JRIIE Journal of Research Innovation and Implications in Education
Center for Research Implications & Practice

Website: www.jriiejournal.com ISSN 2520-7504 (Online) Vol.10, Iss.3, 2026 (pp. 1547 - 1561)

Influence of Sustainable Local Materials Management Practices on the Success of Gisozi Affordable Housing Project in Gasabo District, Rwanda

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Abstract: *Construction delays have become a key contributor to project failure in Rwanda. The primary purpose of this research was to assess the effect of sustainable local materials management on the success of Gisozi Affordable Housing Project in Gasabo District. The theoretical framework was anchored in the Resource-Based View theory, Stakeholder Theory, the Triple Bottom Line framework, and Sustainability Theory. A descriptive and correlational research design was implemented, utilizing both quantitative and qualitative approaches. The study population consisted of 227 professionals from major housing developments, with a sample size of 145 respondents selected using Slovin's formula through stratified and simple random sampling. The regression results showed that sustainable local material planning practices had a positive and significant effect on the success of Gisozi Affordable Housing Project in Gasabo District with B = 0.150, t = 2.459, and p = 0.015, while sustainable local material procurement had B = 0.489, t = 10.188, and p = 0.000. Sustainable local material quality management had B = 0.132, t = 2.694, and p = 0.008, whereas sustainable local material monitoring and evaluation had B = 0.194, t = 2.812, and p = 0.005. The study concludes that sustainable local materials management significantly improves project success, especially when procurement systems, planning controls, quality checks, and monitoring practices are strengthened. The study recommends that Gisozi Affordable Housing Project managers should institutionalize a formal local materials management framework linking supplier rating, delivery tracking, quality testing, and milestone audits to improve project success.*

Key words: Sustainable Local Materials Management, Sustainable Local Material Planning Practices, Project Success, Sustainable Procurement, Sustainable Quality Management, Sustainable Monitoring and Evaluation

How to cite this work (APA):

Uwimana, D. R. & Dushimimana, J. D. (2026). Influence of Sustainable Local Materials Management Practices on the Success of Gisozi Affordable Housing Project in Gasabo District, Rwanda. *Journal of Research Innovation and Implications in Education, 10*(3), 1547 – 1561. **https://doi.org/10.59765/bgy7f5**

1. Introduction

Many projects in Rwanda suffer from poor planning, with managers overlooking critical resource details, leading to a sector contribution of 21% to GDP which could be higher with efficiency. Statistics show that the construction industry contributes significantly to the economy, yet 80% of construction permit applications submitted as of 2022 do not meet urbanization standards (RDB, 2023).

Performance issues in the Rwandan construction sector are manifested through a lack of coordination where nearly 70% of households remain unserved by the formal housing market. This formal housing supply channel continues to underperform due to a persistent mismatch between eligible subsidy costs and actual project implementation costs. Only a handful of developers possess the capacity to deliver homes below 40 million Rwandan Francs, and even among them, scalability is a major concern (FinScope, 2023).

Construction delays have become a key contributor to project failure in Rwanda, with 65.7% of public construction projects in Kigali experiencing significant delays. Statistics from the One Stop Center for Construction in Kigali reveal that over 69% of projects issued with permits request an extension of the project schedule. These delays result in time overruns affecting 45% of projects and cost overruns impacting 33.4% of developments in the capital city (Amanya & Njenga, 2022).

Substandard infrastructure and construction mistakes are among the top delay factors, with new affordable residential units receiving support reaching only 14.5% of the 1,800-unit target. Implementation of project components has made progress, yet certain housing developments like Gahanga are only at 44.1% infrastructure progress despite long extensions (World Bank, 2025). In Kigali's urban mobility and housing initiatives, supply chain disruptions and personnel shortages have affected up to 79% and 60% of projects, respectively. Despite these challenges, the sector continues to grow, emphasizing the need for strategies to mitigate delays and standardize measurement practices. High-risk zone relocations involving 2,239 households highlight the urgent social need for successful affordable housing delivery in Gasabo District (Rutagengwa & Kwena, 2024).

None of the study conduct on Affordable housing project in Rwanda has addressed the integrated influence of sustainable local materials management on the success of the project to bridge that gap of knowledge. This study established a comprehensive predictive model that links material planning, procurement, quality, and monitoring to project success of Gisozi Affordable Housing Project in Gasabo District.

1.1 General Objective

The general objective of this research was to assess the effect of sustainable local materials management on the success of Gisozi Affordable Housing Project.

1.2 Specific Objectives

The specific objectives provide a clear direction for the study by specifying the key relationships to be examined.

1. To assess the effect of sustainable local material planning practices on the success of Gisozi Affordable Housing Project in Gasabo District.

2. To evaluate the effect of sustainable local material procurement on the success of Gisozi Affordable Housing Project in Gasabo District.

3. To analyze effect of sustainable local material quality management on the success of Gisozi Affordable Housing Project in Gasabo District.

4. To establish the effect of sustainable local material monitoring and evaluation on the success of Gisozi Affordable Housing Project in Gasabo District.

2. Literature Review

The empirical review synthesizes existing research findings to establish a comparative basis for the study, focusing on how material management dimensions' influence success.

2.1 Local Material Planning Practices and Success of Project

Liaqat et al. (2024) conducted a quantitative survey-based study into the moderating role of sustainable leadership on the link between project management and success in Pakistan. The study utilized data from 285 completed projects and analyzed the relationships using PLS-SEM hierarchical modeling to determine the importance of resource planning in achieving sustainable outcomes. Key findings indicated that sustainable project management practices, particularly those related to material scheduling, are positively associated with project success, with leadership significantly enhancing this. The study concluded that effective planning for project resources is a primary driver of long-term viability and suggested that managers should prioritize the integration of sustainability matters. It was recommended that government bodies should implement mandatory training programs to improve the planning competencies of construction leaders in the region to ensure project delivery.

