



Community Engagement as a Catalyst for Rural School Infrastructure Success: Empirical Evidence from the Force Account Model in Bahi District, Tanzania

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Abstract: School infrastructure projects in sub-Saharan Africa persistently face implementation failures characterized by cost overruns, construction delays, and substandard quality, undermining educational outcomes in resource-constrained rural settings. This study assesses the influence of community engagement on the successful implementation of school infrastructure projects in Bahi District, Tanzania, examining the interplay between funding constraints, technical capacity limitations, policy frameworks, and participatory mechanisms in determining project outcomes. Employing a convergent mixed-methods design, the research surveyed 214 respondents (91.85% response rate) from a stratified sample of 233 stakeholders, including education officials, school heads, teachers, school management committees, councillors, and community members, complemented by semi-structured interviews and documentary review. Quantitative data were analyzed using descriptive statistics and multiple regression analysis, while qualitative data underwent thematic content analysis to capture contextual implementation dynamics. The findings reveal that limited technical expertise constitutes the most critical implementation barrier (61.4%), contributing to poor construction quality (74.6%) and cost overruns (73.6%), while funding-related challenges, including inadequate public investment ($\beta = -0.690$, $p < 0.001$) and delayed fund disbursement ($\beta = -0.483$, $p = 0.005$), significantly impede project effectiveness. Conversely, the force account mechanism emerged as a transformative success factor, reducing construction costs by an average of 41.1% and increasing community participation by 44.4%, with community engagement showing strong positive correlations with timely completion ($r = 0.742$, $p < 0.001$) and community satisfaction ($r = 0.813$, $p < 0.001$). However, participation declines precipitously from 98.35% at project initiation to 32.32% at technical completion stages, revealing critical sustainability gaps. This study contributes empirically by quantifying the cost-effectiveness of community-driven infrastructure models in rural African contexts and theoretically by extending stakeholder theory to demonstrate that sustained, inclusive participation across all project phases is essential for durable educational infrastructure outcomes. Policy implications emphasize strengthening local technical capacity through vocational partnerships, institutionalizing gender-inclusive participation frameworks, ensuring transparent and timely fund disbursement, and establishing hybrid quality assurance systems combining community oversight with professional technical supervision. The study recommends systematic capacity-building interventions, uniform fiscal incentive policies, and structured mechanisms for maintaining community engagement throughout complete project lifecycles to ensure sustainable school infrastructure development in resource-limited rural settings.

Keywords: School infrastructure projects; Community engagement; Force account mechanism; Rural education development; Stakeholder participation; Tanzania

1.0 Background Information

Education serves as a fundamental catalyst for economic growth, poverty reduction, and inclusive development across the globe (Becker, 1964; Schultz, 1961). Countries invest substantially in educational infrastructure because it builds human capital, enhances workforce productivity, and promotes intergenerational social mobility (Wuttaphan, 2017). In Africa, empirical evidence demonstrates that improving access to quality education in rural areas

correlates strongly with better household livelihoods, higher incomes, and enhanced community wellbeing (Gardiner, 2017). However, the expansion of educational access alone remains insufficient; adequate physical infrastructure, including classrooms, laboratories, libraries, and teacher housing, is essential to support effective teaching and learning environments that yield meaningful educational outcomes (Crétot, 2023).



The significance of school infrastructure in developing countries cannot be overstated. Infrastructure determines not only whether children can access education but also the quality of the learning environment they experience (Msunza *et al.*, 2023). In Tanzania, demographic pressure on the education system is substantial, with the 2022 census estimating the population at approximately 65 million, a large proportion of whom are under age 14 and require education services (URT, 2022). The government has responded by constructing new schools, laboratories, girls' hostels, and teacher housing under frameworks including the Education Sector Development Programme, Primary Education Development Programme, and Secondary Education Development Programme (URT, 2004; URT, 2014).

Nevertheless, school infrastructure projects in developing countries continue to face persistent implementation challenges despite considerable investment (Salhi & Massaoudi, 2021). Among the most pervasive challenges are project delays that escalate costs, poor construction quality that undermines functionality and safety, and cost overruns that strain already limited public resources (Kikwasi, 2022). In Tanzania, these challenges are particularly acute in rural districts where financial, human, and technical resources are constrained (Lawrent & John, 2022). The concept of community engagement has therefore gained prominence as a strategy to address resource limitations and enhance project ownership (Massay & Komba, 2022). In the 2023/24 financial year, the Government of Tanzania allocated approximately 21% of the national budget to education, with TZS 29.9 billion specifically earmarked for school infrastructure improvement at primary and secondary levels (URT, 2024). However, persistent implementation constraints continue to diminish the intended impact of infrastructure programmes (World Bank, 2020).

Previous research across sub-Saharan Africa has extensively documented barriers to successful school infrastructure implementation. Studies in Kenya have identified delays in fund disbursement and insufficient monitoring mechanisms as primary obstacles disrupting construction timelines and leading to cost overruns (Mwangi *et al.*, 2022). In Tanzania, overcrowded classrooms, inadequate teaching materials, and poor supervision have been identified as key challenges affecting the effectiveness of rural school projects (Lema & Mbise, 2020). Lawrent and John (2022) observed that while the force account model reduces costs and encourages community participation in Tanzania's rural districts, projects still suffer from delays due to shortages of skilled labour and substandard materials. Matto (2023) identified six latent shortcomings of force account projects in Tanzania's education sector, including inadequate planning and designing, inappropriate adherence to procurement procedures, insufficient contract supervision, lack of

qualified personnel, absence of appropriate equipment, and improper recording of costs.

Empirical evidence has also identified success factors in SIP implementation. Effective leadership, adequate funding, and stakeholder coordination are critical determinants of project success (Järvinen & Virtanen, 2020). In Tanzania, the force account mechanism has demonstrated potential for reducing construction costs while enhancing community participation (Msuya & Makame, 2021; Lawrent & Komba, 2023). Studies have shown that involving parents and local leaders in school construction reduces costs, improves accountability, and strengthens trust between residents and school administrations (Mbise & Joseph, 2021; Massay & Komba, 2022). Community engagement in monitoring and evaluation has been found to have significant positive effects on project sustainability, with research in Kenya demonstrating that community participation in monitoring and evaluation significantly influences education project sustainability (Kamau *et al.*, 2022).

Despite this body of knowledge, significant gaps remain in understanding the mechanisms through which community engagement influences school infrastructure project success in rural African contexts. First, while the benefits of community participation are widely acknowledged, the sustainability of such participation across project lifecycles remains underexplored. Research has documented that community engagement tends to be highest during project initiation and decreases as projects advance toward completion (Massay & Komba, 2022), but the specific factors driving this decline and its implications for project outcomes require further investigation. Second, the relationship between community engagement and project success in contexts where the force account mechanism is employed has not been sufficiently quantified, particularly regarding the cost-effectiveness and quality implications of community-driven construction approaches (Matto, 2023). Third, the gendered dimensions of community participation in school infrastructure projects, including patterns of exclusion and their effects on project outcomes, remain inadequately addressed in the literature (Kitigwa & Onyango, 2023).

From a theoretical perspective, the application of Stakeholder Theory and Human Capital Theory to school infrastructure implementation in rural settings presents opportunities for theoretical refinement. Stakeholder Theory (Freeman, 1984) posits that organisations achieve optimal outcomes by properly acknowledging all project stakeholders' interests and promoting teamwork, full participation, and responsible decision-making. However, the theory has been critiqued for its implicit assumption that stakeholder engagement is inherently equitable and sustainable. Scholars of participatory development have



documented risks of elite capture, whereby better-resourced or more influential community members dominate decision-making, and volunteer fatigue, as the same households are repeatedly called upon to contribute time and materials (Kitigwa & Onyango, 2023). Furthermore, the gendered distribution of participation burdens and benefits, where women supply substantial labour yet remain underrepresented in technical and leadership roles, challenges the theory's assumptions about inclusive participation (Kitigwa & Onyango, 2023).

