
Stakeholder Management Strategies and Performance of Railway Construction and Rehabilitation Projects in Kenya

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Abstract

Railway construction and rehabilitation projects in Kenya continue to record delays, cost overruns and stakeholder dissatisfaction despite substantial public investment. This study examined the influence of two stakeholder management strategies, stakeholder mapping and communication strategies, on the performance of railway construction and rehabilitation projects in Kenya. The study was anchored on Stakeholder Theory and Communication Theory and adopted a descriptive research design. The target population comprised 192 stakeholders, including project managers, engineers, government officials and community representatives, drawn from six major railway projects using a census approach. Primary data were collected using a structured questionnaire and analysed using descriptive statistics, Pearson correlation and multiple linear regression in SPSS version 27. Out of 192 questionnaires administered, 159 were returned, a response rate of 82.8 percent. The findings showed that stakeholder mapping had a strong, positive and statistically significant relationship with project performance ($r = 0.840$, $p < 0.01$; $\beta = 0.348$, $p = 0.000$), as did communication strategies ($r = 0.720$, $p < 0.01$; $\beta = 0.204$, $p = 0.000$). The study concludes that structured stakeholder categorisation and consistent, multi-channel communication are critical enablers of timely, cost-efficient and satisfactory delivery of railway projects in Kenya. It recommends that project teams institutionalise regular stakeholder-map updates with clear documentation of roles and responsibilities, and strengthen two-way communication and feedback channels throughout the project lifecycle.

Keywords: *Stakeholder Mapping, Communication Strategies, Project Performance, Railway Construction, Kenya*

INTRODUCTION

In the context of railway construction and rehabilitation projects, stakeholder management is vital for achieving project performance objectives, particularly in dynamic and resource-intensive environments. Globally, large-scale infrastructure projects, including railway construction, have become increasingly complex, involving multiple stakeholders with diverse interests, ranging from governments and private investors to communities and environmental agencies (Mok et al., 2023). The success of these projects depends on the capacity to identify, engage, and manage stakeholders effectively to ensure alignment with

project goals and to mitigate potential conflicts that may derail progress (Turner & Muller, 2024).

Infrastructure projects, especially in developing countries, face heightened challenges due to socio-political, economic, and environmental dynamics. Globally, stakeholder mapping and engagement have been recognized as key strategies to navigate these complexities, as they enhance decision-making, foster trust among stakeholders, and ensure that projects address the needs and expectations of all involved parties (Nguyen et al., 2023). Without a clear understanding of stakeholder roles and their influence on project performance, projects are likely to encounter delays, budget overruns, and reduced quality of outcomes (Kumar & Sriram, 2024).

In the Kenyan context, railway construction and rehabilitation have been pivotal to the country's economic development, as evidenced by the Standard Gauge Railway (SGR) project and other initiatives aimed at improving connectivity and trade efficiency along the Meter Gauge Railway (MGR). However, the performance of such projects has often been marred by challenges in stakeholder coordination, communication breakdowns, and unresolved conflicts, which have compromised project timelines and budgets (Mutiso & Otieno, 2024). As a result, there was a growing need for robust stakeholder management strategies, including mapping and communication to enhance project performance and ensure sustainable outcomes (Wanjiru & Karanja, 2024).

Stakeholder mapping had been used to prioritize engagement efforts, ensuring that key stakeholders such as county governments and affected communities are adequately represented in project planning and execution (Muriithi & Wanjiku, 2023). Effective mapping not only fostered collaboration but also minimizes delays caused by disputes or opposition from overlooked parties. For example, the Nairobi Commuter Rail service leveraged strategic stakeholder mapping to identify and address the needs of urban commuters, leading to improved acceptance and support for the project (Njoroge & Kariuki, 2023).

However, local railway projects in Kenya also faced challenges in stakeholder management. In some cases, inadequate communication strategies led to misunderstandings and resistance from local communities, as seen in the delays experienced during the expansion of the SGR to Naivasha (Oketch & Nyaga, 2024). These local experiences highlighted the importance of tailored stakeholder management strategies in enhancing the performance of railway projects. By addressing specific challenges related to governance, community dynamics, and resource constraints, Kenya could improve the effectiveness and sustainability of its railway infrastructure initiatives (Mutua & Muthoni, 2024).

