PROJECT COST CONTROL TECHNIQUES AND PERFORMANCE OF WATER PROJECTS IN KERICHO COUNTY, KENYA

Bichang'a Lornah Chepkemboi & Gladys Kimutai

The Strategic JOURNAL of Business & Change MANAGEMENT
ISSN: 2312-9492 www.strategicjournals.com
Vol. 10, Iss.4, pp 569 – 592. November 1, 2023. www.strategicjournals.com, ©Strategic Journals

PROJECT COST CONTROL TECHNIQUES AND PERFORMANCE OF WATER PROJECTS IN KERICHO COUNTY, KENYA

[1] Bichang'a, L. C., & [2] Kimutai, G.

[1] MBA (Project Management) Student, School of Business, Economics and Tourism, Kenyatta University, Kenya
[2] Lecturer, Management Science Department, School of Business, Economics and Tourism, Kenyatta University, Kenya

Accepted: October 10, 2023

DOI: http://dx.doi.org/10.61426/sjbcm.v10i4.2776

ABSTRACT

This study investigated on project cost control techniques on performance of water projects in Kericho County, Kenya. The study variables were grounded on the organizational control theory, the transaction cost theory and the theory of project management. The study applied descriptive research design and targeted 16 completed water projects as the unit of analysis. There was use of semi-structured questionnaires that was first pilot tested and found to be valid and reliable in collecting primary data. The findings showed that improvements in performance of the water projects was due to cost estimation using different models, price variations and forecast that helped in reducing cost overruns. Findings showed project budgeting significantly influenced performance of the water projects based on the budget guidelines, reducing risks, budgets informing project decisions and maximum utilization of resources. The monitoring and evaluation function helped improve performance by regular checks on progress of implementation of project plans, improving transparency, accountability and mechanisms. The results showed that project expenditure controls enhanced performance of the water projects setting limits, authorization process to access resources, monitoring costs and implementing cash flow management systems. The study concluded that project cost control techniques of cost estimation, budgeting, monitoring and evaluation and expenditure controls had positive and significant effects on performance of the water projects in Kericho County. The performance improved in terms of quality and sustainability of the project, keeping to the budget lines and completion on time. The study recommended project managers and team to implement cost control techniques for improvement in performance of projects. It also recommended that county governments to train contractors and project managers on budgeting, expenditure control, cost estimation and monitoring and evaluating project activities. It was recommended that the policy makers should formulate regulations and laws that support control of costs for delivery of quality projects.

Key Words: *Cost Estimation, Budgeting, Monitoring and Evaluation, Expenditure Control*

CITATION: Bichang'a, L. C., & Kimutai, G. (2023). Project cost control techniques and performance of water projects in Kericho County, Kenya. *The Strategic Journal of Business & Change Management,* 10 (4), 569 – 592. http://dx.doi.org/10.61426/sjbcm.v10i4.2776.

INTRODUCTION

Projects are planned pieces of work that can be small, medium or large and aim at attaining a specific goal and services delivery to specified group of people. There are many considerations and factors that come into play in an endeavor to deliver a successful project. Madu, Jimoh, Shittu and Tsado (2019) shared that highly performing and successful projects are the ones that are delivered on time, keep to the stated budget lines, offer quality to the beneficiaries and they are sustainable for a long period of time for enjoyment of its benefits. In projects, its key features are inherent in time, scope and quality of the finished works. Lu (2019) noted that successful projects are determined by elements of project management including aspects such as management of the scope, the time, the resources, procurement process and stakeholders. It also encompasses elements of communication, resources and cost management and cost control aspects. Any project incurs costs and demands for different resources as a way to deliver on the projected service or product. Furthermore, the issue of cost overruns is of great concern to project managers (Karunakaran, Abdullah, Nagapan, Sohu & Kasvar, 2018). In this case, the study considered how to improve project performances as based on controlling of costs.

In Kenya, Waithira and Onjure (2020) argue that cost of inputs, advancing technologies and challenges in the markets hampered the success of farming projects. Thus, to improve the projects' success rate and meeting of customer and market demands at the lowest costs, there is a need of adopting cost control measures. The project managers need to plan, estimate costs and returns, budgeting, monitoring and controlling costs. Mutya (2018) revealed that cost control aspects of budgeting, standard costing and cost control led to improved organizational performance. It was evident that cost control improved performance of the firms in the study. Oyolla (2019) shared that many projects in Kenya fail to be completed due to cost and time overruns. There is a big challenge in controlling costs during construction of road projects. There is need for adoption of financial control systems, management of labor, keeping to project schedule and project design to cut cost of road construction projects. Cost controlling had a positive effect to outcomes of the road construction projects. But, it is important to consider performance water projects and thus the focus of the current study.

In consideration of the huge costs incurred during the implementation of projects and especially mega-projects, it is important to evaluate the project implementation progress to ascertain if it will lead to success of the overall project (Ali & Muathe, 2020). Projects are said to have performed well, if it keeps to the standards set, the final product or service is of high quality and the project is delivered on a timely and cost-effective manner. To attain high performing projects, Mbugua and Winja (2021) maintain that there is need to consider project management elements and get the right staff to handle different phases of the project. Other elements include having clear communication channels, involvement of all stakeholders, sufficient budget and well-knowledgeable and experienced staff. Performance of project as shared by Shani, Owino, Ogutu, and Iraki (2021) adopts these metrics in its measurement, productivity, delivering value, customer and employee satisfaction, returns on the investment made and cost variance.

Cost control is defined as the practice of identification and reduction of expenses in an effort to increase returns and profit margins. The practice equally considers comparison of the actual costs versus the estimates and the budgeted costs and installation of measures to reduce costs at every phase of the project implementation (Abdel-Hamid & Abdelhaleem, 2021). Cost control in projects involves finding economical ways of operating and prevention of wastes of resources using re-use and recycling measures. Kim (2019) noted that to address the problem of cost overruns, many project

management experts advocate for use of cost control measures. According to the Project Management Institute (PMI, 2017), cost control is the adopted processes to monitor the project status through updating the budgets and the cost baselines. The monitoring will inform decisions on managing project costs and growing the profit margins and returns from the outcomes of the overall project. Similarly, Adjei, Aigbavboa and Thwala (2018) view cost control as comparisons made between the actual results, the deviations made and corrective measures undertaken to ensure proper cost management. Keen monitoring will allow the project managers to note the cost variances and make immediate changes to avert the issue of cost overrun and eventual failure of the project.

Water scarcity is common feature in Kenya, such that the country has 647m^3 of fresh water against the recommended minimum level of 1000m^3, and hence efforts have been made to invest on water projects to supplement the demands. To achieve this, the national government has prioritized the provision of quality, clean, affordable and sustainable water and sanitation services. There have been reforms in the water sector and devolving the function to county governments is aimed at improve the provision and supply of water services to the locals (WASREB Impact Report, 2018). The Kericho County Government receives water and sanitation services from Kericho Water and Sanitation Company (KEWASCO) that aims at providing safe and clean water to the residents. The company has had challenges in service delivery based on high operational costs, poor revenue collection, water interruptions and irregular supply. These issues have led to construction of water projects at different locations that are managed by local water resources committee members. The limited natural water sources from rivers and rainfall, demands alternative manmade sources of water like water pans, dams and boreholes for the residents of Kericho County.

The Kericho County Government has initiated and completed sixteen (16) water projects spread across all its six sub-counties to help in delivering clean and safe water. The water projects help the residents in accessing water from close quarters to their homes. Some of the water projects have been reported to have issues with misappropriation of funds, limited funds and wastage of resources and this has had negative impact on service delivery and performance of the projects (Siele & Tibbs, 2019). There have been cost, time and schedule overruns in the projects due to mismanagement of funds, political interferences, planning and budgeting inadequacies and insufficiency of financial resources. The water projects have helped in solving the issues of distance and access to water as a resource, but questions still linger on infrastructure and costing and budgeting elements of the projects. The delivery, performance and sustainability of the projects have been poor meaning that the residents of the county still need to walk longer distances in search of clean water. In attempt to improve performances of the water projects, this study will look at project cost control. The study was carried out to empirically show the effect that cost control techniques will have on performance of these water projects.

Statement of the Problem

Projects as planned pieces of work are identified and implemented to attain specific goals like socio-economic development and provision of essential services. So, when they fail to be delivered on time, as per the cost estimates and quality, the goal remains unattainable. Attaining high performance in projects is a challenge in many developing nations as most fail to be completed in time, as per budget and stated standards and quality (Kosgei, 2021). In Kenya, there is a high number of projects that are abandoned, incomplete, incur cost and time overruns and poor quality. This has denied the general population a chance to enjoy the benefits and improve the quality of life. The issue is worsened when the project is meant to provide an essential product to life, as the case of water

projects and especially in areas lacking sufficient natural sources. Therefore, Muema and Ngugi (2021) argue that cost control is an important aspect in eliminating unnecessary costs, avoiding wastage during implementation and increasing project success.