Human Capital Theory (Becker, 1964; Schultz, 1961) demonstrates that education spending creates productive employees and enhances economic growth. When applied to school infrastructure projects, this theory suggests that investments in educational facilities represent investments in human capital that generate long-term returns (Wuttaphan, 2017). However, the theory has been critiqued for its narrow focus on economic outcomes and its inattention to the social processes through which infrastructure investments translate into human capital formation (Crétot, 2023). In the context of community-driven infrastructure projects, the relationship between participation processes and human capital outcomes, including skill development, social capital formation, and collective efficacy, requires further theoretical elaboration.

The force account mechanism, as operationalised in Tanzania, represents an institutional innovation that attempts to address the dual challenges of limited financial resources and weak community engagement (PPRA, 2020). Defined as a process where works are carried out by a procuring entity using its personnel and equipment (Matto, 2023), the force account approach mobilises community labour and local leadership to construct school infrastructure at lower cost and with greater local ownership (Lawrent & John, 2022). However, the circumstances under which force account is justified, including remote locations, emergency situations, and routine maintenance activities (PPRA, 2020), raise important questions about the conditions under which community-driven approaches achieve optimal outcomes. The absence of simplified guidelines, inadequate equipment and labour, and lack of quality assurance plans have been identified as challenges undermining force account effectiveness (Matto, 2023).

This study addresses the identified empirical and theoretical gaps by assessing community engagement in the implementation of school infrastructure projects in Bahi District, Tanzania, and examining the success factors that influence effective execution of school construction initiatives in rural settings. The study is grounded in the complementary theoretical frameworks of Human Capital Theory (Becker, 1964; Schultz, 1961) and Stakeholder Theory (Freeman, 1984) and employs a convergent mixed-

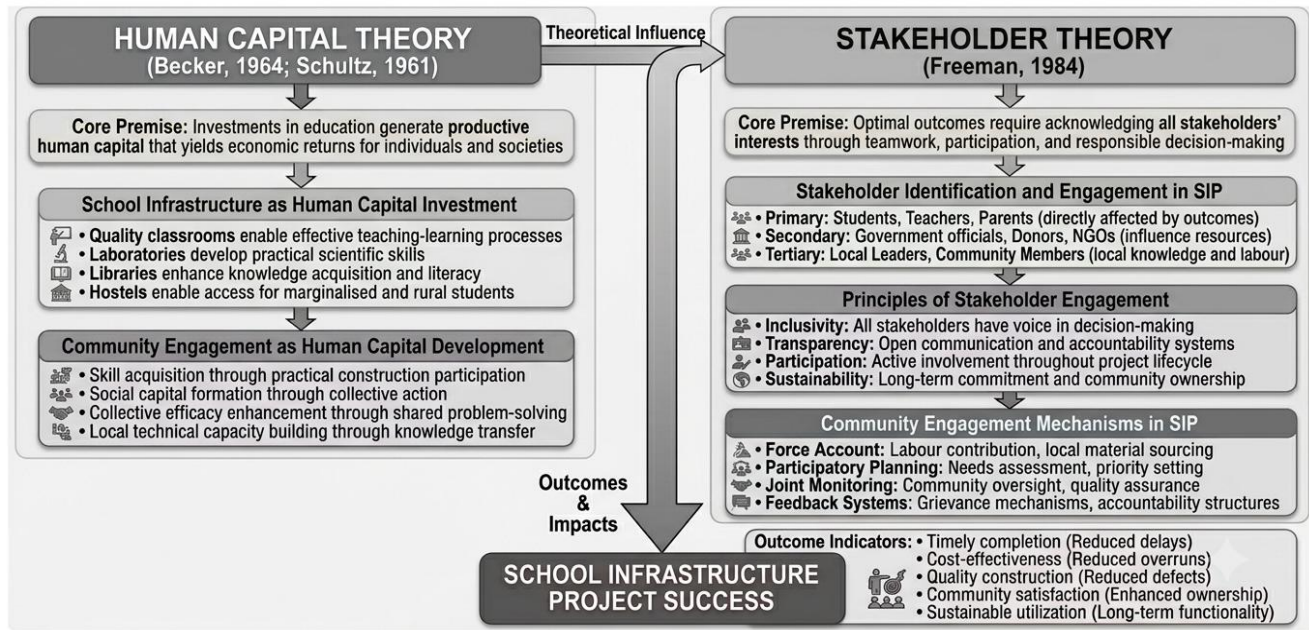
methods design (Creswell & Creswell, 2018) to capture both the breadth and depth of implementation dynamics.

This study addresses the identified empirical and theoretical gaps by assessing the influence of community engagement on the successful implementation of school infrastructure projects in Bahi District, Tanzania, examining the interplay between funding constraints, technical capacity limitations, policy frameworks, and participatory mechanisms in determining project outcomes. Specifically, the study identifies challenges affecting SIP implementation, examines success factors facilitating effective execution, assesses the role and extent of community engagement, and evaluates the cost-effectiveness of the force account mechanism. The central research question guiding this investigation is: *How does community engagement influence successful SIP implementation in rural Tanzania, and what factors mediate this relationship?* This study makes several contributions: it provides empirical evidence quantifying the cost-effectiveness of community-driven infrastructure models (Lawrent & John, 2022; Matto, 2023); extends Stakeholder Theory by examining conditions under which community engagement translates into sustainable outcomes, including institutional mechanisms sustaining participation across project lifecycles (Massay & Komba, 2022); and offers practical recommendations for strengthening local technical capacity, enhancing fund disbursement, and institutionalising community engagement in resource-limited rural settings (World Bank, 2020). Therefore, by focusing on Bahi District in Dodoma Region, a rural area characterised by limited financial, human, and technical resources, this study provides insights applicable to similar contexts across sub-Saharan Africa where school infrastructure remains a critical development challenge (Crétot, 2022; World Bank, 2020), with findings intended to inform policy decisions regarding effective integration of community engagement mechanisms with technical and financial support systems.

2.0 Theoretical Framework

This study is grounded in two complementary theoretical perspectives: Human Capital Theory and Stakeholder Theory. These frameworks collectively provide a robust analytical lens for understanding how community engagement influences school infrastructure project success in rural Tanzanian contexts. Figure 1 illustrates the conceptual relationship between these theories and their application to school infrastructure project implementation, demonstrating the integrated analytical framework guiding this investigation.

Figure 1: Conceptual Framework Integrating Human Capital Theory and Stakeholder Theory for School Infrastructure Project Success



Source: Authors' conceptualisation based on Becker (1964), Schultz (1961), and Freeman (1984)

2.1 Human Capital Theory

Human Capital Theory, pioneered by Schultz (1961) and comprehensively developed by Becker (1964), posits that investments in education, training, and health create productive human capital that generates economic returns for individuals and societies (Schultz, 1961; Becker, 1964). The theory fundamentally challenges the traditional view of labour as a homogenous factor of production, instead arguing that education-based knowledge, abilities, and skills serve as capital assets that yield earnings gains, improved work possibilities, and advanced social progress (Wuttaphan, 2017). As Becker (1964) articulated, expenditure on education constitutes an investment with many similarities to investment in physical capital, national resources are utilised while the student is in school, but later in life, more-educated workers contribute more to national output than less-educated workers.

The application of Human Capital Theory to school infrastructure projects in rural settings reveals several important dimensions. First, infrastructure investments represent a form of human capital formation because quality classrooms, laboratories, and libraries create conditions conducive to effective teaching and learning, thereby enhancing students' cognitive development and future productivity (Crétot, 2023). Second, community engagement in infrastructure construction generates human capital benefits beyond the physical structures themselves, as participants acquire technical skills, develop social networks, and build collective efficacy that can be applied to future community development initiatives (Massay & Komba, 2022). Third, the sustainability of infrastructure investments

depends on the human capacity to maintain and utilise facilities effectively, making technical training and community capacity-building essential complements to physical construction (Lawrent & Komba, 2023).