Statement of the Problem

Railway construction and rehabilitation projects are central to Kenya's national infrastructure agenda, yet many continue to experience underperformance despite large-scale investments. For example, the SGR project between Mombasa and Naivasha, which cost over Kshs. 660 billion, encountered delays and cost overruns attributed to unresolved stakeholder concerns such as land compensation and community displacement (Kenya Railways Corporation, 2023; Mutiso & Otieno, 2024). Phase 2A of the SGR project experienced a five-month delay due to stakeholder challenges including land compensation disputes, while the MGR-SGR Link Project suffered a fifteen-month delay due to land acquisition issues that compelled the Government of Kenya to allocate KES 1.1 billion to the National Land Commission for land compensation (KRC, 2025). These challenges reflect a broader pattern in which stakeholder-related issues such as poor communication, inadequate conflict resolution, and unclear

stakeholder mapping negatively affect project timelines, cost efficiency, and satisfaction among involved parties.

While global evidence shows that effective stakeholder management enhances project performance through improved alignment of interests, timely decision-making, and minimized disruptions (Mthombeni et al., 2022), there is a notable gap in empirical research specific to Kenyan railway projects. Most local studies either generalize stakeholder engagement or focus on broader project management factors without critically examining the effects of specific strategies such as stakeholder identification, stakeholder mapping, communication approaches, and conflict resolution mechanisms. Additionally, there is a contextual gap in that most infrastructure-related stakeholder studies in sub-Saharan Africa prioritize roads, energy, or housing projects, with minimal focus on railway systems despite their growing strategic importance (Bouraima et al., 2023). This study therefore sought to address these gaps by evaluating the effect of stakeholder mapping and communication strategies on the performance of railway construction and rehabilitation projects in Kenya.

Research Objectives

- i. To assess the influence of stakeholder mapping on the performance of railway construction and rehabilitation projects in Kenya.
- ii. To examine the role of communication strategies in enhancing the performance of railway construction and rehabilitation projects in Kenya.

LITERATURE REVIEW

Theoretical Review

Stakeholder Theory

Stakeholder Theory, introduced by Freeman (1984), focuses on identifying and managing the interests of individuals, groups or organisations that can influence, or be influenced by, an entity's operations. It holds that an organisation's long-term success depends on its ability to align and balance the interests of its stakeholders, advocating for inclusivity, fairness and collaboration in decision-making (Mitchell et al., 2023). The theory has been critiqued for offering limited guidance on prioritising competing stakeholder interests and for being difficult to operationalise, since defining stakeholder boundaries and engagement levels requires considerable effort (Jones et al., 2022; Harrison & Wicks, 2023). In this study, Stakeholder Theory underpins the expectation that stakeholder mapping, by categorising stakeholders according to their influence and interest, enables project teams to prioritise engagement and align stakeholder expectations with project goals, thereby improving performance outcomes such as timely completion and cost efficiency.

Communication Theory

Communication Theory, rooted in the work of Shannon and Weaver (1949), explains the process of transmitting information between parties to achieve mutual understanding, involving a sender, a message, a channel, a receiver and feedback (Craig, 2022). The theory highlights barriers to effective communication, such as noise and misinterpretation, and the strategies needed to overcome them (Dainton & Zelle, 2023). It has been critiqued for its comparatively simple, linear conception of communication, which can understate the interactive, iterative nature of communication in multi-stakeholder settings, as well as the role of non-verbal cues and power dynamics (Rogers, 2022; West & Turner, 2023). In this study, Communication Theory grounds the expectation that clear, timely and two-way communication builds trust and reduces misunderstanding among the diverse stakeholders involved in railway projects, thereby supporting better coordination and project outcomes.

Empirical Review

Agyeman et al. (2023) examined the role of stakeholder mapping in the performance of railway projects in Ghana, collecting data from 180 project managers and analysing it using path analysis. The study found that stakeholder mapping accounted for 53 percent of the variance in performance metrics such as timely completion and cost efficiency, and that 74 percent of respondents reported that structured mapping processes reduced conflict and improved project timelines.

