

Project Cost Estimation and Performance of Donor-Funded Public Health Projects in Kenya

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ABSTRACT

Accurate cost estimation is a critical component of project management and plays a significant role in determining the success of donor-funded public health projects. Despite increased funding from development partners, many public health projects in Kenya continue to experience budget overruns, resource inefficiencies, and implementation challenges that negatively affect project performance. This study aimed to examine the relationship between project cost estimation and the performance of donor-funded public health projects in Kenya and to assess the moderating role of Organizational Process Assets on this relationship. Organizational Process Assets were conceptualized as organizational culture, policies, and procedures that support project implementation and decision-making. The study adopted a positivist research philosophy and a descriptive research design. Data were collected from donor-funded public health projects implemented within the Lake Victoria region of Kenya using structured questionnaires and other complementary data collection methods. Quantitative data were analysed using descriptive and inferential statistics, including correlation, regression, and moderation analyses. The findings revealed that project cost estimation was positively and statistically significantly related to project performance ($\beta = 0.519$, $p < 0.05$). The study established that cost estimation explained 26.9% of the variation in project performance ($R^2 = 0.269$), making it the strongest predictor among the project cost management practices examined. The findings indicate that accurate forecasting of project costs enhances resource allocation, minimizes budget deviations, and improves the likelihood of achieving project objectives. The study further established that Organizational Process Assets significantly moderated the relationship between project cost estimation and project performance. The inclusion of Organizational Process Assets increased the model's explanatory power from 33.6% to 56.8%, demonstrating that strong organizational culture, effective policies, and well-defined procedures enhance the effectiveness of cost estimation practices and improve project outcomes. The study concludes that accurate cost estimation is a key determinant of performance in donor-funded public health projects. It further concludes that Organizational Process Assets strengthen the contribution of cost estimation to project success by promoting consistency, accountability, knowledge sharing, and informed decision-making. The study recommends strengthening institutional cost-estimation frameworks, enhancing staff capacity for project costing, and investing in robust organizational systems and procedures to improve the performance and sustainability of donor-funded public health projects.

Keywords: Cost Estimation, Organizational Process Assets, Project Performance, Donor-Funded Public Health Projects, Kenya.

Date of Submission: 08-09-2026

Date of Acceptance: 17-09-2026

I. INTRODUCTION

Accurate project cost estimation is critical for the successful execution of donor-funded health projects, which often operate with limited financial resources. Accurate cost estimation is essential for predicting the monetary value of project activities, resources, and deliverables, enabling realistic budgeting. Previous studies indicate that improved cost estimation methods have led to an average 15% reduction in cost overruns in donor-funded health projects (Smith & Jones, 2023).

Donor-funded health projects play a critical role in improving healthcare outcomes and enhancing the well-being of communities in Kenya. The growth of the Public Benefit Organization (PBO) sector has significantly contributed to the implementation of these projects. According to the Public Benefit Organizations Regulatory Authority (PBORA, 2025), Kenya had approximately 14,687 registered PBOs as of 2025, and the sector received KES 246.7 billion in funding during the 2024/2025 financial year, up from KES 210 billion in 2023/2024, reflecting its growing contribution to national development. The sector supports key areas such as health, education, humanitarian assistance, environmental conservation, and community development. The health sector remains one of the largest beneficiaries of donor funding, with earlier reports indicating that nearly 50% of donor resources channeled through NGOs were allocated to health projects (National Council of NGOs Bureau [NCB], 2021). Despite the continued increase in donor funding, many health projects fail to achieve their intended outcomes due to weaknesses in project management practices, including inadequate planning, poor cost management, weak monitoring and evaluation systems, and limited stakeholder involvement, which negatively affect project performance (Mobegi et al.2019).

Project cost estimation techniques are increasingly gaining visibility and importance for performing organizations. The use of best project cost estimation techniques leads to project success, added value to project deliverables, and improved project management activities (Anabela et al.2019). Project cost estimation practices spanning the project life cycle are crucial to determining a project's performance and success. There is a significant correlation between project cost estimations and the performance of donor-funded public health projects. Additionally, when organizational process assets are set or made available to the project team, they influence, and even change, the project cost management practices that the project team and managers deploy. These practices include project cost planning, project cost estimation, Project budgeting, and cost control and monitoring (Stephen et al.2019).

1.2 Statement of the Problem

Public health projects play a critical role in promoting disease prevention, improving health outcomes, and advancing national development goals, particularly in low and middle-income countries like Kenya. These projects are designed to address widespread health challenges, including reducing HIV/AIDS prevalence, controlling malaria, improving maternal and child health, promoting family planning, and expanding access to clean water and sanitation services (Obare et al.2018). Despite their significance, the performance of many donor-funded public health projects in Kenya remains suboptimal due to poor cost management practices. Donor contributions account for approximately 70% of Kenya's public health budget, while the national government contributes only about 30% (Obare et al.2018). This over-reliance on donor support increases the pressure on project implementers to demonstrate efficiency, accountability, and measurable outcomes. Unfortunately, persistent cost-related challenges undermine the delivery and sustainability of these crucial health interventions.

Major issues affecting donor-funded public health projects in Kenya include frequent cost overruns, poor cost planning, inaccurate cost estimates and budgeting, and weak cost monitoring systems (Onyango & Lubembe, 2019). According to Musiega et al. (2023), 54% of the projects either exceed their allocated budgets or fail to deliver key outputs within the planned financial framework. With 58% of the projects aimed at HIV prevention and maternal health services often experiencing budget shortfalls and poor cost estimates, this contributes to a 43% delay in the procurement of essential medical supplies, limits outreach efforts, and compromises the quality-of-service delivery (Musiega et al.2023).