Water coverage in Kenya stands at 55% and sewerage services stand at 16% which is low compared to the projection of 80% according to the water services sector report of 2017. The residents continue to suffer as the climate changes resulting in low rainfall quantities and changed rainfall patterns. The focus has shifted to water projects to supply the resource for livelihood of the people. In Kericho, Siele and Tibbs (2019) noted that disconnection of water supplies and incompletion of water projects has left the residents of the county in dire need of clean safe water. There are stalled projects like the Chuboit water project that used up over ksh.3.8M and another water project in Momoniat location; leaving 100,000 residents of Kipkellion Sub-County with no water source. There are also delays in project delivery such as the case is of the Kimugu water project that was to serve 200,000 people and supply 13M liters of water. There was also poor workmanship and quality of the project was low as is the case of Chepcholiet water pan and spillway and which stands incomplete. The water committee report (2018) was such that some projects have been used as conduit for squandering public funds as is the case of Kapchumba, Tabule and Chemila water projects. Thus, need to seek means of improving performance of the water projects to serve the people of Kericho. This study will consider effect of project cost control to improve performances water projects.

Several studies have been done on cost control and performance, such as Waithira and Onjure (2020) on performance of fish farming projects as influenced cost control practices in Kiambu County. The improved performance of these projects was due to practices of financial training, standard costing and budgeting. The gaps created were based on context being fish-farming projects in Kiambu and conceptualization of cost control is different from the present study. Joseph, *et al.* (2020) investigation was on project cost control and managing risks in the Nigerian construction industry. The results showed effective project cost control improved the quality of risk management by reducing conflicts and project delivery. The study gap is in context as it was done in Nigeria and conceptually, there was no mention of performance of projects. Hussein (2020) study was on project performance at the water sector trust fund as influenced by monitoring practices. Findings revealed that monitoring plans, tools, techniques and practices significantly affected the performance of the projects. The study created gaps in concept by covering one element of cost control measures.

The challenges in performance of projects and issues faced by water projects in Kericho County and the identified gaps in the reviewed studies; created a need for further investigation in the area. The identified contextual, conceptual and knowledge gaps in research were filled by investigating on project cost control techniques and performance of water projects within Kericho County, Kenya.

Study Objectives

The main objective of this study was to investigate the effect of project cost control techniques on performance of water projects in Kericho County, Kenya. The study was guided by these specific objectives:

- To assess the effect of project cost estimation on performance of water projects in Kericho County, Kenya
- To determine the effect of project budgeting on performance of water projects in Kericho County, Kenya
- To find out the effect of project monitoring and evaluation on performance of water projects in Kericho County, Kenya
- To determine how project expenditure control affects the performance of water projects in Kericho County, Kenya

LITERATURE REVIEW

Theoretical Framework

Organizational Control Theory

The theory was formulated by Cheney and Tompkins (1987) and its main concept is sustaining high performance outcomes by developing systems between the organization and its system. The systems and control measures must be able to align the activities and actions of the organization with its overall goal. Snell (1992) noted that is on the basis of developing control mechanisms across all functional and operational units of an organization. Its basis is on the systems and mechanisms used in an organization to influence the sub-units to behave in a certain manner for achieved of a specified goal. According to Liu, Borman and Gao (2014) the main aim of the theory is setting a schedule for implementing action plans and monitoring and evaluating different key and elemental operations that dictate the behavior of staff and deliver on the organizational goals. Its focus is equally on shaping and swaying the behaviors and the driving force in each adopted technique.

The organizations' set different control forms that once adopted can help in delivering the goals. Most managers use the organizational structure, performance measurement and control systems based on behavior, input and outputs (Parker & Manley, 2017). On behavior control, firms formulate policies, norms, practices and standards and the management regularly monitors and evaluates the actions of staff to attain the set goals. In the same manner, project managers can check on project team members to ensure they abide by set standards of behavior to attain project goals. The second aspect is on input controls by improving the competencies of staffs through trainings and growth and development programs. The quality of raw materials and parts and tools need to be checked to positively affect the quality of the finished product. On output controls is based on checking performance of employees, machine output and functional and operational units and rewarding those who perform well (Liu, *et al.* 2014).

Transaction Cost Theory

It was founded by Williamson (1979) and its main concept is complete use of the structure of the organization for economic efficiency and for minimization of costs of exchange. The theory informs that all transactions that occur in market exchanges for products and cash there is a corresponding costs attached. Parties to the transaction make agreements in a contract that govern the nature of the interaction and in that biding contract the costs are indicated on which party will carter for that. The signing of the contract agreements serves as protection against any opportunist behavior that one of the parties may assume to exploit. Alaghehband, Rivard, Wu and Goyette (2011) shared that the basis of the theory is finding measures to reduce the transaction costs through adoption several methods such as partnerships, monitoring and evaluating transaction process, use of digital systems and technology.

In project management, the theory seeks means of reducing high operational costs especially in megaprojects. The large projects incurred huge costs in acquiring raw materials, tools and equipment and labor and the transactions costs can be huge, hence calling for measures to reduce the costs. The project managers can form a specific team to monitor costs and design systems to cut-down operational costs. The tendering process should be efficient to get quality products from suppliers with the lowest bid quotes or apply supply chain elements such as bulk purchasing to enjoy economies of scale. Rindfleisch (2020) shared the project profitability can be reduced if the transaction costs are very high and the margins can be high for small projects whose profit margins are equally low. If transaction costs are high, the project managers might compromise on quality of materials and the ultimate final project quality and its service. Effective management of transaction costs, needs managers to estimate the costs,

budget for them, closely monitor it and set measures to control it for successful projects.

Theory of Project Management

The theory was founded by Koskela and Howell (2002) and its key concept is on aspects of project management including project initiation, planning, execution, monitoring and controlling and closure of the overall project. The project management is undertaken by the management paradigm and uses planning to attain its overall goals and objectives. In essence, the theory adopts the concepts as stipulated in the PM-BOK (Project Management Body of Knowledge) and PMI (Project Management Institute), such that the theory is divided into two – the theory of project and the theory of management (Morris, 2002).

The theory of project is based on the concept of transformation of project operations. In that the project is divided into functional areas that transform the inputs to outputs. The overall project tasks is transformed and regrouped to smaller tasks and assigned to teams to deliver them independently. For the theory of management is based on three elements, management as a planning tool and works to develop and implement plans for success of the overall project. The link is on causal connections that deliver expected project outcomes. The second aspect is on dispatching model that is conceptualized through dispatch of project tasks to different work stations and project team members. The last is based on the thermostat model that follows the principles of possibility of variances between the standard and value and taking corrective actions to control the project outcomes (Hanisch & Wald, 2012).

Empirical Literature

Ahn, Ji, Ahn, Park, Lee, Kwon and Kim (2020) study was on improving construction cost estimation through the CBR models and evaluating its performance. The study noted that use of case-based reasoning model is effective in achieving reliable and accurate estimation of costs for projects and more so during the initial project stages. Case-based reasoning (CBR) is best used in the project identification, scope and design phase since it relies on historical data from similar projects and their recorded information. The data is then compared to the present project and lends credence to cost estimation for all project activities and operational areas. The researchers concentrated on multi-family housing complexes as the case studies and the CBR model was based on absolute error rate, standard deviation of findings and means for accuracy of cost estimation. Results found that use of CBR model in cost estimation enhanced accuracy and stability and supported making of decisions during the initial stages of the projects. The study recommended that CBR model can also be used in estimation of project scheduling, time allocation and allocation of resources. The study focus was on CBR model and did not assess the linkage of cost estimation and resulting performance of the projects, thus creating conceptual gaps.

Fazil, Lee and Tamyez (2021) investigation was on cost estimation and its performance within the construction projects in Malaysia. It was noted that estimating of costs in construction projects is a critical element and valuable in avoiding cases of cost overrun. Through the use of cost estimation aspects, the article provided a way of measuring performance of cost estimation in construction sector. The researchers collected secondary data by reviewing 23 journals, 238 construction cost estimation papers in the past 31 years, revealing that only 33 papers concentrated on performance and outcomes of cost estimation. The results identified the factors linked to performance of cost estimation as based on elements of organizational control theory, contingency theory and task-technology fit theory. The framework for cost estimation was based on control themes such as control practices, overall project cost and assessing costs incurred by previous projects and applying it to the current study. The study created methodological gaps since it used secondary data by reviewing journals and its context was based on Malaysia construction sector.

