



# Stakeholder Ownership and Sustainability of Climate Change Projects in Rwanda: A Case of Green Gicumbi Project

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## Abstract

This study assessed the impact of stakeholder ownership on the sustainability of climate change projects in Rwanda, focusing on the Green Gicumbi Project (GGP). It specifically examined the roles of community, private sector, and government ownership in promoting project sustainability. Using a descriptive survey design, data were collected from 105 respondents out of 142 stakeholders involved in the climate-resilient settlements component of GGP. Analysis via SPSS (version 26) included correlation and regression techniques. Validity and reliability were confirmed through expert review and Cronbach's Alpha (above 0.7), respectively. Results showed a very strong positive correlation between community ownership and sustainability ( $r = 0.984$ ,  $p < 0.001$ ), with community engagement accounting for 96.9% of sustainability variance. Similarly, private sector ownership correlated strongly with sustainability ( $r = 0.987$ ,  $p < 0.001$ ), contributing 97.5%. Government ownership also demonstrated a significant positive correlation ( $r = 0.904$ ,  $p < 0.001$ ), explaining 81.7% of sustainability outcomes. All regression models were statistically significant ( $p < 0.05$ ). The study concluded that stakeholder ownership significantly enhances GGP sustainability. Recommendations include decentralizing decision-making and streamlining administrative processes. Future research should explore other GGP components and extend analysis to other climate projects in Rwanda, considering additional factors influencing sustainability.

**Keywords:** *Stakeholder Ownership, Project Sustainability, Climate Change Project*

**Green Gicumbi Project**

## 1 Introduction

Once perceived as a distant or speculative threat, climate change has become a hard-felt reality, manifesting in various forms such as excessive rainfall, elevated temperatures, forest fires, and shifting tidal regimes (Warren, 2019). Today, climate change stands as one of the most expansive global environmental, economic, and political challenges facing humanity (Mucaj, 2021). Projects, particularly development and environmental interventions, are deeply interlinked with their environmental contexts. While they are influenced by their surroundings, they also contribute significantly positively or negatively to environmental and socio-economic change (Brolin, 2017).

From a sustainability perspective, projects produce outcomes that, while beneficial in the short term, may lead to long-term consequences for various stakeholders. Armenia et al. (2019) argue that each project inherently creates economic, social, and environmental (SEE) impacts, which in turn define its sustainability. The delivery of project outputs, therefore, must be assessed not only through efficiency (cost, time, and quality) but also through long-term viability and inclusivity. Within this context, project ownership one of the core principles of the international aid effectiveness agenda is increasingly acknowledged as a key determinant of sustainability (USAID, 2020).

Sustainable outcomes are more likely when local stakeholders are engaged throughout the project lifecycle, from design to implementation and monitoring. Theories such as Stakeholder Theory, Participation Theory, and the Theory of Change emphasize that meaningful participation, shared vision, and empowered ownership contribute to lasting results (Leal & Brandli, 2016; Bonnett, 2019). Global experiences underscore this; for instance, Mucaj (2021) found that externally funded projects in Kosovo only proved sustainable when local actors were fully

involved. However, achieving effective ownership is complex, as it involves coordination between donors, government agencies, communities, and private sector actors (Manzaneque-Lizano et al., 2019).

In Africa, inclusive stakeholder ownership has been linked to enhanced decision-making and resilience in environmental projects. In Ethiopia, citizen participation through civil society, media, and academia has improved responses to climate challenges (Zikargae et al., 2022). In the DRC and Kenya, community involvement has shown to be instrumental in balancing environmental protection with economic viability (Kyamusugulwa, 2019; Ochunga & Awiti, 2019). In Rwanda, the emphasis on climate resilience is central to national policy frameworks such as Vision 2050 and the Green Growth and Climate Resilience Strategy. Yet, studies show that many externally funded projects fail to sustain their impact once donor support ends (IFAD, 2020; REMA, 2021). Tumwebaze and Irechukwu (2022) highlight a disconnect between donor priorities and local stakeholder participation, with communities often relegated to passive roles. This limits project ownership, reducing the potential for long-term impact.

Rwanda remains vulnerable to climate risks, particularly in rural areas reliant on natural resources. As REMA (2021) observes, land degradation, droughts, and floods threaten socio-economic progress. Understanding the role of stakeholder ownership in sustaining climate projects is therefore vital. This study focuses on the Green Gicumbi Project (GGP), a six-year initiative targeting climate-resilient settlements and landscape restoration in northern Rwanda. Specifically, the study seeks to examine the effects of community, private sector, and government ownership on the sustainability of the GGP, thereby informing future climate project design and implementation.