In the Nyanza and Western regions, for example, HIV prevalence rates remain significantly high at 5.6% and 3%, respectively, compared to the national average of 3.46% due to cost management inefficiency (Obare et al.2018). This indicates gaps in the timely and effective delivery of HIV prevention and treatment interventions, partly due to resource mismanagement. Additionally, access to improved water sources remains critically low, with only 40% of households in Siaya, Homabay, Busia, and Kakamega counties having reliable access to safe water (SNV, 2018). Poorly managed water and sanitation projects often lead to unfinished or dysfunctional facilities, exposing communities to preventable diseases and further straining the public health system. Additionally, maternal and neonatal mortality rates remain high in certain regions due to delayed project implementation, budget constraints, and poor planning in the construction and equipping of health facilities (World Health Organization, 2022).

Despite the recognized importance of project cost estimation practices in enhancing project success, there is a limited body of empirical research in the Kenyan context that specifically examines the relationship between cost estimation and the performance of donor-funded public health projects. Previous studies have primarily focused on the general performance of donor-funded public health projects, without in-depth analysis of cost estimation (Musiega et al.2023; Onyango & Lubembe, 2019). This presents a critical knowledge gap that this study seeks to address.

1.3 Specific Objective

- i. To examine the relationship between cost estimation and performance of donor-funded public health projects in Kenya.
- ii. To examine the moderating role of organizational process assets and performance of donor-funded public health projects in Kenya.

1.4 Research Hypotheses

- i. H01: There is no significant relationship between cost estimation and the performance of donor-funded public health projects in Kenya.
- ii. H02: There is no significant moderating role of organizational process assets on the relationship between project cost management practices and the performance of donor-funded public health projects in Kenya.

2.1 THEORETICAL FRAMEWORK

The theory adopted in this research paper come from the discipline of project management to bring new dimensions to the selected topic to light. The theory linked to project cost estimation was Estimation Theory. This theory can be traced back to foundational works in mathematical statistics by Jacques Bernoulli (1713), Pierre-Simon Laplace (1774), and Daniel Bernoulli (1778). However, the foundations of modern estimation theory are primarily attributed to Ronald A. Fisher. In 1912, Fisher introduced the method of maximum likelihood estimation, and in 1922, he published a seminal paper clarifying the nature and objectives of estimation.

In this context, estimation theory identifies cost estimation as a critical component of effective project cost management, providing the basis for cost budgeting, resource allocation, and risk management. Accurate cost estimation enables project managers to forecast financial requirements, identify potential cost overruns, and make informed decisions to improve the performance of donor-funded public health projects. The theory also highlights the importance of estimation tools, including parametric, analogous, and bottom-up approaches, and evaluates their relevance to project outcomes. Furthermore, estimation theory underscores the need to integrate cost analysis with project scheduling and risk assessment to establish a comprehensive cost-planning framework (Blessing & Ifeanyi, 2025).

2.2 Empirical Review

According to Benedict et al. (2022), in their study titled “Project Cost Estimation: Issues and the Possible Solutions in Donor-Funded Projects,” they noted that establishing a comprehensive project budget based on accurate cost estimation techniques is a critical prerequisite for project success, as it enhances resource allocation, cost control, and the likelihood of achieving project objectives. They also noted that, after estimation, the project budget can be modified as the project progresses from the conceptual phase to the “check estimate” phase.

Another study done by (Ike et al.2022), on the relationship between Cost Estimation and Performance of donor-funded public health projects in Abuja, where the purpose of the study was to examine the relationship between Cost Estimation and Performance of donor-funded public health projects in Selected Construction Firms in Abuja, using multiple regression analysis, they found out that there exists a statistically significant relationship between the cost Estimation such as bottom up cost estimation and parametric cost estimation and performance of donor-funded public health projects. Based on this result, they pointed out that project managers need to be cognizant of this relationship and focus on developing estimates and schedules using modern project management tools that would project accurate costs and schedules.

A similar study was conducted by Babatunde et al. (2022). Titled “A Systematic Review on Development of a Framework for Construction Project Cost Estimation: A Case Study of Nigeria”, this study did not show the essential interest in cost estimation techniques, which is becoming an emerging problem within the project area that badly requires attention to curtail the risk across the project life cycle. This, therefore, needs concerted efforts.

