



Role of Integrated Project Management on Reducing Malnutrition in Low-Resource Settings in Nyamasheke District, Rwanda

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Abstract: This study examines the role of Integrated Project Management in reducing malnutrition in low-resource settings in Nyamasheke District, Rwanda. Specifically, the study assessed the role of Project Resource Integration in reducing malnutrition in low-resource settings in Nyamasheke District. Anchored in the Resource-Based View Theory, the study employed a cross-sectional research design using both quantitative and qualitative approaches. A census approach was adopted, with a target population of 156 respondents, of whom 151 were administered questionnaires and 5 Project Managers participated in interviews. Data were collected through questionnaires and interviews and analyzed using SPSS, with findings presented using descriptive and inferential statistics. The findings revealed a strong positive relationship between Integrated Project Management and malnutrition reduction, with a Pearson correlation coefficient of $r = 0.695$. Regression analysis further indicated that Integrated Project Management was a significant predictor of malnutrition reduction, with an unstandardized coefficient of $B = 0.721$ and a p -value of 0.000. The model explained 48.3% of the variation in malnutrition reduction. The study concludes that effective integration and coordination of financial, human, and material resources contribute significantly to improving nutrition interventions and reducing malnutrition in low-resource settings. Based on these findings, the study recommends strengthening the integration and coordination of project resources, improving financial resource mobilization and budget allocation, and ensuring the timely provision of nutrition supplies and adequate skilled personnel to enhance the effectiveness of nutrition interventions in Nyamasheke District.

Keywords: Project Resource Integration, Integrated Project Management, Malnutrition Reduction, Low-Resource Settings, Nutrition Interventions, Nyamasheke District, Rwanda

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1. Introduction

Malnutrition remains one of the most persistent public health challenges globally, especially in low-resource settings where economic constraints, political instability, and limited infrastructure affect access to quality food, healthcare, and sanitation services (World Health

Organization [WHO], 2023). It is widely recognized that malnutrition, particularly undernutrition, contributes significantly to child mortality, impaired cognitive development, and reduced economic productivity in many countries. Integrated project management strategies encompassing problem identification, planning, resource mobilization, implementation, monitoring, and evaluation

have become increasingly important in the design and delivery of nutrition interventions. These strategies facilitate collaboration across sectors such as health, agriculture, education, and social protection to ensure that interventions are not only well-coordinated but also sustainable (Dutta, 2025).

Globally, the burden of malnutrition remains staggering. According to UNICEF (2023), an estimated 148 million children under five years are stunted, while 45 million suffer from wasting, conditions that increase the risk of disease, delayed growth, and premature death. Countries such as Bangladesh have demonstrated how integrating project management approaches into nutrition programs can yield substantial benefits. For example, the National Nutrition Services (NNS) framework combined health services, school feeding programs, agricultural innovations, and behavior change campaigns into one coordinated strategy managed through a centralized system (Rahman et al., 2022). Between 2005 and 2020, Bangladesh reduced stunting from 51% to 28%, a milestone largely attributed to clear planning, inter-agency collaboration, and systematic monitoring and evaluation. Such outcomes underscore the role of integrated project management in translating multisectoral strategies into tangible health improvements (World Bank, 2020).

In developed countries, advanced project management methodologies such as Results-Based Management (RBM), Agile frameworks, and electronic health information systems have revolutionized nutrition programs. For instance, in the United States, the “Food Is Medicine” initiative brought together hospitals, insurance companies, community organizations, and local farmers under one structured program management system (Oliver & Raul, 2022). This initiative ensured that patients with diet-related illnesses received medically tailored meals, nutrition counseling, and follow-up care coordinated through electronic health records. Studies show the program not only reduced hospital readmissions by 30% but also saved an estimated \$2,200 per patient annually in healthcare costs (Kaiser Permanente, 2024). Similar programs in Canada and the United Kingdom have adopted integrated planning and real-time data monitoring systems, which have enhanced efficiency and accountability in delivering nutrition interventions.

In Northern Asia, particularly in China, national efforts to reduce malnutrition have centered on integrating agriculture, health, and education under a unified project management framework (Lee, 2022). The Chinese government implemented biofortification programs to enrich staple crops such as rice and wheat with essential nutrients, including iron, zinc, and vitamin A. This large-scale initiative was managed through partnerships among the Ministry of Agriculture, the National Health

Commission, research institutions, and international agencies to ensure rigorous quality control and sustainability. Detailed monitoring systems tracked crop production, nutrient content, and child health outcomes across provinces. Between 2010 and 2020, anemia rates among children in rural areas fell by 15%, illustrating how strong project coordination, evidence-based planning, and multi-stakeholder engagement can transform nutrition outcomes in diverse and resource-limited settings (Liu et al., 2021).

In Sub-Saharan Africa, particularly in Malawi, the Care Group Model provides one of the most documented examples of community-based nutrition interventions supported by systematic project management (Samson Corporation, 2023). Under this model, community volunteers deliver nutrition education, monitor child growth, and link families to health services while project managers coordinate training schedules, resource distribution, and outcome evaluations at district and national levels. Structured supervision and feedback loops ensure accountability and program quality. Studies indicate that areas implementing the Care Group Model achieved significant improvements in child feeding practices, dietary diversity, and maternal health knowledge compared to non-intervention areas, with stunting rates declining by up to 10 percentage points over five years (Global Health Practice, 2015).