In the context of rural Tanzania, Human Capital Theory provides a powerful justification for investing in community-driven infrastructure models. When communities contribute labour and materials to school construction, they not only reduce monetary costs but also develop local technical expertise, strengthen social cohesion, and enhance their capacity to address future development challenges (Msuya & Makame, 2021). This dual benefit, improving infrastructure while building human capital, makes community engagement particularly valuable in resource-constrained rural districts where formal technical expertise is scarce and economic opportunities are limited (Lawrent & John, 2022).

However, Human Capital Theory has been critiqued for its narrow focus on economic outcomes and its tendency to treat education as a purely instrumental investment (Crétot, 2023). In the context of community-driven infrastructure projects, this critique highlights the need to consider the social, cultural, and political dimensions of participation alongside its economic benefits. The theory's emphasis on individual returns to education must be balanced with recognition that infrastructure projects produce collective benefits that extend beyond individual human capital formation (Gardiner, 2017).

2.2 Stakeholder Theory

Stakeholder Theory, launched by Freeman (1984), provides a framework for understanding how organisations achieve optimal outcomes by properly acknowledging all project



Stakeholders' interests (Freeman, 1984). The theory promotes teamwork, embraces full participation, and encourages responsible decision-making to achieve fair handling of stakeholder requirements (Freeman *et al.*, 2010). Unlike traditional shareholder-focused approaches, Stakeholder Theory argues that organisations must consider the interests of all parties affected by their actions, including employees, customers, suppliers, communities, and society at large (Freeman, 1984).

Freeman (1984) formally defined stakeholders as “any group or individual who can affect or is affected by the achievement of the organisation’s objectives” (p. 46). This definition has been widely adopted in project management literature, with subsequent scholars emphasising that stakeholders can actually or potentially affect or be affected by project outcomes (Mitchell *et al.*, 1997). As illustrated in Figure 1, for school infrastructure projects, Stakeholder Theory identifies a diverse array of stakeholders whose interests must be considered: students who will use the facilities, parents who contribute resources and labour, teachers who require adequate working conditions, community members who provide local knowledge and oversight, government officials who fund and regulate projects, and donors who provide additional resources (Mbise & Joseph, 2021). The theory emphasises that sustainable project success depends on effectively engaging all these stakeholders, addressing their concerns, and building consensus around project objectives and implementation approaches (Massay & Komba, 2022).

The application of Stakeholder Theory to community engagement in school infrastructure projects reveals several critical insights. First, meaningful stakeholder participation requires identifying all relevant stakeholders and understanding their diverse interests, capacities, and constraints (Msunza *et al.*, 2023). In rural Tanzanian contexts, this includes recognising the specific roles and contributions of women, youth, and marginalised groups who may be overlooked in traditional project governance structures (Kitigwa & Onyango, 2023). Second, stakeholder engagement must be sustained throughout the project lifecycle, from initial planning through construction to maintenance and utilisation (Johnson *et al.*, 2020). Third, effective stakeholder engagement requires institutional mechanisms that enable transparent communication, inclusive decision-making, and accountable resource management (Kamau *et al.*, 2022).

However, Stakeholder Theory has been critiqued for its implicit assumption that stakeholder engagement is inherently equitable and sustainable (Kitigwa & Onyango, 2023). Scholars of participatory development have documented risks of elite capture, whereby better-resourced or more influential community members dominate decision-

making and direct benefits toward themselves, marginalising poorer households (Johnson *et al.*, 2020). Reliance on unpaid community labour can also generate volunteer fatigue, as the same households are repeatedly called upon to contribute time and materials, eroding participation over the project lifecycle (Massay & Komba, 2022). Furthermore, the burden and benefits of participation are frequently gendered: women often supply substantial labour yet remain under-represented in technical and leadership roles (Kitigwa & Onyango, 2023). Recognising these limits is important for interpreting empirical findings, since high reported participation does not necessarily imply that participation is inclusive, equitably distributed, or durable (Mbise & Joseph, 2021).

2.3 Complementary Theoretical Integration

The integration of Human Capital Theory and Stakeholder Theory provides a comprehensive analytical framework for this study. As illustrated in Figure 1, these theories complement each other in explaining how community engagement influences school infrastructure project success in rural Tanzania.

Human Capital Theory explains *why* investment in school infrastructure and community engagement matters for long-term development outcomes. By conceptualising infrastructure as an investment in human capital, the theory demonstrates that quality educational facilities generate returns through improved learning outcomes, enhanced workforce productivity, and greater social mobility (Wuttaphan, 2017). When communities participate in infrastructure construction, they simultaneously build physical assets and develop human capabilities, acquiring skills, building social networks, and strengthening collective efficacy that can be applied to future development challenges (Lawrent & Komba, 2023).

Stakeholder Theory explains *how* community engagement should be structured to achieve sustainable outcomes. By identifying all relevant stakeholders and their interests, the theory provides guidance on designing inclusive participation mechanisms, ensuring transparent communication, and building accountability systems that maintain stakeholder engagement throughout project lifecycles (Freeman *et al.*, 2010). The theory highlights that sustainable project success depends on effectively engaging diverse stakeholders, addressing their concerns, and building consensus around project objectives and approaches (Massay & Komba, 2022).

Together, these theories suggest that successful school infrastructure projects in rural Tanzania require:

- i. *Investment in human capital* through quality infrastructure that enables effective teaching and learning;

- ii. *Community capacity-building* that develops local technical expertise and social capital;
- iii. *Inclusive stakeholder engagement* that gives voice to all affected parties;
- iv. *Sustained participation* maintained through transparent communication and accountability; and
- v. *Institutional mechanisms* that prevent elite capture and ensure equitable benefit distribution.

This integrated framework guides the empirical investigation by identifying key variables to examine: funding adequacy, technical capacity, policy support, community participation levels, and institutional mechanisms for engagement. It also informs the interpretation of findings by providing theoretical explanations for why certain factors promote or impede project success in rural Tanzanian contexts. The framework's dual theoretical grounding recognises both the instrumental value of infrastructure investment in human capital development and the process-oriented importance of inclusive stakeholder engagement in achieving sustainable outcomes.

3.0 Methodology

3.1 Research Approach and Design

This study adopted a convergent mixed-methods approach, collecting both quantitative and qualitative data simultaneously and integrating them to provide comprehensive insights beyond what either method could yield alone (Creswell & Creswell, 2018). As illustrated in Figure 2, the convergent design enabled the merging of numerical data with in-depth qualitative insights from respondents, providing a holistic understanding of the research problem (Creswell & Plano Clark, 2018). This design is particularly appropriate for studying complex

infrastructure projects, where both statistical patterns and contextual understandings are essential for meaningful interpretation (Tashakkori & Teddlie, 2010).