Isma'il et al. (2024) explored the impact of inventory control and measurement strategies on the operational and financial sustainability of micro and small enterprises in the African construction supply chain. The methodology involved a survey of 300 business owners and an analysis of their material management practices during the institutionalization phase of corporate sustainability in the region. Results indicated that the adoption of appropriate stock control and planning strategies can generate tangible benefits by minimizing losses due to material deterioration, theft, or expiry. The study concluded that many organizations still operate without digitized planning systems, which limits the quality of their decisions and reduces their overall project success rates. It was recommended that SMEs should prioritize the implementation of basic ERP systems to enhance their material planning accuracy and responsiveness to market demands.

2.2 Local Material Procurement and Success of Project

Wu et al. (2023) explored the correlation between sustainable project management and project success, focusing on the moderating effect of stakeholder engagement in the Chinese construction industry. The study analyzed 365 questionnaires gathered from professionals, guided by the resource-based view and stakeholder theories to understand the drivers of procurement effectiveness in urban developments. Results demonstrated that sustainable procurement management, specifically the sourcing of local and ethical building materials, significantly influences construction project success in complex urban environments today. The study concluded that stakeholder engagement acts as a critical moderator that enhances the impact of sustainable procurement practices on the final outcomes of the build. It was recommended that construction firms should develop more collaborative relationships with regional suppliers to ensure the availability of high-quality indigenous resources and support growth.

Afshari and Bafti (2023) conducted an empirical analysis of project procurement management as a strategic pillar, emphasizing its role in achieving economic project delivery and resource optimization. The research utilized a survey of project managers to assess how the execution of project contracts and the management of regional suppliers influence the overall success of developments. Key findings revealed that strategic procurement management entails the management of project suppliers and the optimization of risk along the entire supply chain to minimize delays. The study concluded that the complexity in procurement management has led to the adoption of smart contracts and digital platforms for more efficient and accountable acquisition. It was recommended that developers should prioritize the selection of suppliers who can guarantee the availability of required materials at the optimum time and quantity for sites.

2.3 Local Material Quality Management and Success of Project

Panigrahi et al. (2024) analyzed the impact of material quality management on the operational sustainability of small businesses in the Global South, emphasizing digitized measurement strategies. The study utilized empirical evidence from Latin America and other developing regions to document the positive impacts generated by the implementation of ERP systems and digital monitoring. Results indicated that organizations which continue to operate without digitized systems face significant difficulties in maintaining quality standards, which in turn reduces their profitability and client ratings. The study concluded that flexibility in inventory management and a rigorous approach to quality control are decisive factors for the long-term sustainability of construction firms. It was recommended that project managers should focus on enhancing their technical capabilities to better monitor the structural integrity of regional building materials and components.

Gavhane (2025) investigated the mechanisms of material quality control and their correlation with the return on assets in the contemporary construction sector, focusing on waste reduction. The research utilized a metaheuristics approach to model material replenishment policies and their impact on the final quality of infrastructure projects during the 2024-2025 period. Findings showed that the adoption of coordinated quality decisions and the use of weighted average valuation methods provide transparency in the measurement of project performance and durability. The study concluded that the absence of safety stock policies and poor quality control lead to emergency purchases of substandard materials at high prices, negatively affecting success. It was recommended that firms should align their quality management practices with international standards, such as IFRS, to ensure consistent project excellence and structural safety for end-users.

Dufitumukiza (2022) provided an empirical study on the effect of project management practices on the success of the Musanze Agri Market project using a sample of professional respondents. The research used a descriptive and correlational approach to show that effective planning for material and equipment quality significantly contributed to the project's high success rate. Key findings indicated a strong positive correlation between material and equipment planning and the achievement of high levels of stakeholder satisfaction and infrastructure durability in Rwanda. The study concluded that the use of specialized knowledge and unique local resources allowed the project to maintain its competitive edge and meet required benchmarks. It was recommended that developers should integrate proactive risk planning into their quality management frameworks to address potential disruptions caused by unforeseen material defects or weather conditions.

2.4 Local Material Monitoring and Evaluation and Success of Project

Tambwe et al. (2025) investigated the application of digital sustainability tools, such as IoT and artificial intelligence, in the monitoring and evaluation of inventory for construction enterprises. The research evaluated how the ability to detect fluctuations in demand and to reconfigure stock policies in real-time strengthens the competitive advantage and sustainability outcomes of firms. Findings showed that recent studies indicate these digital capabilities are being integrated with Industry 4.0 tools, providing updated support for resource-based view arguments in the contemporary sector. The study concluded that organizations which

continue to operate without digitized monitoring systems limit their decision-making quality and face higher risks of operational failure. It was recommended that project managers should prioritize the implementation of real-time monitoring platforms to enhance their responsiveness to volatile market conditions and supply chain shifts.

Rutagengwa and Kwena (2024) examined the influence of monitoring and control on the performance of construction projects in Rwanda, utilizing a sample of 120 professional respondents for evaluation. The study analyzed the relationship between project monitoring and outcomes such as minimize project completion time and delay, using a multiple regression model to test hypotheses. Key findings indicated that while monitoring was being performed, it often lacked the necessary frequency and accuracy to prevent significant impacts on project performance and satisfaction. The study concluded that the construction industry in Rwanda encounters numerous non-technical challenges that have led to delays and poor performance due to inadequate oversight systems. The researcher recommended that project managers should utilize the Construction Management Information System (CMIS) to automate their monitoring and evaluation activities and improve decision-making.