2.3 Conceptual Framework

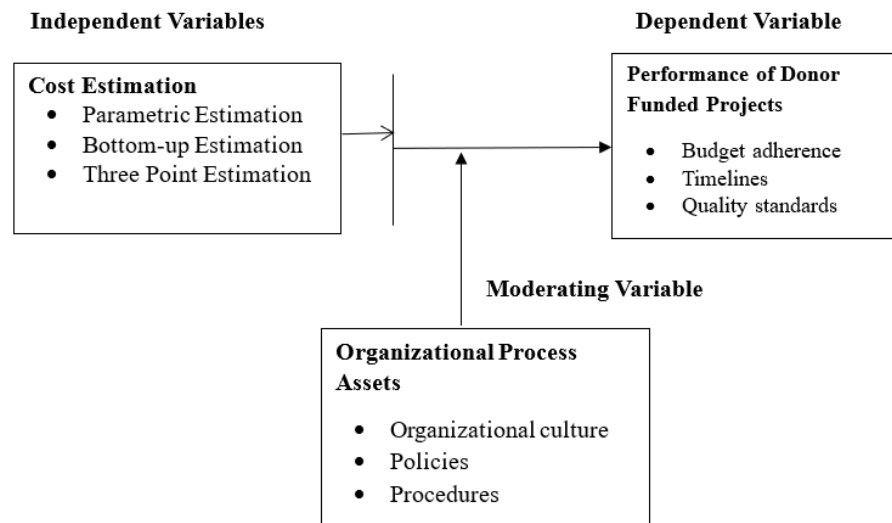


Figure 2. 1: Conceptual Framework

Figure 2.1 illustrates the hypothesized relationship between project cost estimation and the performance of donor-funded public health projects. The framework proposed that cost estimation is positively related to the performance of donor-funded public health projects, as measured by budget adherence, project timelines, and quality standards. The framework further proposed that Organizational Process Assets, represented by organizational culture, policies, and procedures, moderate these relationships by strengthening the effectiveness of project cost estimation. Consequently, projects operating within organizations with strong Organizational Process Assets are expected to achieve higher performance than projects implemented in organizations with less-developed institutional systems.

III. RESEARCH METHODOLOGY

This study adopted a positivist research philosophy, a methodological paradigm in descriptive research that applies principles of the natural sciences to investigate social phenomena. The study targeted a population of 305 donor-funded public health projects completed within the past five years across counties in the Lake Victoria region. A simple random sampling technique was employed to select 173 projects. The study further adopted a triangulation approach to data collection. Primary data were collected using questionnaires, interviews, and non-participant observations. In addition, secondary data were utilized to complement and validate the primary findings. Document analysis was conducted on project reports, financial statements, audit reports, and government health sector performance reviews. Research assistants were involved in data collection and received adequate training to ensure efficient, effective data collection. The data collection tools were pre-tested and revised to align with the study's objectives and scope. Questionnaires were administered using the drop-and-pick method, allowing respondents sufficient time to complete them. Secondary data were collected to complement and triangulate the results. These data were retrieved from project financial reports, performance audits, evaluation documents, organizational records, academic journals, and previous research studies relevant to the topic. The materials were obtained through library research and reputable online databases. The selection of secondary data was guided by relevance, credibility, and recency to ensure the use of reliable and authoritative information.

Key informants, including top management staff, project managers, and key stakeholders, were purposively selected to participate in in-depth interviews to gain insights into how project cost management practices influence the performance of donor-funded health projects in Kenya. Each key informant was interviewed individually to allow for detailed analysis while ensuring confidentiality. Document analysis was conducted through a systematic review of project financial reports, performance audits, monitoring and evaluation documents, organizational policies, and donor progress reports related to donor-funded public health projects in Kenya. These documents were obtained from implementing agencies, donor organizations, and government health departments, with an emphasis on records that provide detailed insights into cost management practices, project timelines, budget adherence, and performance outcomes.

3.1 Pilot Study Results

The questionnaires were pre-tested to ensure they were practicable, pertinent, reliable, and effective (Cooper & Schindler, 2022). Pilot testing was the first phase in data collection under the research process. This test was done to identify any weaknesses in the design and instrumentation, according to Saleemi (2017). The

study selected 10% of the sample, which was 17 projects, according to Mugenda and Mugenda (2019). The pilot test also assessed the data for applicability, interpretability, and effectiveness in addressing the study problem. However, the pilot test results were not included in the results.

3.1.1 Reliability of Research Instrument

Cronbach's Alpha was used to assess the questionnaire's reliability. The overall Cronbach's alpha was 0.799, which was considered good, and the research instrument was therefore found to be reliable for the current study. Kimaku, Omwenga and Nzulwa (2019) stated that the reliability of the constructs was acceptable based on the rule that when Cronbach's alpha value is greater than 0.9, it is considered excellent; when the value is 0.8, it is deemed very good, and when it is 0.7, it is rated as good.

Table 3.1: Overall Reliability Coefficients (Cronbach Alpha) of the Independent Variables.

S/No.	Variable	No. of Items	Cronbach Alpha Value	Remarks
2	Cost Estimation	06	0.745	Good
3	Performance of donor-funded public health projects.	06	0.852	Very Good
	AVERAGE	06	0.799	Good

3.1.1 Validity for Cost Estimation

To test the construct validity of Cost Estimation, the (06) measurement items were equally subjected to factor loadings. The study results are shown in Table 3.2. Based on the results, all measurement items had factor loadings above the minimum threshold of 0.40, indicating they are sufficient for analysis.

Table 3.2: Factor Loadings for Cost Estimation Measurement items

Cost Estimation Measurement items	Initial	Extraction
There is a quality issue with the available data for cost estimation.	1.000	.974
There are clearly defined scope control procedures in place to help reduce cost estimation errors caused by scope changes.	1.000	.981
The project team always identifies and analyzes potential project risks that can affect project costs and puts in place a plan to mitigate and implement risk responses	1.000	.801
To avoid human errors, such as bias, optimism, pressure, and experience, the project uses a systematic and transparent approach to cost estimation.	1.000	1.000
There is consistency in cost estimation, which is adopted by the project	1.000	.974
Accurate cost estimation techniques reduce cost overrun	1.000	.981

Extraction Method: Principal Component Analysis

3.1.2 Validity for: Organizational Process Assets

To test the validity of Organizational Process Assets, the variable was measured using (06) measurement items. The factor loadings for the measurement items are shown in Table 3.2. From the results, all measurement items had factor loadings above the minimum threshold of 0.40, indicating they are sufficient for analysis.