Mwaguni, Mbugua and Rambo (2020) researched on budgets and the performance of research projects in public universities in the Kenyan coastal region. Study participants included staff working at the universities of Technical and Pwani in Mombasa and using random sampling the list composed of 285 participants. The researchers collected primary data using interviews and open-ended questionnaire and data was later analyzed. The study concentrated on budget elements of reviewing budgets, compliance of budgets, stakeholder involvement budget guidelines and budgeting controls and research projects performances. The findings revealed that budgets improved the performance of the research projects and the relationship between the variables was positive and significant. Conclusions showed that budget guidelines had the biggest influence on research projects' performance, this was followed by complying with the budget, budget reviews, stakeholder involvement and lastly budget controls. The study created contextual gaps as its focus was on the research projects, in coast based universities.

Eyibio and Daniel (2020) conducted a study on how effective is resource budgeting as a tool for managing of projects. Due to globalization of markets, all organizations seek to maximize funds and resources use to deliver highly performing projects that improve the profitability of projects. The issue of budgeting is important in relating resource budgeting and project management and performance. The focus was determining the significance of the relations existing between effective resource budgeting and project management and review of past papers to collect data and quantitatively analyze it. The findings revealed that resource budget is an effective tool in managing projects and has a significant effect in project success. The study concluded that review of past articles realized that resource budgeting led to success of projects in Nigeria. The study conceptual gaps as resource budgeting was linked to project management while the present study will link budgeting to project performance.

Sinigi and Kaburu (2020) investigation was on monitoring and evaluation and performance of youth employment projects within the Narok County Government in Kenya. Focus was on the 32 projects that were active in 2014 to 2018 and from which questionnaires were filled from 195 respondents who included project managers, government representatives and youths and then later analyzed using descriptive, inferential statistics. The research revealed that M&E had noteworthy effect to performance of the youth employment projects. Monitoring and evaluation was effective because the staffs were well-trained, knowledgeable, skilled and experienced; there was also involved of all stakeholders in awareness creation, oversight role, collecting information, assessing and reporting findings. The study concluded that M&E process works where staffs are trained, feedback is freely given, embraced and acted upon, continuous improvement and regular activities for monitoring and reporting findings. Successful projects are the ones where there is stakeholder involvement, continuous improvement and feedback is seamless and information sharing. The study created conceptual gaps by not assessing the effect of M&E on performance of the youth projects and its contextual background is in Narok County.

Kissi, Agyekum, Baiden, Tannor, Asamoah and Andam (2019) assessed the project monitoring and evaluation practices and its impact on success of construction projects in Ghana. Focus was on monitoring and evaluation practices as an important aspect of project implementation, execution and its management. Some of the monitoring and evaluation (M&E) practices include learning culture, data and information collection, assessment and application, participatory approach and feedback mechanism. These practices were included in the research tool used to collected data from project professionals in the construction

industry of Ghana. Through use of PLS and SEM, the findings showed that M&E practices had significant effects and led to success of construction projects. Further findings also revealed that M&E practices were affected by the project scope, and health and safety practices in the construction projects. The study concluded that M&E practices are significant and critical to the success of projects and once applied increase the success rate of project delivery. The study created contextual gaps since its background was done in the construction projects and in Ghana.

Omotayo, Bankole and Olubunmi Olanipekun (2020) assessed on prediction of the most applicable post-contract cost controlling techniques within the construction industry and its projects. The study concentrated on use of artificial neural network approach to predict the ideal cost control technique since the post-contract phase is critical for project implementation and its success. The researchers noted that in some instances, the deployed cost control technique has not yielded the expected results of reducing cases of cost overruns. The study focused on cost control techniques such as cost forecasting, cash flow, having a working budget, taking corrective actions, monitoring overhead, material, labor and equipment costs, identifying indicators of cost overruns and managing variations. The 135 project managers and quantity surveyors that took part in the study shared that use of artificial neural network approach to predict the ideal cost controlling technique led to better management and control of project expenditures. Further results revealed that project managers and quantity surveyors influenced the decision on the choice and implementation of the post-contract cost and expenditure control approach. The choice of cost control technique was done by the quantity surveyors but the responsibility of its implementation was mostly done by project managers. The study concluded that cost control techniques, cost management practices and cost monitoring approaches led to reducing project costs and expenses and improved the overall performance of construction projects. Conceptually, the focus of this study was in predicting the ideal post-contract cost controlling techniques using artificial neural network approach. The present study will link cost and expenditure control to performance of projects.

Khodeir and El Ghandour (2019) in the study that was examining the role played by value management in controlling cost overruns for the residential construction projects in Egypt. The study noted that in practice, the actual costs incurred in any project differs from the planned and estimated project costs and reaches values that range between 21% - 55%. In mega-construction projects, cost overrun is a key element and is likely to hinder the success of projects. Cost overruns are due to inaccurate cost estimates, delays in implementation and conclusion, changes in project design and scope, weak planning processes, and increased cost of materials. Thus, use of value management is based on value analysis, value engineering and value methodology to assess changes in design and execution of projects and the accompanying cost variations. The researchers reviewed past literature on cost implementation. The findings showed that use of value management led to improved controls for cost overruns and improved outcomes of the residential projects in Egypt. The study concluded that adoption of value management helped the residential projects to achieve 15% - 40% savings in the total costs of the project. The contextual gaps created linked to assessing residential projects in Egypt, and methodologically, the study used secondary date by reviewing past literature. Conceptual gap is such that performance of the project was not assessed.

Conceptual Framework

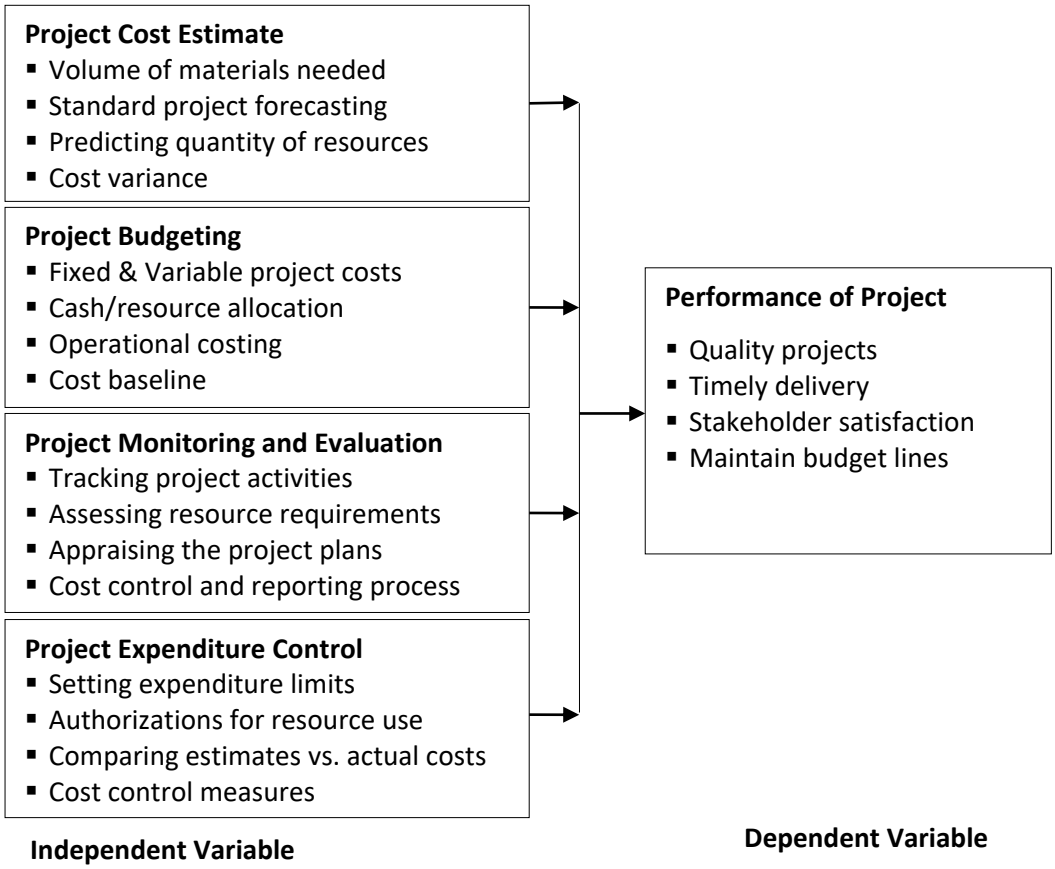

Figure 1: Conceptual Framework
Source: Researcher (2022)

METHODOLOGY

This study employed the use of descriptive research design, that Doyle, McCabe, Keogh, Brady and McCann (2020) defines as an approach that represents the elements without any manipulation. The study targeted 16 completed water projects in Kericho County as the unit of analysis. These water projects gave a clear picture on performance outcomes and the adopted cost control measures and association between the two elements. The respondents included persons associated with project planning and implementation and included 67 people. The targeted population was the unit of observation and covered the project managers, the project contractors, the chairperson of the water committees and officials from the county government. This study employed stratified sampling method where the respondents were grouped as per the function they hold in the water projects including project manager or water committee chairperson. Census sampling was then applied in including all the 16 water projects and one project manager, contractors and water committee chair were included in the study. All the county officials in charge of water projects and residing from the ministry of water, energy and natural resources from the Kericho County were also included in the study. Thus, the sample size of the study participants was 67 respondents who participated in the study.