3. Methodology

3.1 Research Design

The study implemented a descriptive and correlational research design with quantitative and qualitative approaches to provide a holistic analysis of the Gasabo housing sector. Through a mixed research approach that integrates quantitative survey data and qualitative interview insights, the study captured both statistical trends and contextual factors influencing construction performance.

3.2 Study Population and Sample

The target population for this research consisted of 227 professionals involved in the management of affordable housing projects in Gasabo District, Rwanda. The population included managers, engineers, site supervisors, technical and field officers. These categories were selected because of their direct influence on material management decisions and their deep knowledge of the project's performance outcomes. The sample size was 145 respondents, ensuring a 95% confidence level for the final results.s

3.3 Data Collection Instruments

The study utilized structured questionnaires for the quantitative survey and semi-structured interview guides for the qualitative data collection from the professionals. The questionnaires featured a 5-point Likert scale to measure the influence of material management on project success, allowing for efficient statistical processing. The interview guides consisted of open-ended questions designed to capture deeper contextual insights and to explore the human factors of management performance.

3.4 Data Analysis

The researcher performed a descriptive analysis for the independent variable dimensions planning, procurement, quality, and monitoring and the dependent variable of project success using Likert data.
The researcher performed a multiple regression analysis to test the four null hypotheses and to establish the influence of sustainable local materials management. The analysis used a p-value threshold of 0.05 to determine significance, ensuring that results are 95% likely to be accurate for the industry.

3.5 Ethical concerns

The research was conducted in full compliance with the ethical standards of the University of Kigali. The researcher prioritized the privacy and dignity of the participants, ensuring that every step of the study was carried out with professional honesty.

4. Results and Discussion

4.1 Response Rate

Response rate is important because it shows the level of participation of selected respondents in the study. A high response rate improves the reliability of the study findings because it reduces the risk of non-response bias. In this study, questionnaires were distributed to professionals involved in Gisozi Affordable Housing Project in Gasabo District.

Table 1: Response rate

Questionnaires	Frequency	Percentage (%)
Returned Complete	137	94.5
Returned Incomplete	1	0.7
Unreturned	7	4.8
Total	**145**	**100.0**

Source: Field Data, 2026

The results in Table 1 indicates response rate, showing that 137 questionnaires were returned complete representing 94.5%, 1 questionnaire was returned incomplete representing 0.7%, and 7 questionnaires were unreturned representing 4.8%. The complete responses formed the basis for data analysis because they contained usable information on sustainable local materials management and project success. The incomplete and unreturned questionnaires were excluded from analysis because they could not provide reliable evidence for the study objectives. Therefore, the response rate was high enough to support valid interpretation of findings for Gisozi Affordable Housing Project in Gasabo District.

4.2 Descriptive Statistics

This section presents descriptive statistics on all independent variables and the dependent variable using mean and standard deviation. Respondents were asked to rate their level of agreement or disagreement on a 5-point scale, with 1 indicating Strongly Disagree and 5 indicating Strongly Agree. The mean values were classified into specific ranges: 1.0 to 1.8 as very low, 1.9 to 2.6 as low mean, 2.7 to 3.4 as neutral, 3.5 to 4.2 as high mean, and 4.3 to 5.0 as very high mean. The standard deviation was used to determine whether the data is homogeneous or heterogeneous. If the standard deviation is less than or equal to 0.5, the data is characterized as homogeneous. In contrast, if the standard deviation surpassed 0.5, the data was classified as heterogeneous.

Table 2: Descriptive statistics on Sustainable local material planning practices

	N	Mean	Std. Deviation
The project management team achieves high forecast precision in predicting the quantities of local materials required.	137	4.30	.460
There is effective lead-time control implemented to ensure local materials arrive before they are needed on-site.	137	4.21	.410
The procurement of local materials maintains strict schedule alignment with the overall construction timeline.	137	4.28	.542
The project ensures optimal resource allocation specifically for the handling and storage of local materials.	137	4.20	.423
Overall	**137**	**4.25**	**.458**

Source: Field Data, 2026

The results in Table 2 indicates descriptive statistics on sustainable local material planning practices, where the statement that the project management team achieves high forecast precision in predicting the quantities of local materials required had a mean of 4.30 and standard deviation of 0.460. The mean falls within the very high mean range, showing very strong positive agreement among respondents on the existence of accurate forecasting for local materials. The standard deviation is less than or equal to 0.5, meaning the responses were homogeneous and respondents shared similar views. This implies that forecasting helped Gisozi Affordable Housing Project estimate local material needs in a coordinated way before construction activities required them.

There is effective lead-time control implemented to ensure local materials arrive before they are needed on-site recorded a mean of 4.21 and standard deviation of 0.410. The mean is within the high mean range, showing strong positive agreement among respondents that lead-time control was practiced in the project. The standard deviation is less than or equal to 0.5, meaning the data is homogeneous and views were closely distributed. This suggests that delivery timing for local materials was managed in a way that supported continuity of construction activities.

Regarding forecast precision and lead-time control, the project coordinator narrated: "I participated in preparing material schedules before the main construction phases started. I noticed that local suppliers were contacted early, which helped the project team know the quantities and timing of cement blocks, aggregates, and other local inputs. This planning reduced pressure on the site because materials were normally requested before the work teams needed them."

