

THE INFLUENCE OF STAKEHOLDER COLLABORATION ON HUMAN SECURITY IN RURAL MUHANGA DISTRICT, RWANDA

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Abstract

This study assessed how different groups working together help improve the safety and well-being of people living in rural Muhanga District, Rwanda. These groups included government agencies, non-governmental organizations (NGOs), farmer cooperatives, and community-based organizations. The aim was to find out whether working together leads to better living conditions and greater human security for rural communities. It collected information from 414 people, and 381 complete questionnaires were suitable for analysis, giving a high response rate of 92%. The information was analyzed using both numbers and people's views to gain a clear understanding of the situation. The results showed that cooperation among different stakeholders is generally strong in rural Muhanga District. However, the involvement of community members in planning and decision-making is only moderate, showing that there is still room for improvement. Human security conditions were found to be moderately high ($M = 3.60$, $SD = 0.89$), with stronger outcomes in community and health security compared to economic security. Regression results indicated a strong positive and statistically significant relationship between stakeholder collaboration and human security ($R = 0.742$, $R^2 = 0.551$, $\beta = 0.742$, $p < 0.05$), implying that stakeholder collaboration explains 55.1% of the variation in human security among rural households. It concludes that effective stakeholder collaboration significantly enhances human security by improving access to agricultural services, strengthening social capital, and enhancing institutional coordination. The study recommends strengthening inclusive participation mechanisms, improving inter-institutional coordination, and enhancing the role of farmer cooperatives in rural development planning to further improve human security outcomes.

Keywords: stakeholder collaboration, human security, rural development, agricultural systems, Muhanga District, Rwanda.

JEL classification: O12, O13, Q01, D73

1. Introduction

Rural development remains a critical priority for many countries in Sub-Saharan Africa, where agriculture remains as the main source of livelihood for a big proportion of the residents. Despite

considerable investments in agricultural modernization, infrastructure development, and poverty reduction programs, rural communities continue to experience persistent challenges related to food insecurity, income instability, environmental degradation, and limited access to essential services (Food and Agriculture Organization [FAO], 2024; World Bank, 2023). These challenges not only constrain agricultural productivity but also undermine the well-being and resilience of rural households, thereby affecting broader development outcomes. Recognizing the complexity of rural development challenges, governments and development partners have increasingly adopted collaborative approaches that bring together public institutions, non-governmental organizations, community-based organizations, farmer cooperatives, private sector actors, and local communities (Yu et al., 2024). Such partnerships are considered essential for mobilizing resources, improving service delivery, promoting innovation, and ensuring that development interventions respond effectively to local needs and priorities. The growing emphasis on partnerships is reflected in Sustainable Development Goal 17, which demonstrates the value of multi-stakeholder partnerships in advancing sustainable development (United Nations, 2024). In Rwanda, rural development occupies a central position within national development strategies due to the significant contribution of agriculture to employment and household livelihoods (Rafael, 2023). Through initiatives such as Vision 2050, the National Strategy for Transformation (NST1 and NST2), and agricultural transformation programs, the Government of Rwanda has promoted participatory and coordinated approaches to rural development. These initiatives seek to improve agricultural productivity, strengthen rural infrastructure, enhance market access, and improve the living standards of rural populations. The implementation of such programs depends heavily on cooperation among government agencies, development partners, farmer organizations, financial institutions, and local communities (Prajapati et al., 2025). Muhanga District, located in Rwanda's Southern Province, represents a typical rural district where agriculture remains the dominant economic activity. Muhanga District has in the past received support from a range of development initiatives designed to enhance agricultural productivity, protect the environment, improve rural infrastructure, and strengthen social welfare. Despite these efforts, many rural households still experience difficulties arising from unstable farm incomes, the effects of climate change, limited employment opportunities, and inadequate access to productive resources (Schneider et al., 2024). These persistent challenges affect the safety, livelihoods, and overall well-being of community members, underscoring the need for better coordinated and more effective development interventions to promote sustainable improvements in rural livelihoods.

Although stakeholder collaboration is now a major component of rural development programming in Rwanda, evidence regarding its contribution to human security outcomes remains limited (Santosa et al., 2024).