A semi-structured questionnaire was employed as the research instrument to collect primary data from both open and closed-ended questions. The data type was quantitative and qualitative. The open questions allowed the respondents space to express themselves and use their own words to

describe the phenomenon and thus enrich the study. The instrument questionnaire was pilot tested using 8 respondents from 2 water projects in Bomet County, the Labotiet and Kaptebeswet water projects that were funded and operationalized by the county. The respondents included project managers, contractors, water committee chairpersons or members and county officials from the water department. The pilot study checked that the instrument was fit for use in the present study and alterations and errors were collected to deliver a fit research instrument. This study in checking for questionnaire validity employed content validity technique that used the opinion and help of experts in data collection tools, the researchers and classmates who went through the questionnaire. All the collected data was checked, coded and entered into SPSS version 25.0 for analysis. Younas, Shahzad and Inayat (2021) noted that analysis is a systematic process of arranging and extracting valuable information from data and from which conclusions and recommendations were made. For the collected data that was quantitative in nature, the researcher conducted descriptive analysis to obtain means, frequencies and standard deviations. Inferential statistics was done to assess the association and strength of the relationship between the variables. This was done using Pearson's correlation analysis and multiple regression analysis.

FINDINGS AND DISCUSSIONS

Descriptive Analysis

The descriptive analysis was done and the study findings were presented as per the objectives in these subsequent tables and discussions.

Project Cost Estimation

Table 1: Project Cost Estimation

Statement	N	Mean	Std. Dev.
Use of different models helps in accurately estimating overall project costs	53	4.05	.820
Experts are involved in estimating the volume of materials needed for completion of the water projects	53	3.79	.755
The project forecasts inform decision making done by the project managers	53	3.96	1.006
Resource estimates works to avoid instances of cost overruns	53	3.72	1.054
Calculating project cost estimate factors in pricing variation to avoid deficits	53	4.01	1.228
Estimating volume of work helps in scheduling tasks while reducing conflicts due to double scheduling	53	3.77	.708
Cost estimates is done as per project phase that is compiled into overall report	53	3.66	1.005
Aggregate Score		**3.85**	**.939**

The results in table 1 showed that the aggregate score was high at (M=3.85, SD =.939) noting that respondents agreed that adoption of project cost estimation led to improved performance of the water projects in Kericho County. The respondents also strongly agreed that there was use of different models for accurate estimating project costs (M=4.05, SD =.82) and the respondents shared that to avoid deficits in calculating cost of the project is through doing the cost estimates with price variations (M =4.01, SD =1.228). These findings are echoed by Romanovich and Adel (2018) who used the building information modeling (BIM) and Ahn, *et al.* (2020) adopted the Case-based reasoning (CBR) model to estimate costs in projects. Kermanshachi, *et al.* (2018) found that project cost estimation enhance knowledge on cost management that lead to successful projects.

The respondents also showed that respondents agreed that the project forecasts were instrumental in decision making (M =3.96, SD=1.006), the estimation of volumes of materials needed in the water projects is done by experts, was agreed with scores of (M=3.79, SD =.755) and the respondents also agreed that estimations made on volume of

work helps in scheduling and avoiding work conflicts (M=377, SD =.708). Similarly, Ahn, *et al.* (2020) noted that cost estimation that was accurate supported the decision making process in projects. In addition, Romanovich and Adel (2018) in their study revealing that estimation of work in projects helps in avoiding instances of double scheduling, conflicts and disagreements at the workplace and re-doing the same work.

The findings also show that avoidance of cost overruns was possible through estimating resource (M=3.72, SD=1.054) and the respondents also agreed that cost estimates were done according the specific project phase and a report was made, (M=3.66, SD =1.005). The researchers' Fazil, *et al.* (2021) revealed that estimating cost of project is critical and helps in avoiding cost overruns. The cost estimates can be drawn from past projects by assessing the costs incurred and estimated project costs. The Project Management Institute (PMI, 2017) noted that cost estimations, improve decision making and avoid cost overruns, resulting in high performance of the overall project.

The respondents were also asked to share on benefits of accurately estimating cost of the projects, and responses indicated that cost estimation is done to ensure success of projects through access to information on resource mobilization, allocation and utilization. The respondents also noted that cost estimates bring in the aspect of risk management by accurately planning of the work, the resources and outcomes. Another respondent shared that cost estimation allows for information sharing with all stakeholders and hence they would know what they are investing their time, resources, efforts and funds and expected outcomes. The estimations bring clarity in the work space by avoiding conflicts and confusions, resulting in better performance outcomes. The respondents also revealed that cost estimation is an essential phase in projects that align needs, expectations and outcomes.

Project Budgeting

Table 2: Project Budgeting

Statement	N	Mean	SD
The budget includes both fixed and variable costs of the water project	53	3.7	1.309
Formulated budget give an indication of how funds or other resources are allocated	53	3.34	1.208
Budget covers all operational costing for all functional areas of the water project	53	3.49	.992
The budget guidelines indicate sources plus utilization of project resources	53	3.89	.847
The project budget helps in maximizing usage of funds or other resources	53	4.22	.993
Budgeting informs the project decision making process done by managers	53	4.09	.882
The project budget includes possible risks as it sets the costing baseline	53	3.81	1.001
Aggregate Score		**3.79**	**1.033**

The results on Table 2 indicated that there was a high aggregate score at (M=3.79, SD=1.033) as the respondents agreed on project budgeting influencing the performance of the water projects in Kericho County. Study respondents strongly agreed that through utilization of project budget, there was maximization in utilization of project funds and other resources, with scores of (M= 4.22, SD =.993) and the budgeting process also informed the decision-making exercise undertaken by project managers, was agreed at score of (M =4.09, SD =.882). These results were also echoed by Mwaguni, *et al.* (2020) noting that budgets improve performance of projects through setting guidelines and compliance with the budget estimates and reviews. Kwon and Kang (2019) mentioned that budgeting allows managers to reduce project costs and improve utilization of the resources for delivery of successful projects.

The respondents also agreed with this statement on project budget showing the source of resources and indicate the utilization point (M =3.89, SD =.847) and the respondents indicate that the project

budget set cost baselines to avoid risks on excessive use with high scores of (M =3.81, SD = 1,001) and the budget was made up of both fixed and variable costs for the water projects (M =3.7, SD = 1.309). These findings are also shared by Eyibio and Daniel (2020) that an effective resource budget shows sources of resources, its utilization across the different implementation units and outcomes yielded. The budgeting is a good tool for management of projects and enhances chances of success of the projects. According to Abdel-Hamid and Abdelhaleem (2021) budgeting enables the managers to accurate calculate project costs and in instances of variations, corrective measures are taken.

Moderate extent was agreed on the statement that the budget covered all the operational costs covering all the functional areas of the project with low scores of (M =3.49, SD = .992 and low score ratings were found for how budget was formulated to indicate the allocation of funds and other resources (M =3.34, SD = 1.208). On the contrary, Adafin, *et al.* (2020) shared that a project budget that fails to consider risks that impact the project is likely to cause inefficiencies that result in poorly completed projects. An effective project budget must consider the risks, the plan and expected incurred costs in the project, thus the budget will be able to accurately forecast on cost estimates for the project. Kwon and Kang (2019) shared that project managers face a challenge in completing projects on time, keeping to the costs and quality, hence the need for assessing cost of risks and incorporate in the budget.