## 2. Review of Related Literature

### 2.1 Empirical Review

#### 2.1.1 Impact of Community Ownership on Project Sustainability

Community ownership has emerged as a pivotal factor influencing the sustainability of development projects, especially in contexts characterized by limited resources, complex stakeholder networks, and long-term environmental or social goals. A growing body of literature emphasizes the importance of engaging local communities not only as beneficiaries but as active agents throughout project lifecycles. In Kosovo, Mucaj (2021) conducted a qualitative study of the Kosovo Environmental Programme (KEP), which was financed by the Swedish International Development Cooperation Agency (SIDA). The study utilized 20 semi-structured interviews with diverse stakeholders including local communities, CSOs, private sector, and government actors. Applying the Local Engagement Assessment Framework (LEAF), the research revealed that sustainability was significantly enhanced when stakeholders, particularly community members, were involved from the design through to the implementation and monitoring phases. Mucaj concluded that sustained impact was directly linked to the extent of community engagement and ownership. Similarly, in Kenya, Ochunga and Awiti (2019) examined stakeholder participation in Plan International's projects in Homa Bay Town. The study sampled 113 respondents from 51 organizations and found that interactive ( $r = 0.365$ ,  $p = 0.000$ ), functional ( $r = 0.455$ ,  $p = 0.000$ ), and optimum participation ( $r = 0.382$ ,  $p = 0.000$ ) all showed statistically significant and positive correlations with project sustainability. In contrast, passive participation had a negative correlation ( $r = -0.043$ ). These findings emphasize that sustainability is more likely when communities actively participate in decision-making rather than being treated as passive recipients.

In Ethiopia, Zikargae, Woldearegay, and Skjerdal (2022) explored the impact of environmental conflicts on community-based forest programs managed by the Organization for Rehabilitation and Development in Amhara (ORDA). Using qualitative tools like interviews, FGDs, and observations with 17 purposively sampled participants, the study identified socioeconomic, cultural, and ecological conflicts as major barriers to community ownership and sustainability. The authors advocated for cultural and participatory communication strategies to enhance ownership and long-term forest resource sustainability.

In Central America, Feliciano and Sobenes (2021) assessed perceptions of climate risk in Guatemala's hotspot regions. Using semi-structured interviews with diverse stakeholders, they found that community-based inter-municipal organizations play a potentially vital role in building adaptive capacity and sustaining outcomes, despite the statistically low significance of some stakeholder categories. These findings support the notion that community-led structures can be instrumental in embedding resilience and continuity in vulnerable contexts. In rural Ethiopia, Zikargae et al. (2022) further explored how grassroots participation shaped environmental project sustainability. Their thematic analysis identified consultation, collaboration, and partnership as key participatory models. The authors emphasized that trust and acceptance from local communities were best achieved when community voices guided project direction and implementation. The grassroots model they proposed aligns

closely with participatory and stakeholder engagement theories, underscoring the importance of community-centric approaches.

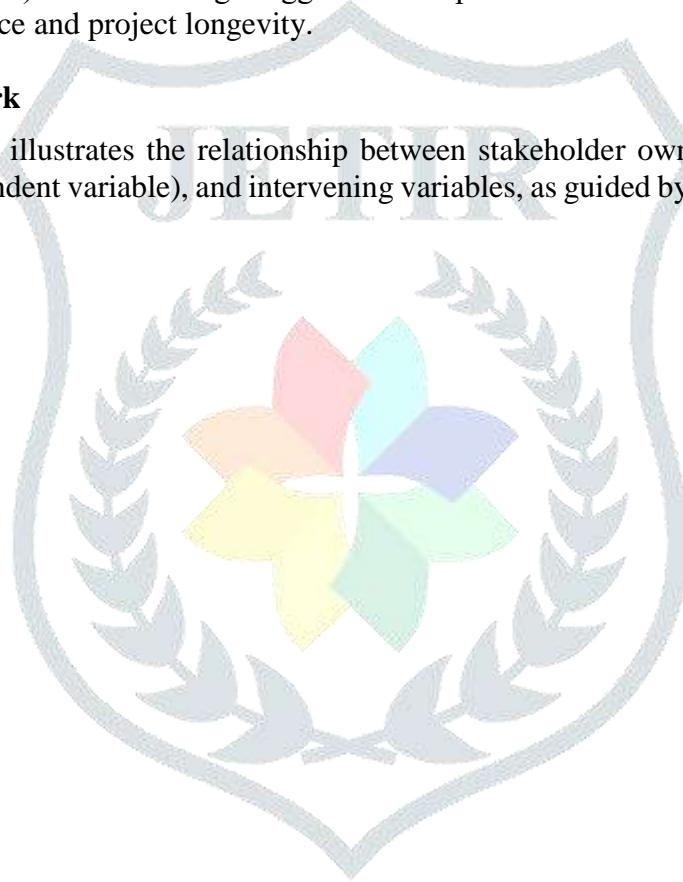
Nyaga and James (2019), studying food security projects in Kenya's Kajiado County, confirmed that 76% of variations in sustainability could be explained by community participation ( $R^2 = 0.76$ ). Their regression analysis demonstrated that stakeholder engagement during all project stages was a strong predictor of long-term success. The study stressed that projects lacking community input often struggled post-intervention due to weak ownership and accountability gaps.

In Rwanda, Tumwebaze and Irechukwu (2022) investigated the Skills Development Fund in Gasabo District and found exceptionally strong correlations between community participation and project outcomes: beneficiary ownership ( $r = 0.949$ ), satisfaction ( $r = 0.928$ ), and sustained progress ( $r = 0.961$ ), all at  $p = 0.00$ . These figures underscore that community ownership is not just a desirable feature but a statistically significant predictor of sustainability in development programming.