The procurement of local materials maintains strict schedule alignment with the overall construction timeline recorded a mean of 4.28 and standard deviation of 0.542. The mean is within the high mean range, showing strong positive agreement among respondents that material procurement was linked to the project schedule. The standard deviation surpassed 0.5, meaning the data is heterogeneous and respondents had varied experiences regarding the consistency of schedule alignment. This shows that schedule coordination existed, although some respondents observed differences in how it was applied across project activities.

The project ensures optimal resource allocation specifically for the handling and storage of local materials recorded a mean of 4.20 and standard deviation of 0.423. The mean is within the high mean range, showing strong positive agreement among respondents on the adequacy of resource allocation for local material management. The standard deviation is less than or equal to 0.5, which means that the data is homogeneous and

responses were close to each other. This indicates that Gisozi Affordable Housing Project had clear arrangements for handling and storage resources needed to protect local materials.

On schedule alignment and resource allocation, the site supervisor stated: "I worked closely with storekeepers and technical officers to make sure that delivered materials were placed in safe locations. I observed that storage areas were prepared before large deliveries arrived, and this helped reduce damage and confusion on site. The planning system made daily construction work easier because materials were linked to the work program."

The overall mean for sustainable local material planning practices was 4.25 with an overall standard deviation of 0.458. The mean falls within the high mean range and is close to the very high range, showing strong positive agreement among respondents that planning practices were effectively applied in the project. The standard deviation is less than or equal to 0.5, meaning the responses were homogeneous and respondents generally shared similar opinions. Therefore, planning practices were perceived as an important support to the success of Gisozi Affordable Housing Project through forecasting, timing, schedule coordination, and resource allocation.

The outcomes are also consistent with Liaqat et al. (2024), who argued that effective planning of project resources strengthens long-term project viability by helping managers anticipate supplier capacity, lead-time risks, and material allocation needs. Their argument supports the current study because sustainable housing projects require early planning systems that connect local supplier readiness with construction timelines, especially where affordability depends on avoiding waste and delay.

Resource-Based View Theory supports this objective because planning capability is treated as an internal organizational resource that can create better project performance when it is valuable and difficult to imitate. Robertson (2024) explained that internal capabilities such as specialized forecasting knowledge and operational coordination strengthen competitive advantage. This theory therefore supports the role of local material planning as a strategic capability for affordable housing success.

Table 3: Descriptive statistics on Sustainable local material procurement

	N	Mean	Std. Deviation
The project utilizes a formal vendor rating system to evaluate the performance of local material suppliers.	137	4.17	.375
There is a high level of contract clarity regarding the delivery terms and specifications of local materials.	137	4.16	.388
The project prioritizes high local content in its procurement strategy to support the regional economy.	137	4.11	.377
The procurement of local materials has resulted in measurable cost savings compared to imported alternatives.	137	4.20	.417
Overall	**137**	**4.16**	**.389**

Source: Field Data, 2026

The findings in Table 3 indicates descriptive statistics on sustainable local material procurement, where the statement that the project utilizes a formal vendor rating system to evaluate the performance of local material suppliers had a mean of 4.17 and standard deviation of 0.375. The mean is within the high mean range, showing strong positive agreement among respondents that supplier performance was formally assessed. The standard deviation is less than or equal to 0.5, meaning the data is homogeneous and respondents had similar views. This implies that vendor rating helped the project identify reliable local suppliers for affordable housing construction materials.

There is a high level of contract clarity regarding the delivery terms and specifications of local materials recorded a mean of 4.16 and standard deviation of 0.388. The mean is within the high mean range, showing strong positive agreement among respondents that local material contracts were clear. The standard deviation is less than or equal to 0.5, meaning the data is homogeneous and respondents were consistent in their responses. This suggests that contract terms helped reduce misunderstanding about quantities, delivery dates, and quality specifications.

Regarding supplier evaluation and contract clarity, the procurement officer narrated: "I was involved in checking supplier records before purchase orders were approved. I observed that suppliers who delivered on time and respected technical specifications were preferred for repeated orders. This made procurement more predictable because the project team could rely on vendors with proven performance."

The project prioritizes high local content in its procurement strategy to support the regional economy recorded a mean of 4.11 and standard deviation of 0.377. The mean is within the high mean range, showing strong positive agreement among respondents that local

sourcing was emphasized. The standard deviation is less than or equal to 0.5, which indicates homogeneous responses among respondents. This means that Gisozi Affordable Housing Project used procurement as a channel for supporting regional suppliers and reducing dependence on external sources.

Concerning local content and cost saving, a project partner stated: "I saw that the project gave priority to locally available construction inputs whenever they met the required standards. I believe this decision helped the project avoid unnecessary transport costs and reduced waiting time for imported materials. The approach also encouraged local businesses because they became part of the housing delivery process."

The procurement of local materials has resulted in measurable cost savings compared to imported alternatives recorded a mean of 4.20 and standard deviation of 0.417. The mean is within the high mean range, showing strong positive agreement that local procurement contributed to cost savings. The standard deviation is less than or equal to 0.5, meaning the data is homogeneous and respondents were closely aligned. This indicates that the use of local materials supported affordability by reducing transport costs, import-related delays, and procurement expenses.

The overall mean for sustainable local material procurement was 4.16 with an overall standard deviation of 0.389. The mean is within the high mean range, showing strong positive agreement among respondents that procurement practices were effectively used in the project. The standard deviation is less than or equal to 0.5, meaning the responses were homogeneous and the respondents generally agreed on the procurement situation. Therefore, local material procurement contributed to project success through supplier assessment, clear contracts, local content use, and cost-saving mechanisms.

