EFFECTS OF PROJECT LIFE CYCLE MANAGEMENT ON PERFORMANCE OF WATER DEVELOPMENT PROJECTS IN KENYA

(A CASE OF KITUI COUNTY)

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ABSTRACT

The Kenyan government and international organizations have continued to invest in the implementation of water development projects to assist the rural communities to alleviate the problem of water scarcity. The performance of these projects is the major problem as they are not successful and falling out of use at an alarming rate. In order to make the investment in implementation of water development projects more effective and worth, success rates of these projects should be increased. The study therefore examined the effect of project life cycle management on the performance of water projects in Kenya as the main objective of the study. The study adopted a descriptive research approach which involved using case study design. A stratified random sampling design was used whereby 37 respondents formed 10% of the target population. A pilot study was conducted to pretest the validity and reliability of instruments for data collection. The study involved the use of questionnaire method to collect data. The data was analyzed by use of both qualitative and quantitative methods with the help of Statistical Package for Social Sciences (SPSS) version 21 and excel. The study findings showed that project initiation phase, project planning phase, project execution phase and project closure

phase had effects on the performance of the water development projects in Kenya. The correlation and regression analysis showed they had positive relationship and this implies that they influenced performance of water development projects with a significant relationship at 5% level of significance and 95% level of confidence. The study established that project planning phase was the most significant factor. Based on these findings, the study recommends that an evaluation to be conducted on the implemented projects to establish whether the project life cycle management was considered and what led to project delays in implementation thus affecting the performance of such projects in other areas of Kenya for the generalization of the findings of the study.

INTRODUCTION

Kenya's long-term development blueprint, Vision 2030, aims at creating a "globally competitive and prosperous country with a high quality of life by 2030. Vision 2030 therefore aims at guiding the country towards meeting the Millennium Development Goals (MDGs) by 2015 and beyond, transforming Kenya into "a newly industrialized, middle-income country." One of the most important organizational developments in recent years has been the significant growth in project work across different sectors and industries (Maylor et. al 2006).

Projects need to be performed and delivered under certain constraints. Traditionally, these constraints have been listed as scope, time and cost (Harold 2009). These three constraints are often competing constraints: increased scope means increased time and increased cost: a tight time constraint could mean increased costs and reduced scope; and a tight budget could mean increased time and reduced scope. Enhancement of project performance will bridge productivity gaps Malladi (2007). In enhancing project performance, there is a need to address the effect project life cycle management have on performance of water development projects. However, many problems have arisen during water project implementations which centered on overruns of project indicators. Regional Partnership for Resource Development (2009) says that development projects are often the constituent of activities of programs. For instance in the case of water supply, the construction of a well for a village community constitute a project, as would the construction of dam and a pipeline for an urban supply. According to the World Health Organization (2005), 2.2

million people in developing countries, most of them children, die every year from diseases associated with lack of safe drinking water and inadequate sanitation and hygiene. Improvements in these services could reduce mortality rates due to diarrheal diseases by an estimated 65% and related morbidity by 26% (WHO, 2004). The United Nations Millennium Goals (UN, 2004) specifically target water and sanitation measures, and the United Nations General Assembly proclaimed the years 2005 to 2015 as the International Decade for Action 'Water for Life'.

The pace of modernization and standards of living is accelerated through development projects. These projects are however faced with project cycle management challenges which affect their completion and they fail to achieve the set objectives. Chikati (2009) explains that over the past ten years, both in Europe and developing countries; analysis has shown that the failure rate for projects achieving their stated objectives is extremely high, at 60% in some cases. Some of these projects have gone to full implementation but without much benefit to the communities. Other projects prove to be unsustainable, whereas some prematurely terminated due to lack of proper financial management and low stakeholder involvement in the planning and execution processes, inadequate skills and empowerment of the communities involved and poor M & E framework (Summer 2001). Many projects are currently on a downward trend in their formative stages, while others collapse within five years of their existence due to inadequate information on project life cycle management which has led to low production in many sectors thus, the projects fail to reach completion and also fail to meet the required quality standards of the users (Mugambi, 2005).

Global Perspective of Performance of Water Development Projects

Loker (2000) did a study on the impact of a major environment and development project in the El Cajon region of Central Honduras in South America. His main concern in the study was to know what types of mismanagement in the execution of a project cause the failure of projects. His study revealed that ignoring the key variables of projects in terms of social and environmental aspects led to failure of projects. He suggested the improved designing of projects' monitoring and evaluation of different project phases during different time intervals and involvement of the people and social scientists during project execution process as key variables to improve project

performance. On the other hand a study done by Laufer, Woodward & Howell (1999) considered the project team's decision-making process as critical to project planning. They identified insidious elements of uncertainty and demand, which so often affect project performance and success.

Matsumura (2008) conducted a study on causes of poor performance in World Bank Water and Sanitation projects in USA. The study established that most projects in the study population were overscheduled and under cost, and a small portion of projects performed poorly in terms of objectives set during project initiation phase, institutional development, and sustainability. The findings from this research identified causes of poor performance to be inadequate revenue, poor organization, and overly optimistic goals during project planning and execution phases. Komolawati (2008) study on Participation and project sustainability: participatory integrated development in Rain-fed areas (PIDRA) projects in East Java-Indonesia. The study found out that most participants were actively involved and participated in the project execution activities but rarely participated in project planning and design as well as monitoring and evaluation. This led to poor performance of the PIDRA projects.