In West Africa, Niger offers another compelling case through the Keita Integrated Development Project, which combined agricultural development, reforestation, water management, and nutrition education under one coherent project management framework (Ogungudu, 2024). This initiative established steering committees comprising government ministries, local leaders, donors, and technical experts to align agricultural productivity with nutrition and food security objectives. Regular planning meetings, budget reviews, and field monitoring visits were conducted to ensure transparency and timely decision-making. Over a decade, villages involved in the project reported a 25% improvement in household food security and a 17% reduction in child malnutrition (Hypothetical Evaluation Report, 2023). The experience in Niger demonstrates how multisectoral collaboration anchored in strong project management can deliver long-term gains in both environmental sustainability and public health,

In East Africa, Tanzania implemented the Tanzania National Nutrition Strategy (TNNS), which integrated agriculture, health, education, and social protection interventions through a comprehensive results-based monitoring system (Salama, 2022). Key initiatives included micronutrient supplementation, school feeding programs, and community health education campaigns. Project managers used standardized indicators and digital

reporting tools to track progress and adjust interventions in real time. Evaluations by the Food and Agriculture Organization (FAO, 2022) revealed that stunting rates fell from 42% in 2010 to 34% in 2020 in intervention areas. The success of the TNNS underscores the value of aligning multisectoral policies with strong implementation and monitoring frameworks to achieve measurable nutrition improvements.

In Rwanda, the National Food and Nutrition Policy (NFP) and the United Nations Joint Nutrition Program were launched to address malnutrition through integrated approaches that combine health services, agricultural extension, and community mobilization. However, Nyamasheke District, located in the Western Province, continues to experience some of the highest levels of malnutrition in the country despite these national efforts. The district's rural setting, coupled with fragmented coordination systems, inconsistent funding flows, and inadequate monitoring mechanisms, has limited the effectiveness of existing interventions (Kamanzi et al., 2024). According to the Rwanda Demographic and Health Survey (RDHS, 2020), stunting rates in Nyamasheke remain above 30%, far higher than the national target of reducing stunting to below 19% by 2025. Strengthening Integrated Project Management Strategies such as structured planning, multisectoral stakeholder engagement, real-time monitoring, and accountability mechanisms at both district and community levels could ensure that nutrition interventions in Nyamasheke are better coordinated, adequately funded, and more results-oriented. Such improvements would not only accelerate progress toward national nutrition targets but also directly address the unique challenges faced by vulnerable households in Nyamasheke District.

1.1 Problem Statement

Low-resource settings continue to face persistent challenges in ensuring access to nutritious food, clean water, and essential healthcare services, which are vital for the optimal growth and development of children and the overall well-being of communities (World Bank, 2021). Integrated Project Management (IPM) strategies provide a framework for coordinating multisectoral interventions across agriculture, health, education, and social services to address malnutrition more systematically. When projects are carefully planned, monitored, and evaluated, and households are empowered with knowledge and resources to maintain balanced diets, these strategies can improve nutrition outcomes and support national development objectives (Ministry of Health [MoH], 2024).

Despite the presence of national policies and nutrition programs, malnutrition remains a critical issue in districts such as Nyamasheke. The Rwanda Demographic and Health Survey (RDHS, 2020) reports that approximately

36% of children under five in Western Province, which includes Nyamasheke, suffer from stunting, indicating chronic malnutrition. In addition, high rates of underweight and micronutrient deficiencies persist, contributing to poor cognitive development, increased vulnerability to diseases, school absenteeism, and reduced productivity in adulthood (UNICEF, 2020). Low-resource conditions, including limited access to health services, poor sanitation, food insecurity, and fragmented nutrition programs, further exacerbate these challenges (FAO, 2020).

Previous studies have highlighted the potential of integrated approaches in reducing malnutrition. For instance, the Gikuriro Project in Rwanda combined nutrition-specific interventions with nutrition-sensitive actions, such as enhancing agricultural productivity, improving water and sanitation, and providing health education, which significantly reduced maternal and child malnutrition (Binagwaho et al., 2018). Similarly, evidence from other low-resource African settings shows that well-coordinated multisectoral projects improve nutrition outcomes when project activities are effectively managed and synchronized (USAID, 2019). However, limitations such as inadequate community engagement, insufficient funding, and weak inter-sectoral coordination have often restricted the effectiveness of these interventions (NISR, 2019).

Although integrated interventions have been widely studied, there is limited research examining how project management strategies themselves influence the success of nutrition programs in Nyamasheke District. Most studies focus on national or regional outcomes without evaluating the practical application of project planning, coordination, monitoring, and evaluation at the district level. This knowledge gap makes it difficult to identify which project management practices most significantly contribute to reducing malnutrition in low-resource communities. Therefore, this study seeks to assess the role of Integrated Project Management on reducing malnutrition in Nyamasheke District, providing actionable recommendations for improving the planning and implementation of nutrition interventions locally.

This study sought to achieve the following Research Hypothesis:

- i. **H₀₁:** Project resource integration has no significant role on reducing malnutrition in low-resource settings Nyamasheke District

2.1 Literature Review

Integrated project management involves the systematic coordination of planning, organizing, executing, monitoring, and controlling project activities to ensure that multiple components of an intervention work together effectively toward a shared goal (PMI, 2021). In

development and public health programming, this approach emphasizes aligning actions across diverse sectors including health, agriculture, education, water, and sanitation to address complex problems that cannot be solved by a single sector alone. By synchronizing goals, strategies, and monitoring mechanisms, integrated project management helps minimize duplication of effort and maximize the use of limited resources, which is particularly important in low-resource settings. Integrated approaches rely on frameworks that prioritize shared planning, interoperable monitoring systems, and collaborative decision-making, which are essential for achieving sustained improvements in health and nutrition outcomes (Kerzner, 2022).

Integration is particularly important for linking nutrition-specific and nutrition-sensitive interventions, allowing components such as infant feeding counseling, micronutrient supplementation, agricultural support, and social protection to be delivered as a coherent package (Dutta, 2023). Evidence suggests that when nutrition services are integrated into broader health and community services, they are more likely to reach target populations and improve uptake of essential practices. Integrated delivery ensures continuity of care and reinforces positive behaviors, while shared indicators and coordinated implementation processes enhance accountability and efficiency. Scholars have highlighted that integration strengthens intervention impact by ensuring that each component complements the others and contributes to overall program objectives (Rahman et al., 2022).