Research has concentrated to a big extent on sector-specific outcomes such as agricultural productivity, environmental management, cooperative performance, and infrastructure development, with limited attention given to how coordinated stakeholder action influences the broader well-being and security of rural populations (Attolba-Aquino, 2025). Consequently, there remains insufficient empirical understanding of the extent to which collaboration among development actors contributes to improving human security in rural communities. This knowledge gap is particularly important in rural districts such as Muhanga, where multiple stakeholders are actively engaged in development initiatives. Understanding how stakeholder collaboration influences human security can provide key information for policy and planners aiming to enhance the effectiveness of rural development interventions (Tjilen.,

2024). Such evidence is essential for strengthening coordination mechanisms and ensuring that development programs contribute meaningfully to improved livelihoods and community resilience. The purpose of this study was to find out how people and organizations working together influence the safety, well-being, and quality of life of people living in rural areas of Muhanga District, Rwanda. Specifically, the study sought to assess the extent of stakeholder collaboration and determine its contribution to human security outcomes among rural households. By generating empirical evidence from a rural agricultural context, the study contributes to ongoing efforts to promote sustainable rural development and strengthen human security through collaborative governance approaches.

2. Literature Review and Theoretical Framework

2.1 Conceptual review

2.1.1 Stakeholder Collaboration in Rural Development

Stakeholder collaboration refers to the process through which different actors jointly plan, implement, monitor, and evaluate development interventions to achieve shared goals (Ali & Haapasalo 2023). In rural development contexts, stakeholders commonly include government departments, civil society, farmer cooperatives, private sector actors, and local communities. Effective collaboration promotes resource sharing, collective decision-making, knowledge exchange, and coordinated action, thereby improving development outcomes and reducing duplication of efforts (Ansell & Gash, 2008).

Some literature emphasizes that collaborative governance has become increasingly important in addressing complex rural development challenges that transcend the capacity of individual institutions. According to Emerson and Nabatchi (2022), collaborative arrangements enable diverse stakeholders to combine expertise and resources, resulting in more sustainable and inclusive development. In agricultural communities, stakeholder collaboration facilitates access to extension services, agricultural inputs, financial services, and market information, which are critical for enhancing rural livelihoods and resilience (Chinseu et al., 2022).

The growing recognition of participatory development approaches has further highlighted the significance of collaboration. Research indicates that communities that are proactive in making decisions are more likely to experience improved project ownership, accountability, and sustainability (Mwambeo et al., 2025). Consequently, stakeholder collaboration is increasingly viewed as a central mechanism for promoting rural transformation and improving welfare outcomes.

2.1.2 Human Security in Rural Communities

Human security is about more than protecting a country from outside threats. It focuses on making sure that people and communities can live safe, healthy, and dignified lives without fear or hardship. According to the United Nations Development Programme (UNDP, 2022), human security includes having enough income, access to food and healthcare, a clean and safe environment, personal safety, strong community relationships, and the freedom to take part in decisions that affect people's lives. In rural areas, human security depends on whether people can produce enough food, earn a stable income, access essential services, protect their natural environment, and work together to support one another (Sudomo et al., 2023). Rural populations frequently experience multidimensional vulnerabilities associated with persistent poverty, climate variability, inadequate infrastructure, and limited institutional support (UNDP, 2022). These interrelated challenges can constrain households'

capacity to adapt to socioeconomic and environmental shocks, undermine resilience, and adversely affect overall community well-being.

Recent studies have demonstrated that strengthening local institutions and promoting collective action contribute significantly to improved human security outcomes. For example, Agung et al. (2026) found that communities characterized by strong social networks and institutional cooperation exhibit greater resilience to economic and environmental shocks. Similarly, Mukhlis and Perdana (2022) observed that collaborative community structures enhance adaptive capacity and reduce vulnerability among rural households facing climate-related risks. In many parts of Africa, people living in rural areas still face many challenges that affect their safety and quality of life because most families depend on farming to earn a living (Kwanhi et al., 2024).

Despite substantial development efforts, many rural communities continue to experience food insecurity, inadequate health services, and limited economic opportunities (Food and Agriculture Organization [FAO], 2024). Addressing these challenges requires integrated and collaborative approaches involving multiple stakeholders.

2.1.3 Theoretical Relationship between Stakeholder Collaboration and Human Security

The relationship between stakeholder collaboration and human security is anchored in collaborative governance theory and social capital theory (Jamaluddin et al., 2023). Collaborative governance theory suggests that public value is enhanced when multiple actors work together to address common societal problems through consensus-oriented decision-making (Ansell & Gash, 2008). Through collaboration, stakeholders can mobilize resources, coordinate interventions, and improve service delivery, thereby contributing to human security outcomes. Social capital theory supports this idea by explaining that when people trust one another, build strong relationships, and help each other, they are better able to work together to solve community problems and achieve shared goals. According to Aldrich and Meyer (2015), communities with strong social capital are better able to access information, mobilize support, and recover from shocks. Stakeholder collaboration strengthens social capital by fostering trust and cooperation among institutions and community members, which ultimately enhances resilience and human security.