Kenyan Perspective of Performance of Water Development Projects

The country is facing a number of challenges related to performance of water projects. Joseph (2013) did a study on the effect of fund management practices on the performance of CDF funded water projects in Kenya a case study of Molo Constituency, Nakuru County, Kenya. The researcher established that majority of the CDF funded projects managed the fund moderately since they fairly embraced and implemented efficient fund management practices in the operations. This has a general implication that efficient fund management practices have a positive effect on the financial performance of CDF funded projects in Kenya and therefore application of project life cycle management should be embraced as a policy recommendation.

On the other hand, Nyaguthii & Oyugi (2013) did a study on the influence of community participation on successful execution of Constituency development fund water projects in Kenya a case study of Mwea constituency and they established that most of Mwea residents do not participate in management of Community Development Funded water projects during the initiation phase, leading to failure before execution phase. Researcher concluded that, community members, whether

influential or not, should be involved in identification (initiation phase), implementation (execution phase), monitoring and evaluation and closure phase (commissioning) of the CDF water projects to boost success and sustainability. These findings also concur with Philip & Abdillahi (2003) the role of popular participation and community work ethic in rural development during the initiation phase.

Further research done by Faith (2010) influence of community participation on the performance of Kiserian dam water project, Kajiado County, Kenya, established that focus group discussions with the area chief and community leaders revealed that the project contractor engaged more 'outsiders' than the local people to provide manpower during construction. This could explain the low level of community participation especially on providing manpower during the execution phase of the project. This led to issues and conflicts thus affecting completion of project in time and increasing cost overruns.

Statement of the Problem

According to the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) Joint Monitoring Program (JMP) for Water Supply and Sanitation report of 2004 at least 44% of the population in sub-Saharan Africa (some 320 million people) does not have access to clean and reliable water supplies from projects installed. The UN Joint Monitoring Program estimates the failure rate for most water development projects in Africa at anywhere from 30 to 60% . Despite the failed water development projects governments and international financial institutions continue investing hundreds of millions of dollars to keep the projects going (WB, 2006) despite evidence that they have not succeeded.

In Kenya about 35% of the water projects implemented will fail due to poor management of the initiation, planning, execution and closure phases of such projects thus don't meet the desired goals and objectives (UNICEF, 2004).According to NTP Report (2012) of Kitui County, 60% of the implemented water projects have been badly implemented while others have not been implemented though they were allocated for funds. The Value for Money Study (Price Waterhouse Coopers, 2007) says 57% of the entire water supply investment in rural areas of Kenya is unproductive, as the invested infrastructures were not functional. The water development projects' failures thus far raise serious doubts about the ability of

international donors to achieve lasting progress anywhere, even as institutions pour billions more dollars into global water development projects as they keep failing, resulting in loss of millions of dollar for organizations (Ochelle,2009). There is little proof on the critical success factors of a particular part of the project management such as risk management and financial management but rarely on project life cycle management on performance of water projects (Jennifer, 2004). This study, thus sought to fill this gap in literature by assessing the effects of project life cycle management on performance of water development projects in Kenya.

Objectives of the study

The general objective of the study was to find out the effects of project life cycle management on the performance of water development projects in Kenya.

Specific Objectives

The specific objectives of the study were to;

i) Identify the effect of project initiation phase on performance of water development projects in Kenya.
ii) Establish the effect of project planning phase on performance of water development projects in Kenya.
iii) Determine the effect of project execution phase on performance of water development projects in Kenya.
iv) Establish the effect of project closure phase on performance of water development projects in Kenya.

Research Questions

The research was guided by the following research questions;

i) How does project initiation phase affect performance of water development projects in Kenya?
ii) To what extent does project planning phase affect performance of water development projects in Kenya?
iii) Does project execution phase affect performance of water development projects in Kenya?

iv) Does project closure phase affect performance of water development projects in Kenya?

Conceptual Framework

Mugenda and Mugenda (2003) defines conceptual framework as a hypothesized model identifying the concepts under the study and their relationships. It's a diagrammatical representation that shows the relationship between independent and dependent variable. The independent variable in the study included project initiation, planning, execution and closure phases. On the other hand, the dependent variable was performance of water development projects in Kenya.