When asked about other ways in which the project budgeting affected the water projects, respondents indicated there was better planning and implementation of the water project activities. All the stakeholders could easily access information on the sources, allocation and utilization of funds and other project resources. The respondents also indicated that the budgeting helped in reducing wastage as dispatch of resources was accompanied by a request form and there were records. Budgeting improved project outcomes and led to successfully completion of the water projects. In addition, the budgeting process draws insight from various stakeholders improving the engagement and participation by all project stakeholders.

Project Monitoring and Evaluation

Table 3: Project Monitoring and Evaluation

Statement	N	Mean	Std. Dev.
Monitoring & evaluation is done by tracking project activities in all phase	53	3.4	1.276
M&E aide in assessing resource demand needed for completion of project	53	3.49	1.265
Project M&E takes a participatory approach by incorporate all project stakeholders	53	3.53	.952
Monitoring costs informs the decision makers in the water projects on resource consumption	53	3.81	1.057
M&E is done to check on implementation of the project plans	53	3.96	.999
project has feedback mechanism for collecting information on progress	53	3.88	.953
The M&E policies ensures transparent and accountable water projects	53	3.92	1.071
Aggregate Score		**3.71**	**1.082**

Source: Field Data (2023)

The findings shown in Table 3 showed that the study respondents agreed that project monitoring and evaluation influenced the performance of the water projects, as the scores were high at (M= 3.71, SD = 1.082). The findings also revealed that respondents agreed that M&E is done by checking on implementation of the project plans (M=3.96, SD =.999) and the project monitoring and evaluation exercise enhances transparency and accountability in the water projects (M =3.92, SD =1.071). Similarly, Kissi, *et al.* (2019) noted that adoption and utilization of M&E practices led to success of

the construction projects. The M&E is based on learning culture and assessment that improve performance of the projects. In addition, Chebet (2021) found that monitoring enhances transparency and accountability in the implementation of project plans and activities. Wambua (2019) stated that competent M&E staff and plans that are well-executed lead to better performing of the projects.

It was also agreed to great extent that the presence of a feedback mechanisms for the water projects at scores of (M = 3.88, SD =.953) and the respondents agreed that the project monitoring and evaluation works to inform decision makers on costs and consumption of the resources (M =3.81, SD =1.057). The respondents also shared that the project monitoring and evaluation was done through participation by all project stakeholders (M =3.53, SD =.952). The researchers' Sinigi and Kaburu (2020) also noted that success of their youth employment projects was influenced by involvement of all stakeholders. The stakeholders helped in creating awareness, information collection and sharing and oversight role which improved project performance outcomes.

Findings also showed that study respondents agreed moderately that the monitoring and evaluation helps in assessing resource demands that are needed towards the completion of the project (M =3.49, SD =1.265) and that monitoring and evaluation exercise works by tracking all project activities across all project phases, was agreed moderately by the respondents (M =3.4, SD =1.276). Chebet (2021) noted that monitoring and evaluation focuses on costs management routines, supervision and capacity of project staffs and had less concerns on assessing and tracking resource demands. Mokua and Kimutai (2019) noted that the M&E system was present but it was not implemented and the M&E report was rarely utilized creating negative impacts on performance of the projects.

The respondents were asked to share how monitoring and evaluation affected the performance of water projects in Kericho County. The responses included that use of monitoring and evaluation report in decision making process, tracking and assessing competencies of project staffs, the effectiveness of the implementation process and outcomes. Conducting monitoring and evaluation exercise enabled the project contractors to take corrective measures whenever they were informed of an error in the project implementation activities. The monitoring and evaluation highlighted the project measurement indicator and stated the M&E framework that guided the project activities leading to its success.

Table 4: Project Expenditure Control

Statement	N	Mean	Std. Dev.
The project managers have set limits to consumption of project funds	53	3.92	1.298
Authorization must be sought before using project resources from project managers	53	3.75	1.207
Regular reviews help in comparing estimates vs. actual costs to avoid unnecessary expenses	53	3.58	1.081
Project managers implement cash flow management to cut project expenses	53	3.88	1.187
The managers actively monitor overhead/operational costs	53	3.86	1.144
Assessments done identify indicators of cost overruns where corrective measures are undertaken	53	3.9	1.147
Delays in implementation at different stages is discouraged to bring expenditures down	53	3.54	1.148
Expenditure control measures like tendering and budgeting is taken to keep to project costing	53	3.72	.885
Aggregate Score		**3.76**	**1.137**

The results shown in Table 4 indicated that the respondents agreed to a great extent that project expenditure control influenced performance of the water projects in Kericho County, as based on aggregate scores of (M =3.76, SD =.1.137). There were high scores on the statements about project managers setting limits on consumption of project funds (M =3.92, SD =1.298) and there are assessments that are taken to identify areas where cost overruns can occur and corrective measures taken (M =3.9, SD =1.147). These findings echo the sentiments of Omotayo, *et al.* (2020) who shared that monitoring overhead costs, labor and material costs, forecasting, budgetary and corrective actions are part of the cost control techniques adopted in projects for improved performance outcomes. Cost control techniques involving cost management and monitoring practices improved overall project performance.

The respondents agreed that project managers oversee the management of cash flows as a means of cutting project costs, at scores of (M =3.88, SD =1.187) and it was agreed on the fact that water project managers actively monitored the overhead and operational costs, where the scores are (M =3.86, SD =1.144). These findings are similar to Khodeir and El Ghandour (2019) who noted cost overruns are a challenge for the mega projects which is largely informed by inaccurate cost estimates, delays and changes in design and scope. Through the value management that had cash management aspects, resulted in improved project performance. Similarly, Abobakr (2018) found that adoption of project expenditure controls helps in reducing cost overruns resulting in successful projects.

Results showed that there was authorization that was needed before project resources can be released for use, at score of (M =3.75, SD =1.207) and to maintain the project costs, expenditure control measures such as tendering and budgeting were undertaken (M = 3.72, SD = .885). These findings are an echo of what Yismalet and Patel (2018) noted that control and management of project costs and expenses is possible using techniques such as tendering, estimations, budgeting and control practices.

The respondents also agreed to the fact that frequent reviews were carried out by comparing estimated and actual project costs as a means of avoid unnecessary project expenses. The agreement had scores of (M =3.58, SD =1.081) and there was discouragement of delays in the implementation to reduce project expenditure (M =3.54, SD = 1.148). According to Omotayo, *et al.* (2020) there is some instances where the adopted control techniques do not yield the anticipated results of reduced cost overruns. The completed project had exceeded its budget estimates and allocated funds or resources. Yismalet and Patel (2018) mentioned that contractors can get low revenues and profits in instances of poor financial management and planning, ineffective expenditure controls and cost management systems.

The respondents were asked to share on other measures that can be adopted in the water projects to control expenses; some of the responses included outsourcing of non-core project activities, implementing cost accounting, budgeting and budgetary controls and cost reduction measures. This can also be achieved through estimating and planning for all project costs and tracking allocation, distribution and utilization of resources to increase gains and value gained from the project.

When asked about the implication of huge expenses of water projects, the respondents revealed that huge expenses can result in compromised quality of acquired raw materials and finished product. It can also cause delays, stalling of projects and abandonment of some projects. There is also no value for money and gaps can lead to wastage of resources, theft, corruption and misappropriation of funds, which leads to poor project performance.

Project Performance

Table 5: Project Performance

Statement	N	Mean	Std. Dev.
The quality of water projects is high	53	3.98	1.028
The water projects are completed as per the scheduled timeline	53	4.13	.899
Beneficiaries are satisfied with the water projects	53	3.77	.993
The water projects maintain the set budget lines	53	4.06	.769
The water projects is sustainable for long	53	3.94	.818
The projects used quality raw materials	53	4	.808
Aggregate Score		**3.98**	**.886**

Source: Field Data (2023)

The findings in Table 5 indicated that respondents agreed on the fact that there was improvement in performance of the water projects in Kericho County, as the score was at a high of (M =3.98, SD =.886). The respondents noted an increase in water projects completed on time (M =4.13, SD = .899), the water projects kept to the budget line (M =4.06, SD =.769) and the project had used quality raw materials (M = 4, SD = .808). The findings also indicated the water projects were of high quality at (M =3.98, SD =1.028), they were also sustainable for lengthy periods with scores of (M = 3.94, SD =.818) and the locals and beneficiaries were satisfied with the water projects at scores of (M =3.77, SD = .993).

These findings are also echoed by Joseph and Caleb (2021) who noted that successful projects are those who are properly managed and keep to their scheduled timeline, cost and quality. Karadimos and Anthopoulos (2021) noted that reducing project costs improved performance of the projects and Joseph *et al.* (2020) found that proper cost control increase completion of projects and reduces cases of abandoned projects. Shani, *et al.* (2021) noted some of the project performance metrics included productivity, delivering value, customer and employee satisfaction, returns on the investment made and cost variance. The performance of water projects, according to Muema and Ngugi (2021) is measured by quality, sustainability of the project and satisfaction with quality and accessibility of water as a product.

