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FACTORS INFLUENCING IMPLEMENTATION OF WATER PROJECTS IN ARID AND SEMI-ARID AREAS OF KENYA: A SURVEY OF EAST POKOT SUB-COUNTY

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ABSTRACT

Grave water shortage in arid and semi-arid areas has raised the concern of government and non-governmental agencies, both local and foreign. The severe water shortage is occasioned by prolonged drought given that it only rains sporadically. The situation has several times occasioned ethnic conflict among the locals. Various agencies have supported communities with water projects but the projects have not been sustainable. Premised on the foregoing realization, it was imperative to examine the various factors that influence implementation of water projects in arid and semi-arid areas of Kenya with the view of suggesting recommendations which if implemented would alleviate the problems associated with water shortage in the said regions. The objective of the study was to examine the influence of project design on project implementation. The study was guided by the stakeholder theory, and implementation theory. The study adopted a survey research design. The target population comprised of contractors, Sub-County water and irrigation officer, project managers, project supervisors and water management committee members working with water projects in arid and semi-arid areas of Kenya. 219 stakeholders working with the aforesaid water projects in East Pokot Sub-County constituted the accessible population. A sample of 88 respondents calculated using Nassiuma's formula was drawn from the study population using stratified random sampling technique. A structured questionnaire was used in data collection. A pilot study was conducted in order to determine the validity and reliability of the research questionnaire. The Statistical Package for Social Sciences software facilitated data processing and analysis. The study employed both descriptive and inferential statistics in the analysis. The study findings were presented in form of tables. It was found there existed a positive, weak and statistically not significant relationship between project design and project implementation. It was concluded that project design had minimal influence on implementation of water projects. It is recommended that there should be regular project evaluation in order to ensure that various benchmarks in the project implementation are met within given timelines. It is recommended that the water project design should tally with available resources and intended purposes of the project.

Keyword: East Pokot Sub-County,Project Design, Project implementation, Water Projects

INTRODUCTION

Background of the Study

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Arid and semi-arid areas generally receive very low amounts of rainfall which is often sporadic. This implies that drought and famine are the order of the day in these areas. Grave water shortage in these regions for industries, agricultural activities and human consumption has raised the concern of government and non-governmental agencies, both local and foreign. The rains received in the foregoing areas are often associated with stormy water runoff, often referred to as floods. In advanced countries such as the United States they have developed mechanisms of managing the situations in these regions. According to Environmental Protection Agency (EPA), there has been fervent efforts to adapt innovative storm water management techniques in arid and semi-arid areas in the Western part of the U.S (EPA, 2009). The aforesaid efforts incorporate the green infrastructure. Green infrastructure is described as a set of practices that imitate natural processes with the aim of retaining and using water harvested during storms. It has been stated that the American Recovery and Reinvestment Act (ARRA) has provided funding to several qualifying projects in the categories of green infrastructure, energy efficiency, water efficiency, and also other innovative projects.

According to the World Bank (2007), Kenya is very prone to climate change because its larger land mass is predominantly arid or semi-arid. In the wake of the foregoing, the country has acted relatively early to adapt climate change. The Kenyan Government, through implementation of Kenya Arid Lands Resource Management Project (ALRMP) has acknowledged the necessity of incorporating climate change issues. In tandem, the government has entrenched Kenya Adaptation to Climate Change in Arid Lands (KACCAL) PROJECT to the ALRMP. The objective of this initiative is to ensure that there is enhanced coordination of information at the national level and also action for management of climate risk. Moreover, the initiative has purposed to support projects that are community-driven by providing technical assistance at the grassroots level (Word Bank, 2007).