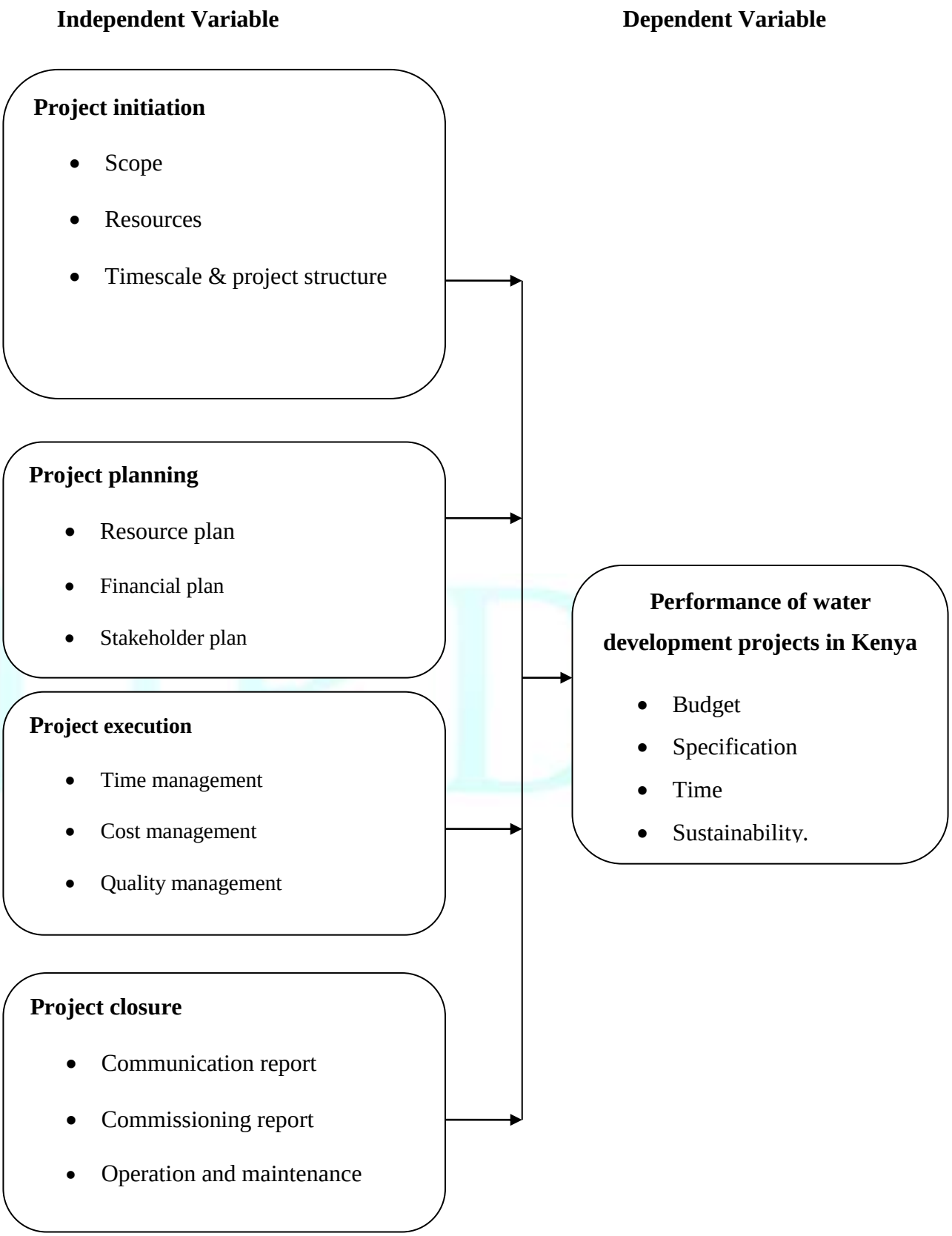
Independent Variable
Dependent Variable
Project initiation
Scope
Resources
Timescale & project structure
Project planning
Resource plan
Financial plan
Stakeholder plan
Project execution
Time management
Cost management
Quality management
Project closure
Communication report
Commissioning report
Operation and maintenance
Performance of water development projects in Kenya
Budget
Specification
Time
Sustainability.

Figure 1; Conceptual framework work for the study

Project initiation

Although the idea of a project life cycle management varies from one project to the other of course certain life stages determines the detail and number of independent steps in the cycle. However, it is possible to identify a generic set of stages that are present in most project cycles. The initiation phase of the life cycle of water development projects play a critical role for planning, execution and determines the end result of the entire project(Mc Conville, 2006).The purpose of the initiation phase is to determine if sufficient demand exists for the project and to begin collecting the necessary background information for project development. Generally, this stage is initiated by a request for intervention, either from within or outside the community. The request is followed by an information gathering period to understand the motivations and expectations behind the demand, in addition to defining an adequate level of improvement (Rebitzer, 2005).

Background information on the social, cultural, and political situation along with environmental and technical constraints to the current system will help assess the extent of need and potential for improvement. Generally, information is collected through a series of site visits, participatory evaluation tools, interviews, observations, and relevant literature reviews during which the opinions of a variety of stakeholders (community leaders, council members, men, women, youth, and development workers) are solicited. At the end of the needs assessment project planners will decide, based on the information gathered, whether or not to proceed with the water development project (Kloppfer, 2003). Mwangi, (2005) expressed that development project starts with the identification of a need or the realization that there is a need. Ravallion (2005) perceives that as a process by which the members of a society increase their personal and institutional capacities to mobilize and manage resources to produce sustainable and justify distributed improvements in their quality of life consistently with their own aspirations. They share information and knowledge, and may contribute to the project, so as to enhance the success of the project and hence ultimately their own interests. The stakeholder involvement encompasses the full spectrum of interaction between stakeholders (governmental, non-governmental, business/private sector, service providers, and the public among others) and the decision-making process. The term encompasses both consultation and participation

(Hughes, 2008).There is a growing consensus that timely and broad based initiation project phase is a vital ingredient for effective development of projects the water project. Globally, there is a new paradigm in the rural development strategy which adopts participatory approach at the initiation phase for effective performance of the water projects (Obadile et al, 2013).

Project planning

Project planning defines the project activities and end products that will be performed and describes how the activities will be accomplished. The purpose of project planning is to define each major task, estimate the time and resources required, and provide a framework for management review and control (Chioma, 2012). This is where the design, action planning, details for the technical design and implementation (action) plan are finalized. Action planning may uncover logistical constraints that affect the feasibility of the selected design.