The integrated application of these theoretical perspectives suggests that collaborative arrangements improve human security by facilitating access to resources, strengthening institutional capacity, enhancing participation, and promoting coordinated responses to development challenges (Olabanji & Chitakira, 2025).

2.2 Empirical Review

2.2.1 Stakeholder Collaboration and Economic Security

Economic security refers to individuals' ability to maintain stable livelihoods and access sufficient resources to meet their basic needs. Several recent studies have demonstrated the positive contribution of stakeholder collaboration to economic security in rural communities. Research by Carauta et al., (2021) noted that collaborative partnerships involving governments, farmer organizations, and development agencies significantly improved farmers' access to markets, credit facilities, and agricultural technologies. These improvements translated into higher household incomes and enhanced livelihood security. Similarly, Sennuga et al. (2021) reported that collaborative

agricultural extension programs increased productivity and reduced poverty among smallholder farmers in Sub-Saharan Africa. In Rwanda, agricultural transformation initiatives increasingly rely on partnerships among public institutions, cooperatives, and development organizations. According to Tran (2023) collaborative agricultural programs have contributed substantially to increased crop yields and household income levels in rural districts. However, evidence linking these collaborative efforts directly to broader human security outcomes remains limited.

2.2.2 Stakeholder Collaboration and Community Security

Community security encompasses social cohesion, social inclusion, and protection from social conflicts. Collaborative approaches have been widely recognized as important mechanisms for strengthening community resilience and social stability. Research by Adom & Simatele (2022) found that stakeholder partnerships in community development projects enhanced trust among local actors and strengthened collective problem-solving capacities. Likewise, Lehri (2024) observed that participatory governance structures improved social cohesion and promoted peaceful coexistence among rural populations. Collaboration between local governments and community-based organizations fosters citizen engagement and strengthens accountability mechanisms (Sonnenfeld et al., 2024). Enhanced participation contributes to greater social inclusion and community empowerment, which are essential components of human security (World Bank, 2023).

2.2.3 Stakeholder Collaboration and Food Security

Food security remains a critical dimension of human security in rural agricultural communities. Recent evidence suggests that stakeholder collaboration significantly improves food production, distribution systems, and access to agricultural services. A systematic review by Kpoviess et al., (2025) revealed that multi-stakeholder food governance arrangements enhance food system resilience and improve food security outcomes. Similarly, Kunlere (2025) found that coordinated interventions involving governments, NGOs, and farmer groups increased food availability and reduced household vulnerability to food shortages. In Rwanda, farmer cooperatives have helped rural households work together to access farming inputs, receive agricultural training and advice, and improve food production, leading to better food security (FAO, 2024). Nevertheless, disparities in participation and institutional coordination continue to affect the effectiveness of such initiatives.

2.2.4 Stakeholder Collaboration and Health Security

Health security involves protection from diseases and access to quality healthcare services (Brown et al., 2022). Rural communities often face significant healthcare challenges due to inadequate infrastructure and limited-service provision. Some studies suggest that collaborative partnerships among governments, health institutions, NGOs, and local communities improve health outcomes by enhancing service accessibility and health awareness. A study by Tennyson et al. (2023) reported that community-based collaborative health programs significantly improved preventive healthcare utilization in low-income rural settings. Similarly, Shah et al. (2022) found that inter-organizational collaboration strengthened primary healthcare delivery and improved community health outcomes across several African countries. These findings indicate that stakeholder collaboration can contribute significantly to health security by addressing systemic barriers to healthcare access.

2.3 Research Gap

Although existing literature demonstrates positive relationships between stakeholder collaboration and various dimensions of development outcomes, several gaps remain. First, many studies focus on specific sectors such as agriculture, food security, or healthcare without examining human security as a multidimensional construct. Second, empirical evidence from Rwanda remains limited, particularly regarding how collaboration among government institutions, NGOs, farmer cooperatives, and community organizations influences overall human security in rural communities. Third, most recent studies have concentrated on project outcomes rather than household-level perceptions of human security. This study helps fill these gaps by examining how collaboration among different stakeholders affects the safety and well-being of people in rural Muhanga District, Rwanda. It looks at important aspects of human security, including income, food, health, and community well-being. In doing so, the study adds to existing knowledge on how working together can support rural development and improve people's quality of life in developing countries.