The findings resonate with Afshari and Bafti (2023), who explained that procurement management is a strategic pillar in construction because it links supplier selection, contract administration, risk optimization, and delivery coordination. Their view supports the current study because affordable housing projects depend on reliable local suppliers, clear agreements, and timely acquisition of materials to maintain cost control and implementation continuity.

Stakeholder Theory supports this objective because procurement of local materials involves relationships among developers, suppliers, local authorities, beneficiaries, and project partners. Liaqat et al. (2024) explained that successful projects manage stakeholder interests through trust, participation, and value creation. This theory therefore supports sustainable local material procurement because supplier relationships and local content choices can improve legitimacy, cooperation, and acceptance of affordable housing projects.

Table 4: Descriptive statistics on Sustainable local material quality management

	N	Mean	Std. Deviation
The local materials used in construction consistently meet the required structural strength standards.	137	4.08	.501
The project ensures that local materials maintain the dimensional precision necessary for accurate assembly.	137	4.13	.497
The aesthetic appeal of the local materials used aligns with the architectural design of the housing units.	137	4.13	.339
All local materials used demonstrate full standard compliance with national building codes and regulations.	137	4.23	.425
Overall	**137**	**4.14**	**.440**

Source: Field Data, 2026

The results in Table 4 indicates descriptive statistics on sustainable local material quality management, where the statement that the local materials used in construction consistently meet the required structural strength standards had a mean of 4.08 and standard deviation of 0.501. The mean is within the high mean range, showing strong positive agreement among respondents that local materials met strength requirements. The standard deviation surpassed 0.5 by a small margin, meaning the data is heterogeneous and respondents had slightly varied views. This suggests that structural strength was generally achieved, although some respondents observed differences in consistency across local material batches.

On structural strength and standard compliance, the quality engineer stated: "I inspected local material samples before they were approved for use in the housing units. I observed that the project required materials to meet technical standards before acceptance on site. This practice helped reduce the risk of weak materials being used in permanent structural works."

The project ensures that local materials maintain the dimensional precision necessary for accurate assembly recorded a mean of 4.13 and standard deviation of 0.497. The mean is within the high mean range, showing strong positive agreement among respondents that dimensional precision was controlled. The standard deviation is less than or equal to 0.5, meaning the data is homogeneous and respondents shared similar views. This indicates that materials used in the project were measured and checked to support proper assembly of housing units.

Concerning dimensional precision and visual quality, the site engineer narrated: "I checked whether blocks and finishing materials matched the measurements needed for proper assembly. I noticed that materials with irregular sizes were separated and reported before use. This helped the project maintain both construction accuracy and the appearance expected in affordable housing units."

The aesthetic appeal of the local materials used aligns with the architectural design of the housing units recorded a mean of 4.13 and standard deviation of 0.339. The mean is within the high mean range, showing strong positive agreement that local materials supported the visual design of the houses. The standard deviation is less than or equal to 0.5, which means the data is homogeneous and respondents had consistent opinions. This implies that local materials were not only evaluated for strength but also for their contribution to the appearance of the housing units.

All local materials used demonstrate full standard compliance with national building codes and regulations recorded a mean of 4.23 and standard deviation of 0.425. The mean is within the very high mean range, showing very strong positive agreement among respondents that compliance with standards was emphasized. The standard deviation is less than or equal to 0.5, meaning the responses were homogeneous and respondents largely agreed. This indicates that the project gave strong attention to building codes and regulatory expectations in using local materials.

The overall mean for sustainable local material quality management was 4.14 with an overall standard deviation of 0.440. The mean is within the high mean range, showing strong positive agreement among respondents that quality management practices were applied in the project. The standard deviation is less than or equal to 0.5, meaning the data is homogeneous and respondents held similar views about quality management. Therefore, quality management supported project success by ensuring material strength, dimensional accuracy, aesthetic suitability, and compliance with building standards.

The findings are consistent with Habert et al. (2025), who stated that sustainable construction success depends on the availability of construction standards and the use of high-performing materials that can meet technical, environmental, and durability requirements. This scholarly position supports the current study because affordable housing projects need quality control systems that ensure local materials can safely support long-term occupation and stakeholder satisfaction.

Triple Bottom Line Framework supports this objective because quality management balances economic, social, and environmental value in the use of local building materials. Cruz et al. (2023) explained that sustainable performance should be evaluated through people, planet, and profit dimensions. This theory therefore supports quality management because durable, safe, and compliant local materials protect beneficiaries, reduce waste, and support responsible construction economics.

Table 5: Descriptive statistics on Sustainable local material monitoring and evaluation

	N	Mean	Std. Deviation
The project employs a robust system for the delivery tracking of all local material shipments.	137	4.13	.497
Regular waste audits are conducted to monitor and minimize the loss of local materials during construction.	137	4.13	.339
Periodic supplier reviews are performed to assess the reliability of local material providers.	137	4.26	.504
The project team conducts a milestone audit at each phase to evaluate the effective use of local materials.	137	4.18	.452
Overall	**137**	**4.18**	**.448**

Source: Field Data, 2026

The findings in Table 5 indicates descriptive statistics on sustainable local material monitoring and evaluation, where the statement that the project employs a robust system for the delivery tracking of all local material shipments had a mean of 4.13 and standard deviation of 0.497. The mean is within the high mean range, showing

strong positive agreement among respondents that delivery tracking was practiced. The standard deviation is less than or equal to 0.5, meaning the data is homogeneous and respondents had similar opinions. This implies that the project followed local material shipments to reduce delays and improve accountability on site.

