
iii. To determine how project management practices affects the performance of small energy projects in Kenya.
iv. To examine how the institutional capacity of implementing agencies affects the performance of small energy projects in Kenya.

RESEARCH QUESTIONS

- How does community participation affect the performance of small energy projects in Kenya?
- To what extent does training of the stakeholders affect the performance of small energy projects in Kenya?
- How do project management practices affect the performance of small energy projects in Kenya?
- How does institutional capacity influence the performance of small energy projects in Kenya?

LITERATURE REVIEW

THEORETICAL FRAMEWORK

The Siriporn Yamnill Theory

The Siriporn Yamnill theory is considered to be relevant on understanding how community participation can influence the role of public-private partnerships in the performance of small energy projects in Kenya and hence provides the theoretical background for this for

this study. Decker (2001) argues that the aim of this theory is to motivate members of a project (community members in this case) in order to adapt and prepare for changes by ensuring that the community has the right to information, experience, and skills essential for socioeconomic changes. An effective partnership recognizes the needs of a rural settlement by prioritizing changes while simultaneously minimizing risks. The strategic alignment concept proposed in this theory ensures that community members have the skills necessary to participate in public projects effectively (Hart, 2003). By establishing consistent public procedures and policies for recruiting, selecting, and orienting community participants in a project, the partnership prepares its workforce to work productively (Rindermann, 2008). In addition, aligning community members according to the mission and vision of a project promote personal career development that can be handy during operations and management.

The technique of offering an array of workshops, self-study options, and lectures covering a variety of professional and technical development topics ensures that a community acquires the desired skills for future improvement of the project (Sternberg & Lubart, 1991). In addition, the theory is believed to offer a platform for effective communication among community members. The effective communication package created involves meetings, multimedia presentations, documents, and other supporting resources (Veger& Novelli, 2012). To ensure partnership readiness, leaders from both the public and private sector start with small virtual changes before implementing the program on a wide scale. After short term success, leaders use the results to introduce the real project by supporting the community in the new infrastructure (Rindermann, 2008).

The Human Capital Theory

The Human Capital theory is considered to be relevant on understanding how training of the stakeholders can influence the role of public-private partnerships in the performance of small energy projects in Kenya and hence provides the theoretical background for this study. Hart, (2003) argues that human capital refers to a variety of resources such as the knowledge, abilities, skills, talents, intelligence, judgment, and wisdom possessed either individually or collectively in a population the above resources represent the total capacity

of a population, which in turn, represent the cumulative wealth that can be directed to achieve the goals of a nation or a portion thereof.

The human capital theory relates to the training of the stakeholders in projects since it is built on the stock of habits, knowledge, personality, and social attributes including creativity that contribute to economic value (Campbell, 1998). However, the level of stakeholders' participation is directly proportional to human intelligence as well as levels of training. Educated individuals often migrate from cities to rural areas in search of opportunities (Hart, 2003). This type of movement has positive effects in both regions of a country: the capital-rich regions access an influx of labor while labor reach regions receive capital when rich entrepreneurs remit money to rural areas (Sternberg & Lubart, 1991). The loss of labor in the urban areas increases the rates of wages for the few individuals who do not immigrate.

The additional manpower in the rural regions lowers wages. The advancement of resources in rural areas requires increased training higher than the norm of primary schooling, which in turn, results in the creation of more formalized training. In partnerships, Campbell (1998) argues that human capital is a constituent of the Intellectual Capital considered as the entire value of a project. As such, it can be considered as the value that the community provides to a rural project through the application of expertise, skills, and know-how.

Human capital is inherent in a community and cannot be considered a characteristic of an organization. As a result, human capital determines the effectiveness of project management as a measure of creativity and innovation (Sternberg & Lubart, 1991). A project's reputation as a leader affects the entire human capital in draws. However, human capital leads to accumulation of risks categorized into four groups (Hart, 2003). Firstly, absence activities where the community does not turn up for project work due to industrial action or sick leave. Secondly, collaborative activities that are related to time expenditure among community members, for instance, instructor-led training and meetings are often despised. Thirdly, knowledge activities related to time wastage due to information retrieving, research and information analysis. Lastly, collaborative process activities that affect the progress of SHP projects such as politics, stress, and manual data transformations (Hart, 2003).