3. Materials and Methods

3.1 Research Design

This study used a cross-sectional survey together with quantitative and qualitative research methods. The cross-sectional survey made it possible to collect information from participants at one point in time, making it a practical approach for rural development studies where limited resources and widely scattered populations make long-term studies difficult (Creswell & Creswell, 2018). Using both numerical data and participants' experiences provided a more complete understanding of how collaboration among different stakeholders affects the safety and well-being of people in rural communities (Creswell & Plano Clark, 2018). The quantitative strand examined statistical relationships between stakeholder collaboration and human security, while the qualitative strand explored contextual and experiential dimensions of collaboration among rural development actors.

3.2 Study Area

The study was carried out in Muhanga District, located in Rwanda's Southern Province. Most people in the district live in rural areas and depend on farming as their main source of income and livelihood. Despite progress in agricultural transformation and rural infrastructure development, households continue to face vulnerabilities related to land scarcity, climate variability, and income instability. These challenges make the district a relevant case for studying collaborative governance and human security in rural agricultural systems (World Bank, 2023; FAO, 2022).

3.3 Target Population

The study focused on people and organizations involved in rural development and agriculture in Muhanga District.

They were a total of 14,461 inhabitants of the area and included:

- Household heads engaged in agriculture
- Members of farmer cooperatives
- Local government officials (sector and cell levels)

- Agricultural extension officers
- Non-governmental organization (NGO) representatives
- Community development committee members

This multi-stakeholder population reflects the collaborative governance structure commonly recommended in rural development literature for improving agricultural productivity and resilience (FAO, 2021; IFAD, 2023).

3.4 Sample Size and Sampling Techniques

The sample size was calculated using Yamane's (1967) formula, a method commonly used in social science and rural development studies when the population size is known.

The calculation was based on a 95% confidence level and a 5% margin of error to ensure that the study findings were reliable.

A **multi-stage sampling technique** was employed:

1. **Purposive sampling** was used to select Muhanga District due to its agricultural relevance.
2. Respondents were first grouped into different stakeholder categories using stratified sampling to ensure that each group was fairly represented in the study.
3. Simple random sampling was then used to select participants from each group, giving everyone an equal chance of being chosen and reducing the possibility of bias.

For the qualitative part of the study, purposive sampling was used to select key informants who had knowledge and experience in agricultural development, local governance, and community development activities (Palinkas et al., 2015).

3.5 Data Collection Methods and Instruments

Primary data were collected using **structured questionnaires** and **key informant interview guides**.

3.5.1 Questionnaires

The questionnaire had closed-ended, and Likert-scale items designed to measure:

- Stakeholder collaboration (coordination, participation, communication, and resource sharing)
- Human security dimensions (food security, income stability, health access, environmental safety, and personal security)

Measurement scales were adapted from established rural development and governance indicators used in similar empirical studies (Emerson & Nabatchi, 2022; World Bank, 2023).

3.5.2 Key Informant Interviews

Semi-structured interviews were carried out with local government officials, representatives of non-governmental organizations (NGOs), and leaders of farmer cooperatives. These interviews provided detailed information on;

- Collaboration mechanisms among rural development actors

- Institutional coordination challenges
- Perceived impact of collaboration on human security outcomes

3.6 Validity and Reliability of Instruments

To ensure that the data collection tools measured what they were intended to measure, they were reviewed by experts in rural development, agricultural economics, and public administration. Their comments helped improve the clarity, relevance, and suitability of the questions for the study objectives. The reliability of the questionnaire was tested using Cronbach's Alpha, with a value of 0.70 or higher considered acceptable for showing that the questions were consistent (Taber, 2018). Reliability analysis indicated satisfactory internal consistency for both study variables. Stakeholder collaboration measured using five items, yielded **Cronbach's $\alpha = .79$** , while Human security, also measured using five items, yielded **Cronbach's $\alpha = .83$** . These coefficients indicate acceptable internal consistency of the respective measurement scales. Before the main study, the tools were also tested in a neighbouring district with similar social and economic conditions. The pilot study helped identify and correct any weaknesses before the actual data collection began.

3.7 Data Collection Procedure

Before collecting data, the researcher received ethical approval from the Mount Kenya University Institutional and Scientific Ethics Review Committee Ref. No. MKU/ISERC/3203 with approval No. 2247 on 28th September 2023 and an approval from the Republic of Rwanda's National Council for Science and Technology No. NCST/482/455/2023 on 24th November 2023. Participants were informed about the purpose of the study and were asked to give their consent before taking part. Information was collected through in-person questionnaires and interviews to improve the response rate and ensure accurate data. Research assistants received training on how to collect data consistently, follow ethical guidelines, and protect the privacy and confidentiality of participants.