Statement of the Problem

According to a Project Information Document (PID) by the World Bank (2007), Kenya is generally a relatively arid country with various parts of the country being affected by immense water shortage. It is stated that about 80% of Kenya is arid and/or semi-arid. The problem of availability of raw water is likely to increase (World Bank, 2011). The highlighted problem is in line with the issues articulated by the Sustainable Development Goals. Goal numbers one and two aim at ensuring there is no poverty, and zero hunger respectively. Goal number six is on clean water and sanitation. Essentially, therefore, ensuring that there is successful implementation of water projects will address the aforestated three goals of the 17 SDGs. Some of the areas that face grave water shortage in Kenya include East Pokot Sub-County which is found in Baringo County. These areas have water projects that have been initiated and completed by various agencies. This notwithstanding, the problem of water shortage continues to be experienced. This raises the issue of sustainability of these water projects after they have been completed.

In spite of the fact that the communities residing in this region are pastoralists and as such do not engage in farming activities, the situation has several times occasioned ethnic conflict among the

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locals. The warring communities often fight for very few and diminishing water resources for both their livestock and households. This implies that unsustainability of water projects has, to a significant extent, contributed to the aforesaid conflict.

Questions exist whether the unsustainability of the water projects could be as a result of poor project design, inappropriate financial management, or project management capability. Premised on the foregoing realization, it was imperative to examine the various factors that influence successful implementation of water projects in arid and semi-arid areas of Kenya with the view of suggesting recommendations which if and when implemented would alleviate the problems associated with water shortage and sustainability in the said regions.

OBJECTIVE OF THE STUDY

The study examined the influence of project design on project implementation.

RESEARCH HYPOTHESIS

H_{01}: There is no statistically significant relationship between project design and successful implementation of water projects in East Pokot Sub-County.

THEORETICAL FRAMEWORK

Stakeholder Theory

The proponent of the stakeholder theory was Freeman (1984). The theory holds that there exists groups of interest in a firm, otherwise known as stakeholders, which the management ought to afford due regard to their interests. The theory was further advanced by Freeman, Harrison, Wicks, Parmer and Colle (2008). The stakeholder theory further asserts that there exists other parties involved, besides the shareholders, and include government agencies, political groups,trade associations, trade unions, communities, financiers, suppliers, employees, and customers among other entities who have a stake in the organization (Freeman, 1984). The theory which is a view of capitalism emphasizes on the interconnected relationships between the aforesaid stakeholders.

Essentially, the stakeholder theory addresses the morals, ethics and values in managing an organization. The stakeholder theory offers an overriding criticism of the shareholder view, where the latter considers the owners (or shareholders) as the only important part of a firm. The shareholder theory holds that a firm has a binding fiduciary duty to prioritize the needs of the owners and as such to increase value for them. However, the stakeholder theory includes other important groups besides the shareholders whose interests are equally important and may, at times, override those of the owners. According to Miles (2012), there exists diverse definitions of stakeholders and what makes a certain group to constitute stakeholders is highly contested.

The stakeholder theory is criticized for the assumption it holds that the stakeholders' interests can be, at best, compromises or balanced against each other. This results from the emphasis of the theory that negotiation is the most crucial means of dialogue when addressing conflicts various stakeholders interests (Blattberg, 2004). The stakeholder theory can be employed in water project implementation in that there are various stakeholders who interests should be addressed. For instance, during project implementation, the contractors and all those involved,

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should factor in the interests of the local communities, financiers, government agencies such as the National Environmental Management Agency (NEMA), political interests (especially for the case of government funded projects), among other stakeholders. Failure to address the interest of any of these and other key stakeholders may derail implementation of water projects.

Implementation Theory

The implementation theory was proposed by Maskin and Sjostrom (2003). The theory states that there exists implementable social choice rules, where an entity is obliged to rationally make a decision from a number of alternatives. It is further postulated that it is plausible to rank the alternatives in order to settle on the most rational one. Ranking may follow a number of rules which include Borda's rule and rank-order voting schemes. Ideally, the implementation theory constitute a set of implementable selection rules.

During implementation, say of a project, the agent ought to have a dominant strategy. It is held that a dominant strategy is optimal for the agent irrespective of the actions of others. According to Gibbard (1973), the search for a dominant strategy may be restricted in such a way that each agent simply report their own preferences, endowments, and productive capacity, amongst other traits. Furthermore, it is asserted that most literature on implementation theory hold that an exogenous planer simply imposes or dictates the mechanism on the agents. Nevertheless, the reality is that, the agents might choose the mechanism to adopt themselves.