Project planning is an aspect of project management. Project management, a professional discipline, may be defined as "the overall planning, coordination and control of a project from inception to completion aimed at meeting a Client's requirements in order to produce a functionally and financially viable project that will be completed on time within authorized cost and to the required quality standard" (PEL, 2009).Project planning entails scheduling of the various activities comprising the project activities and how they interrelate. The activities comprise the legal or regulatory requirements, procurement processes that include seeking for development projects and funding institution approvals, activities of the funding institutions leading to credit award and the actual site works. The planning aims at optimizing time, cost and procurement of human capacity for development projects within the legal, regulatory and policy framework existing for each specific project (Paul, 2008).

Financial management plan according to Kombo (2001) is the management of finances of a business or organization in order to achieve financial objectives. Lamberson, 2005 observed that FM involves the planning and controlling of current assets and liabilities in a manner that eliminates the risk of inability to meet short-term obligations and avoid excessive investments in those assets. Fund management is a very important component of corporate finance because it directly affects the liquidity, profitability and growth of a business (Atrill, 2006).

The aim of Project fund management is to maintain a balance between each of the project fund components, which are inventory, cash receivable and payables, which is a fundamental part of the overall corporate strategy to create value. It is an important source of competitive advantage in project management, Deloof, (2003).This in practice, has become one of the most important issues in organizations with many financial executives struggling to identify the basic project fund drivers and the appropriate level of fund to hold so as to minimize risk, effectively prepare for uncertainty and improve the overall performance of their projects (Lamberson, 2005).

Efficient fund management practices as established by Padachi (2006) are vital for the success and survival of enterprises, which needs to be embraced to enhance performance and contribution to economic growth. Several projects have inherent problems in financial management which includes financial management working foundations are weak and the organizational structure is unreasonable, this leads to poor performance through the difficulty to play the role of supervision and controlling (Knipe et al, 2002). Ignoring financial administrations, inadequate attention to checks and balances and if the cash management is not tight may lead to funds being unused or insufficient in the project implementation, Phinney (2007). Insufficient funding where the firm relies on loans and other intermediaries which may not be forthcoming may lead to projects being underdeveloped (Nosike, 2005).
Stakeholder management plan can be described as a range of practices in which organizations take a structured approach to connecting with stakeholders (Beach, 2009). The plan therefore involves processes whereby all those with a stake in the outcome of a project can actively participate in decisions on planning and management. Participation can take many different forms at different stages of a project cycle ranging from contribution of inputs in predetermined projects and programmes, to information sharing, consultation, decision-making, partnership and empowerment (Marilee, 2000)

Project execution

This phase involves implementing the plans created during the project planning phase. While each plan is being executed, a series of management processes are undertaken to monitor and control the deliverables being output by the project

(Westland 2006). Project execution includes both the pre-construction and construction processes. Pre-construction activities involve the procurement of supplies and financing, site preparation, and potentially the manufacture of construction supplies. The construction process itself must remain flexible to adjust for unanticipated circumstances regardless of action plan guidelines. Maintaining communication lines is critical for progress monitoring and evaluation. Implementation also includes technical training and community education components (Jennifer, 2006).

Execution is the act of carrying out planned activities. The execution of the project plan is simply the act of performing task and activities that result in the production of the project deliverables. Task and activities performed must be completed effectively and efficiently. The project plan serves as a road map and a common frame of reference for all members of the project team (Mc Conville, 2009). The project plan is therefore, the foundation for successful delivery of projects. In a perfect world, plans are executed precisely as written. In reality, no plan is ever performed with such precision. Plans are forward looking documents that cannot anticipate all eventualities. During execution, the project team must continuously monitor its performance in relation to the baseline project plan. By measuring and evaluating the actual execution of project activities against the baseline plan, the project team and stakeholders can gauge the progress of the project (Westland, 2007).Moving from planning into execution can be a major obstacle in successful project delivery. A project kick off meeting can facilitate the transition from planning activities and tasks to executing them (Jason, 2006). A kick off meeting enhances execution by focusing the team on the project and by defining a starting point for beginning project execution. Additionally, it is a milestone when all resources needed to begin execution are assembled and available to the team.

The kick-off meeting provides an opportunity for communication and establishing the commitment of the team and stakeholders to the success of the project. The focus of the meeting is communications, identification of team members and stakeholders, reviewing the project scope and business objectives, identifying the challenges, and identifying the next step in getting the project underway. At this point, team members and team leads must, at a minimum, have copies of the schedule. The schedule must identify to each person his specific tasks and dates for starting and

completing them (Hoard, 2003) .The execution phase is typically the longest phase of the project in terms of duration. It is the phase within which the deliverables are physically constructed and presented to the customer for acceptance. To ensure that the customer's requirements are met, the project manager monitors and controls the activities, resources and expenditure required to build each deliverable (Winsock, 2007).

Project closure

Project closure involves releasing the final deliverables to the customer, handing over. It also involves project documentation to the business, terminating supplier contracts, releasing project resources and communicating the closure of the project to all stakeholders. The last remaining step is to undertake a post-implementation review to quantify the level of project success and identify any lessons learnt for future projects.