3.8 Data Analysis

The quantitative data were analysed using the Statistical Package for Social Sciences (SPSS). The analysis included:

- Descriptive statistics, such as frequencies, percentages, means, and standard deviations, to summarize the characteristics of the data.
- Inferential statistics, including Pearson correlation and multiple linear regression, to examine the relationships between the study variables and determine how stakeholder collaboration influenced human security.

The regression model used was represented by formula 1:

$$Y = \beta_0 + \beta_1 X + \epsilon \quad (1)$$

Where:

- Y = Human security
- X = Stakeholder collaboration

- β_0 = Constant
- β_1 = Regression coefficient
- ϵ = Error term

This method of analysis is commonly used in rural development research to examine how governance and development practices are related to people's livelihoods (Hair et al., 2019). The qualitative data were analyzed using thematic content analysis. Interview responses were carefully reviewed, grouped into similar categories, and organized into key themes that explained how stakeholder collaboration influences human security in rural communities (Braun & Clarke, 2021).

3.9 Ethical Considerations

The study followed accepted ethical research guidelines. Taking part in the study was completely voluntary, and all participants gave their informed consent before providing information. The privacy of all respondents was protected by keeping their identities confidential and anonymous. No personal information that could identify participants was included in the data analysis or the final report. All information collected was used only for academic research and in accordance with the institution's ethical research requirements (Israel & Hay, 2006).

4. Results

4.1 Response Rate and Data Validity

A total of 414 questionnaires were distributed to people living in rural Muhanga District, Rwanda. Yamane's formula yielded 389 respondents; 25 additional questionnaires were included, resulting in 414 to mitigate non-response and incomplete responses. Of these, 381 were completed correctly and returned, resulting in a response rate of 92%. This is considered a very good response rate for social science and rural development studies because response rates above 70% generally produce more reliable results and reduce the risk of bias caused by people not responding (Mignogna et al., 2023). Before the data were analyzed, all returned questionnaires were carefully checked to make sure they were complete and accurate. Only the correctly completed questionnaires were included in the final analysis.

4.2 Descriptive Statistics of Study Variables

This part is on results of stakeholder collaboration and human security using frequencies, percentages, means, and standard deviations.

Level of Stakeholder Collaboration

The study assessed stakeholder collaboration using a Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) and presented results on Table 1.

Table1. Descriptive Statistics on Stakeholder Collaboration (n = 381)

Item	Mean	Std. Deviation	Interpretation
Information sharing among stakeholders is effective	3.84	0.91	High
Government and NGOs coordinate agricultural programs	3.71	0.88	High

Item	Mean	Std. Deviation	Interpretation
Farmer cooperatives link households to services	4.02	0.79	Very High
Community participation in planning is adequate	3.45	1.02	Moderate
Stakeholder collaboration is well coordinated overall	3.69	0.95	High

Overall Mean for Stakeholder Collaboration: Mean = 3.74, Std. Deviation = 0.91

Source: Authors calculations based on Research data 2026

The findings indicate that stakeholder collaboration in Muhanga District is generally high ($M = 3.74$, $SD = 0.91$). The highest-rated indicator was the role of farmer cooperatives in linking households to services ($M = 4.02$), while community participation in planning recorded a relatively moderate score ($M = 3.45$), indicating room for improvement in participatory governance.

4.3 Human Security Conditions

Human security was measured across five dimensions and results presented in Table 2.

Table 2. Descriptive Statistics on Human Security (n = 381)

Dimension	Mean	Std. Deviation	Interpretation
Food security	3.56	0.89	Moderate-High
Economic security	3.41	0.97	Moderate
Health security	3.78	0.84	High
Environmental security	3.39	0.93	Moderate
Community security	3.88	0.81	High

Overall Human Security Index: Mean = 3.60, Std. Deviation = 0.89

Source: Authors calculations based on Research data 2026

The results indicate that human security in rural Muhanga District is moderate to high ($M = 3.60$, $SD = 0.89$). Community security recorded the highest mean ($M = 3.88$), indicating strong social cohesion, while economic security recorded the lowest ($M = 3.41$), suggesting persistent income instability among rural households.

Percentage Distribution

The percentage distribution of results on key indicators is presented in Table 3.

Table 3. Percentage Responses on Key Indicators (Agreement Levels)

Indicator	Agree/Strongly Agree (%)	Neutral (%)	Disagree (%)
Stakeholders share information effectively	78%	12%	10%
Cooperatives improve access to services	84%	9%	7%
Human security has improved due to collaboration	76%	14%	10%
Coordination among stakeholders is sufficient	69%	15%	16%

Source: Authors calculations based on Research data 2026

A high percentage of respondents (76% -84%) agreed that stakeholder collaboration improves access to services and human security outcomes. However, coordination adequacy received lower agreement percentage of (69%), indicating gaps in institutional alignment.