Table 3.2: Factor Loadings for Organizational Process Assets Measurement items

Organizational Process Assets Measurement items	Initial	Extraction
The organization promotes a culture of accountability in the management of project resources.	1.000	.845
The organization has well-established project management policies that guide project implementation	1.000	.769
Standard operating procedures are available and consistently followed during project implementation	1.000	.783

3.1.3 Validity for the performance of donor-funded health projects in Kenya.

To test the validity of the performance of donor-funded health projects in Kenya, the variable was measured using (06) measurement items. The factor loadings for the measurement items are as shown in Table 3.3. From the results, all measurement items had factor loadings above the minimum threshold of 0.40, indicating they are sufficient for analysis.

Table 3.3: Factor Loadings for Performance of donor-funded public health projects in Kenya

Performance of donor-funded health projects in Kenya	Initial	Extraction
Effective management of budgets, timelines, and quality standards improves the overall performance of donor-funded projects.	1.000	.945
The project has involved numerous stakeholders in its exit strategy.	1.000	.879
Budget adherence influences the performance of donor-funded projects.	1.000	.882
Work schedules are completed within set timelines.	1.000	.848
Deliverables always meet the quality acceptance standards threshold set by the key stakeholders.	1.000	.824
The cost performance index and schedule index are primarily used to monitor the performance of donor-funded public health projects.	1.000	.821

Extraction Method: Principal Component Analysis.

IV. RESEARCH FINDINGS AND DISCUSSION

The study sample comprised 173 participants, of whom 165 completed and returned the questionnaires, resulting in a response rate of 95.1%. This response rate meets the criteria suggested by Mugenda and Mugenda (2013) for optimal statistical analysis, as they recommend a response rate exceeding 70%. Similarly, Chopra et al. (2018) consider a return rate of 50% acceptable for analysis and publication, 60% good, and anything exceeding 70% very good.

4.1 Descriptive Analysis

4.1.1 Cost Estimation

The first objective of this study was to examine the relationship between cost estimation and the performance of donor-funded public health projects in Kenya. Six research questions were posed to the respondents. Table 4.1 presents the descriptive statistics results generated for Cost Estimation. To obtain information about the first independent variable, Cost Estimation, numerous statements were asked, and the respondents were required to provide feedback on a Likert scale of one (1) to five (5), with 1 being strongly disagree, 2 being disagree, 3 being neither agree nor disagree, 4 being agree, and 5 being strongly agree to the statements.

On the statement “There is quality of available data for cost estimation” 15.1% strongly disagreed to the statement, 13.9% of the respondents disagreed to the statement, 35.5% of the respondents neither agreed nor disagreed to the statement, 24.7% of the respondents agreed to the statement whereas 10.8% of the respondents strongly agreed to the statement, with a mean of 3.02 and standard deviation 1.195.

On the statement “There is clearly define scope control procedures in place to help reduce cost estimation errors that may occur due to scope change” 13.5% strongly disagreed to the statement, 8.8% of the respondents disagreed to the statement, 10.8% of the respondents neither agreed nor disagreed to the statement, 43.8% of the respondents agreed to the statement whereas 24.1% of the respondents strongly agreed to the statement, with a mean of 3.54 and standard deviation 1.306. On the statement “Project team always identify and analyze potential project risks that can affect project costs and put in place a plan to mitigate and implement risk responses”, 5.2% strongly disagreed to the statement, 23.9% of the respondents disagreed to the statement, 19.1% of the respondents neither agreed nor disagreed to the statement, 20.7% of the respondents agreed to the statement whereas 31.1% of the respondents strongly agreed to the statement, with a mean of 3.49 and standard deviation 1.291.

Regarding the statement “To avoid human errors, such as bias, optimism, pressure, and experience during cost estimation, the project has in place a systematic and transparent approach to cost estimation”, 4.8% strongly disagreed to the statement, 15.9% of the respondents disagreed to the statement, 7.6% of the respondents neither agreed nor disagreed to the statement, 47.0% of the respondents agreed to the statement whereas 24.7% of the respondents strongly agreed to the statement, with a mean of 3.71 and standard deviation 1.145.

On the statement “There is consistency in cost estimation which is adopted by the project” 4.8% strongly disagreed to the statement, 29.9% disagreed to the statement, 5.2% of the respondents neither agreed nor disagreed to the statement, 41.8% of the respondents agreed to the statement whereas 18.3% of the respondents strongly agreed to the statement, with a mean of 3.39 and standard deviation 1.223.

On the statement “Accurate cost estimation techniques reduce cost overrun”, 4.2% strongly disagreed to the statement, 23.9% of the respondents disagreed to the statement, 19.1% of the respondents neither agreed nor disagreed to the statement, 20.7% of the respondents agreed to the statement whereas 32.1% of the respondents strongly agreed to the statement, with a mean of 3.49 and standard deviation 1.291. The overall mean score for the variable was **3.58**, and a standard deviation of 1.21 indicated that the majority of respondents agreed with the statements on Cost Estimation regarding the performance of donor-funded public health projects in Kenya.