Following the acceptance of all project deliverables by the customer, the project will have met its objectives and be ready for closure. Project closure is the last phase in the project life cycle, and must be conducted formally so that the business benefits delivered by the project are fully realized by the customer (Heldmann, 2011).Project closure, or 'close-out', essentially involves winding up the project. This includes: determining whether all of the project completion criteria have been met; identifying any outstanding project activities, risks or issues; handing over all project deliverables and documentation to the customer; cancelling supplier contracts and releasing project resources to the business; communicating the closure of the project to all stakeholders and interested parties (Knipe et al, 2002). A project closure report is documented and submitted to the customer and/or project sponsor for approval. The project manager is responsible for undertaking each of the activities identified in the project closure report, and the project is closed only when all the activities listed in the project closure report have been completed (Kliem, 2008).

Performance of Water Development Projects

Some efforts in rural water development projects have lacked a clear focus on learning and results – including understanding what works and why, in what contexts, and how the best impacts can be achieved with resources invested. To remedy this, dozens of evaluations have been carried out and there have been recent

efforts to take stock of evidence according to KfW and IEG (2011), including with systematic reviews (Waddington et al, 2010). These low levels of access to improved water supply in developing countries have been attributed to causes such as inappropriate system designs, poor implementation and management of water resources, environmental challenges, technical challenges, inappropriate government policies and limited institutional capacity according to Whittington & Kumar (2007). In addition, communities often have considerable difficulty in sustaining operation and maintenance (O&M) of water supply infrastructure over the useful life of the hardware (Davis, 2008).In spite of the huge efforts and investments in the construction of water supply infrastructure, around 63.1 of rural population (16.5m people) is relying on unsafe water (Kenya Census, 2009). The post construction operation and maintenance (O&M) of water supply systems is cited as the major challenge. As per the Water Point Mapping report of three districts, almost one third of all rural water points are dysfunctional in Kenya at any given time (SNV, 2010). According to an IRC Triple-S 2010 study, despite relative success in the provision of new rural water infrastructure in the last two to three decades, studies in many countries show between 30 to 40 per cent of facilities either do not function or are operating below capacity. In Kenya, about 25 to 30 per cent of the recently completed managed rural water supply projects will become dysfunctional in the first three years following completion thus affecting their performance that is they will not be sustainable

METHODOLOGY

The study adopted a descriptive research design for the study to assess the effect of project life cycle management on performance of water development in Kenya with a view to offer solutions. Descriptive research design is chosen because it enables the researcher to generalize the findings to a larger population (Creswell, 2003). According to Mugenda and Mugenda (2003), descriptive research determines and reports the way things are and it helps in establishing the current status of the population.

The target population constituted the 373,996 inhabitants (Kenya population Census, 2009) of the 3 constituencies (Mwingi North, Kitui West and Kitui Central) of Kitui County. If the target population is finite, the following formula (Krejcie & Morgan, 1970) may be used to determine the sample size.

$$S = \frac{X^2NP(1-P)}{d^2(N-1)+X^2P(1-P)}$$

Where:

S = Sample size

X = Z value (e.g. 1.96 for 95% confidence level)

N = Population Size;

P = Population proportion (expressed as decimal) (assumed to be 0.5 (50%) – this provides the maximum sample size).

d = Degree of accuracy (5%), expressed as a proportion (.05); It is margin of error

Applying the formula to get the sample of household population for the study would be 517 people. In Kitui county there are 4.7 people per household (KNBS, 2009). Therefore, the study used 110 household heads. Therefore, the target household population for the study would be 370 respondents which comprised of; the 120 project managers, 140 community committee leader (KNBS, 2009) and the 110 heads households.

According to (Sekaran, 2003) a sample size of 10% of the target population is large enough so long as it allows for reliable data analysis and allows testing for significance of differences between estimates. Therefore, a proportionate sample size of approximate 37 respondents which is 10% of the population was selected using stratified random sampling technique.

Structured questionnaires were used in this study to collect data. Questionnaires are the most commonly used methods when respondents can be reached. They have low cost even when the universe is large and is widely spread geographically and it is free from the bias of the interviewer, answers are in respondents' own words, (Kothari,

2004).The questionnaires comprised of both open ended and closed ended questions. The open ended questions were used to limit the respondents to given variables in which the researcher is interested, while closed ended questions will be used in order to give the respondents room to express their views in a more pragmatic manner (Kothari, 2004).

Data Collection Procedure

The data collection was done by use of the questionnaires. The researcher obtained an introductory letter from the University department of EPD of JKUAT which was issued to the national government officers and the county officers to permit the researcher to carry out the study in the region. Three research assistants were recruited to assist in data collection. The researcher obtained consent from all relevant institutions such as the Ministry of Environment, Water and Natural Resources and relevant groups and individual participants. The permit obtained accompanied the tools for data collection.

Pilot Study

Bordens and Abbott, (2008) defines a pilot study is as a small-scale version of the study used to establish procedures, materials and parameters to be used in the full study. According to (Cooper and Schindler, 2011), pilot test is conducted to detect weaknesses in design and instrumentation and to provide proxy data for selection of a probability sample. The researcher selected a pilot of 4 from the target population to test the reliability and validity of the questionnaire. The rule of thumb is that 1% of the sample should constitute the pilot test (Creswell, 2003).

The researcher used the most common internal consistency measure known as Cronbach's alpha(α).The Alpha ranges between 0 and 1 with the reliability increasing with increase in value. According to (Robinson, 2009) coefficient of 0.6-0.7 is a commonly accepted rule of that would indicate acceptable reliability and 0.8 or higher would indicate good reliability.

The content validity was achieved by subjecting the data collection instruments to an evaluation group of four water development experts who provided their comments and relevance of each item of the instruments and the experts indicated whether the item was relevant or not. The results of their responses were analyzed the percentage of representation using the Content Validity Index.