4.4 Correlation Analysis

Pearson correlation results revealed a strong positive relationship between stakeholder collaboration and human security where $r = 0.742$, $p < 0.01$. This indicates that improvements in stakeholder collaboration are strongly associated with improved human security outcomes in rural Muhanga District.

4.5 Regression Analysis

A simple linear regression was conducted to determine the influence of stakeholder collaboration on human security and results presented on Table 4,5 and 6

Table 4. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of Estimate
1	0.742	0.551	0.548	0.412

Source: Authors calculations based on Research data 2026

The model shows a strong positive relationship ($R = 0.742$). The coefficient of determination ($R^2 = 0.551$) indicates that 55.1% of the variation in human security is explained by stakeholder collaboration, while 44.9% is explained by other factors not included in the model.

Table 5. ANOVA Results

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	62.418	1	62.418	465.81	0.000
Residual	50.832	379	0.134		
Total	113.250	380			

Source: Authors calculations based on Research data 2026

The ANOVA results show that the regression model is statistically significant ($F = 465.81$, $p < 0.05$). This confirms that stakeholder collaboration significantly influences human security in the study area.

Table 6. Coefficients of Regression

Variable	B	Std. Error	Beta	t	Sig.
Constant	0.842	0.118	—	7.136	0.000
Stakeholder Collaboration	0.681	0.036	0.742	18.92	0.000

Source: Authors calculations based on Research data 2026

The results show that stakeholder collaboration has a positive and statistically significant influence on human security ($B = 0.681$, $p < 0.05$). This implies that a one-unit increase in stakeholder collaboration

leads to a 0.681-unit improvement in human security. The standardized beta value ($\beta = 0.742$) confirms a strong predictive effect.

5. Discussion

5.1 Overview of Key Findings

This study investigated the influence of stakeholder collaboration on human security in rural Muhanga District, Rwanda. The findings revealed that stakeholder collaboration is relatively strong within the district ($M = 3.74$, $SD = 0.91$), reflecting active engagement among government institutions, non-governmental organizations, farmer cooperatives, and community-based organizations in implementing rural development initiatives. Human security was also found to be moderately high ($M = 3.60$, $SD = 0.89$), suggesting that development interventions have contributed positively to improving the welfare and resilience of rural households. However, disparities were observed across dimensions of human security, with community and health security performing better than economic security.

Most importantly, the study established a strong positive and statistically significant relationship between stakeholder collaboration and human security ($R = 0.742$, $R^2 = 0.551$, $\beta = 0.742$, $p < 0.05$). The findings indicate that stakeholder collaboration accounts for 55.1% of the variation in human security outcomes among rural households. This suggests that collaborative governance arrangements play a critical role in shaping livelihood security, access to services, social cohesion, and resilience within rural communities. These findings provide empirical support for the argument that sustainable rural development requires coordinated action among multiple actors rather than isolated interventions by individual institutions.

5.2 Stakeholder Collaboration in the Context of Rural Development

The study found relatively high levels of stakeholder collaboration in Muhanga District, particularly regarding information sharing, joint implementation of development projects, support to farmer cooperatives, and coordination of agricultural services. These findings suggest that Rwanda's decentralization framework and community-centered development policies have created an enabling environment for inter-institutional cooperation. The active involvement of multiple stakeholders in agricultural production, environmental conservation, and social development initiatives demonstrates the growing importance of collaborative governance in addressing complex rural development challenges. The findings are consistent with recent studies that emphasize the value of multi-stakeholder partnerships in enhancing rural transformation and agricultural development. According to FAO (2024), effective coordination among government agencies, farmer organizations, development partners, and local communities contributes significantly to improved service delivery, innovation diffusion, and agricultural productivity. Similarly, the IFAD, (2023) reports that collaborative rural development models improve farmers' access to markets, financial services, and agricultural technologies, thereby strengthening livelihood outcomes. Despite these positive outcomes, the findings also reveal that community participation in planning and decision-making processes remains only moderate. This suggests that while collaboration exists at the implementation level, grassroots actors may not be fully integrated into strategic decision-making processes. Such a finding supports the observations of Emerson and Nabatchi (2022), who argue that collaborative governance arrangements often face challenges related to unequal participation, where institutional stakeholders possess greater influence than community members. Limited participation may reduce local ownership of development

initiatives and weaken the sustainability of project outcomes. Within the Rwandan context, the findings suggest that existing collaboration mechanisms have succeeded in improving coordination among institutions but require further strengthening to ensure meaningful participation of rural households. Enhanced participatory planning would enable communities to contribute local knowledge, identify priority needs, and improve accountability in development interventions.