Systems Theory

The Systems theory is considered to be relevant on understanding how project management practices can influence the role of public-private partnerships in the performance of small energy projects in Kenya and hence provides the theoretical background for this for this study. Smith (1998) argues that the systems theory relates to system engineering that is an interdisciplinary means and approach for deployment and realization of successful project management. It can be considered as the science of applying engineering techniques to systems engineering, as well as the application of a system, approaches to the engineering efforts (Decker, 2001). Systems engineering also integrates other specialty groups and disciplines into public-private team efforts to form structured development processes. The resultant structured project development process progresses from ideas to production to operational management and ultimate disposal (Veger & Novelli, 2012). Systems engineering, consequently, considers both the technical needs of a community and the business, with the objective of providing quality service to rural settlements.

This theory is applicable to project management processes that involve more than two parties (public and private sector in this case) due to its complex adaptive system (Veger & Novelli, 2012). The term “complex” implies that the project management practices are diverse and comprising of multiple and interconnected elements (Decker, 2001). The elements must be adaptive in the sense that they have the capacity to learn and change from experience.

The concept behind hyper-systems is to offer a theoretical perspective for implementing and understanding the participation of the private and public sectors as “users”, designers, decision-makers, and other actors in the project in the maintenance or development of community projects (Sternberg & Lubart, 1991). The central topic of systems theory is self-regulating systems, that is, systems that are self-correcting through feedback. The feedback system is a product of human learning processes from an individual perspective to team levels in a project.

Institutional Theory

The Institutional theory is considered to be relevant on understanding how institutional capacity can influence the role of public-private partnerships in the performance of small energy projects in Kenya and hence provides the theoretical background for this for this study. Sternberg and Lubart (1991) argue that the institutional theory focuses on more resilient and deeper aspects of social structures that affect development. It is based on processes by which structures comprising schemes, routines, rules, and norms become implemented as authoritative guiding principles for social behavior. This theory explains the different components of institutional capacity by explaining some of the elements that can be created, adopted, diffused, and adopted over time and space; and the extent to which they fall into disuse and decline (Hart, 2003).

It defines public and private institutions as social constructs that have attained a certain level of resilience. Players, the people who merge the two institutions, must exhibit cultural-cognitive, regulative, and normative characters that, alongside with associated resources and activities, provide meaning and stability to social and economic life (Veger & Novelli, 2012).

Private and public institutions are transmitted by different types of carriers such as symbolic systems, routines, artifacts, and relational systems (Decker, 2001). As a result, institutions operate at different degrees of jurisdiction, from the world perspectives to localized and interpersonal relationships in rural settings. For public-private partnerships to succeed, the two sectors must conform to the beliefs and rules systems prevailing in the rural environments. There is substantial evidence that partnerships in different types of rural settings react differently to various challenges related to the physical environment as well as capital requirements (Rindermann, 2008).

CONCEPTUAL FRAMEWORK

According to Young (2009), conceptual framework is a diagrammatical representation that shows the relationship between dependent variable and independent variables. In the study, the conceptual framework will look at the relationship between the performance of small energy projects and community participation, training of the stakeholders, project management practices, and institutional capacity.