The content validity formula by Amin (2005) was used to in line with other previous studies (Cull, Deigurc-kunt & Morduch,2007; Lefort & Urzua, 2008; The formula is; Content Validity Index = (No. of judges declaring item valid) / (Total no. of items). It is recommended that instruments used in research should have CVI of about 0.78 or higher and three or more experts could be considered evidence of good content validity (Amin, 2005).

Data Processing and Analysis

Data was collected and analyzed by using both quantitative and qualitative methods. Quantitative data was analyzed to yield descriptive and inferential statistics with the help of statistical package of social sciences (SPSS) version 21 and excel. The Likert scale was used to analyze the mean score and standard deviation. The findings were presented using frequency distribution tables and graphs. For further analysis, the researcher adopted correlation analysis and a multiple regression model for the study to establish the strength and direction of the relationship between the independent variables (project initiation, project planning, project execution and project closure on the dependent variable (performance of water development projects in Kenya). This was done at 5% level of significance and SPSS version 21 was used for this purpose. The regression model was as follows:

$$\mathbf{Y = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \varepsilon}$$

Where:

Y= performance of development projects,

β0= constant (coefficient of intercept),

X1= Project initiation;

X2= Project planning;

X3= Project execution;

X4= Project closure;

ε = error term;

β1……β4= regression coefficient of four variables.

RESULTS AND DISCUSSION

A total of 37 questionnaires were administered. Out of these, 11 were administered to sampled households, 14 to community committee leaders and 12 project managers

within the three study constituencies. Out of 11 household questionnaires administered, 10 of them, that is 90.90% were dully filled and returned while 10 out of 12 of project managers' questionnaires representing 83.33% and 13 out of 14 of community committee leaders questionnaires representing 92.85% response rate was achieved. Overall, out of 37 questionnaires distributed, 33 that is 89.19% response rate was achieved while 4 that is 10.81% did not return or returned partially filled questionnaires. This response rate was considered credible enough to allow for generalization of the findings to the target population besides arriving at the conclusions of the study. This response rate was sufficient and representative and conforms to Mugenda and Mugenda (2003) with a stipulation that a response rate of 50% is adequate for analysis and reporting; a rate of 60% is good and a response rate of 70% and over is excellent.

Implemented Water Projects

From the results, 31.82% of the implemented water projects in the study area were boreholes, 45.45% were earth pans, 4.55% water dams and 18.18% were sand dams. The finding is significant as it suggests the different water projects implemented have different performance as the life cycle of each project differ thus affecting performance and its sustainability (Wayne & Wittig, 2002). Any decision making should be tailored to implementation of such projects should in a manner with an understanding of the stages which are involved for every project. The findings of this study are similar with Sally et al (2005) who observed an increased decision making role should consider the type of water projects being implemented has a significant implications for the performance of such projects.

Project Initiation Phase during Implementation of Water Projects

From the study findings in Table 4.8 the majority (90.91%) of the respondents agreed that initiation stage was necessary for implementing water development projects while 9.01% posited that project initiation stage was not necessary for implementation of water projects. This depicts that the project initiation phase is important for better performance of water projects. The findings are in line with Jason (2006), who indicated that all development projects need to put more emphasis at the project initiation phase to enhance their performance and sustainability.

Project planning phase on performance of water projects

From the study findings in Table 4.11 the majority (72.72%) of the respondents agreed that project planning stage is necessary for implementing water development projects while 27.28% posited that project planning stage was not necessary for implementation of water projects. This depicts that the project planning phase is important for better performance of water projects. The findings are in line with Chileshe (2008) who indicated that poor performance of all development projects is due to inadequate effort and resources put at the planning phase of many projects by the implementers.

Project execution phase on performance of water projects

From the study findings in Table 4.15 the majority (70%) of the respondents agreed that project execution phase is necessary for implementing water development projects while 30% cited that project execution phase was not necessary for implementation of water projects. This depicts that the project planning phase is crucial for enhancing performance of water projects. The findings agrees with the study of Winsock (2007) who indicated that project execution phase is the longest and important phase of the project and should be monitored and controlled effectively for better results of any given project. The IFAD (2006) confirms that the strategic performance for 2007 to 2010 for its projects to enhance their performance, acknowledging that ensuring project execution phase is necessary for development of projects to achieve their intended goals.

Project closure phase on performance of water projects

From the study findings in Table 4.21 the majority (72.72%) of the respondents agreed that project closure phase determines the performance of water development projects while 27.28% posited that it did not affect performance of the water projects. This explains that the project closure phase is important for better performance of water projects. The findings are in line with Heldmann (2011) who indicated that project closure being the last phase in the project life cycle, must be conducted formally so that the beneficiaries fully realize the benefits delivered in short better performance of

the project. A project is said to be successful if the undertaking of each of the activities during the project closure phase of the project is closed only when all the activities listed in the project closure report have been completed to the satisfaction of all stakeholders especially in rural water projects (Kliem, 2008).

