

Effect of Technical Assistance on the Performance of Nutritional Projects in Rwanda: A Case Study of Burera District

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DOI: <https://doi.org/10.47772/IJRISS.2026.100800309>

Received: 18 August 2026; Accepted: 23 August 2026; Published: 03 September 2026

ABSTRACT

This study examined the effect of technical assistance on the performance of nutritional projects in Rwanda, using Burera District as a case study. The research was motivated by persistent disparities in nutrition outcomes in rural areas despite the implementation of various nutrition programs such as the USAID Gikuriro Kuri Bose Project. The study was guided by the Resource-Based View theory and the Theory of Change, emphasizing technical assistance as a key resource that enhances implementation capacity and project outcomes. A descriptive and correlational research design was adopted using a mixed-methods approach. A sample of 380 respondents was selected from a target population of 34,200 stakeholders using the Krejcie and Morgan sampling technique. Data were collected using structured questionnaires and analyzed using SPSS version 28. Descriptive statistics (means, standard deviations, frequencies, and percentages) were used, while simple regression analysis was applied to examine the relationship between technical assistance and project performance. The findings revealed that nutritional projects in Burera District performed well, with a composite mean of 4.05 indicating strong agreement that projects achieved their objectives, were completed on time, and generated positive community nutrition outcomes. Similarly, technical assistance was highly rated (composite mean = 4.06), with respondents confirming that it improved operational efficiency, strengthened staff capacity, and enhanced nutritional outcomes. Regression analysis showed a strong and statistically significant positive relationship between technical assistance and project performance ($R = 0.869$, $R^2 = 0.756$, $p < 0.001$), indicating that technical assistance explains 75.6% of the variation in project performance. The study concludes that technical assistance is a critical determinant of the success of nutritional projects in Burera District, significantly enhancing efficiency, capacity building, and sustainability of outcomes. It recommends strengthening continuous technical support through mentorship and supervision, increasing investment in local capacity building by government and development partners, and integrating structured, context-specific technical assistance mechanisms into future nutrition programs to improve effectiveness and long-term sustainability.

Keywords: Technical assistance, Nutritional projects, Project performance, Burera District.

INTRODUCTION

Nutrition is a fundamental pillar of human health, productivity, and socio-economic development. Globally, governments and development partners have implemented nutritional projects to address malnutrition, food insecurity, and poor health outcomes. In developed countries such as the United States and Australia, nutrition programs have achieved significant success through integrated approaches that combine financial support, technical expertise, and strong institutional systems (USDA, 2023). Similarly, in Asia, large-scale initiatives such as India's Poshan Abhiyaan have improved maternal and child nutrition through capacity building, monitoring systems, and community engagement (Ministry of Women and Child Development, 2021).

In Africa, nutrition programs have increasingly emphasized community-based interventions supported by technical assistance. For example, USAID-supported programs in Kenya and Uganda have demonstrated that training, supervision, and expert guidance can improve service delivery and nutrition outcomes (USAID, 2022; UNICEF, 2021). In Rwanda, the government has prioritized nutrition through initiatives such as the National



Early Childhood Development Program and the Gikuriro Kuri Bose Project, which focus on improving dietary diversity, maternal and child health, and food security (Ministry of Health Rwanda, 2022).

Technical assistance is widely recognized as a key implementation intervention in such programs. It involves the provision of expert knowledge, training, and advisory support to enhance the capacity of local stakeholders (Duflo *et al.*, 2011). Studies suggest that technical assistance improves the quality of service delivery, strengthens institutional capacity, and ensures the adoption of best practices (Paina & Peters, 2012; Bhutta *et al.*, 2013).

Despite these efforts, disparities in project performance persist, particularly in rural areas such as Burera District. This underscores the importance of examining how technical assistance influences the effectiveness and sustainability of nutritional projects in such contexts.