Regular waste audits are conducted to monitor and minimize the loss of local materials during construction recorded a mean of 4.13 and standard deviation of 0.339. The mean is within the high mean range, showing strong positive agreement among respondents that waste auditing was conducted. The standard deviation is less than or equal to 0.5, meaning the data is homogeneous and respondents consistently recognized this practice. This indicates that the project attempted to control material waste and protect affordability through regular checks.

Regarding delivery tracking and waste auditing, the field officer narrated: "I recorded local material deliveries and compared them with site requests during construction activities. I observed that tracking helped supervisors notice shortages early and prevent unnecessary repeat orders. Waste checks also encouraged workers to use materials carefully because losses were reported during site meetings."

Periodic supplier reviews are performed to assess the reliability of local material providers recorded a mean of 4.26 and standard deviation of 0.504. The mean is within the high mean range and close to the very high range, showing strong positive agreement that supplier reviews were carried out. The standard deviation surpassed 0.5 by a small margin, meaning the data is heterogeneous and respondents had slightly different experiences with supplier review consistency. This suggests that supplier performance was monitored, although the level of experience with this practice differed across respondents.

The project team conducts a milestone audit at each phase to evaluate the effective use of local materials recorded a mean of 4.18 and standard deviation of 0.452. The mean is within the high mean range, showing strong positive agreement among respondents that milestone audits were used. The standard deviation is less than or equal to 0.5, meaning the responses were homogeneous and closely distributed. This implies that the project reviewed local material use at key implementation stages to support progress control and corrective action.

On supplier review and milestone audit, the project manager stated: "I reviewed supplier performance at different stages of the project and used the reports to guide future orders. I also participated in milestone meetings where material use was compared with work progress. This helped the project team correct issues before they became major delays or cost problems."

The overall mean for sustainable local material monitoring and evaluation was 4.18 with an overall standard deviation of 0.448. The mean is within the high mean range, showing strong positive agreement among respondents that monitoring and evaluation practices were applied in the project. The standard deviation is less than or equal to 0.5, meaning the data is homogeneous and respondents shared similar views. Therefore, monitoring and evaluation supported project success through delivery tracking, waste control, supplier review, and milestone-based assessment of local material use.

The results are consistent with Rutagengwa and Kwena (2024), who emphasized that monitoring and control practices influence construction performance in Rwanda by improving progress tracking and reducing project delays. Their argument supports the current study because monitoring local materials through delivery records, supplier review, and milestone audits strengthens decision-making and prevents material-related failures from affecting project success.

Sustainability Theory supports this objective because monitoring and evaluation help projects maintain responsible use of resources throughout the construction lifecycle. Wahyuningrum et al. (2025) explained that sustainability is a dynamic process of adjustment, learning, and continuous improvement. This theory therefore supports material monitoring and evaluation because regular assessment allows project teams to reduce waste, improve accountability, and protect long-term housing value.

Table 6: Descriptive statistics on Project success

	N	Mean	Std. Deviation
The affordable housing project remains of high relevance to the target beneficiaries' needs.	137	4.32	.469
The project has demonstrated high effectiveness in achieving its intended housing delivery targets.	137	4.18	.452
The project team manages resources with high efficiency to minimize delays and budget overruns.	137	4.16	.368
The project has created a significant positive impact on the living standards of the local community.	137	4.13	.360
The project design and materials ensure the long-term sustainability of the housing units.	137	4.11	.336
Overall	**137**	**4.18**	**.397**

Source: Field Data, 2026

The results in Table 6 indicates descriptive statistics on project success, where the statement that the affordable housing project remains of high relevance to the target beneficiaries' needs had a mean of 4.32 and standard deviation of 0.469. The mean is within the very high mean range, showing very strong positive agreement among respondents that the project responds to beneficiary needs. The standard deviation is less than or equal to 0.5, meaning the data is homogeneous and respondents shared similar views. This implies that Gisozi Affordable Housing Project is perceived as relevant to the housing needs of people in Gasabo District.

Regarding relevance and effectiveness, the local leader narrated: "I observed that the project responded to the real demand for decent and affordable houses in the area. I also noticed that community concerns were considered when the project team explained how the housing units would serve beneficiaries. This made the project meaningful because it addressed practical housing needs in Gasabo District."

The project has demonstrated high effectiveness in achieving its intended housing delivery targets recorded a mean of 4.18 and standard deviation of 0.452. The mean is within the high mean range, showing strong positive agreement among respondents that the project achieved its intended delivery targets. The standard deviation is less than or equal to 0.5, meaning the data is homogeneous and views were consistent. This suggests that the project was viewed as effective in converting planned housing objectives into visible outputs.

The project team manages resources with high efficiency to minimize delays and budget overruns recorded a mean of 4.16 and standard deviation of 0.368. The mean is within the high mean range, showing strong positive agreement that resources were managed efficiently. The standard deviation is less than or equal to 0.5, meaning the data is homogeneous and respondents had closely related opinions. This indicates that resource use in the project contributed to controlling delays and budget pressures.

Concerning efficiency and sustainability, a community partner stated: "I followed the project activities and saw that the team tried to manage resources carefully to avoid unnecessary delays. I appreciated the use of materials that were available locally because it made implementation easier and supported local suppliers. The housing units looked strong and suitable for long-term use by the target beneficiaries."

The project has created a significant positive impact on the living standards of the local community recorded a mean of 4.13 and standard deviation of 0.360. The mean is within the high mean range, showing strong positive agreement among respondents that the project created positive community impact. The standard deviation is less than or equal to 0.5, meaning responses were homogeneous and consistent. This implies that the project was perceived as contributing to better housing conditions and community welfare.