Performance of water implemented water projects

The study sought to establish the rate of performance of implemented water projects in the study area. The findings were as shown in figure 4.1 below;

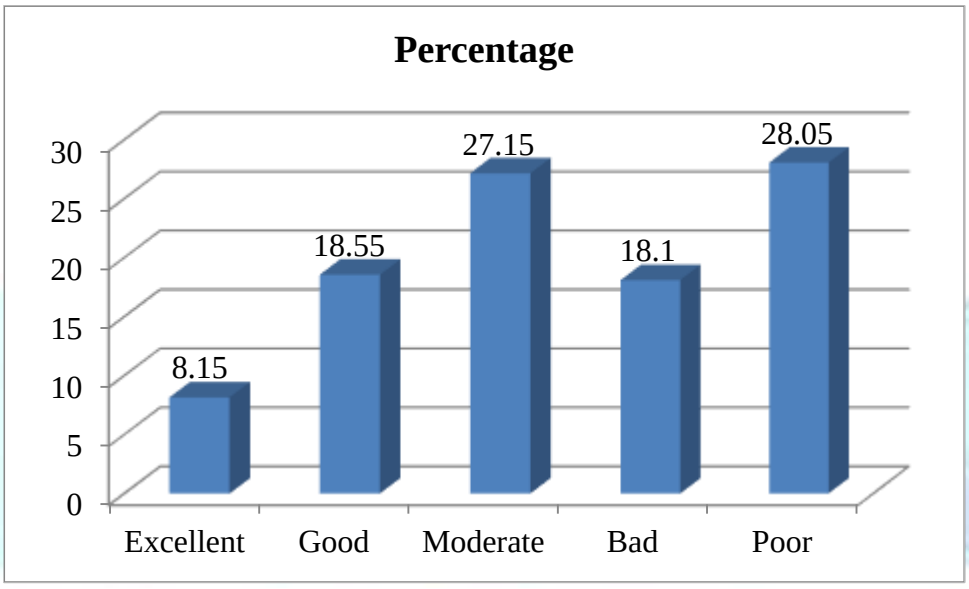

Figure 1: Performance of implemented water projects in the Kitui County

According to the findings, majority of the respondents (28.05) cited that the implemented projects were performing poorly, 27.15% performed moderately, 18.55% were good, 18.10% bad and 8.15% posited that they were excellent. The findings are in line with Mugambi (2005), who indicated that many rural water supply projects are currently on downward trend in their formative stages, while others collapse within five years of their existence due to inadequate information on project life cycle management. Others also fail to reach completion and meet the required quality standards of the users (Zulu & Chileshe, 2008).

Correlation Analysis

To quantify the strength and direction of the relationship between the variables, the study used Karl Pearson's coefficient of correlation (Tafara, 2013). The Pearson product-moment correlation coefficient measure the strength of a linear association

between two variables (Kothari, 2004) The Pearson correlation coefficient, *r*, can take a range of values from +1 to -1. A value of 0 indicates that there is no association between the two variables. A value greater than 0 indicates a positive association, that is, as the value of one variable increases so does the value of the other variable (Creswell, 2003) A value less than 0 indicates a negative association, that is, as the value of one variable increases the value of the other variable decreases. The correlation is significant at the 0.05 level for 2-tailed (Kothari, 2010).

Table 1. Correlation analysis

		Performance of water projects in Kenya	Project initiation phase	Project planning phase	Project execution phase	Project closure phase
Performance of water projects in Kenya	*R*	1.000				
	Sig. (2-tailed)					
	N					
Project initiation phase	*R*	.576	1.000			
	Sig. (2-tailed)	.034				
	N	33				
Project planning phase	*R*	.693	.514	1.000		
	Sig. (2-tailed)	.001	.004			
	N	33	33			
Project execution phase	*R*	.565	.345	.231	1.000	
	Sig. (2-tailed)	.012	.033	.020		
	N	33	33	33		
Project closure phase	*R*	.483	.161	.236	.402	1.000
	Sig. (2-tailed)	.017	.024	.044	.002	
	N	33	33	33	33	

Multiple Regression Analysis

Multiple regression analysis was used to determine whether the independent variables affected the dependent variable. It was used to predict the value of a dependent variable based on the value of two or more other variables (Abbot et al, 2008).

Table 2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.896[a]	.803	.793	.67054

a. Predictors: (Constant), Project initiation phase Project planning phase, Project execution phase, Project closure phase.

The independent variables (Project initiation phase Project planning phase, Project execution phase, Project closure phase) were used to predict the value of the dependent variable (performance of water development projects in Kenya). According to the Model Summary table 4.21, it provides the *R*, R^2, adjusted R^2, and the standard error of the estimate, which was used to determine how well a regression model, fits the data. The "R" column represents the value of *R*, the multiple correlation coefficients. *R* can be considered to be one measure of the quality of the prediction of the dependent variable; in this case, performance of water development projects in Kenya. A value of 0.896, in this result, indicates a good level of prediction. The "R Square" column represents the R^2 value (0.803) that is the coefficient of determination, which is the proportion of variance in the dependent variable that can be explained by the independent variables (technically, it is the proportion of variation accounted for by the regression model above and beyond the mean model). This means 80.3% of the variability of the dependent variable (performance of water projects in Kenya). The remaining 19.7% are the other factors which the researcher recommends for a study to be done to find out which ones also affect performance of water projects in Kenya. The findings corroborates with the findings of Summer(2001), who indicated that the performance of water projects is enhanced by the management of the phases of the project life cycle efficiently to meet the project goals and objectives against the constraints of time, budget and quality.