Eslerod and Jepsen (2023) investigated the effect of communication strategies on the performance of renewable energy projects in Denmark using data from 200 project coordinators and structural equation modelling. Communication strategies explained 56 percent of the variance in project performance, and 78 percent of respondents agreed that effective communication channels and feedback mechanisms enhanced stakeholder collaboration and reduced project delays.

Kujala et al. (2023) examined stakeholder engagement, including mapping and communication practices, in Finland's renewable energy sector, drawing on data from 300 project managers analysed through structural equation modelling. Stakeholder engagement strategies accounted for 59 percent of the variance in project performance, with 85 percent of respondents reporting that structured engagement reduced conflict and increased project acceptance.

Mumba and Malama (2022) explored the impact of communication and conflict-resolution strategies on the performance of mining infrastructure projects in Zambia using data from 200 senior managers analysed through regression. Communication and conflict-resolution strategies accounted for 54 percent of the variance in project performance, with 79 percent of respondents indicating that effective communication channels reduced project delays and improved stakeholder trust.

Collectively, these studies point to a consistent, positive association between structured stakeholder mapping, effective communication and improved project performance across different infrastructure sectors, though most were conducted outside Kenya's railway context.

Research Gaps

Most prior studies on stakeholder mapping and communication strategies have focused on infrastructure projects in developed regions or on other African infrastructure sectors, with limited attention to the specific dynamics of railway construction and rehabilitation projects in Kenya (Eslerod & Jepsen, 2023; Agyeman et al., 2023). Where Kenyan studies exist, they tend to treat stakeholder management broadly, without isolating the distinct contribution of stakeholder mapping and communication strategies to measurable performance outcomes. This study addressed these contextual and conceptual gaps by examining the specific influence of these two strategies on the performance of railway construction and rehabilitation projects in Kenya.

Conceptual Framework

A conceptual framework is a theoretical structure that visually illustrates the relationships between research variables, providing a clear guide for the study (Zikmund et al., 2019). In this research, the independent variables are stakeholder management strategies, represented by stakeholder mapping and communication strategies. The dependent variable was project performance, which was measured through indicators such as timely completion, cost efficiency, quality of deliverables, and stakeholder satisfaction, as depicted in Figure 1.

Independent Variables

Dependent Variable

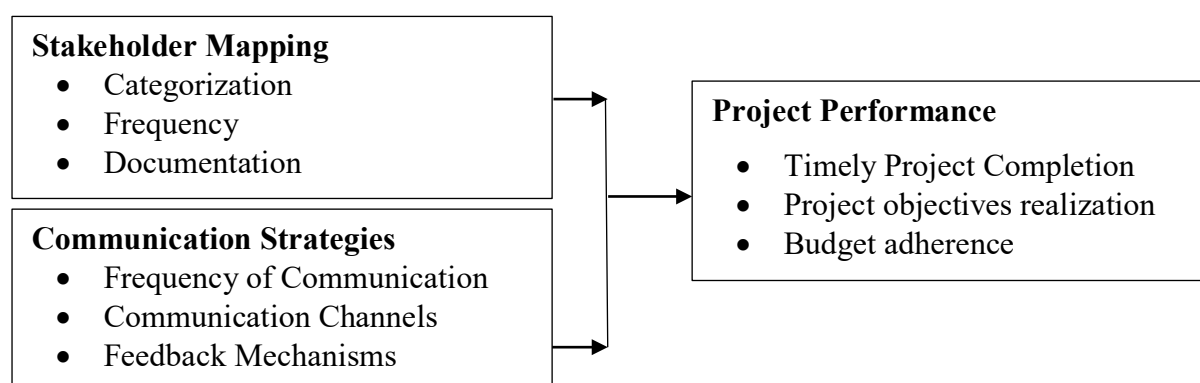


Figure 1: Conceptual Framework

Review of Literature on Study Variables

Stakeholder Mapping

Stakeholder mapping is a strategic process used to analyse and categorise stakeholders based on their level of interest, influence and power in relation to a project, helping project managers identify critical stakeholders and prioritise engagement effort (Eskerod & Jepsen, 2023). Stakeholders are typically classified by power and interest, for example as high-power/high-interest, high-power/low-interest, low-power/high-interest and low-power/low-interest groups, which helps project managers focus effort where it matters most (Reed et al., 2022). Because stakeholder interests and influence shift over the course of a project, regular updates to stakeholder maps are needed to keep engagement strategies relevant and to reduce the risk of conflict (Luyet et al., 2023). Clear documentation of stakeholder roles and responsibilities further supports accountability and minimises misunderstanding (Bryson et al., 2022).