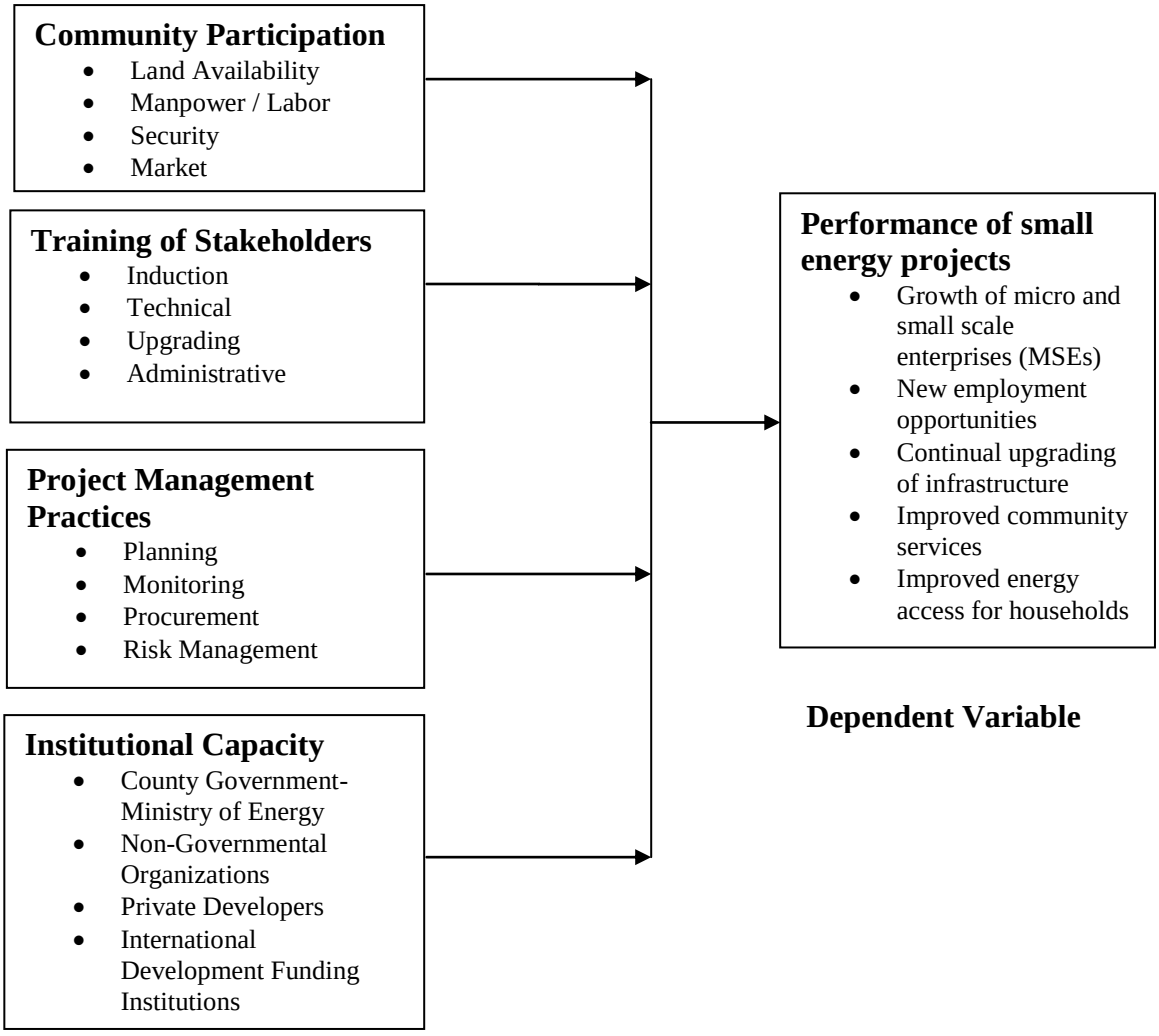

Figure 1 Conceptual Framework

RESEARCH METHODOLOGY

Research Design

The research design suitable for this study is descriptive research design. A descriptive research defines a predetermined characteristic of a phenomenon or population under study (Kline, 2000). Descriptive research is important because it uses both qualitative and quantitative to find solutions to the matter at hand.

Target Population

The target population in this study consisted of project team members from private developers, county government employees in the Ministry of Trade, Energy and Industrialization Bungoma County and households around the three SHP projects in

Soysambu, Kibisi and Sitikho sub locations. The total number of the target population was 1100.

Table 1 Target population

Category	Cumulative No.	Percentage (%)
Private Developers	50	4.5
Ministry of Trade, Energy and Industrialization	200	18.2
Communities:		
Soysambu	340	30.9
Kibisi	287	26.1
Sitikho	223	20.3
Total	**1100**	**100**

(Source: Bungoma County – Census Volume 1, 2009)

Sampling Size and Sampling Technique

This study used stratified random sampling techniques to select the respondents. Stratified random sampling techniques was used to pick representative from each stratum, subjects were selected in such a way that the existing subgroups in the population are more or less reproduced in the sample. The study selected sample of 10% of (1100) from the targeted population. In descriptive studies ten percent of the accessible population is enough sample size (Mugenda & Mugenda, 2008).