In ordinary circumstances, the contract of implementing a project or a given activity should be well designed. It is also stated that the agents or engaged parties would not design an inefficient contract. In the implementation of water projects, implementing agencies enter into contract with the financiers of those projects where they are expected to fully implement the same. In this regard, they are expected to adopt mechanisms which will enable them to effectively implement those projects. As Maskin and Sjostrom (2003) argues that inefficient outcomes may be included in a project contract as 'punishments', failure to implement the water projects as per contractual agreement ought to attract some fines of a kind to the contractors

Empirical Review

This part covers a review of past studies in relation to various factors that impact on implementation of water projects globally, in Africa and also in Kenya. In particular, the reviewed studies revolved around project design and project implementation.

Project Design

A study conducted by the World Bank (2000) focused on the impact of project rules on rural water supply sustainability in 10 different countries around the globe. The study established that project rules are essential elements in project design because they guide the operation of the project by providing a framework through which demand can be expressed and interpreted. Moreover, the study indicated that community participation in project design is allowed in some projects although it is limited since the projects must also adhere to national project design standards. Further the study established that the relationship between demand-responsiveness and sustainability is most effective when household members are involved in the initiation and design phase of the project, as opposed to community representative. This was attributed to the fact that community representatives ignored the demand of certain groups, leading to selection of

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a project design option that did not reflect the needs of the community.
A past study by Marks, Komives and Davis (2014) investigated the relationship between community participation and water supply sustainability in Ghana. Data was collected from 200 rural communities through household surveys, engineering assessments of water points and interviews with water committees. According to the study, the depth of community members' involvement in project planning, as measured by the typical households' extent of engagement, has a positive effect on water sustainability. However, the breadth of participation in planning is not positively associated with water sustainability.
Locally, an empirical study conducted by Nyamasege and Mburu (2015) analyzed the effects of project life cycle management on performance of water development projects in Kenya. The study employed a descriptive research approach and data was obtained from primary sources by use of questionnaires. The results of the study indicated that project initiation phase, planning phase, execution phase and closure phase affected the performance of the project. Further, the study revealed that project planning had the most significant effect on the performance of water projects. According to the study, lack of proper financial management and low involvement of stakeholders in the planning and design processes lead to premature termination of water projects. Moreover, the study indicated that most participants were not actively involved in project planning and design, leading to poor performance of the project.

Project implementation
A study conducted in Romania by Beleiu, Crisan and Nistor (2015) investigated the main factors influencing project success. The study employed questionnaires which were administered to project managers and team members working mostly in Romania. The success factors identified include a set of clearly defined goals, competent team members, compliance with budget, clearly defined roles and communication with stakeholders. The study noted that there must be clearly defined roles and responsibilities when dealing with projects to ensure a project implementation. The results indicated that there is a significant relationship between clearly defined goals and comprehensive control during the project's implementation phase. According to the study, success factors determine the positive outcome of implementing projects and these factors have to be identified before the projects' implementation.
A regional study conducted by Zuofa and Ochieng (2014) sought to examine the concept of project failure in Nigeria. The study, while citing Ewa (2013) noted that in the midst of the anticipated benefits of capital project implementation, most projects executed in Nigerian tertiary institutions fail to accomplish their objectives. The study revealed that projects and their project implementation is among the main objectives of Nigeria's ongoing transformation agenda. The study further established that understanding the concept of project failure and success is still a challenge among project management practitioners. The study recommended introduction of governance mechanism that formulates standard guidelines to support project implementation and take action against project stakeholders who sabotage project implementation and management.
In Kenya, Macharia and Mbassana (2015) conducted a study to examine sustainability of rural water projects in Naivasha, case on point Maraigushu water project. Data was obtained from interviews conducted on water committee members and through conduction of a physical

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assessment of the water project. The study noted that implementation of most projects maybe successful but their sustainability over time can be challenging. The results of the study indicated that the project had been implemented by the donors and the community had been involved in the implementation process. The study recommended that management of the water project should be improved in order to enhance the project's sustainability.