Communication Strategies

Communication strategies are the planned approaches used to share information among stakeholders to ensure alignment, transparency and collaboration throughout a project (Bryson et al., 2022). The frequency of communication is central to maintaining engagement, with high-priority stakeholders such as sponsors and regulators typically requiring more frequent, detailed updates than lower-priority groups (Turner & Muller, 2023). The choice of communication channel, whether in-person meetings, digital platforms, reports or public forums, affects how effectively information reaches different stakeholder groups (Reed et al., 2022). Feedback mechanisms, such as surveys, grievance-redress systems and interactive forums, complete the communication loop by allowing stakeholders to raise concerns and shape project decisions, which in turn strengthens trust (Eskerod & Jepsen, 2023).

Project Performance

Performance in railway construction and rehabilitation projects reflects the extent to which project goals are achieved, and is commonly assessed through timely completion, achievement of project objectives, and adherence to budget (Eskerod & Jepsen, 2023). Timely completion signals effective planning and resource management, while budget adherence reflects disciplined cost management; both are shaped by how well stakeholder interests are anticipated, prioritised and communicated throughout the project lifecycle (Reed et al., 2022).

METHODOLOGY

Research Design

The study adopted a descriptive research design, which is well suited to examining phenomena in their current state. The design enabled a detailed analysis of stakeholder mapping and communication strategies through means and standard deviations, and supported the assessment of their relationships with project performance (Mugenda & Mugenda, 2012).

Target Population and Sampling

The study focused on six major railway construction and rehabilitation projects in Kenya, namely the Standard Gauge Railway (Nairobi–Naivasha), the Naivasha ICD–Longonot Station MGR Link, the Nairobi Commuter Rail Service, and the rehabilitated Meter Gauge Railway lines on the Thika–Nanyuki, Miritini–Mombasa Terminus and Nakuru–Kisumu corridors. Given the manageable size of the population, the study adopted a census approach targeting 192 stakeholders, comprising project managers, engineers, government officials and community representatives, as summarised in Table 1.

Table 1: Sampling frame across the six sampled railway projects.

Project Name	Stakeholder Category	Sample
SGR Phase 2A (Naivasha-Nairobi)	County/Government officials, Engineers, Community Representatives, Contractors	35
Nairobi Commuter Rail (NCR)	Project Managers, County /Government Officials, engineers	30
Miritini MGR – SGR Mombasa Terminus MGR Link	County/Government Officials/project managers	30
Naivasha ICD – Longonot Station MGR Link	Community Representatives, Project managers, engineers, Govt. officials	32
Thika-Nanyuki Metre Gauge Railway	Community Representatives, county officials, government officials, project managers	25
Nakuru – Kisumu MGR Branch Line	Government Officials, community reps, project managers, engineers	40
	TOTAL	192

Data Collection Instrument and Procedure

Primary data were collected using a structured questionnaire built around a five-point Likert scale, ranging from one (strongly disagree) to five (strongly agree). The questionnaire covered respondent demographics and dedicated sections on stakeholder mapping and communication strategies, alongside a section on project performance, with open-ended questions included to enrich the quantitative findings. Prior to full administration, the instrument was pretested with 20 respondents (about 10 percent of the target population) drawn from Nairobi-based stakeholders, who did not participate in the main study.

Reliability and Validity

Reliability was assessed using Cronbach's Alpha, with a coefficient of 0.7 or above considered acceptable. Stakeholder mapping ($\alpha = 0.817$), communication strategies ($\alpha = 0.794$) and project performance ($\alpha = 0.793$) all exceeded this threshold, as did the overall instrument ($\alpha = 0.809$), confirming that the items were internally consistent. Content and

construct validity were established through a review of existing literature, expert review by study supervisors, and alignment of questionnaire items with the sub-constructs of each study variable.