Table 2 Sample Size

Category	Cumulative No.	Percentage (%)	Sample Size SS
Private Developers	50	4.5	5
Ministry of Trade, Energy and Industrialization	200	18.2	20
Communities:			
Soysambu	340	30.9	34
Kibisi	287	26.1	29
Sitikho	223	20.3	22
Total	**1100**	**100**	**110**

Data Collection Procedures

Data collection was done through questionnaires. A questionnaire is a research instrument comprising a set of questions as well as prompts to gather data from respondents (Roger, 2008). Usually, questionnaires contain a series of questions to be answered in a certain format. They are advantageous to other methods of the survey because they are cheap and require little human effort in the process of administration (Krosnick, 2003).

The questionnaires were administered by two research assistants well trained for this purpose. Both open-ended and closed-ended questions were used during data collection. They were exploratory in nature to help respondents provide answers without forcing them to select from predetermined choices (Roger, 2008). Open-ended questionnaires were useful in collecting qualitative data.

Each question was not expected to provide unanticipated or unique answers, but rather, respondents were limited to a series of pre-selected options (Roger, 2008). The questionnaires were availed to the entire sample population both formally and informally. The Likert Scale of 1-5 was used in the closed-end questionnaires where the respondents were expected to choose among the following choices: strongly agree, agree, neutral, disagree, or strongly disagree. It was arranged in a logical manner such that the respondents had a clear understanding of the research from the general questions, independent variables, and dependent variable. The rating is "unipolar" in the sense that it compares one objective at a time rather than combining all the five sections (Norman, 2010).

Data Analysis and Presentation

The data was organized and cleaned of errors made during data collection. It was coded and keyed into the computer and analyzed using descriptive statistics with the aid of the Statistical Package of Social Sciences (SPSS), Microsoft Excel and Microsoft Access Computer Software. Descriptive statistics technique was used to describe or summarize the data in a way that enabled a researcher to meaningfully describe a distribution of measurements or values using a few indices or statistics. Frequency distributions and percentages were generated from the data collected. A frequency distribution table shows the distribution of scores in a sample for a specific variable. It thus gives a record of the number of times a score or a response occurs (Mugenda & Mugenda, 2008).

For each variable, the researchers tabulated the findings and calculated the frequencies and percentages, then made interpretations from the research findings. The information was then presented in form of frequency tables and percentages. The researcher also used inferential statistics which is a technique which permits the use of inferences about the population based on results obtained from samples. This is necessary since the study was conducted on the basis of a sample.

This technique is basically concerned with determining how likely it is for the results that was obtained from the sample to be similar to results from the entire population of the study. The Statistical Package for Social Science (SPSS) version 21 was used to analyse data and was effective in statistical data analysis. The latest version incorporates the deployment and survey authority of numerical data using automated and batch scoring services (Field, 2005). The SPSS software is suitable for data analysis involving multiple regressions, Pearson correlations, and the Analysis of Variance (ANOVA). The resultant data presentation was tabulated and presented using tables, bar graphs and pie charts. Multiple regressions formula was applied in this study to determine the relationship between the independent variables and one dependent variable. The formula for multiple regressions was expressed as follows: $Y=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4+\varepsilon$, Where;

Y= Performance of small energy projects.

β_0=constant (coefficient of intercept),

X_1= Community Participation

X2= Training of the Stakeholder

X3= Project management practices

X4= Institutions' Capacity

ε = error term

$\beta1\ldots\beta_4$= regression coefficient of four variables.

An Analysis of Variance was used to measure statistically the significance in predicting how independent variables influence performance of small energy projects. The test of significance was correlation coefficient, the R square as a measure of significance. The coefficient is a standard measure of an assumed linear relationship between variables. A coefficient of value between (+ve) 0.5 and (-ve) 0.5 or higher indicates a strong relationship and by extension a significant variable in influencing the trend of the dependent variable.

RESEARCH FINDINGS AND DISCUSSION

Community Participation

The study also sought to determine how many community based organization (CBOs) are involved in energy projects in their area. To this attainment, respondents were required to indicate the number ranging from 1-10. Results in table 3 below shows that majority 66 % (65) of the respondents indicated the number of small energy project were between 1-3.