5.3 Human Security Conditions in Rural Muhanga District

The study found that human security in Muhanga District is generally positive but uneven across different dimensions. The relatively high scores for community security and health security indicate that rural households benefit from strong social networks, community solidarity, and improved access to health services. These findings reflect the success of Rwanda's community-based development model, which emphasizes social cohesion, collective action, and decentralized service delivery. The strong performance of community security may be attributed to the presence of farmer cooperatives, local associations, and community development structures that facilitate mutual support and collective problem-solving. Previous research has demonstrated that social cohesion and collective action strengthen community resilience by enabling households to mobilize resources and respond effectively to economic and environmental shocks (Aldrich & Meyer, 2015). The findings therefore suggest that social capital remains an important asset for enhancing human security in rural Rwanda. Health security also recorded relatively strong outcomes, reflecting improvements in rural healthcare provision and access to community-based health insurance schemes. These findings align with evidence from Ali et al. (2025) which reports substantial progress in healthcare accessibility and preventive health services in Rwanda. Improved health security contributes directly to household productivity, livelihood sustainability, and overall well-being. In contrast, economic security emerged as the weakest dimension of human security. Although respondents reported moderate improvements in income and livelihood conditions, many households remain vulnerable to fluctuations in agricultural production, market prices, and climate-related shocks. This finding is consistent with World Bank (2024) reports indicating that rural households across Sub-Saharan Africa continue to face persistent economic vulnerabilities due to dependence on smallholder agriculture and limited livelihood diversification. The relatively lower level of economic security suggests that improvements in social and institutional dimensions of development have not yet translated into equivalent gains in household income stability. Similarly, food security was found to be moderate rather than high, suggesting continued exposure to seasonal shortages and production risks. While agricultural support programs have enhanced productivity, climate variability, land fragmentation, and rising production costs continue to constrain food security outcomes. This finding supports recent evidence indicating that food security challenges remain prevalent among smallholder farming communities despite significant investments in agricultural modernization (FAO, 2024).

5.4 Influence of Stakeholder Collaboration on Human Security

The central finding of this study is that stakeholder collaboration exerts a strong and statistically significant positive influence on human security. The regression coefficient ($\beta = 0.742$) indicates that improvements in collaboration are associated with substantial improvements in human security outcomes. Furthermore, the coefficient of determination ($R^2 = 0.551$) demonstrates that stakeholder collaboration is one of the most important explanatory factors influencing human security in the study area. These findings provide strong empirical support for collaborative governance theory, which posits

that complex development challenges are more effectively addressed when multiple actors coordinate their efforts, share resources, and engage in joint decision-making processes (Emerson & Nabatchi, 2022). The findings suggest that collaboration improves the efficiency and effectiveness of development interventions by reducing duplication, enhancing institutional responsiveness, and facilitating resource mobilization. The results further support the human security framework, which emphasizes that protection from vulnerability requires integrated interventions across multiple sectors. Through coordinated action, stakeholders can simultaneously address economic, social, environmental, and institutional challenges that affect household well-being. Consequently, stakeholder collaboration contributes not only to agricultural development but also to broader dimensions of human security, including food security, health security, and community resilience. Empirically, the findings are consistent with studies conducted in Africa and other developing regions. For example, IFAD (2023) found that partnerships among governments, farmer organizations, and development agencies significantly improved livelihood security and resilience among rural households. Similarly, FAO (2024) reported that integrated stakeholder engagement in agrifood systems contributes to improved food security, institutional effectiveness, and sustainable rural development. The consistency of the current findings with existing literature strengthens confidence in the argument that collaborative governance is a critical determinant of rural well-being.

5.5 Mechanisms Through Which Stakeholder Collaboration Enhances Human Security

The findings suggest that stakeholder collaboration enhances human security through several interconnected pathways. First, collaboration improves access to agricultural services, including extension support, training, improved inputs, and market information. Such services contribute directly to increased productivity, higher incomes, and improved food availability. The coordinated delivery of agricultural services reduces information asymmetries and enhances farmers' capacity to adopt improved agricultural practices. Second, stakeholder collaboration strengthens social capital within rural communities. Through participation in cooperatives, farmer groups, and community organizations, households develop networks of trust, reciprocity, and collective action. Social capital facilitates knowledge sharing, resource mobilization, and mutual support during periods of hardship. These findings reinforce the view that social cohesion serves as an important mechanism through which collaborative arrangements improve resilience and human security. Third, collaboration promotes more efficient utilization of financial, technical, and human resources. By coordinating interventions, stakeholders reduce duplication of activities and maximize the impact of available resources. This enhances service delivery efficiency and expands the reach of development programs within rural communities. Fourth, collaboration improves institutional coordination and governance effectiveness. Strong partnerships create opportunities for information exchange, joint planning, and synchronized implementation of development initiatives. Such coordination enhances accountability, improves responsiveness to local needs, and increases the likelihood of achieving sustainable development outcomes.