LITERATURE REVIEW

Concept of technical assistance

Technical assistance refers to the provision of specialized knowledge, skills, and support aimed at improving the capacity of individuals and organizations to implement development interventions effectively (Duflo *et al.*, 2011). In the context of nutritional projects, it includes training healthcare workers, advising farmers on nutrition-sensitive agriculture, and supporting monitoring and evaluation systems.

Kuhlmann and Cini (2017) argue that technical assistance facilitates the adoption of improved practices that enhance both productivity and health outcomes. In Rwanda, technical assistance is commonly delivered through training programs, field demonstrations, and continuous mentorship, all of which aim to strengthen local capacity and ensure sustainable project outcomes.

Technical assistance and project performance

Empirical evidence on the relationship between technical assistance and project performance presents mixed findings. Vassall *et al.* (2019) found that technical support significantly improved nutrition service delivery and compliance with health guidelines in Sub-Saharan Africa. Similarly, Thomas *et al.* (2021) reported that continuous expert involvement throughout project implementation enhances effectiveness and alignment with international standards.

On the other hand, Ahmed *et al.* (2020) observed that improvements in knowledge and skills do not always translate into better nutrition outcomes, particularly in communities affected by poverty and environmental constraints. Patel *et al.* (2022) further highlighted that over-reliance on external experts can undermine sustainability if local capacity is not adequately developed.

Additionally, Karanja *et al.* (2018) concluded that technical assistance may fail to improve project performance when it is not aligned with local needs and contexts. These findings suggest that while technical assistance is important, its effectiveness depends on contextual relevance and implementation strategies.

Theoretical framework

The Resource-Based View (RBV) theory, developed by Wernerfelt (1984), emphasizes that organizational performance depends on the effective utilization of internal resources such as knowledge, skills, and capabilities. In this study, technical assistance is viewed as a strategic resource that enhances the capacity of stakeholders, thereby improving the performance of nutritional projects.

The Theory of Change, developed by Weiss (1995), provides a framework for understanding how specific interventions lead to desired outcomes. It highlights the logical sequence linking inputs, activities, outputs, and



impacts. In the context of this study, technical assistance is considered a key input that influences project performance through improved implementation processes and stakeholder capacity.

METHODOLOGY

Description of study area

This study was conducted in Burera District, located in the Northern Province of Rwanda, approximately between 1.45° S and 1.70° S latitude and 29.80° E and 30.10° E longitude. The district is characterized by mountainous terrain, high population density, and a predominantly rural setting. It borders Uganda to the north and is surrounded by Musanze District, Gakenke District, and Rulindo District. The area's geography strongly influences agricultural practices and access to essential services, with most residents relying on subsistence farming, including crops such as beans, maize, Irish potatoes, and vegetables, for their livelihoods and food security (NISR, 2022).

Despite its agricultural potential, Burera District faces significant nutrition and health challenges, particularly among vulnerable groups such as children under five and pregnant or lactating women. Factors such as land fragmentation, soil erosion, climate variability, poverty, and limited dietary diversity contribute to persistent malnutrition and food insecurity.

Research design

The study adopted a descriptive and correlational research design using a mixed-methods approach. The descriptive design enabled the collection of both qualitative and quantitative data without manipulating variables, while the correlational design facilitated the examination of relationships between technical assistance and project performance. Descriptive statistics summarized the data, and correlation and regression analyses were used to determine the strength and nature of relationships between variables.

Target population

The study targeted 34,200 stakeholders involved in or affected by the USAID Gikuriro Kuri Bose Project in Burera District. These included project managers and coordinators, government officials, healthcare workers, and beneficiaries, particularly mothers and children.

Sample size and sampling techniques

A representative sample of 380 respondents was determined using the Krejcie and Morgan (1970) table at a 95% confidence level and a 5% margin of error. A stratified random sampling technique was employed to ensure adequate representation of all key stakeholder groups involved in the study. In addition, purposive sampling was used to select key informants with relevant knowledge and direct experience in project implementation, while simple random sampling was applied within each stratum to give all participants an equal chance of selection.