About 23.% (23) of the respondents indicated they were between 4-6 and the remaining 10% (10) indicated they were between 7 - 9.

Table 3 No. of CBOs in Energy Projects

No of CBOs	Frequency	Percent
1 – 3	65	66
4 – 6	23	23
7 – 9	10	11
Total	**98**	**100**

The study sought to find out whether the respondents were willing to surrender land if offered financial compensation at current land market rates or if given in an equal size and alternative piece of land. Majority 98% (96) of the respondents indicated they were willing to give their land if they full compensated financially. About 2% (4) of the respondents preferred to be given an equivalent piece of land. The response shows that community values their land.

The respondents were provided with structured, closed, and open-ended questions.

There was also limited use of a five-point Likert scale (where 1 = Strongly Disagree , 2 = Disagree ; 3 = Neither Disagree Or Agree(Neutral) ; 4 = Agree And 5 = Strongly Agree). The respondent were asked whether land availability determines the viability of a project as well as the room for expansion: Majority 78% (76) of the respondents indicated that they agreed there is availability of land for expansion and on only 22% (17) of the respondents indicated that there was no land for expansion, hence disagreed. The respondents were also asked about the availability of manpower which determines the effectiveness of a project. Relatively a small number of the respondents 37% (36) indicated that they agree that manpower can determine the effectiveness of energy projects and a high number of respondents 63% (62) indicated that they disagree.

Majority 81% (79) of the respondents agreed that availability of security for the project ensures there is no pilferage of materials and misappropriation of funds. Only 19 % (19) of the respondents indicated that they were neutral. Majority 89% (87) of the respondents disagreed that Market for energy resources is the main driver of projects and the remaining and only 11% (11) of the response indicated it was just a driver, hence agreed. The respondents were requested to respond on their own opinion whether community

participation can enhance performance of small energy projects. Majority 86% (84) of the respondents indicated yes has it is very crucial and 11% (11) of the respondents indicated no and only 3% (3) of the respondent's neutral.

Training of Stakeholders

The respondents were also asked to make a choice from five roles that can enhance the performance of small energy projects; where majority 68% (67) of the respondents settled on skilled technicians, about 32 % (31) of the respondents chose management level, relatively high 73% (72) number were for expert, while a small number 22% (21) chose casual labour and only 8% (7) of the respondents indicated none can enhance performance of energy project – table 4. This is in line with ILO (2011) which concluded that plans by governments and others to develop renewable energy projects require a skills component and smaller renewable energy projects require skilled crafts workers with sufficient breadth of skills to be able to do the work by themselves, or at least to cooperate effectively with others.

Table 4 Roles influencing performance of small energy projects

Respondents	Frequency	Percent
Skilled technician	67	68%
Management level	31	32%
Expert	72	73%
Casual Labour	71	72%
None	27	28%

The respondents were requested to respond whether they preferred any type of training before executing these projects. Majority 67% (66) of them indicated yes, while a small number 33% (32) of the respondents indicated no need for any type of training - table 5.

Table 5. Type of Training

Respondents	Frequency	Percent
Yes	66	67%
No	32	33%
Total	**98**	**100**

The respondents were asked what set of skills do they expect to gain during life cycle of the project; they gave the following information; majority 76% (74) of the respondents expect technical skills, about 61% (60) of the respondents expect administrative skills, 42% (41) of

the respondents interpersonal skills and 4% (4) of the respondents organizational skills and only 6% (6) of the respondents communication skills - table 6.

Table 6. Set of Skills

Respondents	Frequency	Percent
Technical	74	76
Administrative	60	61
Interpersonal	41	42
Organizational	4	4
Communication	6	6

The respondents were requested to indicate their agreement or disagreement with the following statements on training of stakeholders in small energy projects. majority 73 % (71) of the respondents disagreed that induction training is important to improve labour quality, about 56% (54) of the respondents strongly disagreed that technical training enables community members to accurately perform technical aspects of projects while 71% (68) of the respondents agreed that upgrading improves skills of the project work force and keep them abreast with emerging trends and only 54% (53) of the respondents strongly agreed that administrative training makes leaders who are rich in theoretical, technical and interpersonal skills – table 7. The respondents were requested to respond on their own opinion whether training of the stakeholders can enhance performance of small energy projects. Majority 70% (69) of the respondents indicated yes has it is very crucial and 25% (25) of the respondents indicated no and only 5% (4) of the respondent's neutral.