Data Analysis

Data were coded and analysed in SPSS version 27. Descriptive statistics, including means and standard deviations, summarised respondents' views on stakeholder mapping and communication strategies. Pearson correlation and multiple linear regression were used to assess the strength, direction and significance of the relationships between these variables and project performance. Open-ended responses were analysed using thematic content analysis. The regression model estimated was of the form:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$$

where Y is the performance of railway construction and rehabilitation projects in Kenya, X1 is stakeholder mapping, X2 is communication strategies, β_0 is the constant term, β_1 and β_2 are the beta coefficients, and ε is the error term.

RESULTS AND DISCUSSIONS

Response Rate

Table 2 presents the response rate, showing the number of questionnaires distributed and those successfully returned for analysis.

Table 2: Response Rate

Response	Frequency	Percentage
Returned	159	82.8
Unreturned	33	17.2
Total	192	100

The results indicate that out of 192 questionnaires distributed, 159 were returned, representing a response rate of 82.8%, while 33 (17.2%) were not returned; this high response rate was considered adequate for reliable data analysis.

Descriptive Statistics

Stakeholder Mapping

Table 3 presents the descriptive statistics for stakeholder mapping, showing respondents' views on the extent to which stakeholder categorization and mapping practices are applied in the project.

Table 3: Descriptive Statistics for Stakeholder Mapping

Statements	N	M	SD
Stakeholders are grouped based on their level of influence	159	4.11	0.31
Stakeholder mapping supports targeted engagement strategies	159	4.11	0.31
Stakeholder maps are regularly updated	159	4.02	0.44
New stakeholders are added as they emerge	159	4.02	0.44
Stakeholder responsibilities are clearly recorded	159	3.03	1.09
The documentation outlines each stakeholder's expectations	159	3.91	0.71
Overall mean		3.86	0.44

The results indicate that stakeholder mapping practices are highly adopted, with an overall mean of 3.86 and a standard deviation of 0.44, suggesting consistency in respondents' views. The highest-rated aspects include grouping stakeholders based on their level of influence (M = 4.11, SD = 0.31) and the use of stakeholder mapping to support targeted engagement

strategies ($M = 4.11$, $SD = 0.31$), indicating that projects effectively prioritize and engage stakeholders strategically. Similarly, regular updating of stakeholder maps and inclusion of new stakeholders as they emerge ($M = 4.02$, $SD = 0.44$) demonstrate that stakeholder mapping is treated as a dynamic process. However, relatively lower scores on recording stakeholder responsibilities ($M = 3.03$, $SD = 1.09$) suggest gaps in formal documentation and clarity of roles.

On the qualitative question on how the process of stakeholder categorization or mapping contributes to smoother project execution, the findings revealed that effective stakeholder mapping is driven by proper prioritization of stakeholders based on influence and interest, clear communication strategies, structured engagement planning, and continuous monitoring of stakeholder dynamics. Respondents emphasized that categorization helps identify key stakeholders requiring close engagement, improves coordination among project actors, and ensures that the right information reaches the right stakeholders at the appropriate time. It also enhances decision-making, reduces confusion, and supports efficient allocation of resources, thereby minimizing delays and improving overall project efficiency. Additionally, the use of structured tools such as stakeholder maps, engagement plans, and tracking mechanisms, as well as continuous updating of stakeholder information, was highlighted as critical in managing relationships and preventing potential conflicts. These findings align with Kujala et al. (2023), who note that effective stakeholder engagement and mapping significantly improve project performance by ensuring alignment between stakeholder interests and project objectives, thereby enhancing coordination, reducing risks, and contributing to successful project execution.

Communication Strategies

Table 4 presents the descriptive statistics for communication strategies, showing respondents' views on the effectiveness of communication practices used to engage stakeholders in the project.

Table 4: Descriptive Statistics for Communication Strategies

Statements	N	M	SD
The project team communicates with stakeholders regularly	159	4.00	0.00
Communication frequency keeps stakeholders informed	159	4.00	0.00
Communication methods are chosen based on the type of message	159	4.01	0.46
Stakeholders have clear channels to give feedback	159	3.91	0.55
Feedback from stakeholders is acknowledged	159	4.11	0.31
Feedback is addressed in a timely manner	159	4.11	0.31
Overall mean		4.02	0.25

The results indicate that communication strategies are highly implemented, with an overall mean of 4.02 and a low standard deviation of 0.25, suggesting strong agreement among respondents. The findings show that regular communication with stakeholders ($M = 4.00$, $SD = 0.00$) and appropriate communication frequency ($M = 4.00$, $SD = 0.00$) are consistently maintained, ensuring stakeholders remain well informed. Additionally, communication methods are appropriately selected based on the nature of the message ($M = 4.01$, $SD = 0.46$), while timely response to feedback ($M = 4.11$, $SD = 0.31$) further enhances stakeholder engagement. However, slightly lower ratings on the availability of clear feedback channels ($M = 3.91$, $SD = 0.55$) suggest minor gaps in facilitating stakeholder input.