CONCEPTUAL FRAMEWORK

A conceptual framework outlines variables of a study and their presumptive relationship either diagrammatically or in form of narrative or both. It is postulated that a conceptual framework facilitates identification of study variables and also clarifies the hypothesized relationships among the stated variables (McGaghie, Bordage & Shea, 2001). The predictor variable include project design. The dependent variable, on the other hand, is project implementation. It is hypothesized that the stated predictor variable is one of the notable factor that influence successful implementation of water projects in arid and semi-arid areas of Kenya. The study was guided by the foregoing general hypothesis.

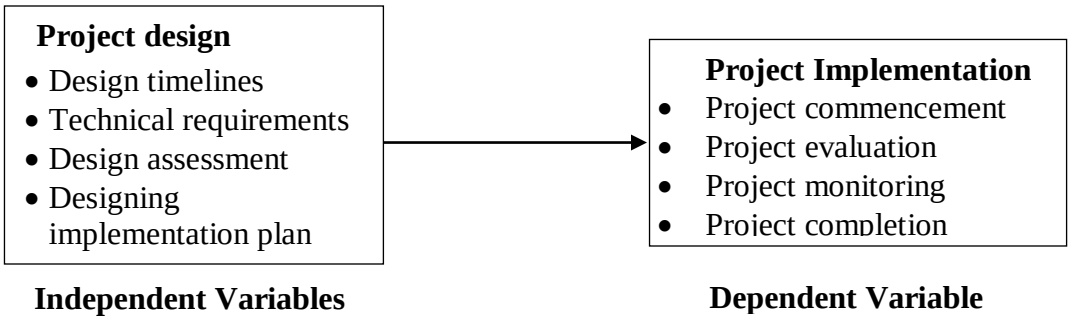

Figure 1: Conceptual Framework

RESEARCH METHODOLOGY

Research Design

A research design is described as a blueprint that facilitated or guides how a research study is conducted (Kothari, 2004). In view of this, this study adopted a survey research design since it was conducted over a specific period of time and involved respondents cutting across various water projects in East Pokot Sub-County. Quantitative approach was employed where the data collected in respect of the study objectives were categorical. This approach involves explaining phenomena through collection of numerical data that are analyzed by use of mathematical methods, otherwise referred to as statistics (Cohen, Manion & Morrison, 2000). In the context of the present study the phenomena revolved around implementation of water projects in arid and semi-arid areas. Categorical data collected in respect of study variables were numerical in nature, hence the choice of quantitative approach

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Target Population

Target population is defined as the population of interest that constitutes subjects or individuals with common character traits (Kothari, 2008). It is also the population to which the ultimate study findings are generalized. In the context of the present study, the target population comprised of water and irrigation officers, contractors, project managers, project supervisors and water management committee members working with water projects in arid and semi-arid areas of Kenya. However, the study was ordinarily conducted over a relatively smaller population that the researcher was able to practically access. This is referred to as the accessible or study population. The accessible population is also defined as the population from which samples are drawn and is a subset of the target population. The 219 Sub-County water and irrigation officer, contractors, project managers, project supervisors and Water Management Committee (WMC) members working with the aforesaid water projects in East Pokot Sub-County constituted the accessible population.

Sampling Technique

Sampling technique is the procedure or method of obtaining the sampled respondents from the study population in accordance with the sampling frame (as shown in Table 3.1). This study adopted stratified random sampling as shown in Table 3.2, because the distribution of the members of the study population was heterogeneous. This technique, according to Kothari (2004), reduces the sampling process bias since it ensures that there is fair and equitable distribution of respondents across all strata as shown in Table 3.2.