Table 7. Respondents' Opinion

Statement	Frequency	Percent
Induction training is important to improve labour quality.	71	73
Technical training enables community members to accurately perform technical aspects of projects.	54	56
Upgrading improves skills of the project work force and keep them abreast with emerging trends	68	71
Administrative training makes leaders who are rich in theoretical, technical and interpersonal skills.	53	54

Project Management Practices

The respondents were asked to indicate which project phase greatly influences the performance of small energy projects. Majority 86% (84) of the respondents indicated that

pre construction phase one is very crucial, 14% (14) of the respondents indicated that construction phase and 34% (33) of the respondents indicated operational phase greatly influences the performance of small energy projects - table 8.

Table 8. Project phases

Respondents	Frequency	Percent
Pre -construction	84	86%
Construction	14	14%
Operational	32	34%

The respondents were asked what type of risks they have encountered/are likely to occur in small energy projects. Majority 76% (74) of the respondents indicated that they have encountered cost based risk and only 14% (14) of the respondents indicated that they have encountered external based risk and a small number 10% (10) of the respondents indicated they have encountered schedule based risk – table 9.

Table 9. Type of Risks

Respondents	Frequency	Percent
Cost Based Risk	74	76%
External Based Risk	14	14%
Schedule Based Risk	10	10%
Total	**98**	**100**

The respondents were asked to indicate the level of agreement or disagreement on statements on project management practices in small energy projects. 77% (75) of the respondents agreed adequate planning avoids the stalling of projects; About 8% (8) of the respondents disagreed monitoring ensures projects are delivered within the stipulated budget; 10% (10) of the respondents strongly disagreed a good procurement plan ensures reliable selection of suppliers, vendors and contractors and 5% (5) of the respondents were neutral whether risk management should be considered when determining the probability of completing a project in time – table 10. This is in line with Khemani et al (2011) who asserts that scope definition and project strategy activities play the most significant role in ultimately determining the success of project execution and can also be critical to successful start-up of operations upon project completion.

Table 10. Respondents' opinion

Statement	Frequency	Percent
Adequate planning avoids the stalling of projects.	Agree	77
Monitoring ensures projects are delivered within the stipulated budget, time and quality standards.	Disagree	8
Good Procurement Plan ensures reliable selection of suppliers, vendors and contractors.	Strongly Disagree	10
Risk Management should be considered when determining the probability of completing a project in time	Neutral	5

Institutional Capacity

The respondents were asked which renewable of energy technology has County Government, Private companies, NGOs and Development Funding Institutions promoted in their county. 87% (85) of the respondents indicated that solar energy has been promoted in their county ; About 8% (8) of the respondents indicated biomass energy has been promoted in their county, also 3% (3) of the respondents Hydropower and only 2% (2) of the respondents were for wind – table11.

Table 11. Renewable Energy

Item	Frequency	Percent
Solar	85	87
Biomass	8	8
Hydropower	3	3
Biomass	2	2
Total	**98**	**100**

The respondents were asked the roles of the National/County Government in PPPs for small energy projects. Majority 67% (66) of the respondents indicated Issuing relevant permits required for projects; About 13% (13) of the respondents indicated ensuring there is infrastructure to enable smooth running of projects, 9% (9) of the respondents indicated making laws, regulations and policies that promote private sector investment, 9% (10) of the respondents indicated collecting revenues from the project and 1% (1) of the respondents indicated providing land for projects - table 12.

Table 12. Role of National / County Government

Respondents	Frequency	Percent
Issuing relevant permits	66	67
Ensuring there is infrastructure	13	13
Making laws, regulations and policies	9	9
Collecting Revenue	9	9
Providing land for projects	1	1
Total	**98**	**100**

The respondents were requested to indicate the role of private developers/NGOs/ Development funding institutions in PPPs for small energy projects. Majority 57% (56) of the respondents indicated training project staff and team members; About 18% (18) of the respondents indicated educating the community and sensitizing them on aspects of the project, also 9% (9) of the respondents indicated management and maintenance of the project and only 10% (10) of the respondents indicated providing funds for the project and only 6% (5) of the respondents indicated supervision of project during implementation - table 13.