The project design and materials ensure the long-term sustainability of the housing units recorded a mean of 4.11 and standard deviation of 0.336. The mean is within the high mean range, showing strong positive agreement that design and materials supported long-term sustainability. The standard deviation is less than or equal to 0.5, meaning the data is homogeneous and respondents shared similar views. This suggests that the houses were perceived as durable and suitable for long-term use.

The overall mean for project success was 4.18 with an overall standard deviation of 0.397. The mean is within the high mean range, showing strong positive agreement among respondents that Gisozi Affordable Housing

Project was successful. The standard deviation is less than or equal to 0.5, meaning the responses were homogeneous and respondents generally agreed on the level of success. Therefore, project success was reflected through relevance, effectiveness, efficiency, community impact, and sustainability of the housing units.

The findings align with Wu et al. (2023), who explained that project success is broader than meeting technical targets because sustainable project management also considers long-term environmental, social, and stakeholder value. This literature supports the present study because affordable housing success should be understood through relevance to beneficiaries, efficient resource use, community impact, and the durability of completed housing units.

Stakeholder Theory supports the dependent variable because project success in affordable housing depends on how well the project creates value for beneficiaries, local authorities, suppliers, partners, and surrounding communities. Smith and Brown (2023) explained that stakeholder-centered projects are more likely to achieve satisfaction and long-term legitimacy. This theory therefore supports the use of relevance, impact, and sustainability as success indicators.

4.3 Inferential Statistics

Table 7: Correlation Between Sustainable Local Materials Management Practices and Project Success

		Sustainable local material planning practices	Sustainable local material procurement	Sustainable local material quality management	Sustainable local material monitoring and evaluation	Project success
Sustainable local material planning practices	Pearson Correlation	1	.817**	.805**	.901**	.878**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	137	137	137	137	137
Sustainable local material procurement	Pearson Correlation	.817**	1	.774**	.804**	.913**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	137	137	137	137	137
Sustainable local material quality management	Pearson Correlation	.805**	.774**	1	.882**	.852**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	137	137	137	137	137
Sustainable local material monitoring and evaluation	Pearson Correlation	.901**	.804**	.882**	1	.889**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	137	137	137	137	137
Project success	Pearson Correlation	.878**	.913**	.852**	.889**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	137	137	137	137	137

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

Source: Field Data, 2026

The findings in Table 7 indicates correlation between sustainable local materials management practices and project success, showing that sustainable local material planning practices had a Pearson correlation coefficient of 0.878 with project success and a significance value of 0.000. Since the p-value is below 0.05, the relationship is statistically significant. The coefficient shows a very strong positive relationship, meaning that better local material planning practices were associated with higher project success. This implies that forecast precision, lead-time control, schedule alignment, and resource allocation were strongly connected with the success of Gisozi Affordable Housing Project.

Sustainable local material procurement had a Pearson correlation coefficient of 0.913 with project success and a significance value of 0.000. Since the p-value is below 0.05, the relationship is statistically significant. The coefficient indicates a very strong positive relationship, meaning that stronger procurement practices were associated with higher success of the project. This suggests that vendor rating, contract clarity, local content, and cost savings were strongly related to the success of Gisozi Affordable Housing Project.

Sustainable local material quality management had a Pearson correlation coefficient of 0.852 with project success and a significance value of 0.000. Since the p-

value is below 0.05, the relationship is statistically significant. The coefficient indicates a very strong positive relationship, meaning that stronger quality management of local materials was associated with higher project success. This implies that structural strength, dimensional precision, aesthetic appeal, and standard compliance were strongly connected to the success of Gisozi Affordable Housing Project.

Sustainable local material monitoring and evaluation had a Pearson correlation coefficient of 0.889 with project success and a significance value of 0.000. Since the p-value is below 0.05, the relationship is statistically significant. The coefficient indicates a very strong positive relationship, meaning that stronger monitoring and evaluation practices were associated with higher project success. This shows that delivery tracking, waste audit, supplier review, and milestone audit were strongly related to the success of Gisozi Affordable Housing Project.

The findings resonate with Tambwe et al. (2025), who explained that digital monitoring, real-time tracking, and data-informed evaluation support better material decisions and reduce operational risks in construction projects. This literature supports the current study because monitoring local material movement and use allows project teams to detect shortages, reduce waste, review suppliers, and maintain progress toward successful housing delivery.

Table 9: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.954[a]	.910	.908	.11867	1.560

a. Predictors: (Constant), Sustainable local material monitoring and evaluation, Sustainable local material procurement, Sustainable local material quality management, Sustainable local material planning practices

b. Dependent Variable: Project success

Source: Field Data, 2026

The results in Table 9 indicates model summary, showing that the regression model recorded R of 0.954, R Square of 0.910, adjusted R Square of 0.908, and Durbin-Watson of 1.560. The R value of 0.954 indicates a very strong combined relationship between the four sustainable local materials management practices and project success. The R Square of 0.910 means that 91.0% of the variation in project success was explained by sustainable local material planning practices, procurement, quality management, and monitoring and evaluation. The remaining 9.0% can be explained by other factors not included in the model, such as funding stability, labour productivity, weather conditions, and policy implementation. The Durbin-Watson value of 1.560 is within the acceptable range, indicating that there was no serious autocorrelation problem in the regression residuals.