Table 1 Sample Distribution

Strata	N	Sampling Proportion	n
Sub-county water engineer	1	0.05	1
Contractors	16	0.07	6
Project managers	34	0.15	13
Project supervisors	76	0.35	31
WMCM	92	0.42	37
Total	**219**	**1.00**	**88**

Research Instrument

A research instrument is a tool that is used to aid in collection of data. In this study, a structured questionnaire was used to facilitate data collection. The reason this tool was chosen was founded on the fact that it was able to facilitate collection of quantitative data particularly in respect of study variables and objectives. In relation to study variables, the questionnaire constituted item on a 5-point Likert scale.

Pilot Testing

A pilot study is defined as a minor study that is carried out prior to the main study (Teijlingen & Hundley, 2001). In the same perspective, it is asserted that a pilot study is a feasibility study that is conducted on a small-scale in preparation of a major study (Polit, Beck & Hungler, 2001). The pilot study involved a small number of randomly selected contractors, project managers, supervisors and Water Management Committee (WMC) working with water projects in Mogotio Sub-County in the larger Baringo County. The respondents in the pilot study were equivalent to

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10% of the sample size (Kothari, 2004), that is, 9 respondents. According to Teijlingen and Hundley (2001), pilot studies are conducted in order to developand test the adequacy of research instruments. Therefore, the data collection instrument was pilot tested in order to determine both its validity and reliability

Validity Testing

Validity testing involves determination of the extent to which a given data collection instrument is able to aid collection of data as it purports (Kimberlin & Winterstein, 2008). As such, a valid instrument is able to facilitate collection of data that can be employed to address objectives of a study. In this study, the content validity was determined through consultation with the supervisor assigned by the University. The supervisor's opinion regarding the content and structure of the questions contained in the questionnaire was considered adequate.

Reliability Testing

Reliability test seeks to assess the level of consistency of the data collection tool. A reliable instrument is, therefore, able to facilitate collection of similar data when administered on different study populations of the same target population. In the context of this study, the Cronbach's alpha coefficient was employed to test the reliability of the structured questionnaire. The choice of this coefficient was founded on the assertion that it is the most commonly and widely used test of reliability particularly when the data collected are quantitative in nature (Kimberlin & Winterstein, 2008). If and when the results of reliability test return alpha at least equal to 0.7 is the instrument considered reliable. The results of the reliability testing as shown in Table 3.3 indicates that the two study variables (project design and successful project completion)were found to be reliable.

Table 2: Reliability Test Results

Study Constructs	Items	Coefficient
Project design	7	0.789
Project implementation	6	0.832

Data Collection Procedure

The researcher obtained the approval of the University to be allowed to embark on data collection. This was followed by seeking the consent of the East Pokot Sub-County water and irrigation officer, contractors, project managers, project supervisors, and WMC working with water projects from which the respondents were drawn. The researcher engaged the services of trained research assistants during data collection due to the wide distribution of water projects in East Pokot Sub-County.

Data Processing and Analysis

The data collected from the respondents were first screened in order to ensure completeness and appropriateness of the filled questionnaires. The Statistical Package for Social Sciences Version 24.0 software facilitated data processing and analysis. The study employed both descriptive and inferential statistics in the analysis. Precisely, frequencies, percentages, means, and standard

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deviations comprised descriptive statistics. In addition, Spearman's rank correlation analysis and multiple regression analysis comprised inferential statistics. The study findings were presented in form of tables. The following regression model guided the inferential analysis.

$$\mathbf{Y= \beta_0 + \beta_1 X_1 + \beta_2 + \beta_3 X_3 + \varepsilon}$$

Where:

Y	represents	Project implementation
β_0	represents	Constant
X_1	represents	Project design
ε	represents	Error term
$\beta_1, \beta_2, \beta_3$	represent	Regression coefficients of predictor variables

RESULTS

Response Rate

Response rate is synonymous to questionnaire return rate and describes the proportion of the number of questionnaires that are returned by or collected from the respondents against the total number of questionnaires issued. A high response rate implies high reliability of the study findings particularly in their representativeness of the study population. A total of 88 questionnaires had been issued to the sampled respondents that comprised of area Sub-County water and irrigation officer, contractors, project managers, project supervisors, and water management committee (WMC) members. After allowing the respondents to fill in the questionnaires, a total of 84 filled questionnaires were collected. This represented a 94.45% response rate which was over and above the 75% questionnaire return rate threshold recommended by Nulty (2008) in survey studies. The relatively high response rate was attributed to the fact that the questionnaires were administered to the respondents by the researcher in person alongside trained research assistants who explained the rationale of the study to the respondents and water projects.