These findings imply that strong communication practices play a critical role in enhancing coordination, transparency, and stakeholder involvement in projects. The high emphasis on

regular communication and timely feedback indicates that effective information flow contributes to improved decision-making and reduced misunderstandings. The results are consistent with Eskerod and Jepsen (2023), who found that effective communication strategies significantly improve project performance by enhancing stakeholder engagement and alignment. Similarly, Mumba et al. (2022) highlight that clear communication and responsive feedback mechanisms are essential in minimizing conflicts and improving the performance of infrastructure projects. Therefore, strengthening feedback channels alongside existing communication practices can further enhance project outcomes.

On the qualitative question on what communication approaches have you found most effective in engaging diverse stakeholders during railway projects, the findings revealed key thematic areas including regular and continuous communication, use of multiple communication channels, clarity of messaging, stakeholder feedback and responsiveness, and inclusivity in engagement approaches. Respondents emphasized that frequent updates, meetings, and briefings keep stakeholders aligned, while the use of diverse channels such as digital platforms, community forums, and face-to-face interactions enhances reach and effectiveness. Clear communication, timely feedback, and inclusive engagement mechanisms were also identified as critical in building trust, reducing misunderstandings, and improving collaboration among stakeholders. These findings align with Turner et al. (2023), who established that effective stakeholder management strategies, particularly strong communication practices, significantly enhance the performance of large-scale infrastructure projects by improving coordination, fostering stakeholder alignment, and supporting timely and informed decision-making.

Project Performance

Table 5 exhibits the descriptive statistics for project performance, showing respondents' perceptions of the overall performance outcomes of the project.

Table 5: Project Performance

Statements	N	Mean	SD
The project is progressing according to its planned milestones	159	3.90	0.55
Project delays are minimized through proactive management efforts	159	3.91	0.55
The project is on track to achieve its set objectives.	159	3.62	0.67
Stakeholder expectations are addressed during project execution.	159	4.11	0.31
The project is operating within the approved budget limits	159	4.01	0.63
Resources are utilized efficiently to maintain cost-effectiveness	159	4.11	0.31
Overall mean		3.94	0.44

The results indicate that project performance is rated highly, with an overall mean of 3.94 and a standard deviation of 0.44, suggesting general agreement among respondents. The findings show that projects are largely progressing according to planned milestones ($M = 3.90$, $SD = 0.55$) and that delays are minimized through proactive management ($M = 3.91$, $SD = 0.55$), indicating effective time management practices. Additionally, the project is perceived to be on track in achieving its objectives ($M = 3.62$, $SD = 0.67$), while strong performance is also reflected in cost management, with projects operating within approved budget limits ($M = 4.01$, $SD = 0.63$) and resources being utilized efficiently ($M = 4.11$, $SD = 0.31$). These results suggest that both time and cost dimensions of performance are well managed.

The findings imply that effective stakeholder management strategies contribute significantly to improved project performance outcomes. This is consistent with Mwangi and Wanjiru (2022), who found that stakeholder management practices enhance the performance of infrastructure projects by improving coordination, reducing delays, and ensuring efficient resource utilization. Similarly, Mumba et al. (2022) established that strong stakeholder management strategies positively influence the performance of large-scale infrastructure projects by supporting timely completion, cost control, and achievement of project objectives. On the qualitative question on from your perspective, what stakeholder-related practices have most influenced the timely completion or cost-effectiveness of the project, the findings revealed key thematic areas including early stakeholder involvement, effective communication, stakeholder coordination and collaboration, continuous engagement, and efficient resource utilization. Respondents emphasized that timely stakeholder input, clear communication of project goals, regular consultations, and strong coordination among stakeholders enhance decision-making, reduce delays, and improve workflow. Additionally, practices such as proactive issue management, conflict prevention, and continuous monitoring were identified as critical in ensuring projects are completed on time and within budget. These findings are consistent with Turner et al. (2023), who established that effective stakeholder management strategies significantly enhance the performance of large-scale infrastructure projects by improving coordination, reducing delays, and supporting cost efficiency.