Correlation Analysis

To establish the effect of project cost control on project performance, correlation analysis was conducted and the results are as shown in Table 6.

Table 6: Correlation Analysis

		Project Performance	Project Cost Estimation	Project Budgeting	Project Monitoring & Evaluation	Project Expenditure
Project Performance	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	53				
Project Cost Estimation	Pearson Correlation	.71	1			
	Sig. (2-tailed)	.000				
	N	53	53			
Project Budgeting	Pearson Correlation	.539	.283	1		
	Sig. (2-tailed)	.000	.000			
	N	53	53	53		
Project Monitoring & Evaluation	Pearson Correlation	.606	.543	.692	1	
	Sig. (2-tailed)	.000	.170	.000		
	N	53	53	53	53	
Project Expenditure	Pearson Correlation	.516	.162	.196	.009	1
	Sig. (2-tailed)	.007	.000	.000	.159	
	N	53	53	53	53	53

The findings shown in table 6 showed that all the project cost control measures adopted in this study were positively correlated to performance of water projects in Kericho County. The results further show that project cost estimation had positive and significant relationship with water project performance based on r =.71. Similarly, project budgeting was strongly and positively linked to water project performance in Kericho County, since it had high score values where r =.539. The results also showed that project monitoring and evaluation with r =.606 had strong and positive relation to water project performance. Lastly, project expenditure at r =.516 was positively and significantly linked to water projects performance in Kericho County. These findings show that the relationship between all the independent variables and the dependent variable was positive. This is based on all the r values being greater than zero as an indication of positive association.

On the strength of the relationship between the variables and basing on the interpretation of the r values where 0 to 0.2 implies very weak correlation, 0.2 to 0.4 implies the relationship is weak; 0.4 to 0.6 indicate moderate strong correlation; 0.6 to 0.8 imply that the correlation is strong and 0.8 to 1.0 imply the correlation is very strong. Based on these categorization, then project cost estimation at (r =.71) and project monitoring and evaluation at (r =. 606) have a strong association with water project performance and project budgeting at (r =.539) and project expenditure (r =. 516) have moderate but strong correlation with water project performance in Kericho County.

These findings imply that the reported improved performance of the water projects in Kericho County was as a resulted of the adopted project cost control measures. The findings are echoed by Mutya (2018) sharing that effective cost control, keeping the costs limited to the budget result in improved project performance. Odhiambo, *et al.* (2020) noted that management of costs and expenses improve project outcomes. In addition, Mwaguni, *et al.* (2020) mentioned that budgets had

a positive and significant influence on performance of the research projects. Gidey (2019) found that cost management in projects with aspects like cost estimation, cost budgeting, cost planning and monitoring helped in attaining project goals and improve project performance

Multiple Regression Analysis

Multiple regression analysis was conducted to evaluate the association between project cost control and performance of water projects in Kericho County, Kenya. The analysis included model summary, ANOVA and beta coefficient and results are indicated in these subsequent sections.

Table 7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.789[a]	.623	.599	.355286

a. Predictors: (Constant), Project cost estimation, Project budgeting, Project Monitoring & Evaluation, Project Expenditure Control

The results shown in Table 7 indicated that project cost estimation, project budgeting, project monitoring and evaluation and project expenditure control are predictors of performance of water projects in Kericho County. The adjusted R square of .599 imply that the four adopted project cost control measures account for 59.9% of the change in performance of the water projects. Thus, 59.9% of changes in performance of the water projects were influenced by project cost estimation, project budgeting, project monitoring and evaluation and project expenditure control. Hence, project cost control improved performance of water projects in Kericho County, Kenya and the remaining 40.1% change in performance of the water projects is explained by other factors outside the scope of the current study.

Table 8: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	22.165	4	5.541	4.0625	.000[b]
	Residual	62.504	48	1.364		
	Total	74.669	52			

a. Dependent Variable: Project Performance
b. Predictors: (Constant), Project cost estimation, Project budgeting, Project Monitoring & Evaluation, Project Expenditure Control

Table 8 indicated that ANOVA analysis was performed at 0.05 significance level and findings showed that F calculated was 4.0625 while F critical was 2.565. The results indicate that the model for analysis is fit and acceptable since the F calculated is greater that the F critical, such that $F_{calculated}$ (4.0625) > $F_{critical}$ value (2.565). The overall significance level of the regression model (sig =.000) imply that at least one of the study variables affects the dependent variable on performance of the water projects. The changes of the performance of the water projects can be explained by the adopted project cost control measures.

Table 9: Regression Coefficient

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	5.567	3.087		1.803	.000
Project Cost Estimation	.993	.618	1.209	1.606	.000
Project Budgeting	1.979	.847	.423	2.336	.032
Project Monitoring & Evaluation	.804	.715	.626	1.124	.000
Project Expenditure Control	2.057	1.476	1.439	1.393	.001

a. Dependent Variable: Project Performance

The adopted model was:

$$Y = 5.567 + .993\ X_1 + 1.979\ X_2 + .804\ X_3 + 2.057\ X_4$$

The findings indicated that when all the four variables of project cost control are valued at zero, then performance of the water projects in Kericho County is valued at 5.567. The findings show that project expenditure control had the highest effect on performance of the water projects, as based on high beta value of (β =2.057, p-value 0.001 < 0.05). These results are echoed by Omotayo, *et al.* (2020) who noted that cost control techniques such as forecasts, cash flow management, presence of a working budget, monitoring the costs of overheads, material, tools, equipment and labor and taking corrective actions whenever variations and signs of cost overruns are identified; these lead to project success. As such, cost control techniques, cost management practices and cost monitoring approaches improve overall project performance. Similarly, Yismalet and Patel (2018) found that control and management of project costs and expenses improve performance outcomes and revenues generated from the project. Abobakr (2018) also shared that estimation, control and management of costs improved the performance of construction projects by reducing cost overruns.

The study findings revealed that aspects of project budgeting had the second largest effect on water projects performance. These findings are based on reported beta values of (β =1.979, p-value 0.032 < 0.05). The results were supported by the researchers Mwaguni, *et al.* (2020) who revealed that budget review, compliance with the budget, involvement of all stakeholders in budget making and budget controls resulted in highly performing research projects. At the same time, Eyibio and Daniel (2020) noted that resource budgeting has a significant effect on success of projects and Kwon and Kang (2019) found that use of accurate and precise budgets led to high performance for the residential projects in the South Korean construction industry.

The study also revealed that project cost estimation had significant effects on water project performance as shared by beta results where (β =.993, p-value 0.000 < 0.05). This finding is echoed by Ahn, *et al.* (2020) noted that accurate cost estimation informs the decision making resulting in successfully completed projects. While Fazil, *et al.* (2021) shared that cost control measures of cost estimation, control practices and assessing incurred project costs helped reduce cost overruns. Kermanshachi, *et al.* (2018) found positive effects of cost estimation as an aspect of cost management leading to success of the projects. Cost estimation of materials needed for each project phase, forecasting and predicting overall project costs, the estimates made with variations and accuracy, help in scheduling project tasks that improve performance of the project.

The study findings also share that project monitoring and evaluation had the least effect on performance of water projects in Kericho County. This is based on beta results reported at (β =.804, p-value 0.000 < 0.05). Just as Sinigi and Kaburu (2020) found that M&E significantly affect performance of the youth employment projects. Alternatively,

Chebet (2021) found positive and significant relationship between M&E and infrastructure projects. The improvement in performance of the projects was informed by the adopted monitoring and evaluation plans, costs, programs, competency of the staffs, assessment and supervision and access, sharing and utilization of data. Mokua and Kimutai (2019) argues that effective use of M&E reports and having trained and experienced monitoring and evaluation staffs is needed for successful delivery of projects.

CONCLUSIONS AND RECOMMENDATIONS

The study concluded that project cost control positively and significantly improved performance of water projects. The project cost control measures assessed in this study resulted in completion of water projects on time and keeping to the budget lines for costs. The quality of the water was good making the beneficiaries including local residents getting satisfaction with the water projects. Adopting the project cost control improved the quality of raw materials used making these water projects sustainable for long.

It was also concluded that the project cost estimation significantly improved performance of the water projects in Kericho County. This was based on accurately estimation of costs, raw materials needed and volume of materials for completion of the water projects. In addition, the estimates included price variation that ensured there were no deficits in funds and resource for smooth implementation of all project activities and plans. Forecasting for all costs and funds enabling work scheduling that improved on timeliness in delivery of the overall water projects.