Table 4.1: Cost Estimation frequencies

Cost Estimation	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Mean	Std. Dev.
There is a quality issue with the available data for cost estimation.	15.1	13.9	35.5	24.7	10.8	3.02	1.195
There are clearly defined scope control procedures in place to help reduce cost estimation errors arising from scope changes.	13.5	8.8	10.8	43.8	24.1	3.54	1.306
The project team always identifies and analyzes potential risks that could affect project costs, and puts in place a plan to mitigate them and implement risk responses.	5.2	23.9	19.1	20.7	31.1	3.49	1.291
To avoid human errors, such as bias, optimism, pressure, and experience during cost estimation, the project has in place a systematic and transparent approach to cost estimation	4.8	15.9	7.6	47.0	24.7	3.71	1.145
There is consistency in the cost estimation adopted by the project.	4.8	29.9	5.2	41.8	18.3	3.39	1.223
Accurate cost estimation techniques reduce cost overrun	4.2	23.9	19.1	20.7	32.1	3.69	1.391

4.1.2 Organization process assets

The second objective of this study was to assess the moderating role of Organization process assets on the relationship between Project Cost management practices and performance of donor-funded public health projects in Kenya. Six research questions were posed to the respondents. Table 4.2 presents the descriptive statistics results generated for Organization Process Assets. To obtain information about the first independent variable, Organization Process Assets, various statements were asked. The respondents were required to provide feedback on the statements using a Likert scale from 1 (strongly disagree) to 5 (strongly agree). On the statement “The organization promotes a culture of accountability in the management of project resources,” 4.8% strongly disagreed with the statement, 13.5% of the respondents neither agreed nor disagreed with the statement, 63.3% of the respondents agreed with the statement, whereas 18.3% of the respondents strongly agreed with the statement, with a mean of 3.90 and a standard deviation of 0.862.

On the statement “Knowledge sharing and lessons learned are encouraged and applied in project implementation.” 2.8% strongly disagreed with the statement, 2.0% of the respondents disagreed with the statement, 4.8% of the respondents neither agreed nor disagreed with the statement, 76.1% of the respondents agreed with the statement, whereas 14.3% of the respondents strongly agreed with the statement, with a mean of 3.97 and standard deviation 0.723. On the statement “The organization has well-established project management policies that guide project implementation”, 12.7% strongly disagreed with the statement, 5.6% of the respondents disagreed with the statement, 12.0% of the respondents neither agreed nor disagreed with the statement, 44.2% of the respondents agreed with the statement, whereas 25.5% of the respondents strongly agreed with the statement, with a mean of 3.64 and standard deviation 1.274.

Regarding the statement “Financial and procurement policies support effective management of donor-funded projects,” 20.7% disagreed with the statement, and 25.9% of the respondents neither agreed nor disagreed with the statement, 37.1% of the respondents agreed with the statement, whereas 16.3% of the respondents strongly agreed with the statement, with a mean of 3.49 and a standard deviation of 0.997. On the statement “Standard operating procedures are available and consistently followed during project implementation,” 2.8% strongly disagreed with the statement, 12.4% disagreed with the statement, 29.5% of the respondents neither agreed nor disagreed with the statement, 37.5% of the respondents agreed with the statement, whereas 17.9% of the respondents strongly agreed with the statement, with a mean of 3.55 and standard deviation 1.012. On the statement “Project monitoring, reporting, and change-control procedures are clearly defined and regularly applied,” 12.4% of the respondents neither agreed nor disagreed with the statement, 48.6% of the respondents agreed with the statement, whereas 39.0% of the respondents strongly agreed with the statement, with a mean of 4.27 and a standard deviation of 0.667.

The overall mean score for the variable was **3.86**, and a standard deviation of **0.898** indicated that the majority of respondents agreed with the statements on Organization Process Assets regarding the performance of donor-funded public health projects in Kenya.

The study supports the finding of Munywoki and Gakuu (2018) that policies are provided to support the successful implementation of the project, ensure integrity in project management processes, and hence improve organization performance.

Table 4. 2: Organization Process Assets frequencies

Organization Process Assets	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Mean	Std. Dev.
The organization promotes a culture of accountability in the management of project resources	4.8	-	13.5	63.3	18.3	3.90	0.862
Knowledge sharing and lessons learned are encouraged and applied in project implementation	2.8	2.0	4.8	76.1	14.3	3.97	0.723
The organization has well-established project management policies that guide project implementation	12.7	5.6	12.0	44.2	25.5	3.64	1.274
Financial and procurement policies support effective management of donor-funded projects.	-	20.7	25.9	37.1	16.3	3.49	0.997
Standard operating procedures are available and consistently followed during project implementation	2.8	12.4	29.5	37.5	17.9	3.55	1.012
Project monitoring, reporting, and change-control procedures are clearly defined and regularly applied.	-	-	12.4	48.6	39.0	4.27	0.667

4.1.3 Performance of donor-funded public health projects

The dependent variable in this study was the performance of donor-funded public health projects. Six research questions were posed to the respondents. Table 4.3 presents the descriptive statistics results generated for the Performance of donor-funded public health projects. To obtain information about the first dependent variable, Performance of donor-funded public health projects, various statements were asked. The respondents were required to provide feedback on the statements using a Likert scale from 1 (strongly disagree) to 5 (strongly agree). On the statement “Effective management of budget, timelines, and quality standards improve the overall performance of donor funded project” 4.8% strongly disagreed to the statement, 13.5% of the respondents neither agreed nor disagreed to the statement, 63.3% of the respondents agreed to the statement whereas 18.3% of the respondents strongly agreed to the statement, with a mean of 3.90 and standard deviation 0.862.