Descriptive Results and Interpretations

In this section the descriptive statistics in tandem with project designand project implementation are presented. The descriptive results are interpreted and further discussed in relation to past empirical findings. The data collected were on a 5-point Likert scale where responses ranged from strongly disagree to strongly agree. The results emanating from descriptive data analysis were in form measures of distribution (frequencies), measures of central tendencies (means), and measures of dispersion (standard deviations).

Design of Water Projects

The views in relation to the design of water projects in East Pokot Sub-County were collected from respective stakeholders. A summary of these views is presented in Table 3. The study revealed that 85.7% of the respondents strongly agreed that the design implementation plan is

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part of planning design input. None of the respondents disputed this assertion. In general, respondents strongly agreed (mean = 4.90) with this proposition while showing insignificant variation in their views (std dev = 0.191). All the sampled respondents (strongly agree = 71.4%; agree = 28.6%) at least admitted that the water projects have specific design timelines. In this respect, respondents, on average, strongly concurred (mean = 4.71) while their opinions returned insignificant variation (std dev = 0.457).

Majority of the respondents agreed that there are specific technical requirements when designing a water project (agree = 54.8%); during the design stage, the project management formulates a capacity building plan to guide the project implementation (agree = 81.0%); the project design spells out accountability mechanisms for effective project implementation (agree = 92.9%); there are clear legal structures governing the project design set put by the relevant government agencies (agree = 90.5%); and that the water project design is assessed regularly (agree = 73.8%). In respect of the foregoing assertions, there was general agreement amongst the sampled respondents (mean ≈ 4.00) while their opinions varied insignificantly (std dev < 1.000).

Table 3: **Descriptive Statisticsfor Project Design**

	n	SA	A	N	D	SD	Mean	Std. Dev.
The design implementation plan is part of planning design input	84	85.7	4.8	9.5	0	0	4.90	.191
The water projects have specific design timelines	84	71.4	28.6	0	0	0	4.71	.457
There are specific technical requirements when designing a water project	84	84.9	54.8	2.4	0	0	4.40	.544
During the design stage, the project management formulates a capacity building plan to guide the project implementation	84	14.3	81.0	4.8	0	0	4.10	.431
The project's design spells out accountability mechanisms for effective project implementation	84	4.8	92.9	2.4	0	0	4.02	.269
There are clear legal structures governing the project design set put by the relevant government agencies	84	0	90.5	9.5	0	0	3.90	.297
The water project design is assessed regularly	84	7.1	73.8	19.0	0	0	3.88	.504

Project implementation

The study further examined the views of stakeholders pertinent to water projects in East Pokot Sub-County regarding successful implementation of the aforestated projects. The pertinent descriptive results are as outlined in Table 4. As shown, the study observed that 35.7% and 64.3% of respondents agreed and strongly agreed respectively that water project implementation often witness time overruns that curtail its success. In general, respondents were in strong

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agreement (mean = 4.64) regarding this proposition while having insignificant variation in their views (std dev = 0.485). Similarly to 90.5% of the respondents admitting that the implementation of water projects is appraised regularly with the aim of ensuring its success, there was an average agreement (mean = 4.00) and insignificant variation in opinion (std dev = 3.12) regarding this proposition.