The study also concluded that project budgeting had a positive and significant effect on performance of the water projects in Kericho County. This was attributed to presence of comprehensive budget that included fixed and variable costs, sources of funds, allocation and utilization of the funds and resources by the various operational units. The budgeting also set guidelines on use of resources and risks to the costing baseline resulting in maximum utilization of funds and other resources in the water projects.

The study conclusions were such that project M&E positively and significantly improved performance of the water projects in Kericho County. The results indicated that monitoring and evaluation function worked by checking execution of plans and getting feedback. There was improved transparency and accountability in resource utilization that enabled the project to keep to budget lines. All stakeholders were involving in monitoring project activities, resource utilization and made decisions concerning key project aspects. However, little was done in tracking project activities from start to end and assessing resource needs across the entire project. For improved performance outcomes, the managers mist track and assess resource needs.

The study further concludes that project expenditure control led to high performance of the water projects in Kericho County. The manager set limits and authorized the allocation and utilization of resources as a way to keep the project within the budget baseline. Cutting down unnecessary and excessive costs was done by implementing the cash flow management, identifying likely areas for cost overruns and avoiding delays. The expenditure control measures resulted in keeping the water projects to budget, acquiring quality raw materials and taking corrective actions to reduce cost overruns leading to quality and sustainable water projects.

The study recommended to the county government of Kericho, other counties, management teams in the water department to adopt project cost control techniques as a means of improving project performance. This will help reduce cost overruns, delays and issues of quality of the finished project and result in improved performance. Management teams of other projects such as construction and building, road and development projects are advised to read and gain insights from this study to implement project cost control techniques.

The study also recommended that the project management and teams improve cost estimation measures that are incurred during the different project phases, and effectively budgeting for material needs for the various functional units of the project. The project managers should also set monitoring and evaluation teams to check on the progress of the project and set expenditure controls for improvement in performance of the projects.

The study also recommended to policy makers at the national and county government level to set guidelines that will reduce the challenges in project performance such as cost overruns, stalling and abandonment of projects. The policies should also endorse and support training programs for contractors, engineers and project managers on management of costs for delivery of quality and timely projects that keep to the stipulated budget.

Suggestions for Further Research

Further research can be done on cost control and performance of other project types such as road or construction projects. This study was done in Kericho County and a similar study can be done in other counties for comparison purposes. There was a residual effect of 40.1% of factors outside the scope of the current study, which future researchers can assess in determining all factors influencing performance of water projects in Kericho County.

REFERENCES

Abdel-Hamid, M., & Abdelhaleem, H. M. (2021). Project cost control using five dimensions building information modeling. *International Journal of Construction Management*, 1-10.

Abobakr, A. (2018). *Necessity of Cost Control Process (Pre & Post Contract Stage) in Construction Projects: Cost Control in Pre & Post Contract*. (Dissertation for Masters' Degree Helsinki Metropolia – University of Applied Sciences)

Adafin, J., Rotimi, J. O., & Wilkinson, S. (2020). Risk impact assessments in project budget development: quantity surveyors' perspectives. *International Journal of Construction Management*, *20*(1), 13-28.

Adjei, K. O., Aigbavboa, C. O., & Thwala, W. D. (2018). The Challenges of Cost Control Practice in the Construction Industry: A Literature Review. In *International Conference on Applied Science and Technology Conference Proceedings, 4* (1), 14-24)

Agarwal, R., Rainey, T. J., Steinberg, T., Rahman, S. A., Perrons, R. K., & Brown, R. J. (2020). LNG regasification–Effects of project stage decisions on capital expenditure and implications for gas pricing. *Journal of Natural Gas Science and Engineering*, *78*, 103291

Ahn, J., Ji, S. H., Ahn, S. J., Park, M., Lee, H. S., Kwon, N., ... & Kim, Y. (2020). Performance evaluation of normalization-based CBR models for improving construction cost estimation. *Automation in Construction*, *119*, 103329

Akeem, L. B. (2017). Effect of cost control and cost reduction techniques in organizational performance. *International Business and Management*, *14*(3), 19-26.

Alaghehband, F. K., Rivard, S., Wu, S., & Goyette, S. (2011). An assessment of the use of transaction cost theory in information technology outsourcing. *The Journal of Strategic Information Systems*, *20*(2), 125-138.

Ali, A. S., & Muathe, S. M. (2020). *Facilitation Strategy and Performance of Donor Assisted Water Supply and Sanitation Development Projects in Wajir County, Kenya* (Doctoral dissertation, Kenyatta University)

Bhorat, H., & Kimani, M. (2018). South Africa's growth trap: The constraints on economic growth and the role of water. *Water Resources Commission*, *2601*(1), 18

Chan, L. L., & Idris, N. (2017). Validity and reliability of the instrument using exploratory factor analysis and Cronbach's alpha. *International Journal of Academic Research in Business and Social Sciences*, *7*(10), 400-410.

Chebet, W. K. (2021). *Role of monitoring and evaluation in development of school infrastructure in Marakwet West Sub-County, Kenya* (Doctoral dissertation, Moi University)

Chege, F. M., & Bowa, O. (2020). Monitoring and evaluation and project performance in Kenya: the case of non-governmental organisations implementing education projects in Nairobi County. *International Academic Journal of Information Sciences and Project Management*, *3*(6), 312-337.

Cheney, G., & Tompkins, P. K. (1987). Coming to terms with organizational identification and commitment. *Communication Studies*, *38*(1), 1-15.

Chipulu, C., Mwanaumo, E., Mwiya, B., Haabazoka, L., & Chisumbe, S. (2019). Accuracy Influencing Factors for Pre-tender Cost Estimates for the Roads Sector in Zambia. In *Construction Industry Development Board Postgraduate Research Conference* (547-555).

Delmon, J. (2021). *Water projects: a commercial and contractual guide*. BRILL

Doyle, L., McCabe, C., Keogh, B., Brady, A., & McCann, M. (2020). An overview of the qualitative descriptive design within nursing research. *Journal of Research in Nursing*, *25*(5), 443-455.

Eyibio, O. N., & Daniel, C. O. (2020). Effective Resource Budgeting as a Tool for Project Management. *Asian Journal of Business and Management (ISSN: 2321-2802)*, *8*(2)

Fazil, M. W., Lee, C. K., & Tamyez, P. F. M. (2021). Cost Estimation Performance in the Construction Projects: A Systematic Review and Future Directions. *International Journal of Industrial Management*, *11*, 217-234.

Feghaly, J., El Asmar, M., & Ariaratnam, S. T. (2021). A comparison of project delivery method performance for water infrastructure capital projects. *Canadian Journal of Civil Engineering*, *48*(6), 691-701.

Gidey, B. (2019). *Staff Perception on Project Cost Management; The Case Of Save The Children Ethiopia, Addis Ababa* (Doctoral dissertation, St. Mary's University).

Hanisch, B., & Wald, A. (2012). A bibliometric view on the use of contingency theory in project management research. *Project Management Journal*, *43*(3), 4-23.

Hussein, Y. N. (2020). *Influence of monitoring practices on projects performance at the water sector trust fund* (Doctoral dissertation, Africa Nazarene University).

Hwang, B. G., Shan, M., Zhu, L., & Lim, W. C. (2020). Cost control in megaprojects: efficacy, tools and techniques, key knowledge areas and project comparisons. *International Journal of Construction Management*, *20*(5), 437-449.

Johnston, B. D. (2014). Sharing data collection instruments. *Injury prevention*, *20*(2), 73-73

Jones, D. E. (2019). Project Cost Monitoring. In *Drug Development* (15-26). CRC Press.

Joseph, F., Egwu, K., Agbo, M., & Nnadi, E. (2020). Project Cost Control for Effective Risk Management in Nigeria Construction Industry. *Inosr Applied Sciences*, *6*(1).

Joseph, O. O., & Caleb, K. C. (2021). Cost Management and Implementation of Construction Projects in Elgeyo Marakwet County, Kenya. *African Journal of Education, Science and Technology*, *6*(4), 133-143.

Karadimos, P., & Anthopoulos, L. (2021). Neural Network Models for Actual Cost and Actual Duration Estimation in Construction Projects: Findings from Greece. *International Journal of Structural and Construction Engineering*, *15*(5), 250-261.