On the statement “The project has involved numerous stakeholders in its exit strategy.” 2.8% strongly disagreed with the statement, 2.0% of the respondents disagreed with the statement, 4.8% of the respondents neither agreed nor disagreed with the statement, 76.1% of the respondents agreed with the statement, whereas 14.3% of the respondents strongly agreed with the statement, with a mean of 3.97 and standard deviation 0.723. On the statement “Budget adherence influences the performance of donor funded projects”, 12.7% strongly disagreed to the statement, 5.6% of the respondents disagreed to the statement, 12.0% of the respondents neither agreed nor disagreed to the statement, 44.2% of the respondents agreed to the statement whereas 25.5% of the respondents strongly agreed to the statement, with a mean of 3.64 and standard deviation 1.274. Regarding the statement “Work schedules are completed within set timelines”, 20.7% disagreed with the statement, and 25.9% of the respondents neither agreed nor disagreed with the statement, 37.1% of the respondents agreed with the statement, whereas 16.3% of the respondents strongly agreed with the statement, with a mean of 3.49 and a standard deviation of 0.997. On the statement “Deliverables always meet the quality acceptance standards set by the key stakeholders” 2.8% strongly disagreed to the statement, 12.4% disagreed to the statement, 29.5% of the respondents neither agreed nor disagreed to the statement, 37.5% of the respondents agreed to the statement whereas 17.9% of the respondents strongly agreed to the statement, with a mean of 3.55 and standard deviation 1.012. On the statement “Cost performance index & schedule index are mainly used for monitoring performance of donor-funded public health projects,” 12.4% of the respondents neither agreed nor disagreed with the statement, 48.6% of the respondents agreed with the statement, whereas 39.0% of the respondents strongly agreed with the statement, with a mean of 4.27 and a standard deviation of 0.667.

Table 4:3: Performance of donor-funded public health projects frequencies

Performance of donor-funded public health projects	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Mean	Std. Dev.
Effective management of budget, timelines, and quality standards improves the overall performance of donor-funded projects	4.8	-	13.5	63.3	18.3	3.90	0.862
The project has involved numerous stakeholders in its exit strategy.	2.8	2.0	4.8	76.1	14.3	3.97	0.723
Budget adherence influences the performance of donor-funded projects.	12.7	5.6	12.0	44.2	25.5	3.64	1.274
Work schedules are completed within set timelines.	-	20.7	25.9	37.1	16.3	3.49	0.997
Deliverables always meet the quality acceptance standards set by the key stakeholders.	2.8	12.4	29.5	37.5	17.9	3.55	1.012
The cost performance index and schedule index are primarily used to monitor the performance of donor-funded public health projects.	-	-	12.4	48.6	39.0	4.27	0.667

4.2 Inferential Analysis

4.2.2 Analysis of Variance

The first objective of the study was to determine the influence of Cost Estimation on the performance of donor-funded public health projects in Kenya. The corresponding hypothesis was: H02: Cost Estimation has no significant influence on the performance of donor-funded public health projects in Kenya.

The analysis of variance was used to assess whether the regression model was a good fit to the data. Based on the analysis of variance (ANOVA) results in Table 4.19, the study found that $\text{Prob} > F(1,51) = 0.000$ was less than the selected 0.05 level of significance. This suggests that the model, as constituted, was fit to predict the performance of donor-funded public health projects in Kenya. Further, the calculated F (341.6) from the table was greater than the critical F (3.91) from the F-distribution tables, supporting the finding that Cost Estimation can predict the performance of donor-funded public health projects in Kenya.

Table 4.4: ANOVA for Cost Estimation

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	51.159	1	51.159	341.06	.000 ^b
Residual	23.817	164	0.15		
Total	74.976	165			

a. Dependent Variable: Performance of donor-funded public health projects in Kenya

b. Predictors: (Constant), Cost Estimation

From the results in Table 4.4, the following regression model was fitted.

$$Y = 1.792 + 0.497 X_2 \text{ (} X_2 \text{ is Cost Estimation)}$$

The coefficient results showed that the constant was 1.792, suggesting that if Cost Estimation were held constant at zero, the Performance of donor-funded public health projects in Kenya would be 1.792 units. In addition, the results showed that the Cost Estimation coefficient was 0.497, indicating that a 1-unit increase in Cost Estimation would be associated with a 0.497 increase in the Performance of donor-funded public health projects in Kenya. It was also noted that the P-value for Cost Estimation coefficient was 0.000, which is less than the set 0.05 significance level, indicating that Cost Estimation was significant. Based on these results, the study rejected the null hypothesis and accepted the alternative. There was strong statistical evidence that Cost Estimation was positively and significantly associated with the performance of donor-funded public health projects in Kenya.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.792	.188		9.523	.000

Cost Estimation	.479	.046	.519	10.462	.000
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a. Dependent Variable: Performance of donor-funded public health projects in Kenya

Table 4.20: Beta Coefficients for Cost Estimation

From the model summary findings in Table 4.21, the R-squared for the relationship between Cost Estimation and Performance of donor-funded public health projects in Kenya was 0.269; this is an indication that at 95% confidence interval, 26.9% variation in Performance of donor-funded public health projects in Kenya can be attributed to changes in Cost Estimation. However, the remaining 73.1% variation in the Performance of donor-funded public health projects in Kenya suggests that factors beyond Cost Estimation explain their Performance.