Table 13. Role of Private Developers/ NGOs/Development Funding Institutions

Item Respondents	Frequency	Percent
Training project staff and team members	56	57
Educating the community and sensitizing	18	18
Management and maintenance of the project	9	9
Providing funds for the project	10	10
Supervision of project during implementation	5	6
Total	**98**	**100**

The respondents were requested to indicate their level of agreement or disagreement on the roles of institutions in small energy projects. Majority 74% (73) of the respondents agreed that the National/County Government determines the energy situation in the county and attracts international donors; About 15% (14) of the respondents disagreed that NGOs expand energy access in rural areas with various programmes, also 6% (6) of the respondents strongly agreed that private developers transfer technological, financial and managerial knows how that promotes socioeconomic development and 4% (4) of the respondents disagreed that international development funding institutions mobilize funds as well as technical assistance to private companies in the energy sector - table 14.

Table 14. Respondents' opinion

Statement	Frequency	Percent
National/County Government determines the energy situation in the county and attracts international donors.	Agreed	74
NGOs expand energy access in rural areas with various programmes.	Disagreed	15
Private developers transfer technological, financial and managerial knows how that promotes socioeconomic development.	Strongly agreed	6
International Development Funding institutions mobilize funds as well as technical assistance to private companies in the energy sector.	Disagreed	4

Performance of Small Energy Projects

The respondents were requested to indicate their level of agreement to the following statements in regards to performance of small energy projects for growth of SMEs in Bungoma County for the last 5 years period: Majority 54% (53) of the respondents indicated that there was an increase of micro and small enterprises due to the projects; About 15% (14) of the respondents agreed infrastructure services have improved due to the project; Also 16% (16) of the respondents indicated that community services have improved; 5% (5) of the respondents indicated that they now use renewable energy for cooking and heating in their houses.

10% (10) of the respondents have better lighting in their house and finally 2% (2) of the respondents indicated that the small energy projects has led to high performance towards better living standards in Bungoma county for the last five years - table 15.This is in tandem with Pfaff et al (2014) that small-scale projects can improve and increase access to energy for individuals and communities that would not have been supplied by market structures.

Table 15. Performance of Small Energy Projects

Respondents	Frequency	Percent
Overall influence of the project on SMEs	53	54
Infrastructure services	14	15
Community services were likely to benefit,	14	14
Now use RE for cooking and heating in their houses	5	5
Better lighting in houses	10	10
High performance throughout the year	2	2

Pearson Correlation Analysis

The study further conducted inferential statistics entailing both Pearson and regression analysis to determine the nature and respective strengths of associations between the independent variables and dependent variable.

Table 16. Model Correlations of all Variables

		Community	Training	Project mgt	Int. capacity	Performance
Community	Pearson Correlation	1		.		.*
	Sig. (2-tailed)		.			
Training of stakeholders.	N	98				
	Pearson Correlation	-.112	1	.		-
Project mgt Practices	Sig. (2-tailed)	.266	.002		.	
	N	98	98	1 98		
	Pearson Correlation	.453	-.230	-.145	1	
Institutional Capacity.	Sig. (2-tailed)	.231	.149	.367		
	N	98	98	98	98	
	Pearson Correlation	.382**	-.073	.226	-.135	1
Performance	Sig. (2-tailed)	.000	.650	.156	.399	
	N	98	98	98	98	98

From the findings, a positive correlation is seen between each variable and performance of small energy projects. The strongest correlation was established between project management practices and performance(r = 0.453 and the weaker relationship found between community participation and performance (r = -0.112). Training of stakeholders and Institutional capacity were found to be strongly and positively correlating with performance of small energy project correlation coefficient of 0.278 and 0.231 respectively. This is tandem with the findings of Camargo (2011), who observed that all the independent variables were found to have a statistically significant association with the dependent variable at over 0.05 level of confidence.