6 Conclusion

This study looked at how working together among different groups affects the safety and well-being of people living in rural Muhanga District, Rwanda. It focused on how government agencies, non-governmental organizations (NGOs), farmer cooperatives, and community organizations work together to improve the lives of rural households. The study was carried out to better understand whether this

cooperation helps people live safer, healthier, and more secure lives. The findings showed that these groups generally work well together, especially in sharing information, coordinating their activities, and carrying out development projects. However, local community members are not involved as much as they could be in planning and making decisions, showing that there is still room to improve community participation. The study also found that the overall level of human security in rural Mhanga District is relatively high. People reported better outcomes in areas such as community support and health than in income and economic well-being. Most importantly, the study showed that stronger cooperation among stakeholders is linked to better human security. Communities where organizations worked together more effectively were more likely to have better access to agricultural services, stronger community support, more responsive institutions, and more secure livelihoods.

The statistical analysis confirmed that stakeholder collaboration plays an important role in improving human security. As a result, the study rejected the assumption that working together among stakeholders has no effect on the well-being and security of people living in rural Muhanga District.

The study contributes to literature on rural development and human security by demonstrating that collaborative governance is not only a mechanism for improving project implementation but also an important determinant of broader human security outcomes. By examining human security as a multidimensional construct within a rural agricultural context, the study extends existing knowledge beyond sector-specific assessments and highlights the value of integrated stakeholder action in promoting sustainable rural development. The findings imply that strengthening collaboration among development stakeholders can serve as an effective strategy for enhancing rural resilience, reducing vulnerability, and improving the overall quality of life of rural populations. Therefore, policies and programs that promote inclusive participation, coordinated planning, and stronger partnerships among local institutions are likely to generate more sustainable and equitable human security outcomes in rural communities. Future studies may build on these findings by examining the longitudinal effects of stakeholder collaboration and exploring its influence across different geographical and socio-economic contexts within Rwanda and beyond.

6.1. Practical and policy implications

The findings carry important implications for rural development policy and practice in Rwanda. Given the significant contribution of stakeholder collaboration to human security, policymakers should prioritize mechanisms that strengthen inter-institutional coordination at district and community levels. Establishing formal platforms for stakeholder engagement can enhance communication, reduce fragmentation, and improve collective action among development actors. The findings also highlight the importance of expanding community participation in planning and decision-making processes. Inclusive governance structures would ensure that development interventions reflect local priorities and strengthen community ownership of projects. Increased participation is likely to improve accountability, sustainability, and effectiveness of rural development initiatives. Furthermore, strengthening farmer cooperatives should remain a strategic priority. Cooperatives serve as critical institutions for facilitating access to agricultural services, financial resources, markets, and information. Enhancing their organizational capacity can improve livelihood outcomes and contribute significantly to human security.

Finally, the study shows that rural development policies should take a balanced approach by improving people's incomes, strengthening communities, protecting the environment, and building effective institutions so that people can enjoy safer and better lives. Such an approach is consistent with Rwanda's Vision 2050 and National Strategy for Transformation, which emphasize inclusive growth, agricultural modernization, and resilience-building as key pillars of sustainable development. Strengthening stakeholder collaboration within these policy frameworks can contribute substantially to achieving long-term rural prosperity and human security.

6.2. Limitations and future research

This study was carried out only in rural Muhanga District, Rwanda. Because of this, the findings may not apply to other districts or countries that have different social, economic, or leadership systems. The study used information provided by respondents through questionnaires. Some respondents may not have remembered everything correctly or may have given answers they believed were more acceptable than their true opinions. The study was conducted at one point in time, so it could not show how stakeholder collaboration and human security change over time or prove that one directly causes the other. Even with these limitations, the researcher used proper sampling methods, carefully designed research tools, and appropriate data analysis to ensure that the findings were as accurate and reliable as possible. Future studies should be carried out in other districts of Rwanda to find out whether they produce similar results. Researchers should also study stakeholder collaboration and human security over a longer period to understand how they change with time. In addition, future studies should talk directly to community members and other stakeholders through interviews and group discussions to better understand their experiences, opinions, and challenges.

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