Inferential Statistics

Correlation Analysis

Table 6 presents the Pearson correlation results showing the strength and direction of relationships between the study variables

Table 6: Correlation Results

		Project Performance	Stakeholder mapping	Communication strategies
Project Performance	Pearson Correlation	1		
Stakeholder mapping	Pearson Correlation	.840 ^{**}	1	
Communication strategies	Pearson Correlation	.720 ^{**}	.109	1

^{**}. Correlation is significant at the 0.01 level (2-tailed).

The Pearson correlation results indicate that stakeholder mapping is strongly correlated with project performance ($r = 0.840$, $p < 0.01$), indicating that well-structured mapping enhances project success. Communication strategies also exhibit a strong positive relationship with project performance ($r = 0.720$, $p < 0.01$).

Regression Analysis

Table 7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.887 ^a	.787	.782	.205769

a. Predictors: (Constant), Communication strategies, Stakeholder mapping

The model summary results indicate a strong relationship between stakeholder management strategies and project performance, as shown by a high correlation coefficient ($R = 0.887$).

The coefficient of determination ($R^2 = 0.787$) implies that approximately 78.7% of the variation in project performance can be explained by stakeholder mapping and communication strategies. The adjusted R^2 of 0.782 further confirms the robustness of the model, indicating that the explanatory power remains high even after adjusting for the number of predictors. Additionally, the low standard error of the estimate (0.206) suggests that the model provides a good fit to the data with minimal prediction errors.

These findings imply that stakeholder management strategies are key drivers of project performance. The high explanatory power demonstrates that effective coordination of stakeholder mapping and communication enhances project efficiency and outcomes. This is consistent with Eskerod and Jepsen (2023), who highlight that structured stakeholder management practices significantly improve project performance through better communication and coordination.

Table 8: ANOVA

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	24.405	2	12.203	288.197	.000b
	Residual	6.605	156	0.042		
	Total	31.010	158			

a. Dependent Variable: Project Performance

b. Predictors: (Constant), Communication strategies, Stakeholder mapping

The ANOVA results indicate that the regression model is statistically significant, as shown by an F-value of 288.197 and a p-value of 0.000, which is below the 0.05 threshold. This demonstrates that the combined effect of stakeholder mapping and communication strategies significantly influences project performance. The higher regression sum of squares (24.405) relative to the residual sum of squares (6.605) further confirms that the model explains a substantial portion of the variation in project performance. These findings suggest that stakeholder management strategies collectively play a critical role in enhancing project outcomes, consistent with Agyeman et al. (2023), who established that structured stakeholder management significantly improves the performance of infrastructure projects through better coordination and engagement.

Table 9: Model Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		Sig.
		B	Std. Error	Beta	t	
1	(Constant)	-1.119	.490		-2.283	.024
	Stakeholder mapping	.351	.083	.348	4.213	.000
	Communication strategies	.363	.095	.204	3.817	.000

a. Dependent Variable: Project Performance

The regression results in Table 4.20 indicate that the stakeholder management variables have a positive and statistically significant effect on project performance. Stakeholder mapping ($\beta = 0.348$, $p = 0.000$) and Communication strategies ($\beta = 0.204$, $p = 0.000$) also show a significant positive effect.