Model Goodness of Fit

Regression analysis was used to establish the strengths of relationship between the dependent variable and the independent variables. The results showed a correlation value (R) of 0.851 which depicts that there is a good linear dependence between the independent and dependent variables.

Table 17. Model Goodness of Fit

R	R^2	Adjusted R^2	Std. Error of the Estimate
0.851	0.781	0.796	0.056

With an R-squared of 0.781, the model shows that community participation, training of the stakeholders, project management practices and institutional capacity explain 78.1% of the variations on performance of small energy projects while 21.9% is explained by other indicators which are not inclusive in study or model. A measure of goodness of fit synopses the discrepancy between observed values and the values anticipated under the model in question (Capelli, 2010).

Analysis of Variance (ANOVA)

Analysis of variance was done to show whether there is a significant mean difference between dependent and independent variables. The ANOVA was conducted at 95% confidence level. From the results in table 18, the P-value of 0.000 implies that performance of small energy projects has a significant relationship with community participation, training of stakeholders, project management practices and institutional capacity which is significant at 5 % level of significance.

This implies that the regression model is significant and can thus be used to evaluate the association between the dependent and independent variables. This is in line with the findings of Berkowitz (2012) who observed that analysis of variance statistics examines the differences between group means and their associated procedures.

Table 18. ANOVA

	Sum of Squares	df	Mean Square	F	P value Sig.
Regression	4.147	1	1.049	43.1233	.000
Residual	6.433	97	.495		
Total	**10.580**	**98**			

Regression Analysis

To establish the degree of influence of small energy project on performance, a regression analysis was conducted, with the assumption that: variables are normally distributed to avoid distortion of associations and significance tests, which was achieved as outliers were not identified; a linear relationship between the independent variables and dependent

variable for accuracy of estimation, which was achieved as the standardized coefficients were used in interpretation.

The regression model was as follows:

$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X3 + \varepsilon$

Small energy project performance = α + β_1 (community participation) + β_2 (training of stakeholders) + β_3 (project management practices) $_+ \beta_4$ (institutional capacity) $_+$ error term.

Regression analysis produced the coefficient of determination.

Regression Coefficients of Determination

The regression analysis produced coefficients of determination. Findings in table 19. reveal a positive relationship between performance of small energy projects and all the independent variables. From the result shown below, it's clear that when all the independent variables are regressed against the dependent variable the constant gives a negative result meaning there is a strong relationship and how each predictor has an effect on the dependent variable.

Table 19. Regression Coefficient Results

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		Std. Error	Beta		
(Constant)	-.183	.060		-1.143	.023
Community P.	.723	.112	.838	5.471	.000
Training Stakeh.	.149	.068	.162	2.471	.041
Project Mgt Pract.	.344	.059	.587	4.386	.000
Inst. Capacity	.247	.115	.321	2.654	.017

A unit change in community participation would thus lead to a .723 effect on performance of small energy projects; while a unit change in training of stakeholders would have an effect of .149 change in on performance of small energy projects, also a unit change in project management practices would have an effect of .344 change in on performance of small energy projects and finally a unit change in institutional capacity would have an effect of .247 change on performance of small energy projects. This is in line with the findings of Olukotun (2008) who observed that community participation is a new vision that seeks to put the rural communities in the driver seat and give them a new set of powers, rights and obligations which enables them to ensure sustainability of their projects.

CONCLUSION

This study concludes that public-private partnerships have broadly impacted on Performance of small Energy projects in Kenya. The modern institutions should drive to embrace the best Performance of small Energy projects. When public-private partnerships is embraced through community participation, training of stakeholders, project management practices and institutional capacity then Performance of small Energy projects in the county would be better.

RECOMMENDATION

The study recommends and confirms that public- private partnerships was significant in enhancing the performance of small energy projects. In future different counties need to strengthen public-private partnerships in energy sector through community participation, training of stakeholders, project management practices and institutional capacity which in turn will improve significantly the performance small energy projects. This study therefore sought to explore what past scholars had said on the influence of public private partnership in the performance of small energy projects in Kenya and tested viability of best projects practices and its long-run relationship to their impact and its performance. From the foregoing, this study recommends that public private partnerships should strive to be proactive on how to perform better to retain all stakeholders and improve the standards of living in the county.

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