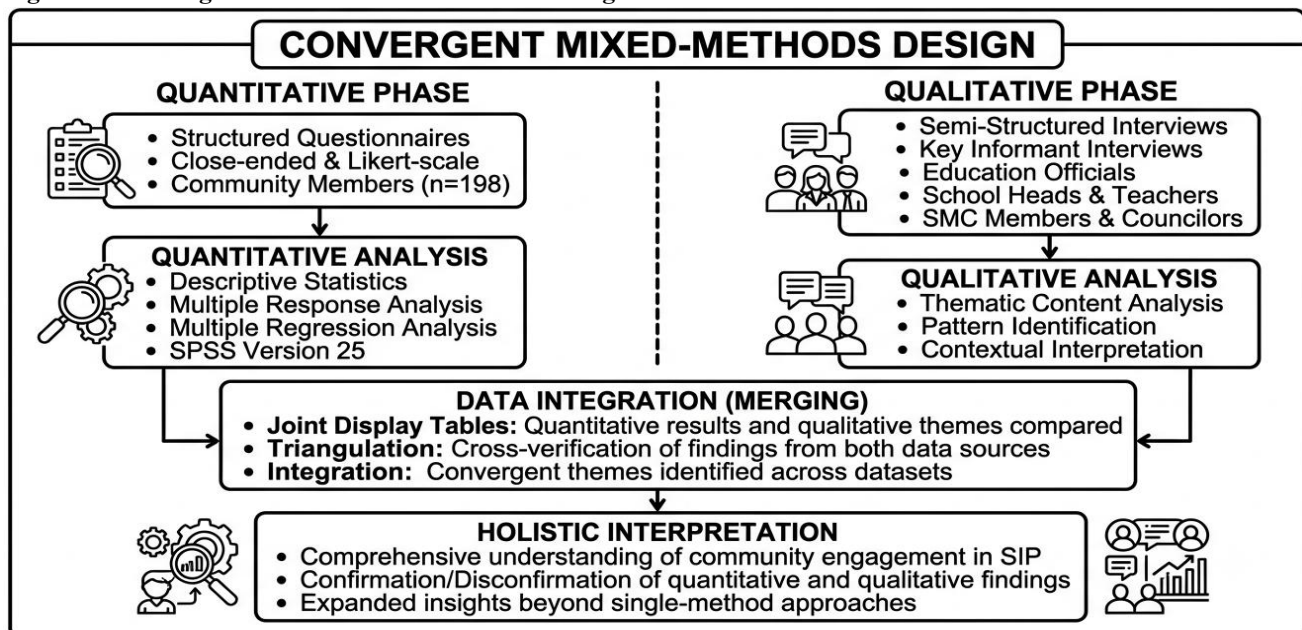
The convergent design was selected for several methodological reasons. First, it enabled the collection of broad, generalisable quantitative data on patterns of community engagement while simultaneously capturing rich, contextual qualitative data on implementation processes (Creswell & Creswell, 2018). Second, the design allowed for triangulation of findings, where quantitative and qualitative results could be compared to confirm, disconfirm, or expand understanding of the research problem (Tashakkori & Teddlie, 2010). Third, the approach accommodated the study's diverse stakeholder groups, with different methods suited to different respondent categories (Bryman, 2016).

3.2 Study Area and Population

The study was conducted in Bahi District, Dodoma Region, Tanzania, specifically in three wards: Bahi, Mundemu, and Msisi. These wards were selected because they are located in rural settings and had ongoing school infrastructure projects during the study period, making them appropriate contexts for examining community engagement in SIP implementation (Lawrent & John, 2022).

The target population (N = 556) comprised heads of schools, teachers responsible for infrastructure projects, Ward Education Officers, district education officials, School Management Committee members, ward councilors, and community members (parents) directly involved in or affected by SIPs. This population was selected because these stakeholders possess direct knowledge of SIP implementation processes and community engagement

Figure 2: Convergent Mixed-Methods Research Design



Source: Adapted from Creswell & Creswell (2018) and Creswell & Plano Clark (2018)

practices (Msunza *et al.*, 2023).

Table 1: Study Area Characteristics

Ward	Location	Key Features	SIP Projects (2023-2024)
Bahi	Central Bahi District	District headquarters; higher population density	3 classroom blocks; 1 laboratory
Mundemu	Eastern Bahi District	Rural agricultural area	2 classroom blocks; 1 teacher house
Msisi	Western Bahi District	Remote rural area	2 classroom blocks; 1 girls' hostel

Source: Bahi District Council, Education Department Records, 2024

3.3 Sample Size and Sampling Technique

Using Yamane's (1967) formula with a 95% confidence level and 5% margin of error, the calculated sample size was 233 respondents. The formula was applied as follows:

$$n = \frac{N}{1+N(e)^2}$$

Where:

- n = sample size
- N = target population (556)
- e = margin of error (0.05)

$$n = \frac{556}{1 + 556(0.05)^2} = \frac{556}{1 + 556(0.0025)} = \frac{556}{1 + 1.39} = \frac{556}{2.39} = 233$$

The study ultimately consulted 214 respondents, yielding a response rate of 91.85%. This response rate exceeds the acceptable threshold of 70% recommended for social science research (Babbie, 2016; Creswell & Creswell, 2018).

A stratified sampling design was adopted in which the target population was first divided into strata defined by ward (Bahi, Mundemu, and Msisi) and by stakeholder role (district education officials, Ward Education Officers, heads of schools, School Management Committee members, teachers, ward councillors, and community members). Within the key-informant strata, purposive sampling was used to select respondents with specific knowledge of and direct experience in SIP implementation, while simple random sampling (the lottery method) was applied within the community-member stratum to select 198 respondents, ensuring unbiased representation (Etikan *et al.*, 2016; Patton, 2015).

The 19 respondents not reached (233 proposed versus 214 actual) arose almost entirely from non-response among institutional key informants whose official duties made them unavailable during the fieldwork window: one Ward Education Officer, two heads of schools, three School Management Committee members, two teachers, and two

ward councillors could not be reached after repeated visits. Non-response among community members was minimal (9 of 207). Because the stratified design distributed the shortfall across categories rather than concentrating it, the resulting sample retained adequate coverage of all stakeholder groups (Bryman, 2016).

Table 2: Sample Size Distribution

S/N	Population Description	Proposed Sample	Actual Sample	Response Rate (%)
1	District Education Officials	2	2	100.0%
2	Ward Education Officers	3	2	66.7%
3	Heads of Schools	6	4	66.7%
4	School Management Committees	6	3	50.0%
5	Teachers (Infrastructure)	6	4	66.7%
6	Ward Councillors	3	1	33.3%
7	Community Members	207	198	95.7%
Total		233	214	91.85%

Source: Field Data, 2025

The stratified sampling approach ensured representation across stakeholder groups, while the purposive selection of key informants ensured access to specialised knowledge of SIP implementation processes (Patton, 2015). The lottery method for community members ensured each community member had an equal chance of selection, minimising selection bias (Babbie, 2016).

3.4 Data Collection Methods

3.4.1 Questionnaire Survey

Structured questionnaires with both open and closed-ended questions were administered to community members to collect quantitative data. Likert-scale questions quantified respondents' perceptions and attitudes, ensuring comparability and facilitating statistical analysis (De Vaus, 2013). The questionnaire was designed to capture data on:

- Demographic characteristics:** Gender, ward, and roles in SIP
- Challenges in SIP implementation:** Funding adequacy, technical capacity, transparency
- Success factors:** Policy implementation, force account effectiveness, community engagement
- Community engagement levels:** Participation across SIP process stages

The questionnaire was pre-tested with 20 community members from a non-participating ward to assess clarity, comprehensibility, and reliability. Adjustments were made



based on pre-test findings to improve question wording and response options (Bryman, 2016).

3.4.2 Semi-Structured Interviews

Semi-structured interviews were conducted with key informants including heads of schools, teachers, Ward Education Officers, district education officials, School Management Committee members, and ward councilors. Interview guides aligned with study objectives focused on identifying challenges, success factors, and community engagement practices (Kvale & Brinkmann, 2015).

The semi-structured format allowed for flexibility in exploring emerging themes while maintaining focus on research objectives (Patton, 2015). Interviews were conducted in Swahili to facilitate natural expression, then transcribed and translated into English for analysis. Each interview lasted 30-45 minutes and was audio-recorded with participant consent.

3.4.3 Documentary Review

Policy documents, school project reports, and official records from Bahi District Council Education Department were reviewed to triangulate data and provide background information (Bowen, 2009). Documents reviewed included:

- Project completion and expenditure reports (2023-2024)
- Force account guidelines (PPRA, 2020)
- Education sector performance reports (URT, 2024)
- School development plans
- Minutes of School Management Committee meetings

Documentary review provided contextual information on SIP implementation processes, funding allocations, and project outcomes, enabling cross-verification of survey and interview findings (Yin, 2014).

3.5 Data Analysis

3.5.1 Quantitative Data Analysis

Quantitative data were analyzed using SPSS Version 25 through several analytical techniques. Descriptive statistics (frequencies, percentages, means) were computed to summarise respondent characteristics, challenge perceptions, and engagement patterns (Field, 2018). Multiple response analysis was employed to examine the frequency and patterns of responses where participants could select multiple options, such as roles played in SIP and types of engagement (De Vaus, 2013).