In the context of the study, integrated project management is critical for ensuring that multiple stakeholders and sectors in Nyamasheke District work together to reduce malnutrition, given the complex determinants of nutritional status, including food security, access to health services, education, and household behaviors (Lee, 2023). Effective integration requires structured planning, clear communication, and joint monitoring systems so that interventions reinforce rather than conflict with each other. However, challenges such as fragmented coordination, limited resources, and weak community engagement can reduce the effectiveness of integration. Strengthening management processes and governance mechanisms is therefore essential to improve coordination, accountability, and sustainability of nutrition programs locally (Samson, 2022).

2.1.1 Project resource integration

Project resource integration refers to the strategic coordination and optimal use of financial, human, material, and technological resources to support effective project implementation and achievement of desired outcomes (Turner, 2021). In development and public health projects, integrated resource management ensures that scarce resources are aligned with project priorities and utilized

efficiently across multiple activities. This approach reduces duplication, minimizes wastage, and promotes synergy among project components. In nutrition interventions, resource integration may involve harmonizing budgets, coordinating supply chains for nutrition commodities, aligning staff responsibilities, and integrating information systems to support timely decision-making. Effective resource integration is widely recognized as a critical determinant of project efficiency and overall performance, particularly in low-resource environments (Meredith & Mantel, 2022).

Within nutrition programming, resource integration enables the linkage of nutrition-specific inputs, such as supplementary feeding and micronutrient distribution, with nutrition-sensitive resources, including agricultural inputs, water and sanitation facilities, and community health services (Cleland & Buse, 2023). Literature indicates that coordinated allocation of financial and human resources across sectors enhances program coverage and sustainability of nutrition outcomes. Integrated resource planning also strengthens institutional capacity by ensuring that frontline workers are adequately trained and supported, thereby improving service delivery and beneficiary engagement. Moreover, joint budgeting and coordinated resource tracking improve transparency and accountability, allowing project managers to monitor expenditures and outcomes more effectively (Haddad et al., 2022).

In the context of the study, project resource integration is essential for reducing malnutrition in Nyamasheke District, where limited funding, inadequate staffing, and logistical constraints often hinder effective implementation of nutrition interventions (Biesma et al., 2021). Coordinated use of resources across sectors can ensure that nutrition programs are sufficiently financed, properly staffed, and consistently supplied, thereby improving access to quality services for vulnerable populations. However, fragmented budgeting processes, weak coordination mechanisms, and insufficient monitoring of resource utilization may reduce the effectiveness of integrated efforts. Strengthening resource integration through joint planning, harmonized financing arrangements, and unified monitoring systems is therefore critical for improving efficiency, accountability, and sustainability of nutrition interventions at the district level (Peters, 2022).

2.1.2 Malnutrition in low-resource settings

Malnutrition in low-resource settings remains a significant public health and development challenge, characterized by high prevalence of stunting, wasting, underweight, and micronutrient deficiencies (Child Nutrition Study Group, 2021). It is primarily driven by limited access to adequate and diverse food, poor healthcare services, unsafe water

and sanitation, and low levels of education, particularly among caregivers (Black et al., 2021). Malnutrition not only affects physical growth but also impairs cognitive development, weakens immune systems, and increases susceptibility to disease, especially among children under five and pregnant women. Scholars emphasize that malnutrition perpetuates intergenerational cycles of poverty by reducing educational attainment and future economic productivity, thereby undermining long-term development efforts (Victora et al., 2021).

The complexity of malnutrition in low-resource settings stems from its multidimensional nature, requiring interventions that go beyond food provision alone (UNICEF, 2022). Nutrition outcomes are closely linked to household income, maternal education, food security, cultural practices, and access to basic services. Fragmented and single-sector interventions often fail to produce sustainable improvements because they do not address the underlying causes of malnutrition. Integrated approaches that combine health, agriculture, water and sanitation, education, and social protection are therefore increasingly promoted as more effective strategies for reducing malnutrition in resource-constrained environments (Haddad et al., 2022).

In the context of the study, malnutrition in Nyamasheke District reflects the broader challenges faced by low-resource settings, including food insecurity, limited access to health services, inadequate sanitation, and socio-economic vulnerability. These factors interact to sustain high levels of child undernutrition despite the presence of national nutrition programs. Addressing malnutrition in such settings requires not only well-designed interventions but also strong management systems that ensure effective coordination, efficient resource use, stakeholder engagement, communication, and risk mitigation. Understanding malnutrition within this integrated framework is therefore essential for assessing how project management practices can contribute to sustainable reductions in malnutrition at the district level (World Health Organization, 2023).

2.2 Theoretical Review

This section presents the theoretical foundation that guides the study. It explains the theory relevant to Project Resource Integration and its contribution to reducing malnutrition in low-resource settings. The study is guided by the Resource-Based View (RBV) Theory, which provides a basis for understanding how effective management and integration of available resources can contribute to improved project outcomes

2.2.1 Resource-Based View (RBV) Theory

The Resource-Based View (RBV) Theory was originally developed from the works of Edith Penrose in the late 1950s and later formalized by scholars such as Wernerfelt and Barney, who emphasized the role of internal resources in achieving superior performance (Terru, 2024). Penrose in 1959 introduced the idea that organizations grow and succeed based on how effectively they utilize their internal resources, while Wernerfelt in 1984 and Barney in 1991 expanded the theory by explaining that resources which are valuable, rare, inimitable, and non-substitutable provide a sustainable advantage. In the context of project management, RBV highlights that successful project outcomes depend not only on external conditions but also on how financial, human, technical, and informational resources are strategically integrated and managed to achieve project objectives (Festino & Garcio, 2024).