Similar observations were made in respect of the assertion that the implementation of water projects is closely monitored to ensure that it is successful. In this regard, 90.5% of the respondents were in agreement which was further supported by general admission (mean = 4.00) and insignificant variation in opinion (std dev = 0.312) in respect of the foregoing proposition. It was agreed by a majority of respondents that the implementation of water projects is evaluated regularly by competent personnel(agree = 92.9%),and thatimplementation of water projects is commenced on schedule in order to enhance successful implementation(agree = 76.2%).The variation in respondents' views in respect of these assertions was found to be insignificant (std dev < 1.000). However, majority of the respondents (73.8%) disputed that water projects are usually completed on time. Generally, the assertion was disputed (mean = 1.83) and the respondents had insignificant variation in their views (std dev = 0.490).

Table 4: Descriptive Statistics for Project implementation

	n	SA	A	N	D	SD	Mean	Std. Dev.
Water project implementation often witness time overruns that curtail its success	84	64.3	35.7	0	0	0	4.64	.485
The implementation of water projects is appraised regularly with the aim of ensuring its success	84	4.8	90.5	4.8	0	0	4.00	.312
The implementation of water projects is closely monitored to ensure that it is successful	84	4.8	90.4	4.8	0	0	4.00	.312
The implementation of water projects is evaluated regularly by competent personnel	84	2.4	92.9	2.4	2.4	0	3.95	.379
Implementation of water projects is commenced on schedule in order to enhance successful implementation	84	9.5	76.2	14.3	0	0	3.95	.492
Water projects are usually completed on time	84	0	0	4.8	73.8	21.4	1.83	.490

Inferential Findings

This section presents results emanating from inferential analysis. The results are interpreted and discussed in relation to past empirical studies on implementation of projects particularly water projects. In this respect, the relationship between the predictor variable (project design,) and the dependent variable (project implementation) is determined. Moreover, the results of the coefficient of determination (R^2) indicate the extent to which the studied factors explained

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successful water project completion. This section also shows the results of analysis of variance (ANOVA) which seek to test the significance of the regression model. The last part outlines the regression coefficients that indicate the extent to which project implementation is influenced by the studied factor, and also the results of t-statistics that facilitate testing of the null hypothesis.

Correlation Results, Interpretations and Discussions

The Pearson's product moment correlation coefficient was employed to determine how project design related with project implementation. The pertinent correlation results areas shown in Table 5. The study found that there existed a positive, weak and statistically not significant relationship between project design and project implementation ($r = 0.201$; $p > 0.05$). The correlation results were interpreted to mean that improving the project design, had little likelihood to result in improvement of implementation of water projects. These findings were in contrast of the observations of a study carried out by Allahim (2013) that unclear project scope leads to unrealistic designs which lead to delays in project implementation.

Table 5: Correlation between Project Design and Project Implementation

		Project Implementation
Project Design	Pearson Correlation	.201
	Sig. (2-tailed)	.199
	n	84

Results of simple linear regression analysis

In this section inferential results in relation to general correlation (R), coefficient of determination (R^2), regression coefficients, and t-statistics are outlined and explained. According to the results of ($R^2 = 0.041$) shown in Table 6, project design explained only 4.1% of water project implementation. This implied that there were other factors represented by 95.9% that could possibly impact on implementation of water projects in the aforesaid Sub-County, but were not examined by the present study. The results further illustrated that project design played a very minimal role in determining implementation of the aforesaid water projects.

Table 6: Model Summary

Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.202[a]	.041	.017	.99142
a. Predictors: (Constant), Project Design				

The significance of the following simple linear regression model was tested and the pertinent results are as shown in Table 7.

$Y = \beta_0 + \beta X + \varepsilon$

The variables Y and X, represent project implementation and project design respectively. β_0, represents the regression constant, while βrepresents regression coefficient of the predictor variable. Lastly, ε represent the error margin. The study found that the aforestated regression

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model was not statistically significant (F = 1.708 > 0.05), and thus was not very suitable in assessing the influence of project design on implementation of water projects.