Multiple regression analysis was conducted to examine relationships between funding-related challenges and effective SIP implementation. The regression model was specified as:

$$Y_i = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3$$

Where:

- Y_i = Effective SIP implementation (composite score)
- α = Constant term
- X_1 = Low public investment
- X_2 = Delayed disbursement of funds
- X_3 = Lack of transparency
- X_4 = Misalignment between needs and allocation
- $\beta_1, \beta_2, \beta_3, \beta_4$ = Regression coefficients
- ϵ_i = Error term

The dependent variable, “effective SIP implementation,” was operationalised as a composite score derived from respondents’ ratings of the extent to which their school actively took part in, and successfully advanced, its infrastructure project across the construction cycle (Field, 2018). This indicator was adopted because, in the force-account context of rural Tanzania, a school’s sustained participation in the construction process is the most direct observable proxy for implementation effectiveness (Lawrent & John, 2022).

Diagnostic tests confirmed that the regression assumptions were met: residuals were approximately normally distributed, relationships were linear, multicollinearity was not a concern ($VIF < 5$), homoscedasticity held, and the Durbin-Watson statistic (1.892) confirmed independence of residuals (Field, 2018).

3.5.2 Qualitative Data Analysis

Qualitative data from interviews underwent thematic content analysis to identify key patterns related to challenges, success factors, and community participation (Braun & Clarke, 2006). The analysis followed a systematic process:

- i. **Familiarisation:** Reading and re-reading transcripts to gain overall understanding
- ii. **Initial coding:** Identifying meaningful segments and assigning codes
- iii. **Theme development:** Grouping codes into themes based on patterns and relationships
- iv. **Theme review:** Refining themes to ensure coherence and distinctiveness
- v. **Theme definition:** Defining and naming themes with clear descriptions
- vi. **Reporting:** Presenting themes with illustrative quotes

NVivo 12 software was used to manage and organise qualitative data, facilitating systematic coding and theme development (Bazeley & Jackson, 2013). Themes were identified both deductively (based on research objectives and



theoretical framework) and inductively (emerging from the data).

3.5.3 Data Integration

Integration of quantitative and qualitative data followed the convergent design procedures recommended by Creswell and Plano Clark (2018). Joint display tables were developed to compare quantitative results with qualitative themes, enabling identification of confirming, disconfirming, and expanded findings (Guetterman et al., 2015). This integration approach enhanced the validity and richness of findings by providing multiple perspectives on the research problem.

Table 3: Data Integration Procedure

Step	Quantitative Data	Qualitative Data	Integration Output
1	Descriptive statistics on challenges	Thematic analysis of challenge narratives	Joint display of challenge patterns
2	Regression analysis of success factors	Theme identification of success factors	Comparison of statistical and thematic findings
3	Engagement level frequencies	Engagement process descriptions	Integrated understanding of participation patterns
4	Cost-effectiveness analysis	Force account implementation experiences	Comprehensive assessment of force account mechanism

Source: Adapted from Creswell & Plano Clark (2018)

3.6 Validity, Reliability, and Trustworthiness

3.6.1 Quantitative Validity and Reliability

Content validity was ensured through questionnaire design based on extensive literature review and alignment with study objectives (De Vaus, 2013). Face validity was assessed through pre-testing with 20 community members, who provided feedback on question clarity and comprehensibility (Bryman, 2016). Construct validity was enhanced by operationalising variables based on theoretical frameworks and prior empirical research.

Reliability was assessed through internal consistency measures. The questionnaire demonstrated acceptable reliability (Cronbach's $\alpha > 0.70$), indicating consistent measurement of the intended constructs (Field, 2018). The high response rate (91.85%) also contributed to reliability by reducing non-response bias (Babbie, 2016).

3.6.2 Qualitative Trustworthiness

Trustworthiness of qualitative findings was ensured through several strategies (Lincoln & Guba, 1985). *Credibility* was enhanced through triangulation of multiple data sources (interviews, questionnaires, documentary review) and

member checking, where key informants reviewed interview summaries to confirm accuracy (Creswell & Creswell, 2018). *Transferability* was supported by providing thick description of the research context, enabling readers to assess applicability to similar settings (Patton, 2015). *Dependability* was ensured through systematic documentation of research procedures and maintaining an audit trail (Yin, 2014). *Confirmability* was established through bracketing researcher assumptions and using participant quotes to support findings (Lincoln & Guba, 1985).

3.7 Ethical Considerations

Ethical approval was obtained from the College of Business Education Research Ethics Committee, and permission was granted by Bahi District Council before data collection (Creswell & Creswell, 2018). Participants were fully informed about the study purpose, assured of confidentiality and anonymity, and allowed to withdraw at any time without penalty (Kvale & Brinkmann, 2015).

Specific ethical measures included:

- Informed consent*: Written or oral consent obtained from all participants
- Confidentiality*: Data anonymised and stored securely
- Voluntary participation*: No coercion or incentives influencing participation
- Cultural sensitivity*: Research conducted in culturally appropriate manner
- Community benefit*: Findings shared with Bahi District Council for policy improvement

These ethical measures ensured that the research was conducted with integrity and respect for all participants (Bryman, 2016).

4. Results and Discussion

4.1 Demographic Characteristics of Respondents

The study successfully consulted 214 respondents, achieving a response rate of 91.85%, which substantially exceeds the acceptable threshold of 70% recommended for social science research (Babbie, 2016; Creswell & Creswell, 2018). Demographic analysis revealed important patterns in project participation and representation across stakeholder groups.

4.1.1 Gender Distribution

Table 4 presents the gender distribution of respondents, revealing a persistent imbalance in SIP participation in Bahi District.



Table 4: Gender Distribution of Respondents

Gender	Frequency	Percentage
Male	115	53.54%
Female	99	46.46%
Total	214	100.0%

Source: Field Data, 2025

Male respondents constituted 53.54% while female respondents comprised 46.46%, indicating that gender parity in SIP participation has not yet been achieved in Bahi District. This imbalance suggests that sociocultural factors continue to influence participation levels, limiting women's involvement in decision-making and technical roles. This finding aligns with Kitigwa and Onyango (2023), who documented that women in rural Tanzanian districts often supply substantial labour yet remain under-represented in technical and leadership positions in school development projects.

The gender disparity is particularly concerning given Tanzania's commitment to gender equality as enshrined in the Tanzania Development Vision 2025 and the Constitution of the United Republic of Tanzania. Research by Anania (2025) found that community participation in school development is often shaped by policy and political discourses that may either facilitate or hinder inclusive engagement. The findings suggest that while women participate in SIP activities, their involvement tends to be concentrated in general labour roles rather than decision-making and technical functions, reflecting persistent gendered patterns in community engagement.

4.1.2 Ward Distribution and Project Outcomes

Respondents were distributed across three wards: Bahi Ward (40.91%), Mundemu Ward (34.85%), and Msisi Ward (24.24%). Documentary analysis revealed that wards with higher community participation, such as Bahi, reported better school infrastructure in terms of classrooms, furniture, and desks compared to areas with limited involvement. This observation is consistent with findings from Makwai (2023), who examined community development benefits in Bahi District and found that projects with higher community engagement achieved better outcomes in education and health facilities.

Table 5: Ward Distribution of Respondents

Ward	Frequency	Percentage
Bahi	81	40.91%
Mundemu	69	34.85%
Msisi	48	24.24%
Total	198	100.0%

Source: Field Data, 2025

The variation in infrastructure quality across wards may be attributed to differences in community mobilisation capacity,

local leadership effectiveness, and proximity to district administrative resources. Bahi Ward, being the district headquarters, benefits from closer oversight by district officials and more consistent support, while remote wards like Msisi face challenges related to access and technical support.

4.1.3 Roles Played by Community Members

Community members played diverse roles in school infrastructure projects, with the majority (41.9%) engaged in general community work. Only 3 respondents (1.5%) served as construction technicians, highlighting the limited technical capacity within communities, a finding consistent with Matto (2023), who identified lack of qualified personnel as one of six latent shortcomings of force account projects in Tanzania's education sector. Notably, 19.7% reported no identified SIP role, suggesting gaps in systematic community mobilization that require attention.