In development and nutrition-related interventions, RBV provides a strong theoretical foundation for understanding the importance of resource integration in achieving program effectiveness. Nutrition projects in low-resource settings often operate under severe financial, human, and infrastructural constraints, making efficient resource coordination essential (White, 2024). Scholars argue that projects which integrate resources across sectors and institutions are more capable of minimizing wastage, avoiding duplication, and improving service coverage. Effective resource integration enhances operational efficiency, strengthens implementation capacity, and increases the likelihood of achieving intended nutrition outcomes, including reductions in malnutrition (Helfat & Peteraf, 2023).

In the context of the study, the RBV theory is relevant for explaining how project resource integration contributes to reducing malnutrition in Nyamasheke District. The theory suggests that when resources such as funding, skilled personnel, nutrition supplies, and logistical support are well-coordinated, nutrition interventions become more efficient and sustainable. However, challenges such as fragmented funding mechanisms, limited technical capacity, and weak coordination structures may limit the effectiveness of available resources. Therefore, RBV theory supports the variable project resource integration, which emphasizes effective coordination of financial, human, and material resources to enhance nutrition program performance.

2.3 Empirical Literature

This section reviews previous empirical studies related to Project Resource Integration and malnutrition in low-resource settings. It focuses on evidence from different contexts and identifies methodological, contextual, and

measurement gaps that justify the current study in Nyamasheke District, Rwanda

2.3.1 Project Resource Integration and Malnutrition in low-resource settings

Empirical evidence indicates that effective project resource integration plays a crucial role in improving nutrition outcomes, particularly in low-resource settings. Aluko and Mensah (2023) conducted a cross-sectional study among 150 program managers and 300 beneficiaries in rural districts, using structured questionnaires and interviews to assess resource allocation and integration in community-based nutrition programs. Their findings revealed that projects with integrated resource planning coordinating funds, personnel, and logistics achieved higher coverage of nutrition services and reduced service duplication compared to programs with fragmented resources. The study concluded that efficient resource integration strengthens operational capacity and service reach, recommending that multi-sectoral resource planning and standardized tracking systems be implemented. However, the study did not specifically assess the direct impact of resource integration on malnutrition rates among children under five, representing a research gap that this study seeks to address.

Similarly, Nyoni and Chikore (2024) employed a quasi-experimental design to compare two nutrition intervention programs, one with integrated agricultural, health, and social protection resources and another without integration. Data were collected over 18 months from 500 households using surveys and growth monitoring data. The study found that households in the integrated program experienced significant improvements in dietary diversity and child nutrition status, with a 12% reduction in stunting and a 9% reduction in underweight prevalence. The study concluded that integration of resources across sectors positively influences child nutrition outcomes and recommended that development agencies coordinate sectoral resources prior to program implementation to enhance effectiveness. A research gap identified was the lack of investigation into which specific resource integration mechanisms contributed most to these improvements.

Kamau (2023) conducted a mixed-methods study in low-income rural districts, collecting quantitative data from 250 households and qualitative data from 20 program managers to examine resource integration in nutrition supplementation and community feeding programs. Findings indicated that programs with well-coordinated resources experienced higher beneficiary satisfaction, fewer stock-outs of nutrition supplies, and more consistent service delivery. The study concluded that proper resource integration is essential for maintaining service continuity and maximizing program efficiency and recommended

implementing centralized resource management systems to track allocation, reduce wastage, and improve efficiency. The research gap was the absence of long-term assessments of how resource integration affects malnutrition indicators such as stunting or wasting trends.

A longitudinal study by Adeyemi and Lungu (2023) across five districts over two years assessed the effect of integrating logistics, financial, and human resources on nutrition program outcomes. Data were collected through program reports, household surveys, and interviews with 100 project staff. The study found that programs implementing integrated resource planning reported significant reductions in program delays, better staff allocation, and more efficient delivery of nutrition supplements, which contributed to improved adherence to feeding programs. The study concluded that long-term resource integration enhances program reliability and beneficiary outcomes and recommended formal resource integration protocols and training for project managers. A gap in the study was the lack of evaluation of how community-level engagement influences the effectiveness of resource integration.

In Rwanda, Kamanzi (2024) conducted a descriptive case study analyzing four nutrition intervention projects in rural districts. Data were collected through document reviews, structured questionnaires with 200 beneficiaries, and interviews with program coordinators to examine how financial, human, and logistical resources were managed. The findings revealed that integrated management of resources contributed to consistent delivery of nutrition education, supplements, and agricultural support, which improved nutrition awareness and household practices. The study concluded that resource integration is a key driver of program effectiveness and recommended prioritizing integrated budgeting and cross-sector coordination to maximize nutrition outcomes. The research gap identified was that the study focused primarily on program processes and did not quantify the direct effect of resource integration on malnutrition reduction among children, highlighting the need for further empirical evaluation in the Rwandan context.

3. Methodology

This study adopted a cross-sectional research design using a mixed-methods approach to examine the role of Integrated Project Management (IPM) in reducing malnutrition in Nyamasheke District, Rwanda. The cross-sectional design enabled the researcher to collect data at a single point in time and assess the relationship between project resource integration, stakeholder integration, communication integration, risk management integration, and malnutrition reduction. Quantitative data were

collected through structured questionnaires, while qualitative data were obtained through interviews and focus group discussions. This approach enabled the researcher to combine numerical findings with the experiences and perceptions of project managers, stakeholders, Community Health Workers, and other participants, providing a comprehensive understanding of IPM practices and their contribution to nutrition outcomes.

The target population consisted of 156 stakeholders involved in nutrition interventions in Nyamasheke District, including project managers, Community Health Workers, local government officials, and NGO staff. These respondents were selected because they were directly involved in planning, implementing, coordinating, monitoring, and supervising nutrition programs. The population included stakeholders from the Gikuriro Project, UNICEF Nutrition Program, World Food Programme School Feeding Program, Rwanda Integrated Nutrition Project, CARE International Nutrition Project, local government, and NGOs. The inclusion of these groups provided relevant information on project resource integration, stakeholder integration, communication integration, risk management integration, and malnutrition reduction.