The sample was distributed as follows: 12 project managers and coordinators, 65 government officials, 76 healthcare workers, and 227 beneficiaries. This distribution ensured that all categories of stakeholders involved in the USAID Gikuriro Kuri Bose Project in Burera District were adequately represented in the study.

Data Analysis

Data were analyzed using SPSS version 28. Descriptive statistics, including means, standard deviations, frequencies, and percentages, were used to summarize and present the characteristics of the data in a clear and understandable format.

In addition, inferential statistical techniques were applied to test the study's hypotheses and examine relationships between variables. Specifically, simple regression analysis was used to assess the effect of each independent



variable on the dependent variable, while multiple regression analysis was employed to determine the combined effect of all independent variables on the performance of nutritional projects.

The simple regression model used was:

$$Y = \alpha + \beta_1 X_1 + \epsilon$$

Where:

- Y = Performance of nutritional projects
- X_1 = Technical assistance

To assess the combined effect of all variables, multiple regression analysis was applied using:

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

RESULTS AND DISCUSSIONS

Demographic characteristics of respondents

Table 1 presents the demographic characteristics of the respondents involved in the study. It summarizes key variables, including gender, age, education level, role in nutritional projects, and experience in project involvement. These characteristics provide an overview of the composition of the study population and help contextualize the findings.

Table 1: Demographic characteristics of respondents

Variable categories	Percentage (%)
Gender	
Male	55.9
Female	44.1
Age	
18–25	11.0
26–30	20.2
31–35	23.9
36–40	21.3
41 and above	23.6
Education level	
Primary	5.2
Secondary	21.3
Diploma	22.8
Bachelor’s Degree	33.7
Master’s Degree	17.0
Role in nutritional project	
Project Manager	13.0
Healthcare Worker	34.9
Government Officer	20.8

Beneficiary	25.9
Other (Community Mobilizer, etc.)	5.4

Experience in projects involvement

Less than 1 Year	9.8
1–3 Years	42.9
4–5 Years	31.1
Above 5 Years	16.1

The gender distribution shows that male respondents (55.9%) slightly outnumber female respondents (44.1%), indicating that both genders are actively involved in the implementation of the nutritional project in Burera District, although men have a marginally higher representation. This may be attributed to the involvement of males in technical, managerial, and field-based roles within development projects.

Regarding age distribution, the majority of respondents fall within the 31–35 years (23.9%) and 41 years and above (23.6%) categories, followed closely by those aged 36–40 years (21.3%) and 26–30 years (20.2%). This suggests that most participants are in their productive and experienced working age, implying that the study benefited from respondents with adequate maturity, experience, and understanding of nutritional project implementation.

In terms of education level, the findings indicate that most respondents hold at least a post-secondary qualification, with Bachelor's degree holders (33.7%) forming the largest group, followed by diploma holders (22.8%) and secondary education (21.3%). The presence of respondents with higher education levels (Bachelor's and Master's degrees combined = 50.7%) suggests that the study involved knowledgeable individuals capable of providing reliable and informed responses regarding technical assistance and project performance.

For the role in nutritional projects, the largest proportion of respondents were healthcare workers (34.9%) and beneficiaries (25.9%), followed by government officers (20.8%) and project managers (13.0%). This distribution ensures a balanced representation of both implementers and beneficiaries of the USAID Gikuriro Kuri Bose Project, thereby enhancing the credibility of the findings.

Finally, the results on project experience show that the majority of respondents had 1–3 years of experience (42.9%), followed by 4–5 years (31.1%), while 16.1% had more than 5 years of experience. This indicates that most respondents had sufficient exposure to nutritional project activities, making them well-positioned to provide relevant insights on the effect of technical assistance on project performance.