Table 4.21: Model Summary for Cost Estimation

Model	R	R Square	Adjusted R-Square	Std. Error of the Estimate
1	.519 ^a	.269	.267	.68365

a. Predictors: (Constant), Cost Estimation

The second objective of the study was to determine the moderating role of the Organizational process asset on the relationship between Project Cost Estimation and the Performance of donor-funded public health projects in Kenya. Moderation occurs when the relationship between the dependent variable and the independent variables depends on a third variable (the moderating variable). The relationship this variable has is termed an interaction, as it affects the direction or strength of the relationship between the dependent and independent variables. To achieve the fifth research objective, the study conducted a moderating-effect regression analysis. This (moderating effect regression analysis) also guided the study in testing the fifth research hypothesis. Organizational process asset (M) was introduced as the moderating variable.

H₀: Organizational process asset has no significant moderating role on the relationship between Project cost management practice and Performance of donor-funded public health projects in Kenya.

The model for the moderating role was:

$$Y = \beta_0 + \beta_1(X \cdot M) + \beta_2(X \cdot M) + \beta_3(X \cdot M) + \beta_4(X \cdot M) + \epsilon$$

Where Z is the moderator (Organizational process asset), X₁ – X₄ are the independent variables

The study combined all four variables (Cost planning, Cost Estimation, Cost Budgeting and Cost Control) to form a new variable X. The study then used stepwise regression to establish the moderating role of Organizational process asset (M) on the relationship between independent variable (X) and Performance of donor-funded public health projects in Kenya (Y).

From the analysis of variance findings in Table 4.5, the F-calculated values were 491.02 for the first model and 551.93 for the second model. Since the F-calculated values for the two models exceeded the F-critical values, 3.890 (first model) and 2.651 (second model), the two models were a good fit to the data. Hence, they could be used to predict the moderating role of the Organizational process asset on the Performance of donor-funded public health projects in Kenya.

Table 4. 5: ANOVA for the Moderation role

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	63.832	1	63.832	491.02	.000 ^b
	Residual	21.675	164	0.13		
	Total	85.507	165			
2	Regression	107.958	3	35.986	551.93	.000 ^c
	Residual	13.622	209	0.0652		
	Total	121.58	165			

a. Dependent Variable: Performance of donor-funded public health projects in Kenya

b. Predictors: (Constant), Organizational process asset, Cost planning * Organizational process asset, Cost Estimation* Organizational process asset, information management security * Organizational process asset, Cost Budgeting * Organizational process asset, Cost Control * Organizational process asset

Further, by substituting the beta values as well as the constant term from the coefficient's findings for the first step regression modelling, the following regression model was fitted:

$$Y = 1.387 + 0.608 X$$

Where X is the project cost management practice

The findings show that when the project cost management practice is held constant at zero, the performance of donor-funded public health projects in Kenya remains at 1.387. The findings also show a statistically significant

relationship between project cost management practices and the performance of donor-funded public health projects in Kenya, as indicated by a regression coefficient of 0.608 (p-value = .000).

By substituting the beta values as well as the constant term from model 2 emanating from the second step in regression modeling, the following regression model was fitted:

$$Y = 3.876 + 0.220 X + 0.325 M + 0.283 X*M$$

Where X is Project cost management practice; M is Organizational process asset, and X*M is the interaction term between Project cost management practice and Organizational process asset.

The findings show that when the Project cost management practice, Organizational process asset and interaction (X*M) are held constant at zero, the performance of donor-funded public health projects in Kenya is at a constant value of 3.876. The model also indicated that Project cost management practices had a positive and statistically significant relationship with the performance of donor-funded public health projects in Kenya, as shown by a regression coefficient of 0.220 (p-value = 0.002). On the other hand, the interaction between Project cost management practice and Organizational process asset (X*M) also had a positive and significant relationship with the Performance of donor-funded public health projects in Kenya, as shown by a regression coefficient of 0.283 (p-value = 0.000).

It is therefore seen that Project cost management practice, on its own, has a 22% relationship with the Performance of donor-funded public health projects in Kenya. However, when interacting with the Organizational process asset, the effect is 28.3%. This clearly indicates that introducing the Organizational process asset as a moderating variable positively influences the performance of donor-funded public health projects in Kenya. The study therefore rejects the null hypothesis and accepts the alternative that the Organizational process asset has a significant moderating role in the relationship between Project cost management practice and Performance of donor-funded public health projects in Kenya.

Table 4.6: Beta Coefficients for Moderation Role

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.387	.194		7.163	.000
	Project cost management practice	.608	.050	.580	12.260	.000
	(Constant)	3.876	1.009		3.841	.000
2	Project cost management practice	.220	.067	.782	3.284	.002
	Organizational process asset	.325	.048	.310	6.748	.000
	Interaction (X*M)	.283	.065	1.661	4.357	.000

a. Dependent Variable: Performance of donor-funded public health projects in Kenya

From the model summary findings in Table 4.7, the first model for which is the regression between Performance of donor funded public health projects in Kenya (X) without moderator, Organizational process asset (M) and interaction, the value of R-squared was 0.336 which suggests that 33.6% change in Performance of donor funded public health projects in Kenya can be explained by changes in Project cost management practice. The p-value for the first model (0.000) was less than the selected significance level (0.05), indicating that the model was significant. In the second model, which included components of Project cost management practice, Organizational process asset and Performance of donor-funded public health projects in Kenya (X*M) as predictors, the R-squared was 0.568. This implies that the introduction of Organizational process asset in the second model led to a 0.232 increase in r-squared, indicating that Organizational process asset positively moderates the Performance of donor-funded public health projects in Kenya.