Table 3: Analysis of Variance[a]

	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	252.17	4	63.0425	12.4212	.0002[b]
	Residual	142.1112	28	5.0754		
	Total	394.282	32			

a. Dependent Variable: Performance of project water development projects in Kenya

b. Predictors: (Constant), Project initiation phase, Project planning phase, Project execution phase, Project closure phase

The reports summary ANOVA and F statistic (12.4212) is greater than the table value and is significant at 0.05 confidence level. The value of F is large enough to conclude that the set of independent variables; Project initiation phase Project planning phase, Project execution phase, Project closure phase affect performance of water projects in Kenya. The table shows that the independent variables statistically significantly predict the dependent variable, $F(4,28) = 12.4212$, $p < .0005$

Table 4: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	94.578	2.493		2.129	.000
	Project initiation phase	.696	.351	.202	.635	.003
	Project planning phase	.893	.139	.123	.376	.001
	Project execution phase	.759	.345	.017	2.311	.002
	Project closure phase	.623	.231	.209	.469	.004

a. Dependent Variable: Performance of project water development projects in Kenya

The general form of the equation to predict performance of water projects in Kenya from Project initiation phase Project planning phase, Project execution phase, Project closure phase is:

$Y = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \varepsilon$ Where Y = performance of water projects in Kenya; β0 = Constant Term; β1, β2, and β3 = Beta coefficients; X1=Project initiation phase; X2= Project planning phase; X3= Project execution phase; X4 = Project closure phase and ε = Error term.

The model equation would be;

$Y=94.578 +0.696X1 + 0.893X2 + 0.759X3 + 0.623X4.$

The study found out that when all independent variables (Project initiation phase Project planning phase, Project execution phase, and Project closure phase) are kept constant at zero the performance of water development projects in Kenya will be at 94.578. At one percent change in project initiation phase will lead to (0.696%) variations in the performance of water projects in Kenya. Also a one percent change in project planning phase will lead to (0.893%) variations in the performance of water

development projects in Kenya. Further, a one percent change in project execution phase will lead to (0.759%) variations in the performance of water projects in Kenya and one percent increase in project closure lead to (0.623%) variations in the performance of water projects in Kenya. Therefore, according to the findings, the project planning phase was the most significant factor. This concludes that project planning phase in the project life cycle management influenced more on performance of water development projects in Kenya followed by project execution phase. Then project initiation phase and lastly project closure phase. The findings corroborates with World Bank (2006) that there is increased performance of water development projects when the planning phase and execution phase are properly executed. These are the success factors in implementation of projects in public and private organizations (Wambugu, 2012)

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The study found out that the project initiation phase, project planning phase, project execution phase and project closure phase influence the performance of water development projects in the study area. From the study findings, the study revealed that project initiation phase is the foundation of making right and effective decisions thus the study concludes that project initiation phase had positive effects on performance of water development projects in the study area.

The study also revealed that project planning is in the fore front to initiate a culture of effective and efficient implementation of water projects thus ensuring they are finished in time, within budget and accepted specifications for sustainability purposes. Therefore the study concludes that project planning phase had positive effects on performance of water development projects in the study area..

Additionally, the study established that project execution phase enables the implementation and performance of activities to be effectively executed and controlled thus the study concludes that lead project execution phase had a positive effects on performance of water projects in the study area. Finally, the study also revealed that project closure phase determines the closure of activities before handing over to the client (beneficiaries) and it enhances development and performance of water development projects, thus the study concludes that enhancing

project closure phase resulted to a positive effect on performance of water development projects in the study area. The findings corroborates with the findings of Summer (2001), who indicated that the performance of water projects is enhanced by the management of the phases of the project life cycle efficiently to meet the project goals and objectives against the constraints of time, budget and quality.

Recommendations

The study recommends that improvement in project initiation phase activities as it enhances of water development projects in Kenya. The project managers should focus on activities related to the project scope, resources and tight schedules and project structure as they determine the performance of water development projects especially in the rural settings.

Additionally, the study recommends for better development, implementation and management of project planning phase aspects such as resource plan, financial plan, procurement plan, stakeholder plan, communication plans since they strongly influence successful implementation and performance water development projects in Kenya. The large projects (scope), limited margin leads to cost overruns when the implementation schedule is tight in order to meet the specifications which can be easily compromised thus affecting successful implementation and performance of water projects in Kenya.

Further the study recommends for effective project governance in the execution phase of activities such as management of time, cost, and quality among others. The rationales are straightforward that is delays in completion time may turn a promising investment opportunity into an expensive failure, cost overrun directly encroaches on anticipated benefits and compromised specifications thus affecting successful implementation of such projects.These factors in the long run determine the performance of water development projects in Kenya.

Finally, the study recommends that the project closure phase to be done in order establishment of ownership by the beneficiaries for sustainability of the projects after implementation. Results of the study indicated that while project closure phase encompasses handing over of the project to the beneficiaries and training them on

operation and maintenance is a positive step in ensuring performance and sustainability of water development projects in Kenya.

Suggestions for Further Study

Since this study was on the effects of project life cycle management on performance of water development projects in Kenya; the study recommends that;

I. Similar and other studies should be conducted in other areas of Kenya for comparison purposes and to allow for generalization of findings on the effects of project life cycle management on performance of water development projects in Kenya.

II. Similar and related studies on other factors should be conducted to investigate challenges facing sustainability of water development projects in Kenya

III. The regression model established that 80.3% of the variability of the performance of water projects was explained by the phases of the project life cycle management. The researcher recommends for a further study to be conducted on the remaining 19.7% factors that influence performance of water development projects.

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