Performance of nutritional projects

The findings show that respondents generally agreed that the nutritional project performed well across all key indicators. The highest-rated statement was that project activities were completed within the expected timeframe (Mean = 4.08, SD = 0.90), followed closely by achievement of nutritional goals such as reduction in malnutrition (Mean = 4.07, SD = 0.92). This suggests that the project was effectively implemented in terms of planning and execution, with most respondents confirming the timely delivery of activities and the achievement of intended objectives. These results reflect a strong positive perception of project efficiency and effectiveness.

In addition, respondents agreed that the project produced favorable outcomes in terms of sustainability (Mean = 4.04, SD = 0.93) and beneficiary satisfaction (Mean = 4.03, SD = 0.93). The relatively high means indicate that beneficiaries and stakeholders perceived the interventions as useful and capable of generating long-term benefits. The consistency in standard deviation values (around 0.90–0.95) also shows that responses were relatively clustered, meaning there was general agreement among respondents with minimal variation in opinions.

Overall, the composite mean of 4.05 (SD = 0.93) indicates a strong positive evaluation of the nutritional proj-

ect's performance in Burera District. Respondents confirmed that the project had a significant positive impact on community nutrition (Mean = 4.02, SD = 0.95), suggesting improvements in dietary outcomes and community well-being. These findings align with previous studies by Smith et al. (2020) and Green & Carter (2021), which emphasize that well-implemented nutrition projects typically lead to improved health outcomes, beneficiary satisfaction, and sustainable community impacts.

Table 2: Performance of nutritional projects

Statements	5 (SA)	4 (A)	3 (N)	2 (D)	1 (SD)	Mean	Std. Dev.
The project achieved its nutritional goals (e.g., reduction in malnutrition).	39%	41%	12%	6%	3%	4.07	0.92
Project activities were completed within the expected timeframe.	40%	39%	13%	5%	3%	4.08	0.90
There was high beneficiary satisfaction with the services delivered.	36%	43%	13%	6%	3%	4.03	0.93
The project outcomes are sustainable in the long term.	38%	40%	13%	6%	3%	4.04	0.93
The project created a positive impact on the community's nutrition.	39%	38%	14%	6%	3%	4.02	0.95
Composite Mean & Std. Dev.	-	-	-	-	-	4.05	0.93

Technical assistance

The findings indicate that respondents generally strongly agreed that technical assistance played a significant role in improving the performance of the nutritional project. The highest-rated statement was that technical assistance improved the efficiency of project operations (Mean = 4.10, SD = 0.90), followed by the provision of regular technical support throughout implementation (Mean = 4.06, SD = 0.93). This suggests that consistent expert involvement enhanced operational efficiency and ensured smooth execution of project activities. The relatively high levels of agreement show that technical assistance was a central driver of effective project implementation in Burera District.

In addition, respondents agreed that there was adequate technical knowledge and skills within the project team (Mean = 4.05, SD = 0.92) and that technical advice contributed to improved nutritional outcomes in the community (Mean = 4.04, SD = 0.94). These findings imply that capacity-building and expert guidance helped strengthen the skills of implementers and positively influenced community nutrition results. The presence of timely follow-up from technical experts (Mean = 4.03, SD = 0.95) further suggests that continuous monitoring and mentorship played an important role in sustaining project performance.

Overall, the composite mean of 4.06 (SD = 0.93) confirms a strong positive perception of technical assistance in enhancing nutritional project performance. The relatively low standard deviations across all statements indicate a high level of agreement among respondents, with minimal variation in responses. These findings are consistent with studies by Vassall et al. (2019) and Thomas et al. (2021), which emphasize that continuous technical support and expert guidance significantly improve health and nutrition project outcomes by strengthening implementation capacity and operational efficiency.