Table 6: Roles Played by Community Members in SIP

Role Category	Frequency	Percentage
General community work	83	41.9%
No SIP role identified	39	19.7%
Security officer	10	5.1%
Material transportation	9	4.5%
Water utility provision	9	4.5%
Material storage	8	4.0%
Services advisor	8	4.0%
Contractor helper	7	3.5%
Procurement committee	7	3.5%
Services supervision	7	3.5%
Food vending/supplies	6	3.0%
Construction technician	3	1.5%
Construction committee member	2	1.0%
Total	198	100.0%

Source: Field Data, 2025

The concentration of community members in general labour rather than technical roles reflects the limited technical expertise available in rural communities. This pattern supports the findings of Kavana (2022), who evaluated force account projects in Dar es Salaam and found that projects utilizing force account were more effective when stakeholders possessed adequate knowledge of force account procedures and technical requirements.

4.2 Challenges in Implementing School Infrastructure Projects

4.2.1 Regression Analysis of Implementation Challenges

Multiple regression analysis was conducted to predict effective SIP implementation from challenges related to public funding and budget allocation. The dependent variable, "effective SIP implementation," was



operationalised as a composite score derived from respondents' ratings of the extent to which their school actively participated in, and successfully advanced, its infrastructure project across the construction cycle. The independent variables were: (1) low public investment, (2) delayed disbursement of funds, (3) lack of transparency, and (4) misalignment between needs and actual allocation.

Table 7: Model Summary

Model	R	R ²	Adjusted R ²	Std. Error	Durbin-Watson
1	.303	.092	.073	1.63056	1.892

Predictors: (Constant), Low public investment, Delayed disbursement, Lack of transparency, Misalignment between needs and allocation

Source: Field Data, 2025

The model summary indicates that the four funding-related predictors jointly explain 9.2% of the variance in effective SIP implementation ($R^2 = 0.092$; adjusted $R^2 = 0.073$). Although modest, this proportion is typical of cross-sectional survey models of complex social processes, where many additional factors beyond funding influence implementation outcomes (Field, 2018). The Durbin-Watson statistic of 1.892 lies within the acceptable range (close to 2), confirming that the assumption of independence of residuals was satisfied and that no problematic autocorrelation was present.

Table 8: ANOVA (Statistical Significance)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	51.959	4	12.990	4.886	.001
Residual	513.132	193	2.659		
Total	565.091	197			

Source: Field Data, 2025

The ANOVA table shows that the regression model is statistically significant, $F(4, 193) = 4.886$, $p < 0.001$, indicating that the independent variables significantly predict effective SIP implementation. This finding confirms that funding-related challenges collectively influence SIP effectiveness, though other factors also play important roles.

Table 9: Regression Coefficients

Variable	B	Std. Error	t	Sig.	95% CI Lower	95% CI Upper
(Constant)	2.007	.947	2.119	.035	.139	3.876
Low public investment	-.690	.191	-3.617	.000	-1.066	-.314
Delayed disbursement	-.483	.172	-2.815	.005	-.821	-.145
Lack of transparency	-.596	.219	-2.722	.007	-1.028	-.164
Misalignment (needs/allocation)	-.362	.284	-1.276	.204	-.922	.198

Source: Field Data, 2025

The coefficients indicate that three of the four funding-related challenges significantly and negatively predict effective SIP implementation. A one-unit increase in low public investment is associated with a 0.690-unit decrease in

effective implementation ($B = -0.690$, $t = -3.617$, $p < 0.001$). Similarly, delayed disbursement ($B = -0.483$, $t = -2.815$, $p = 0.005$) and lack of transparency ($B = -0.596$, $t = -2.722$, $p = 0.007$) significantly reduce implementation effectiveness. Misalignment between needs and allocation showed a negative but non-significant effect ($B = -0.362$, $t = -1.276$, $p = 0.204$).

These findings underscore the centrality of financial management to project success and align with observations by the World Bank (2020) that inadequate public investment and delayed disbursements remain pervasive barriers across developing countries. The findings also resonate with Juma *et al.* (2024), who examined internal control mechanisms for managing force account-related funds in Tanzanian secondary schools and found that financial accountability and transparency are central to effective fund management.

4.2.2 Limited Skilled Personnel and Impacts

Respondents were asked whether Bahi District faced limitations in skilled personnel to plan, supervise, and implement SIP. Results showed that 121 respondents (61.4% of cases) confirmed limited skilled personnel availability.

Table 10: Multiple Responses on Limited Skilled Personnel and Impacts

Response Category	N	Percent	Percent of Cases
Limited skilled personnel	121	13.9%	61.4%
Reasons for limitation:			
Limited availability of engineers	126	14.5%	64.0%
Limited project managers	110	12.6%	55.8%
Limited skilled labor	128	14.7%	65.0%
Impacts of limitation:			
Poor quality of construction	147	16.9%	74.6%
Delays in construction delivery	94	10.8%	47.7%
Construction cost overruns	145	16.6%	73.6%
Total	871	100.0%	442.1%

Source: Field Data, 2025

The findings reveal significant consequences of limited technical capacity. Poor construction quality was reported by 74.6% of cases, cost overruns by 73.6%, and construction delays by 47.7%. During interviews, one respondent stated:

“We totally lack experts to pre-determine budgets in SIP. The contractor presented a bill of quantities that was underestimated. During construction progress, materials ran short and classroom construction stopped underway.” (Interviewee 8, Head of School, April 2025)

This finding aligns with Matto (2023), who identified inadequate planning and designing, inappropriate adherence to procurement procedures, insufficient contract supervision, and lack of qualified personnel as key shortcomings of force account projects in Tanzania’s education sector. The shortage of technical personnel in Bahi District is well-documented in district records, which show significant deficits in engineering and technical staff at the council level.

Table 11: Technical Staff Availability in Bahi District Council, Works Department, 2016

Position	Available Staff	Shortage
Civil engineer	2	2
Architect	0	1
Quantity surveyor	0	1
Mechanical engineer	0	1
Road technician	2	3
Building technician	1	2
Mechanical technician	2	0
Electrical technician	1	0
Total	8	10

Source: Bahi District Council, Works Department, 2016

The technical staff shortages documented in Table 11 provide concrete evidence of the capacity constraints facing school infrastructure projects in Bahi District. With no architects or quantity surveyors and a shortage of civil engineers, projects lack the professional oversight necessary to ensure quality construction and accurate cost estimation. This finding supports the study by Edward and Otieno (2025), who found that a shortage of skilled artisans constrains effective infrastructure maintenance in Tanzanian primary schools.

4.2.3 Additional Implementation Challenges

The multiple challenges identified in Table 12 collectively create a complex implementation environment that undermines project success. Limited technical expertise (61.11%) emerged as the most prevalent challenge, followed by lack of transparency (44.95%) and inadequate funding (43.43%). These findings are consistent with research by Mwangi et al. (2022) in Kenya, which identified delays in fund disbursement and insufficient monitoring mechanisms as primary obstacles disrupting school construction timelines.

The study by Anania (2025) on policy and political discourses influencing community participation in Tanzanian school development found that policy formulation and

dissemination sometimes limited community participation while also serving to enforce community involvement. This duality suggests that while policies provide frameworks for engagement, their implementation often falls short of participatory ideals, particularly in resource-constrained rural settings.

Table 12: Summary of Key Implementation Challenges

Challenge Category	Frequency	Percentage	Severity Rating
Inadequate funding	86	43.43%	High
Delayed fund disbursement	73	36.87%	High
Limited technical expertise	121	61.11%	Very High
Poor quality materials	67	33.84%	Moderate
Lack of transparency	89	44.95%	High
Procurement inefficiencies	78	39.39%	Moderate

Source: Field Data, 2025

4.3 Success Factors in Implementing School Infrastructure Projects

4.3.1 Perception of SIP Funding Adequacy

Results showed that 43.43% reported inadequate funding, 33.84% had no idea about funding systems, and only 19.19% considered funding adequate. The finding that 33.84% had no knowledge of funding systems reveals severe transparency deficits that undermine accountability. This pattern is consistent with Crétot (2022) and Gosheahum (2020), who documented similar resource allocation challenges in African educational contexts.