The study employed census sampling, whereby all 156 members of the target population were included in the study. This technique was considered appropriate because the population was relatively small and accessible. Including the entire target population enabled the researcher to obtain comprehensive information from project managers, Community Health Workers, local government officials, and NGO staff and to capture the perspectives of all key stakeholders involved in Integrated Project Management for nutrition interventions in Nyamasheke District.

The study used three main data collection instruments: structured questionnaires, interview guides, and a documentary review checklist. These instruments were selected to collect both quantitative and qualitative information relevant to the study objectives. Questionnaires provided standardized quantitative data, interview guides enabled the collection of detailed information from project managers, and documentary review provided information from existing records and reports. The combination of these instruments enabled the researcher to obtain comprehensive information concerning Integrated Project Management and malnutrition reduction.

Structured questionnaires were used to collect quantitative data from respondents involved in nutrition interventions. The questionnaire contained closed-ended questions and Likert-scale items measuring project resource integration,

stakeholder integration, communication practices, risk management, and malnutrition reduction. It also collected information concerning nutrition practices, child feeding behaviors, and perceptions of the effectiveness of nutrition interventions. The questionnaire provided standardized information and facilitated statistical analysis of the relationships between the study variables.

A semi-structured interview guide was used to collect qualitative data from project managers involved in nutrition interventions in Nyamasheke District. The guide focused on project planning, coordination, monitoring, implementation, resource integration, stakeholder collaboration, communication strategies, and risk management practices. The semi-structured format enabled respondents to provide detailed explanations of their experiences and perceptions while allowing the researcher to obtain information that could not be fully captured through questionnaires.

Documentary review was used to obtain relevant secondary information from existing records and publications. The documents reviewed included nutrition status reports from the Ministry of Health and Nyamasheke District Health Office, project implementation reports from the Gikuriro Project, UNICEF Nutrition Program, WFP School Feeding Program, Rwanda Integrated Nutrition Project, and CARE International Nutrition Project, as well as monitoring and evaluation reports and annual food security and nutrition reports. These documents provided information on program coverage, resource allocation, implementation strategies, project outcomes, and malnutrition trends over time and helped to complement and verify information obtained through questionnaires and interviews.

The research instruments were piloted before the main data collection to assess their clarity, feasibility, and effectiveness. The questionnaires and interview guides were pre-tested with 20 respondents from a neighboring district with demographic and program characteristics similar to those of Nyamasheke District. The pilot study helped identify unclear questions, logistical challenges, and timing problems associated with data collection. Feedback from the pilot exercise was used to revise and improve the instruments to ensure that they were clear, relevant, and appropriate for the main study.

The validity of the research instruments was assessed through expert evaluation. The questionnaire, interview guide, and documentary review checklist were submitted to three experts in project management and research methodology who assessed the relevance, clarity, adequacy, and appropriateness of the items in relation to the study objectives and variables. Their comments and recommendations were incorporated before data collection. The Content Validity Index (CVI) was

calculated by dividing the number of relevant items by the total number of items evaluated. Of the 25 items assessed, 23 were rated as relevant, resulting in an overall CVI of 0.92. This value was above the acceptable threshold of 0.70 and indicated that the instruments had high content validity.

The reliability of the instruments was assessed to determine their consistency and stability. Standardized procedures were used during data collection, including clear instructions, consistent administration of questionnaires and interviews, and uniform recording of documentary information. Data from the pilot study were analyzed using Cronbach’s alpha to determine the internal consistency of the Likert-scale items, with a value of 0.70 or higher considered acceptable. Inter-rater reliability was also applied to qualitative data to improve consistency in coding and interpretation. These procedures helped ensure that the instruments produced dependable and consistent information.

The collected data were analyzed using quantitative and qualitative techniques. Quantitative data from the questionnaires were coded and entered into SPSS for analysis, while qualitative information obtained from interviews and documentary reviews was analyzed thematically. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the characteristics of respondents and the study variables. Simple linear regression analysis was used to examine the influence of project resource integration, stakeholder integration, communication integration, and risk management integration on malnutrition reduction. Qualitative information was coded into themes and compared with quantitative findings through triangulation to provide a comprehensive interpretation of the results.

Ethical principles were observed throughout the study to protect the rights, privacy, and well-being of participants. Informed consent was obtained before data collection, and participants were informed about the purpose of the study, their involvement, the voluntary nature of participation, and their right to withdraw without penalty. Confidentiality and privacy were maintained by coding participants’ information, securely storing collected data, restricting access to the researcher, and presenting findings in aggregate form. Ethical clearance and permission to conduct the study were obtained from the relevant institutional authorities, Nyamasheke District authorities, community leaders, and organizations involved in nutrition programs. Cultural norms and values were also respected throughout the research process to ensure that the study was conducted responsibly and without causing harm to participants.

4. Results and Discussion

This section presents the analysis and interpretation of the findings of the study in relation to the research hypothesis

4.1 Findings

This section presents the analysis and interpretation of the findings of the study in relation to the research hypothesis.

4.1.1 Response Rate

The study targeted a total population of 156 respondents comprising 5 Project Managers, 92 Community Health Workers, 3 Local Government Officials, and 56 NGO Staff involved in nutrition interventions in Nyamasheke District. The study adopted a census approach whereby all members of the target population were considered for participation. Of the total population, 151 respondents were administered questionnaires while 5 Project Managers were selected as key informants and participated in interview sessions. Out of the 151 questionnaires distributed to respondents, 146 were successfully completed and returned, resulting in a response rate of 96.7%. Additionally, all 5 Project Managers participated in the interview sessions, representing a 100% interview response rate. The following table presents the response rate of respondents.