Table 7: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.678	1	1.678	1.708	.199[a]
	Residual	39.317	40	.983		
	Total	40.995	41			

a. Predictors: (Constant), Project Design
b. Dependent Variable: Project implementation

The results indicated in Table 8 show the regression coefficient (β_n) and the results of the t-statistics.β_0, represents the regression constant, while βrepresents regression coefficient of the predictor variable. Lastly, ε represents the error margin.

Table 8: Regression Coefficientsand Results of T-Statistics

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.026	3.279		.008	.994
Project Design	1.147	.878	.202	1.307	.199

a. Dependent Variable: Project implementation

The results indicated in Table 8 were used to interpret the following regression model:
$Y= \beta_0 + \beta X+ \varepsilon$
Substitution of the model:
$Y= 0.026+ 1.147X_1$
The above regression model was interpreted to mean that a unit increase in project implementation required1.147 unit increase in project design while other factors that were not studied were held constant as represented by (β_0 = 0.026). According to the results of the regression analysis, a substantive input of project design was required for project implementation to be realized in East Pokot Sub-County. Given that project planning is closely linked to project design, it was imperative to infer that the results of this study deviated from the findings revealed in a study conducted by Nyamasege and Mburu (2015) that that project planning had the most significant effect on the performance of water projects. In respect of the present study, project design which encapsulate project planning, had minimal effect on successful implementation of water projects. Similar to the results of this study were the findings of a past study conducted by

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Cheruiyot (2016). This was found to be true since project design and project implementationwere positively correlated.

Testing Null Hypothesis (H_0)

The t-statistics were employed to test the null hypothesis. The results of the t-statistics are as shown in Table 8.The null hypothesis stated that: There is no statistically significant relationship between project design and successful implementation of water projects in East Pokot Sub-County. According to the results ($t = 1.307$; $p > 0.05$), the stated null hypothesis was not rejected; rather, it was taken to be true.

DISCUSSION

The study recorded a high response rate which was attributed to administration of questionnaires on the respondents by the researcher in person and also involving trained research assistants. Majority of stakeholders working with water projects in East Pokot Sub-County were found to be men, a factor that stemmed from the culture of the local communities that advocated for male chauvinism. The stakeholders had at decent level of education, a factor that was fundamental in implementation of water projects. Majority of the respondents had worked with water projects for a relatively short period of time. This could have been attributed to the water projects having been initiated relatively recently. Design of water projects was found to play quite a minor role in project implementation. This was possibly due to the fact that, irrespective of the project design, the implementation was bound to take place. Interpretatively, other underlying factors such as financial resources and human resource, were potentially more fundamental in implementation of water projects when juxtaposed against project design.

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CONCLUSIONS AND RECOMMENDATIONS

Conclusions

It was concluded that in planning design input, there was an implementation plan for the same. In tandem, it was concluded that there were specific design timelines for implementing water projects. In the same light, the study concluded that there are specific technical requirements when designing water projects. The study concluded that, at project design stage, it was the task of the project management, say project management committee, to formulate a capacity building plan to guide the implementation of the water projects. It was inferred that project design spells out accountability mechanisms for effective project implementation. Pertinent government agencies were deduced to stipulate clear legal structures governing the design of water projects. In the same vein, it was concluded that the water project design was assessed regularly. Moreover, the study observed and concluded that project design minimally influenced implementation of water projects in East Pokot Sub-County.

Recommendations

The study recommended that the water project design should tally with available resources and intended purposes of the project. For instance, the scope which the project is intended to serve and the financial resources allocated to the project should be factored in when formulating the

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project design. It is also advisable to ensure that there is regular project evaluation in order to ensure that various benchmarks in the project implementation are met within given timelines. The water project design should be assessed regularly in order to ensure that it conforms to the expectations of pertinent stakeholders.

The study further recommended that the project implementation ought to be appraised severally in the due course of its implementation in order to curtail probable time overruns and/or failed project implementation. Besides close monitoring of the projects, it is recommended that an audit trail of the entire project implementation ought to be carried out with the object of ensuring that all resources were optimally and rationally employed.

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