Karunakaran, P., Abdullah, A. H., Nagapan, S., Sohu, S., & Kasvar, K. K. (2018). Categorization of potential project cost overrun factors in construction industry. In *IOP Conference Series: Earth and Environmental Science 140* (1) 012098

Kermanshachi, S., Anderson, S., Molenaar, K. R., & Schexnayder, C. (2018). Effectiveness assessment of transportation cost estimation and cost management workforce educational training for complex projects. In *International Conference on Transportation and Development 2018: Planning, Sustainability, and Infrastructure Systems* (82-93). Reston, VA: American Society of Civil Engineers.

Khodeir, L. M., & El Ghandour, A. (2019). Examining the role of value management in controlling cost overrun [application on residential construction projects in Egypt]. *Ain Shams Engineering Journal*, *10*(3), 471-479.

Kim, Y. W. (2019). The impact of make-ready process on project cost performance in heavy civil construction projects. *Production Planning & Control*, *30*(13), 1064-1071.

Kissi, E., Agyekum, K., Baiden, B. K., Tannor, R. A., Asamoah, G. E., & Andam, E. T. (2019). Impact of project monitoring and evaluation practices on construction project success criteria in Ghana. *Built Environment Project and Asset Management, 9* (3), 364-382

Kosgei, N. K. (2021). Stakeholder Consultation and Implementation Water Projects: A Case of Machakos County, Kenya. *East African Journal of Business and Economics*, *4*(1), 14-21.

Koskela, L., & Howell, G. (2002). The theory of project management: Explanation to novel methods. In *Proceedings IGLC, 10* (1), 1-11

Kwon, H., & Kang, C. W. (2019). Improving project budget estimation accuracy and precision by analyzing reserves for both identified and unidentified risks. *Project Management Journal*, *50*(1), 86-100.

Liu, L., Borman, M., & Gao, J. (2014). Delivering complex engineering projects: Reexamining organizational control theory. *International Journal of Project Management*, *32*(5), 791-802.

Love, P. E., Ahiaga-Dagbui, D. D., Smith, S. D., Sing, M. C. P., & Tokede, O. (2018). Cost profiling of water infrastructure projects. *Journal of Infrastructure Systems*, *24*(4), 04018023

Lu, X. (2019). A study on the cost of production in film project management: Taking small-budget films in China as an example. *Open Journal of Social Sciences*, *7*(03), 75.

Lukale, A. M. (2018). *Determinants of cost overruns in rural roads infrastructure projects in Kenya* (Doctoral dissertation, Strathmore University).

Madu, N., Jimoh, R., Shittu, A., & Tsado, T. (2019). Assessment of Drivers and Challenges of the Use of Cost Control Techniques in Dam Project Delivery in Nigeria. *Environmental Technology and Science Journal, 10*(2), 53-63

Mbugua, M., & Winja, M. (2021). Identification and Ranking of Key Performance Indicators in Building Construction Projects in Kenya. *Engineering, Technology & Applied Science Research*, *11*(1), 6668-6673.

McKenney, S., & Reeves, T. C. (2018). *Conducting educational design research*. Routledge

Mokua, C., & Kimutai, G. (2019). Monitoring and Evaluation Systems and Performance of Public Private Partnership Projects in Nairobi City County, Kenya. *International Journal of Current Aspects*, *3*(6), 124-148.

Morris, P. W. (2002, May). Science, objective knowledge and the theory of project management. In *Proceedings of the Institution of Civil Engineers-Civil Engineering, 150* (2), 82-90) Thomas Telford Ltd

Muema, D. M., & Ngugi, L. (2021). Critical Success Factors and Performance of Water Projects in Machakos County, Kenya. *Journal of Entrepreneurship & Project Management*, *1*(2), 25-37.

Murata, K., Tezel, A., Koskela, L., & Tzortzopoulos, P. (2017). An Application of Control Theory to Visual Management for Organizational Communication in Construction. In *25th Annual Conference of the International Group for Lean Construction* (185-191)

Mutya, T. (2018). Cost control: A fundamental tool towards organisation performance. *Journal of Accounting & Marketing*, *7*(3), 1-11.

Mwaguni, H. J., Mbugua, J., & Rambo, C. (2020). Budgets and Performance of Research Projects in Public Universities in the Coastal Region, Kenya. *European Journal of Business and Management Research*, *5*(3)

Odhiambo, J. O., Wakibia, J., & Sakwa, M. M. (2020). Effects of monitoring and evaluation planning on implementation of poverty alleviation mariculture projects in the coast of Kenya. *Marine Policy*, *119*, 104050

Omotayo, T., Bankole, A., & Olubunmi Olanipekun, A. (2020). An artificial neural network approach to predicting most applicable post-contract cost controlling techniques in construction projects. *Applied Sciences*, *10*(15), 5171.

Oyolla, C. A. (2019). *Factors Influencing Cost of Road Construction Projects Within Selected Urban Areas in Kenya* (Doctoral dissertation, University of Nairobi).

Parker, A., & Manley, A. (2017). Goffman, identity and organizational control: Elite sports academies and social theory. *Sociology of sport journal*, *34*(3), 211-222

Pollack, J. (2007). The changing paradigms of project management. *International journal of project management*, *25*(3), 266-274

Richardson, G. L. (2010). *Project management theory and practice*. Crc Press.

Rindfleisch, A. (2020). Transaction cost theory: past, present and future. *AMS Review*, *10*(1), 85-97.

Romanovich, M. A., & Adel, O. A. (2018). Cost estimation and performance analysis using building information modeling (BIM) for the project in construction industry of Saudi Arabia. In *BIM-моделирование в задачах строительства и архитектуры* (188-192).

Saad, W., & Taleb, A. (2018). The causal relationship between renewable energy consumption and economic growth: evidence from Europe. *Clean Technologies and Environmental Policy*, *20*(1), 127-136.

Seliudi, M. (2019). *"Assessing Factors Causing Delay and Cost Overruns in Construction of Ground Water Project in Dar es salaam* (Doctoral dissertation, The Open University of Tanzania)

Shani, F.Y, Owino, Z.B Ogutu, M Iraki, X.N (2021). Competitive strategies and performance of project based Non-Governmental Organizations in Kenya. *DBA Africa Management Review, 11*(1), 10-18

Sharma, G. (2017). Pros and cons of different sampling techniques. *International journal of applied research*, *3*(7), 749-752

Siele, K. C., & Tibbs, C. Y. (2019). Accounts receivable management and financial performance of Kericho Water and Sanitation Company Limited, Kericho, Kenya. *International Academic Journal of Economics and Finance*, *3*(3), 1-17.

Sinigi, J., & Kaburu, K. (2020). Monitoring and Evaluation and Performance of Youth Employment Projects in Narok County, Kenya. *Journal of Entrepreneurship & Project Management*, *4*(4), 41-55.

Snell, S. A. (1992). Control theory in strategic human resource management: The mediating effect of administrative information. *Academy of management Journal*, *35*(2), 292-327

Taber, K.S. (2018).The Use of Cronbach's Alpha When Developing and Reporting Research Instruments in Science Education. *Res Sci Educ* 48, 1273–1296

Tariq, S., & Zhang, X. (2020). Critical failure drivers in international water PPP projects. *Journal of Infrastructure Systems*, *26*(4), 04020038

Waithira, M. D., & Onjure, C. O. (2020). Influence of Cost Control Practices on Performance of Fish Farming Projects Funded by the Kiambu County Government, Kenya. *The International Journal of Business Management and Technology, 4* (3), 114-130

Wambua, C. M. (2019). *Monitoring And Evaluation Practices And Perfomance Of County Funded Education Projects In Makueni County, Kenya* (Doctoral dissertation, Doctoral dissertation, Kenyatta University)

Wang, Q., Mei, T., Kong, L., & Xiao, Y. (2019). Incentive Compensation Structure for Cost Control of Construction Project Based on IPD-Ish in China. In *ICCREM 2019: Innovative Construction Project Management and Construction Industrialization* (101-108). Reston, VA: American Society of Civil Engineers.

Williamson, O. E. (1979). Transaction-cost economics: the governance of contractual relations. *The journal of Law and Economics*, *22*(2), 233-261

Xue, X., Jia, Y., & Tang, Y. (2020). Expressway Project Cost Estimation With a Convolutional Neural Network Model. *IEEE Access*, *8*, 217848-217866.

Yismalet, A., & Patel, D. (2018). A critical literature review on improving project cost management practice and profitability of domestic contractors. *International Journal of Engineering Technologies and Management Research*, *5*(1), 51-58.

Younas, A., Shahzad, S., & Inayat, S. (2021). Data Analysis and Presentation in Integrative Reviews: A Narrative Review. *Western Journal of Nursing Research*, 01939459211030344