The resultant regression model:

$$Y = -1.119 + 0.351X_1 + 0.363X_2$$

Discussion of the Findings

Stakeholder Mapping and Project Performance

The research established that stakeholder mapping has a significant and positive effect on project performance in railway construction and rehabilitation projects. Descriptive results indicated that respondents generally agreed that stakeholder mapping enhances project outcomes, with grouping stakeholders based on their level of influence ($M = 4.11$, $SD = 0.31$) and supporting targeted engagement strategies ($M = 4.11$, $SD = 0.31$) receiving the highest ratings. Additionally, respondents agreed that stakeholder maps are regularly updated ($M = 4.02$, $SD = 0.44$) and that new stakeholders are incorporated as they emerge ($M = 4.02$, $SD = 0.44$), reflecting the dynamic nature of stakeholder management. However, the recording of stakeholder responsibilities received a comparatively lower mean score ($M = 3.03$, $SD = 1.09$), suggesting gaps in formal documentation and clarity of roles. The overall mean score of 3.86 ($SD = 0.44$) indicates strong agreement that stakeholder mapping contributes to improved project performance. Correlation results further revealed a strong positive relationship between stakeholder mapping and project performance ($r = 0.840$, $p < 0.01$), while regression analysis confirmed that it significantly predicts project performance ($\beta = 0.348$, $p = 0.000$).

These findings are consistent with Agyeman et al. (2023), who established that stakeholder mapping significantly improves project performance by enhancing coordination, prioritization, and conflict management. Similarly, Mwangi and Wanjiru (2022) found that structured stakeholder management practices, including mapping, improve infrastructure project outcomes by strengthening engagement and reducing inefficiencies. Overall, the results suggest that effective stakeholder mapping enhances coordination, improves resource allocation, and supports informed decision-making, although strengthening documentation of stakeholder roles and responsibilities would further improve project performance.

Communication Strategies and Project Performance

The research established that communication strategies have a significant and positive effect on project performance in railway construction and rehabilitation projects. Descriptive results indicated that respondents generally agreed that effective communication enhances project outcomes, with regular communication with stakeholders ($M = 4.00$, $SD = 0.00$) and appropriate communication frequency ($M = 4.00$, $SD = 0.00$) receiving high ratings. Additionally, respondents agreed that communication methods are selected based on the nature of the message ($M = 4.01$, $SD = 0.46$) and that feedback is addressed in a timely manner ($M = 4.11$, $SD = 0.31$), highlighting strong responsiveness. However, the availability of clear channels for stakeholder feedback recorded a slightly lower mean score ($M = 3.91$, $SD = 0.55$), suggesting minor gaps in facilitating stakeholder input. The overall mean score of 4.02 ($SD = 0.25$) indicates strong agreement that communication strategies contribute to improved project performance. Correlation results further revealed a strong positive relationship between communication strategies and project performance ($r = 0.720$, $p < 0.01$), while regression analysis confirmed that it significantly predicts project performance ($\beta = 0.204$, $p = 0.000$).

These results are consistent with Eskerod and Jepsen (2023), who established that effective communication strategies enhance project performance by improving stakeholder collaboration and reducing delays. Similarly, Ochieng and Muturi (2021) found that clear communication channels and feedback mechanisms significantly improve project outcomes by strengthening stakeholder relationships and minimizing project risks. Overall, the results suggest that strong communication practices enhance coordination, improve transparency,

and support timely decision-making, although further strengthening of feedback channels would enhance stakeholder engagement and overall project performance.

Conclusions

The study concludes that stakeholder mapping significantly improves project performance by enabling proper categorization and prioritization of stakeholders. Structured mapping enhances targeted engagement, resource allocation, and coordination, thereby improving efficiency and reducing project-related conflicts.

The study concludes that effective communication strategies are essential for successful project performance. Regular, clear, and timely communication enhances stakeholder engagement, reduces misunderstandings, and supports informed decision-making, leading to improved coordination and overall project outcomes.

Recommendations

Strengthening stakeholder mapping practices is essential for improving project coordination and efficiency. Continuous categorization of stakeholders based on their influence and interest, alongside regular updates of stakeholder information, ensures that engagement remains relevant throughout the project lifecycle. Clear documentation of stakeholder roles and responsibilities further enhances accountability and targeted interaction.

Enhancing communication strategies is crucial for maintaining effective stakeholder engagement. The use of multiple communication channels, combined with clear, timely, and consistent information sharing, improves transparency and reduces misunderstandings. Establishing strong feedback mechanisms and encouraging two-way communication enables better responsiveness and more informed decision-making.

Future studies could expand the scope of this research by examining additional variables that may influence project performance, such as leadership styles, organizational culture, technological adoption, and regulatory frameworks. There is also a need for comparative studies across different sectors or geographical regions to determine whether the observed relationships hold in varying contexts.

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