Table 1. Response Rate of Respondents

Category	Total Population	Response Rate	Percentage
Survey Respondents (Questionnaires)	151	146	96.7
Total	156	151	96.8

Source: Field Data, 2026

The findings in Table 1 indicate that out of the 151 questionnaires distributed to respondents, 146 were

successfully completed and returned, resulting in a response rate of 96.7%. This response rate demonstrates a

high level of participation among the respondents and indicates their willingness to provide information regarding integrated project management practices and malnutrition reduction initiatives in Nyamasheke District. The high response rate suggests that the data collected were adequate and representative of the target population. A response rate of 96.7% minimizes the possibility of non-response bias and enhances the reliability and validity of the study findings. The returned questionnaires provided sufficient information for statistical analysis and interpretation of the study variables.

According to Mugenda and Mugenda (2009), a response rate of 70% and above is considered satisfactory for research purposes, while a response rate exceeding 80% is regarded as excellent. Therefore, the response rate achieved in this study was considered excellent and sufficient for drawing valid conclusions regarding the

influence of integrated project management practices on the reduction of malnutrition in Nyamasheke District.

4.1.2 Descriptive Statistics on Project Resource Integration

The study was to assess the role of project resource integration in reducing malnutrition in low-resource settings in Nyamasheke District. Respondents were requested to indicate their level of agreement with statements relating to resource integration practices within nutrition projects. A Likert scale, ranging from 1 to 5, was utilized to gauge respondents' attitudes, with 5 indicating "Strongly Agree," 4 for "Agree," 3 for "Neutral," 2 for "Disagree," and 1 for "Strongly Disagree." This approach enabled the researchers to effectively interpret and categorize respondents' views on the study's key topics. The results of the descriptive analysis are provided in Table 2 below.

Table 2. Level of agreement of risk planning and performance of PASP

Statement	N	Mean	Std.
Adequate budget allocation improves the effectiveness of nutrition interventions.	146	3.84	.927
Availability of skilled staff supports successful implementation of nutrition programs.	146	4.27	.783
Proper coordination of financial and human resources reduces service duplication.	146	4.42	.786
Timely delivery of nutrition supplies enhances child nutrition outcomes.	146	4.34	.883
Integrated management of resources contributes to reduction of malnutrition in the community.	146	4.43	.787

Source: Field data, 2026

Table 2 presents the findings on the role of project resource integration in reducing malnutrition in low-resource settings in Nyamasheke District. The results indicate that respondents generally agreed that project resource integration contributes significantly to the success of nutrition interventions and the reduction of malnutrition. The statement that integrated management of resources contributes to the reduction of malnutrition in the community recorded the highest mean score of 4.43 with a standard deviation of 0.787, followed closely by the statement that proper coordination of financial and human resources reduces service duplication, which obtained a mean score of 4.42 and a standard deviation of 0.786. These findings suggest that effective coordination and integration of available resources enhance efficiency in service delivery and improve the overall effectiveness of nutrition programs.

The findings further reveal that timely delivery of nutrition supplies enhances child nutrition outcomes, with a mean score of 4.34 and a standard deviation of 0.883. Similarly, the availability of skilled staff supports successful implementation of nutrition programs, as reflected by a mean score of 4.27 and a standard deviation of 0.783. The high level of agreement on these statements indicates that

both human resources and material resources are critical for achieving positive nutrition outcomes. Skilled personnel facilitate effective planning, implementation, and monitoring of nutrition interventions, while timely availability of nutrition supplies ensures that beneficiaries receive the required services and support without interruption.

The statement that adequate budget allocation improves the effectiveness of nutrition interventions recorded the lowest mean score of 3.84 with a standard deviation of 0.927, although respondents still generally agreed with the statement. The relatively lower mean score suggests that some concerns may exist regarding the adequacy of financial resources available for nutrition projects. Nevertheless, the overall findings demonstrate that project resource integration plays a significant role in reducing malnutrition by promoting efficient utilization of financial, human, and material resources. Effective resource integration therefore strengthens project implementation capacity and contributes to improved nutritional outcomes among vulnerable populations in Nyamasheke District.

From the findings, the study revealed that project resource integration plays a significant role in reducing malnutrition

in low-resource settings in Nyamasheke District. The results indicate that effective coordination of financial, human, and material resources enhances the implementation of nutrition interventions and contributes to improved nutritional outcomes among beneficiaries. The study further revealed that integrated management of resources, proper coordination of financial and human resources, timely delivery of nutrition supplies, and availability of skilled staff improve the effectiveness of nutrition programs and strengthen project performance. Although adequate budget allocation recorded the lowest mean score, respondents generally agreed that financial resources remain essential for supporting nutrition interventions. Overall, the findings suggest that effective project resource integration enhances efficiency in service delivery, minimizes resource wastage, and contributes significantly to the reduction of malnutrition within the community.

The qualitative insights obtained from the interviews with Project Managers further support the quantitative findings regarding the role of project resource integration in reducing malnutrition in Nyamasheke District. When asked how financial, human, and material resources are integrated to support nutrition interventions and improve nutrition outcomes, one Project Manager explained that adequate budget allocation and effective deployment of skilled personnel have enabled the successful implementation of nutrition programs across different communities. The respondent noted that proper coordination of resources ensures that nutrition activities are conducted as planned, thereby improving access to nutrition services and contributing to the reduction of malnutrition among vulnerable groups.

Another Project Manager emphasized the importance of timely procurement and distribution of nutrition supplies in achieving project objectives. The respondent indicated that effective resource integration helps ensure the availability of essential nutrition commodities, facilitates timely service delivery, and minimizes delays that could negatively affect beneficiaries. The respondent further stated that continuous monitoring of resource utilization enables project teams to identify resource gaps early and take corrective actions, thereby enhancing project effectiveness and improving nutrition outcomes within the community.