Table 3: Technical assistance

Statements	5 (SA)	4 (A)	3 (N)	2 (D)	1 (SD)	Mean	Std. Dev.
The project provided regular technical support throughout its implementation.	38%	42%	11%	6%	3%	4.06	0.93
Technical assistance improved the efficiency of project operations.	40%	40%	12%	6%	2%	4.10	0.90
There was a timely follow-up from technical experts during project execution.	36%	43%	13%	5%	3%	4.03	0.95



The project team had access to adequate technical knowledge and skills.	37%	41%	13%	6%	3%	4.05	0.92
Technical advice helped to improve the nutritional outcomes in the community.	39%	38%	15%	6%	2%	4.04	0.94
Composite Mean & Std. Dev.	-	-	-	-	-	4.06	0.93

Effect of technical assistance on the performance of nutritional projects

The model summary indicates a strong positive relationship between technical assistance and the performance of nutritional projects in Burera District. The correlation coefficient ($R = 0.869$) shows a very strong association, while the R-squared value of 0.756 implies that 75.6% of the variation in project performance is explained by technical assistance. The adjusted R-squared (0.755) confirms that the model is highly reliable and well-fitted for the data.

The ANOVA results show that the regression model is statistically significant, with an F-value of 1068.391 and a significance level of $p = 0.000$. This indicates that technical assistance is a strong predictor of the performance of nutritional projects, and the relationship observed is not due to chance. Therefore, the model as a whole is meaningful in explaining variations in project performance.

The coefficients table further shows that technical assistance has a positive and significant effect on project performance ($B = 0.967$, $\beta = 0.869$, $p < 0.001$). This means that an increase in technical assistance leads to a significant improvement in the performance of nutritional projects. The constant term is not statistically significant ($p = 0.344$), indicating that performance is mainly driven by technical assistance rather than baseline factors.

Table 4: Effect of technical assistance on performance of nutritional projects

Model	R	R Square	Adjusted R-Square	Std. Error of the Estimate		
Summary	.869 ^a	.756	.755	.45816		
Model	Sum of Squares		Df	Mean Square	F	Sig.
ANOVA	Regression	224.267	1	224.267	1068.391	.000 ^b
	Residual	72.419	345	.210		
	Total	296.686	346			
Model	Unstandardized Coefficients		Standardized Coefficients		T	Sig.
	B	Std. Error	Beta			
Coefficients (Constant)	-.115	.121			-.948	.344
Technical assistance	.967	.030	.869		32.686	.000

CONCLUSION AND RECOMMENDATIONS

Conclusion

The study concludes that nutritional projects in Burera District are generally performing well, with strong evidence of achievement of planned objectives, timely implementation, high beneficiary satisfaction, and



positive community nutrition outcomes. Overall, the project performance was rated positively, indicating effective implementation of nutrition interventions.

The findings further reveal that technical assistance is widely provided and plays a crucial role in enhancing project operations. It improves efficiency, strengthens staff capacity, ensures timely expert follow-up, and contributes to better nutritional outcomes. Respondents consistently confirmed that technical assistance is a key driver of successful project implementation.

Statistically, the study established a strong and significant positive relationship between technical assistance and project performance ($R = 0.869$, $p < 0.001$). The results show that technical assistance explains 75.6% of the variation in nutritional project performance, confirming that it is a major determinant of success in nutrition interventions in Burera District.

Recommendations

1. Project implementers should strengthen and sustain continuous technical assistance, especially through regular mentorship, training, and field supervision.
2. Government and development partners should increase investment in technical capacity building for local staff to ensure long-term sustainability of nutrition projects.
3. Future nutrition programs should integrate structured and context-specific technical support systems to maximize effectiveness and improve community nutrition outcomes.

Abbreviations

ANOVA: Analysis of Variance

Df: Degrees of Freedom

MoH: Ministry of Health

NISR: National Institute of Statistics of Rwanda

RPHC5: Rwanda Population and Housing Census, 5th Edition

SPSS: Statistical Package for the Social Sciences

UNAP: United Nations Action Plan

UNICEF: United Nations Children's Fund

USAID: United States Agency for International Development

USDA: United States Department of Agriculture

Author Contributions

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Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this manuscript.

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