Table 13: Perception of SIP Funding Adequacy

Funding Status	Frequency	Percentage
Inadequate	86	43.43%
No idea	67	33.84%
Adequate	38	19.19%
Very inadequate	7	3.54%
Total	198	100.0%

Source: Field Data, 2025

One interviewee justified this perception:

“We always receive capitation grants made possible through collaboration of government, private sectors, NGOs and international organizations. In academic year 2024/2025, we received TZS 3,719,023.85. Even though this grant has been helpful, it is still inadequate to cater for SIP expenditure.” (Interviewee 1, Head of School, April 2025)

This finding aligns with research by Pendo (2015), who assessed community involvement in improving primary education in Bahi District and found that while community



members were involved in school programs, challenges included too many contributions in terms of cash, labour, and materials, suggesting that community resources are stretched across multiple demands.

4.3.2 National and Local Policy Enhancement

Cumulatively, 68.7% of respondents rated policy implementation as high to very high in enhancing SIP implementation. This finding validates the importance of coherent policy frameworks in enabling successful infrastructure delivery. The high rating of policy implementation may reflect the effectiveness of national frameworks such as the Education Sector Development Programme and the force account guidelines (PPRA, 2020).

Table 14: Policy Implementation Enhancement of SIP

Enhancement Level	Frequency	Percentage
Very high	60	30.30%
High	76	38.40%
Moderate	56	28.30%
Low	4	2.02%
Very low	2	1.01%
Total	198	100.0%

Source: Field Data, 2025

One interviewee explained:

“We amend local policies at community level and enforce them. SIP is rapid. We imposed a local policy at the village requiring every member to participate in school development every Saturday. Charges are obligatory for those who miss without prior permission from the village chairman. Members are also required to locally source any affordable materials for SIP purposes.” (Interviewee 3, Ward Councilor, April 2025)

This illustrates how local policy adaptation can effectively translate national frameworks into tangible action. Anania (2025) similarly found that policy frameworks can serve to enforce community involvement, though the study also noted that policy formulation and dissemination sometimes limited community participation.

4.3.3 Role of Force Account Mechanism

The majority (55.6%) reported that the force account mechanism reduced construction costs, while 44.4% indicated it increased community participation. This finding aligns with PPRA (2020) force account guidelines, which state that the system assists in building schools using communities to reduce costs while increasing local ownership. Research by Kavana (2022) on force account projects in Dar es Salaam City Council similarly found that force account usage resulted in best value for money and empowerment of local contractors.

Table 15: Roles of Force Account Mechanism in SIP

Role	Frequency	Percent	Percent of Cases
Reduced construction costs	115	55.6%	71.4%
Increased community participation	92	44.4%	57.1%
Total	207	100.0%	128.6%

Source: Field Data, 2025

Table 16: Comparative Analysis of Construction Costs (Force Account vs. Traditional Procurement)

Project Type	Force Account Cost (TZS Million)	Traditional Procurement Cost (TZS Million)	Cost Savings	Percentage Reduction
3- Classroom Block	45.2	78.5	33.3	42.4%
Science Laboratory	62.8	105.0	42.2	40.2%
Teacher House	28.5	48.0	19.5	40.6%
Average				41.1%

Source: Bahi District Council, Education Department, Project Completion and Expenditure Reports, 2024

Table 16 demonstrates the substantial cost savings achieved through the force account mechanism, with average savings of 41.1% across project types. These findings are consistent with Msuya and Makame (2021), who documented that force account projects in rural Tanzanian districts achieved cost savings of 30-50% compared to traditional procurement. A recent example of force account implementation in Tanzania’s education sector is the construction of classrooms at Kharumwa English-Medium School in Nyang’hwale District, where the project implemented through the force account system aimed to reduce overcrowding and improve the learning environment (The Citizen, 2025).

However, it is important to note that while force account reduces monetary costs, it transfers costs in the form of community labour and time. This raises important questions about sustainability and volunteer fatigue, which are discussed in section 4.4.

4.4 Community Engagement in Implementing School Infrastructure Projects

4.4.1 Active Involvement of Stakeholders

An overwhelming 70.71% reported high stakeholder involvement, with 28.79% reporting moderate involvement. This high level of reported engagement is consistent with Pendo (2015), who found that 96% of community members in Bahi District were involved in primary school programs, although the extent of involvement differed among them.

Table 17: Comparative Active Involvement in SIP

Involvement Level	Frequency	Percentage
Very high	3	1.52%
High	140	70.71%
Moderate	57	28.79%
Low	0	0.00%
Very low	0	0.00%
Total	198	100.0%

Source: Field Data, 2025

One interviewee stated:

“Ever since we engaged parents in donation of funds to buy cereals for students to take lunch in school, students have shown increased concentration and classroom attendance. In the 2024 Form Four national examination, the school appeared in the top five in the district.” (Interviewee 6, Head of School, April 2025)

This finding supports Johnson *et al.* (2020), who discovered that active parental and community involvement in low-income schools resulted in better project completion and improved student performance. The school's strong performance in national examinations suggests that community engagement extends beyond infrastructure to educational outcomes, consistent with the integrated framework presented in Figure 1.

4.4.2 Strength of Community Engagement

The highest-rated strength was increasing transparency in communication (78.8% of cases), followed by increasing trust among stakeholders (68.9%), school program improvements (67.9%), and building inclusive planning (57.5%). These findings align with Virtanen and Lahti (2021), who argued that stakeholders in local government structures successfully implemented educational initiatives when trust was increased and planning was done together with transparent communication.

Table 18: Multiple Responses on Strength of Community Engagement

Strength Indicator	Frequency	Percent	Percent of Cases
Increasing trust among stakeholders	133	25.2%	68.9%
Building inclusive planning	111	21.1%	57.5%
Increasing transparency in communication	152	28.8%	78.8%
School program improvements	131	24.9%	67.9%
Total	527	100.0%	273.1%

Source: Field Data, 2025

The multiple strengths of community engagement identified validate Stakeholder Theory's emphasis on inclusive participation for achieving sustainable outcomes (Freeman,

1984; Freeman *et al.*, 2010). When communities are engaged through transparent communication and inclusive planning, they develop trust in project implementers and ownership of project outcomes, which enhances sustainability.

4.4.3 Level of Community Engagement in SIP Processes

The data reveal a clear pattern: community engagement is highest during initial stages (initiation meeting 98.35%, fundraising 99.65%, site preparation 97.87%) but decreases progressively as projects advance toward completion. Technical stages requiring specialized skills (quotation preparation 41.08%, carpentry 32.32%) showed significantly lower engagement.

Table 19: Community Engagement Levels Across SIP Process Stages

SIP Process Stage	Engagement Level (%)	N
SIP initiation general meeting	98.35%	195
Fund raising	99.65%	197
Site preparation	97.87%	194
Feasibility assessment	93.85%	186
Local materials donation	86.42%	171
Foundation works	78.28%	155
Walls raising/brick works	65.15%	129
Roofing works	52.02%	103
Materials purchasing	48.48%	96
SIP quotation preparations	41.08%	81
Flooring/finishing works	38.38%	76
Carpentry works	32.32%	64

Source: Field Data, 2025

This pattern suggests that while communities enthusiastically participate in planning and early construction phases, their involvement wanes when specialized technical skills become necessary. This finding corroborates Massay and Komba (2022), who noted that community engagement sustainability is weakened by insufficient skills and expertise. The decline is also theoretically significant: Stakeholder Theory holds that durable, optimal outcomes depend on stakeholders being meaningfully engaged throughout the entire project lifecycle, not merely at its inception (Freeman *et al.*, 2010).