Table 4.7: Model Summary for Moderation Role

Model	R	R Square	Adjusted R-Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.580 ^a	.336	.334	.65170	.336	150.295	1	95	.000
2	.754 ^b	.568	.564	.52727	.232	79.360	3	93	.000

a. Predictors: (Constant), Project cost management practice

b. Predictors: (Constant), Project cost management practice, Organizational process asset , Interaction (X*M)

V. DISCUSSION & CONCLUSION OF THE STUDY

Based on the findings, Cost estimation had the strongest positive relationship with the performance of donor-funded public health projects. Using the regression coefficient, Cost estimation had a significant positive effect on project performance (B = 0.479, β = 0.519, $p < 0.001$). A one-unit increase in Cost Estimation was associated with a 0.479-unit improvement in the performance of donor-funded public health projects in Kenya. This significant relationship underscores the importance of accurate, detailed cost estimation during the project planning phase. By precisely forecasting the costs of different project activities, managers can allocate resources more effectively, avoid budget overruns, and minimize financial shortfalls.

The R-squared value of 0.269 further underscores the importance of cost estimation, indicating that the quality of cost estimation explains 26.9% of the variation in performance of donor-funded public health projects. This suggests that over a quarter of the success in these projects is directly related to accurate cost forecasting, indicating that this practice significantly influences project outcomes. While other factors also contribute to the performance of donor-funded public health projects, cost estimation stands out as a key driver of success. The study's findings suggest that improving cost estimation techniques can substantially enhance the performance of donor-funded public health projects, making it a critical area for focus in project management.

The study also revealed that organizational process assets play a significant moderating role in enhancing the relationship between project cost estimation and performance of donor-funded public health projects. The inclusion of organizational process assets as a moderating variable increased the R-squared value from 0.336 to 0.568. This substantial rise indicates that integrating organizational process assets into project management strategies significantly amplifies the positive relationship between cost management practices and the performance of donor-funded public health projects. This enhancement suggests that organizations with well-established processes, frameworks, and tools can leverage their existing resources to optimize cost management practices effectively, leading to better project outcomes.

Furthermore, the findings highlight the critical importance of organizational process assets in the successful execution of donor-funded public health projects. By facilitating smoother interactions, improving information flow, and enhancing decision-making, these assets enable project teams to navigate complexity more efficiently. The increased R-squared value implies that a considerable portion of the variability in the performance of donor-funded public health projects can now be attributed to the interplay between effective cost management and robust organizational processes. This suggests that organizations should invest in developing and refining their process assets further to enhance the performance of donor-funded public health projects, as doing so not only solidifies the foundation for successful cost management but also ensures the realization of project goals and objectives.

The study concludes that cost estimation is positively associated with the performance of donor-funded public health projects in Kenya. The findings demonstrate that accurate cost estimation significantly enhances project performance by improving resource allocation, reducing budget uncertainties, and supporting informed decision-making throughout the project lifecycle. With cost estimation accounting for 26.9% of the variation in project performance, the study confirms that reliable cost forecasting is a fundamental determinant of project success.

The study further concludes that Organizational Process Assets significantly strengthen the relationship between project cost estimations and performance of donor-funded public health projects. The substantial increase in the model's explanatory power from 33.6% to 56.8% indicates that organizational culture, policies, procedures, and institutional knowledge enhance the effectiveness of cost management practices. Therefore, organizations that invest in robust process assets are better positioned to achieve improved project outcomes, accountability, and sustainability in donor-funded public health projects.

VI. RECOMMENDATIONS

Based on the study findings, it is recommended that implementing partners use evidence-based estimation techniques, such as parametric, bottom-up, and three-point methods. The government should also institutionalize standardized cost-estimation frameworks within the public health sector. To enable accurate project cost estimation, regulatory agencies should develop a national database and cost-estimation benchmarks. This recommendation is based on the finding that cost estimation had the strongest relationship with the performance of donor-funded public health projects, resulting in a 26.9% improvement. Implementing organizations should invest in enhanced cost-estimation tools, up-to-date historical cost databases, and continuous capacity-building and training for project teams in modern estimation techniques. Additionally, incorporating risk-adjusted estimation techniques and data analytics can improve estimation accuracy and reduce cost uncertainties during project implementation. Given the largest observed relationship size in cost estimation, resulting in a 26.9% change in the performance of donor-funded public health projects, organizations should prioritize enhanced cost estimation tools and techniques. Project donors should support the creation of sector-specific project cost estimation models and provide technical assistance to implementing organizations in applying these models, internationally recognized estimation methodologies. Project funding decisions should be informed by the effective, quality, and accuracy of cost estimates presented by project implementers.

Additionally, policymakers should establish a national knowledge management framework for donor-funded public health projects to facilitate the documentation of lessons learned, standard operating procedures, templates, and best practices. This would strengthen institutional memory and improve the future performance of donor-funded public health projects. This recommendation is supported by the study's findings, which indicated that organizational process assets significantly moderate the relationship between project cost management

practices and performance of donor-funded public health projects, thereby increasing explanatory power from 33.6% to 56.8%. Also, implementing organizations should establish a centralized project management office (PMO) responsible for maintaining project templates, policies, lessons learned repositories, risk registers, and historical project records. Establishment of organizational process assets will enable organizational learning, standardization, and continuous improvement across donor-funded projects. Investing in institutional capacity building should be a top priority for donors, with support for the creation of project management systems, knowledge repositories, standard operating procedures, and project team training programs. By strengthening organizational process assets, donors will enhance project sustainability, improve project governance, and optimize the effectiveness of donor funding in public health initiatives.

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