Table 10: ANOVA Summary

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18.882	4	4.721	337.214	.000[b]
	Residual	1.859	132	.014		
	Total	20.741	136			

a. Dependent Variable: Project success

b. Predictors: (Constant), Sustainable local material monitoring and evaluation, Sustainable local material procurement, Sustainable local material quality management, Sustainable local material planning practices

Source: Field Data, 2026

The findings in Table 10 indicates ANOVA summary, showing that the regression model had F-statistic of 337.214 and significance value of 0.000. Since the significance value is below the 0.05 level, the overall regression model was statistically significant. This means that sustainable local material planning practices, procurement, quality management, and monitoring and evaluation jointly had a significant effect on the success of Gisozi Affordable Housing Project. The F value also shows that the explanatory power of the model was strong enough to predict project success from the selected independent variables. Therefore, the ANOVA results confirmed that the regression model was suitable for hypothesis testing and interpretation of the effect of sustainable local materials management practices on project success.

Table 11: Coefficient Summary

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	.156	.115		1.357	.178		
	Sustainable local material planning practices	.150	.061	.159	2.459	.015	.164	6.086
	Sustainable local material procurement	.489	.048	.493	10.188	.000	.292	3.421
	Sustainable local material quality management	.132	.049	.154	2.694	.008	.209	4.780
	Sustainable local material monitoring and evaluation	.194	.069	.214	2.812	.005	.118	8.502

a. Dependent Variable: Project success

Source: Field Data, 2026

The results in Table 11 indicates coefficient summary, showing that sustainable local material planning practices had B of 0.150, t-value of 2.459, and significance value of 0.015. This means that one unit increase in sustainable local material planning practices will increase project success by 0.150 units when other variables are held constant. Since the p-value is below 0.05, the effect is statistically significant.

The findings align with Olawale and Sun (2025), who argued that rigorous planning protocols and data-driven forecasting improve infrastructure delivery by reducing overruns and improving the predictability of resources. This literature supports the current objective because affordable housing projects need planning practices that forecast quantities, align delivery time, and allocate resources effectively before local materials are required on site.

Sustainable local material procurement had B of 0.489, t-value of 10.188, and significance value of 0.000. This means that one unit increase in sustainable local material procurement will increase project success by 0.489 units when other variables are held constant. Since the p-value is below 0.05, the effect is statistically significant.

The outcomes are supported by Afshari and Bafti (2023), who explained that procurement management improves project success through supplier coordination, risk optimization, contract management, and timely acquisition of required resources. This literature supports the current objective because the procurement of local materials can directly influence cost savings, delivery reliability, and the continuity of construction activities in affordable housing projects.

Sustainable local material quality management had B of 0.132, t-value of 2.694, and significance value of 0.008. This means that one unit increase in sustainable local material quality management will increase project success by 0.132 units when other variables are held constant. Since the p-value is below 0.05, the effect is statistically significant.

The findings are consistent with Sanchez et al. (2024), who emphasized that improved material performance, testing, and technical quality systems enhance infrastructure durability and the value delivered to occupants. This literature supports the current objective because local materials must meet structural, dimensional, aesthetic, and regulatory requirements before they can contribute to safe and successful affordable housing delivery.

Sustainable local material monitoring and evaluation had B of 0.194, t-value of 2.812, and significance value of 0.005. This means that one unit increase in sustainable local material monitoring and evaluation will increase project success by 0.194 units when other variables are held constant. Since the p-value is below 0.05, the effect is statistically significant.

The adopted regression model for this study was structured as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$$

Where Y represents project success, β_0 represents the constant, X_1 represents sustainable local material planning practices, X_2 represents sustainable local material procurement, X_3 represents sustainable local material quality management, X_4 represents sustainable local material monitoring and evaluation, and e represents the error term.

The fitted model was:

$$\text{Project Success} = 0.156 + 0.150X_1 + 0.489X_2 + 0.132X_3 + 0.194X_4 + e$$

Table 12: Decision on Null Hypotheses

Hypothesis	Null Hypothesis	Sig.	Decision
H01	Sustainable local material planning practices have no significant effect on the success of Gisozi Affordable Housing Project in Gasabo District.	0.015	Rejected
H02	Sustainable local material procurement has no significant effect on success of Gisozi Affordable Housing Project in Gasabo District.	0.000	Rejected
H03	Sustainable local material quality management has no significant effect on the success of Gisozi Affordable Housing Project in Gasabo District.	0.008	Rejected
H04	Sustainable local material monitoring and evaluation have no significant effect on the success of Gisozi Affordable Housing Project in Gasabo District.	0.005	Rejected

Source: Field Data, 2026

The findings in Table 12 indicates decision on null hypotheses, showing that all significance values were below the 0.05 level. The first null hypothesis was rejected because sustainable local material planning practices had a significant effect on project success. The second null hypothesis was rejected because sustainable local material procurement had a significant effect on project success. The third and fourth null hypotheses were also rejected because sustainable local material quality management and sustainable local material monitoring and evaluation significantly affected project success in Gisozi Affordable Housing Project.

5. Conclusion and Recommendations

5.1 Conclusion

The study concludes that sustainable local materials management has a significant role in improving the success of Gisozi Affordable Housing Project in Gasabo District. Planning practices, procurement, quality management, and monitoring and evaluation worked together to support relevance, effectiveness, efficiency, community impact, and sustainability of the project. The results show that affordable housing projects can perform better when local materials are managed through clear forecasts, reliable supplier systems, strict quality controls, and continuous progress review. Therefore, strengthening sustainable local materials management should be considered a practical pathway for improving affordable housing delivery in Rwanda.

5.2 Recommendations

This section presents recommendations based on the findings of the study

1. Gisozi Affordable Housing Project managers should strengthen material forecasting by preparing detailed local material quantity plans before every construction phase begins.
2. Developers and partners should prepare clear procurement contracts that specify local material standards, delivery terms, inspection procedures, and penalty conditions.
3. Local authorities and affordable housing project partners should promote local content policies that encourage the use of qualified regional suppliers.

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