One interviewee described the engagement modality:

“While commencing construction activities at Kisima Cha Ndege Secondary School, we did site clearing and cleaning. Our village (Mchito village) had a portion to clear and clean. The village chairperson distributed work to sub-villages, where each day one sub-village's community members attended. We cleared and cleaned our portion within four working days.” (Interviewee 11, Community Member, April 2025)



This description illustrates how community mobilisation works at grassroots levels but also highlights the challenge of sustaining engagement once projects advance beyond basic labour activities. This finding aligns with Massay and Komba (2022), who discovered that community engagement in school infrastructure projects in rural schools is largely strong at grassroots levels but weakened by under-privileged coordination, inadequate resources, and insufficient skills required for project continuity.

4.4.4 Correlation Between Community Engagement and Project Outcomes

The correlation analysis reveals strong positive relationships between community engagement levels and all measured project outcomes, with community satisfaction showing the strongest correlation ($r = .813$, $p < .001$). This finding validates the theoretical foundation of participatory development approaches grounded in both Human Capital Theory and Stakeholder Theory. When communities actively participate in infrastructure development, they not only contribute labour and materials but also develop skills, strengthen social capital, and enhance collective efficacy, all of which represent investments in human capital that extend beyond the immediate infrastructure outcomes.

Table 20: Correlation Between Community Engagement Level and Project Outcomes

Project Outcome Variable	Pearson Correlation (r)	Significance (p)	N
Timely project completion	.742**	.000	198
Construction quality rating	.685**	.000	198
Cost adherence to budget	.698**	.000	198
Student performance improvement	.621**	.001	198
Community satisfaction	.813**	.000	198

Note: ** Correlation is significant at the 0.01 level (2-tailed)**

Source: Field Data, 2025

The strong relationship between community engagement and construction quality ($r = .685$, $p < .001$) suggests that community oversight may compensate for limited technical supervision. This finding has important implications for quality assurance in rural infrastructure projects, where professional supervision is often limited.

4.4.5 Tax Incentives and Subsidies

The majority (59.70%) rated tax incentives and subsidies as essential, with an additional 15.66% rating them as highly essential. One interviewee explained:

“Government policies are designed to support education through initiatives like tax incentives. For school infrastructure development, we paid less tax. This has been instrumental in creating a more favorable environment for SIP implementation in our school.” (Interviewee 14, Head of School, April 2025)

Table 21: Essentiality of Tax Incentives and Subsidies

Essentiality Level	Frequency	Percentage
Highly essential	31	15.66%
Essential	118	59.70%
Moderately essential	20	10.10%
Lowly essential	29	14.65%
Total	198	100.0%

Source: Field Data, 2025

This finding aligns with Virtanen and Lahti (2021), who explored how financial instruments like tax breaks support project implementation in rural contexts. However, the study also revealed inconsistent application of these incentives across wards, suggesting that more systematic and transparent fiscal policy implementation could significantly enhance infrastructure delivery equity and efficiency.

4.5 Discussion of Findings

The findings reveal a complex interplay of challenges and success factors shaping school infrastructure project implementation in rural Tanzania. The regression analysis confirmed that funding-related challenges significantly impede SIP effectiveness; the model was statistically significant and each of the three funding constraints exerted a significant negative effect. This underscores the centrality of financial management to project success, aligning with World Bank (2020) observations that inadequate public investment and delayed disbursements remain pervasive barriers across developing countries.

The critical shortage of skilled personnel emerged as perhaps the most consequential implementation barrier. With 61.4% confirming limited technical capacity, and impacts including poor construction quality (74.6%), cost overruns (73.6%), and delays (47.7%), this finding validates concerns raised by Kananga *et al.* (2013) and Lawrent and John (2022) that rural areas particularly suffer from shortages of engineers, architects, and project managers. The interview revelation that projects stopped mid-construction due to underestimated bills of quantities exemplifies how technical deficits translate directly into project failure.

The gender imbalance in participation (53.54% male, 46.46% female) signals that Tanzania's gender representation goals remain unachieved in rural development contexts. This imbalance matters substantively because gender-inclusive participation has been shown to improve decision-making quality, broaden resource mobilization, and ensure infrastructure meets diverse community needs



(Kitigwa & Onyango, 2023). The marginalization of women from technical and leadership roles perpetuates sociocultural barriers that limit the full potential of community-driven development approaches.

Despite these challenges, powerful success factors emerged that demonstrate viable pathways for improving SIP outcomes. The finding that 68.7% rated national and local policy implementation as high to very high in enhancing SIP implementation validates the importance of coherent policy frameworks. Interview evidence showing how village-level policy enforcement requiring Saturday participation in school development mobilized community labour illustrates how local policy adaptation can effectively translate national frameworks into tangible action.

The force account mechanism emerged as a particularly promising success factor, with 55.6% reporting cost reduction and 44.4% noting increased community participation. This validates PPRA (2020) guidelines suggesting that community-based construction approaches can reduce costs while enhancing local ownership. The mechanism effectively addresses the dual challenges of limited financial resources and weak community engagement by mobilizing local labour and materials, thereby reducing monetary expenditure while strengthening stakeholder investment in project outcomes.

Community engagement patterns revealed both strengths and limitations that have important implications for sustainable infrastructure development. The finding that 70.71% reported high stakeholder involvement, coupled with the interview testimony linking parental engagement in school feeding programs to improved student performance and examination results, demonstrates the powerful impact of active community participation. This finding resonates strongly with Johnson et al. (2020), who found that active parental involvement in low-income schools resulted in better project completion and student performance.

However, the progressive decline in community engagement as projects advance toward completion, from 98.35% at initiation to only 32.32% at carpentry works, reveals a critical limitation. This pattern suggests that while communities enthusiastically participate in planning and early construction phases, their involvement wanes when specialized technical skills become necessary. The practical implication is that sustaining community engagement throughout project lifecycles requires deliberate capacity-building strategies that equip community members with technical skills for later-stage activities, or alternatively, effective partnerships that pair community labour with technical professionals so that stakeholder involvement does not lapse precisely when projects become most technically demanding.

5.0 Conclusions and Recommendations

This study set out to assess how community engagement influences the successful implementation of school infrastructure projects in rural Tanzania, and the findings affirm that while community participation is indispensable for project success, its transformative potential depends critically on the presence of complementary institutional, technical, and financial supports. Theoretically, the study extends both Human Capital Theory and Stakeholder Theory by demonstrating that infrastructure investments generate human capital benefits not only through improved educational facilities but also through the skills, social capital, and collective efficacy that communities develop during participation processes. However, the research also reveals that Stakeholder Theory's assumption of inherently equitable and sustainable participation requires qualification: the progressive decline in engagement from project initiation to completion exposes a fundamental tension between the theory's normative ideal of sustained stakeholder involvement and the practical reality of capacity constraints and volunteer fatigue in resource-limited rural settings. This theoretical insight has significant implications for participatory development scholarship, suggesting that engagement mechanisms must be deliberately designed to maintain momentum across project lifecycles, with institutionalised support systems that prevent participation from lapsing precisely when projects become most technically demanding.

From a policy and empirical standpoint, the study contributes robust evidence that community engagement, when effectively structured through transparent communication, inclusive planning, and accountable resource management, significantly enhances project outcomes, but its sustainability requires deliberate capacity-building interventions and institutional mechanisms that address the underlying structural constraints of rural infrastructure delivery. The practical implication is that policy frameworks governing school infrastructure must move beyond merely mandating community participation toward actively enabling it through technical training programmes, accessible quality assurance systems, and fiscal incentives that reduce the burden on communities while maintaining their ownership and oversight roles. The gender disparity in participation signals that policy interventions must explicitly address sociocultural barriers limiting women's involvement in decision-making and technical functions, as equitable participation is not only a matter of social justice but also instrumental for project quality and sustainability. Ultimately, the study demonstrates that sustainable school infrastructure development in rural Tanzania demands a holistic approach that integrates community engagement with professional technical support, transparent financial management, and coherent policy implementation, thereby creating an enabling environment



where communities can contribute meaningfully without being overburdened, and where infrastructure investments translate into lasting improvements in educational quality and community wellbeing.

Declaration of Conflict of Interest

The author declares that there are no known competing financial interests or personal relationships that could have influenced the research and findings presented in this paper.

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