These findings are consistent with previous empirical studies that highlighted the importance of project resource integration in improving nutrition outcomes in low-resource settings. For instance, Aluko and Mensah (2023) found that projects with integrated resource planning achieved higher coverage of nutrition services and reduced

duplication of activities compared to projects characterized by fragmented resource utilization. Similarly, Nyoni and Chikore (2024) established that integration of agricultural, health, and social protection resources contributed to improvements in child nutrition status, including reductions in stunting and underweight prevalence. Likewise, Kamanzi (2024) reported that integrated management of financial, human, and logistical resources improved delivery of nutrition education, supplements, and agricultural support, thereby enhancing household nutrition practices. These findings support the current study's conclusion that effective integration of project resources contributes significantly to reducing malnutrition in low-resource settings.

The findings are further supported by the Resource-Based View (RBV) Theory, which was advanced by Wernerfelt (1984) and Barney (1991) and later discussed by Terru (2024) and Festino and Garcio (2024). The theory argues that organizational performance depends on the effective utilization and coordination of valuable resources. According to Helfat and Peteraf (2023), projects that strategically integrate financial, human, technical, and material resources are more likely to achieve their intended objectives. In the context of the present study, the high levels of agreement regarding resource coordination, availability of skilled staff, timely delivery of nutrition supplies, and integrated resource management demonstrate that effective utilization of available resources enhances implementation efficiency and contributes to improved nutrition outcomes among beneficiaries in Nyamasheke District.

The findings are also consistent with the conceptual arguments advanced by Turner (2021) and Meredith and Mantel (2022), who emphasized that project resource integration reduces wastage, minimizes duplication of effort, and improves overall project effectiveness. Similarly, Cleland and Buse (2023) and Haddad et al. (2022) observed that coordinated allocation of financial, human, and material resources strengthens service delivery and promotes sustainability of nutrition interventions. Therefore, the findings of this study confirm that effective project resource integration is a critical component of integrated project management and plays an important role in enhancing the effectiveness of nutrition interventions and reducing malnutrition in low-resource settings such as Nyamasheke District.

4.1.3 Correlation Analysis

The findings of the correlations between the independent variables and the dependent variables are summarized and presented in Table 3

Table 3: Correlation between independent variable and dependent variable

		Integrated project management	Malnutrition in low-resource settings
Integrated project management	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	146	
Malnutrition in low-resource settings	Pearson Correlation	.695**	1
	Sig. (2-tailed)	.000	
	N	146	146

Source: Primary data, 2026

The correlation results in Table 3 show that Integrated Project Management has a strong positive relationship with malnutrition in low-resource settings, as indicated by a Pearson correlation coefficient of $r = 0.695$. The relationship is statistically significant at the 1% level because the significance value is $p = 0.000$, which is less than 0.01. This means that improvements in Integrated Project Management are associated with improved malnutrition reduction outcomes in low-resource settings. The analysis was based on 146 respondents. Therefore, the findings indicate that effective integration of project resources, stakeholders, communication, and risk management is positively associated with efforts to reduce malnutrition.

4.1.4. Regression analysis

A simple linear regression analysis was performed to determine the extent to which Integrated Project Management predicts malnutrition reduction in low-resource settings. The analysis examined the contribution of the single independent variable, Integrated Project Management, to the dependent variable, Malnutrition in Low-Resource Settings. The regression analysis was conducted after confirming that the relevant assumptions of regression analysis were satisfied. The results of the regression analysis are presented in Table 4.

Table 4. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.695 ^a	.483	.479	.29034

a. Predictors: (Constant), Integrated Project Management

The model summary in Table 4 shows that the correlation coefficient (R) is 0.695, indicating a strong positive relationship between Integrated Project Management and Malnutrition in Low-Resource Settings. The R Square value of 0.483 indicates that Integrated Project Management explains approximately 48.3% of the variation in malnutrition reduction outcomes in low-resource settings, while the remaining 51.7% may be explained by other factors not included in the model. The

Adjusted R Square of 0.479 indicates that the model retains approximately 47.9% of its explanatory power after adjustment. The standard error of the estimate is 0.29034, indicating the average level of difference between the observed and predicted values of the dependent variable. Overall, the model indicates that Integrated Project Management has a substantial predictive relationship with malnutrition reduction in low-resource settings.

Table 5. ANOVA results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.339	1	11.339	134.511	.000 ^b
	Residual	12.139	144	.084		
	Total	23.478	145			

a. Dependent Variable: Malnutrition in low-resource settings

b. Predictors: (Constant), Integrated project management

The ANOVA results in Table 5 show that the regression model is statistically significant, with an F-value of 134.511 and a corresponding significance value of $p = 0.000$, which is less than the 0.05 significance level. This indicates that Integrated Project Management significantly predicts Malnutrition in Low-Resource Settings. The regression sum of squares is 11.339, while the residual sum of squares is 12.139, representing the variation explained

and unexplained by the regression model, respectively. The mean square for regression is 11.339, compared with 0.084 for the residual. The total sum of squares is 23.478, representing the overall variation in the dependent variable. Therefore, the statistically significant ANOVA result indicates that Integrated Project Management has a significant explanatory effect on Malnutrition in Low-Resource Settings.

Table 6. Regression Coefficients

Model	Unstandardized		Standardized	t	Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
1 (Constant)	1.268	.213		5.958	.000
Integrated project management	.721	.062	.695	11.598	.000

a. Dependent Variable: Malnutrition in low-resource settings

Table 6 presents the regression coefficients for the relationship between Integrated Project Management and Malnutrition in Low-Resource Settings. The unstandardized coefficient (B) for Integrated Project Management is 0.721, with a standard error of 0.062. The standardized coefficient (Beta) is 0.695, indicating a strong positive relationship between Integrated Project Management and Malnutrition in Low-Resource Settings. The t-value is 11.598, with a significance level of $p =$

0.000, which is less than 0.05, indicating that Integrated Project Management is a statistically significant predictor of Malnutrition in Low-Resource Settings. The constant value of 1.268 represents the expected value of the dependent variable when Integrated Project Management is zero. Therefore, the findings indicate that effective Integrated Project Management significantly contributes to improved malnutrition reduction outcomes in low-resource settings.

Table 7. Hypotheses Testing Results

Null Hypothesis	Coefficient	t-value	p-value	Condition	Decision
H ₀₁ : Project resource integration has no significant role on reducing malnutrition in low-resource settings Nyamasheke District	0.721	11.598	0.000	p-value < 0.05	Reject H ₀

Source: Primary data, 2026

The hypothesis testing results in Table 7 show that Project Resource Integration has a statistically significant positive relationship with reducing malnutrition in low-resource settings in Nyamasheke District. The regression coefficient of 0.721 indicates a positive contribution of Project Resource Integration to malnutrition reduction, while the t-value of 11.598 and p-value of 0.000 demonstrate that the relationship is statistically significant at the 5% level. Since the p-value is less than 0.05, the null hypothesis (H₀₁), which stated that Project Resource Integration has no significant role in reducing malnutrition in low-resource settings in Nyamasheke District, is rejected. Therefore, the study concludes that Project Resource Integration has a

significant positive role in reducing malnutrition in low-resource settings in Nyamasheke District.

4.2 Discussion of Findings

The objective of this study was to assess the role of Project Resource Integration in reducing malnutrition in low-resource settings in Nyamasheke District. The findings revealed that Project Resource Integration plays an important role in improving the implementation of nutrition interventions and contributing to the reduction of malnutrition. Effective coordination and utilization of financial, human, and material resources were found to support efficient service delivery, reduce duplication of

activities, ensure the availability of nutrition supplies, and strengthen the implementation of nutrition programs. These findings indicate that nutrition interventions are more likely to achieve their intended outcomes when available project resources are properly planned, coordinated, allocated, and utilized.

The findings further showed that effective resource integration requires adequate financial support, skilled personnel, timely availability of nutrition supplies, and proper coordination of resources. Financial resources enable nutrition projects to implement planned activities, while skilled personnel support effective planning, implementation, monitoring, and delivery of services. Timely procurement and distribution of nutrition supplies also help prevent interruptions in service delivery and ensure that beneficiaries receive the necessary support. Therefore, effective Project Resource Integration involves not only mobilizing resources but also ensuring that they are appropriately coordinated and continuously monitored throughout project implementation.

The qualitative findings supported the quantitative findings, as Project Managers emphasized the importance of adequate budget allocation, effective deployment of skilled personnel, timely procurement, and distribution of nutrition supplies. They also indicated that continuous monitoring of resource utilization enables project teams to identify resource gaps and take corrective action. These experiences demonstrate that proper resource integration strengthens the continuity and efficiency of nutrition services and enables projects to respond more effectively to the needs of vulnerable communities.

The findings are consistent with Aluko and Mensah (2023), who found that integrated resource planning improves nutrition service coverage and reduces duplication of activities. Similarly, Nyoni and Chikore (2024) established that integrating resources from agriculture, health, and social protection improves child nutrition outcomes. Kamanzi (2024) also reported that coordinated management of financial, human, and logistical resources improves the delivery of nutrition education, supplements, and agricultural support. These studies support the present finding that effective integration of project resources strengthens the implementation and effectiveness of nutrition interventions.

The findings are also supported by the Resource-Based View Theory, which emphasizes that effective utilization and coordination of valuable resources contribute to improved project outcomes. In nutrition interventions, financial resources, skilled personnel, nutrition supplies, technical expertise, and logistical support are important resources that need to be effectively coordinated. Proper integration of these resources can minimize wastage,

improve service delivery, and strengthen the capacity of nutrition projects to achieve their intended outcomes. The findings therefore demonstrate the relevance of the Resource-Based View Theory in explaining how effective Project Resource Integration can contribute to reducing malnutrition in Nyamasheke District.

The findings are further consistent with Turner (2021) and Meredith and Mantel (2022), who emphasized that effective resource integration reduces duplication, minimizes wastage, and improves project effectiveness. Cleland and Buse (2023) and Haddad et al. (2022) similarly emphasized the importance of coordinated financial, human, and material resources in strengthening nutrition service delivery and sustainability. Therefore, the study confirms that effective Project Resource Integration is an important component of Integrated Project Management and contributes to improving nutrition interventions and reducing malnutrition in low-resource settings such as Nyamasheke District.

5. Conclusion and Recommendations

5.1 Conclusion

The study concluded that Project Resource Integration plays a significant role in reducing malnutrition in low-resource settings in Nyamasheke District. Effective integration and coordination of financial, human, and material resources were found to support the successful implementation of nutrition interventions, improve service delivery, minimize duplication and wastage, and ensure the timely availability of nutrition supplies. The study therefore concludes that strengthening project resource integration is essential for improving the effectiveness of nutrition programs and contributing to better nutrition outcomes among vulnerable communities in Nyamasheke District.

5.2 Recommendations

Based on the study findings, the following recommendations are made:

1. Nyamasheke District authorities and nutrition project managers should strengthen the integration and coordination of project resources. Financial, human, and material resources should be jointly planned, allocated, and coordinated to reduce duplication, minimize wastage, and improve the effectiveness of nutrition interventions.
2. Nutrition project implementing organizations should strengthen financial resource mobilization and budget allocation. Adequate financial resources should be planned and mobilized to

ensure that nutrition activities are implemented continuously and that resource limitations do not affect the delivery of essential nutrition services.

3. Nutrition project managers should improve the timely provision of nutrition supplies and ensure adequate skilled personnel. Stronger procurement, distribution, and human-resource planning should be implemented to ensure that essential nutrition supplies and qualified staff are consistently available for effective service delivery.

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