Finally, Uwamariya et al. (2021) examined stakeholder participation in the Deaf Donor Funded Project in Kicukiro, Rwanda. With 152 respondents, the study revealed significant positive relationships between stakeholder engagement and effective leadership: skills ( $\beta = .315$ ,  $p = .000$ ), resources ( $\beta = .031$ ,  $p = .033$ ), and materials ( $\beta = .692$ ,  $p = .000$ ). These findings suggest that empowered and resourced community stakeholders can improve both governance and project longevity.

### 2.3 Conceptual Framework

The conceptual framework illustrates the relationship between stakeholder ownership (independent variable), project sustainability (dependent variable), and intervening variables, as guided by Creswell and Creswell (2018).





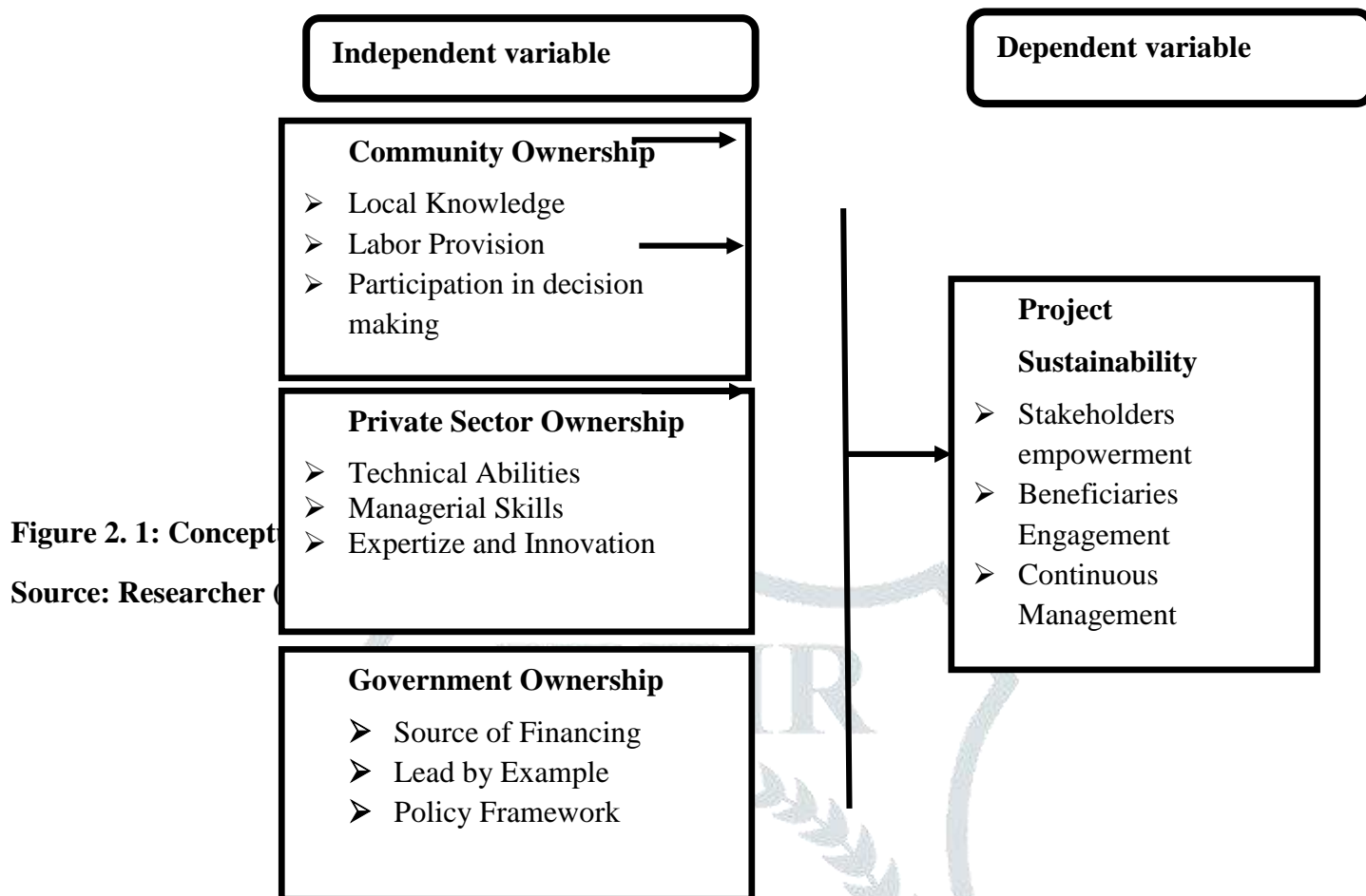


Figure 2. 1: Conceptual Framework

Source: Researcher (2025)

### 3. Research Methodology.

#### 3.1 Research Design

Saunders (2016) defines research design as the framework of research methods and techniques chosen by a researcher to conduct a study. It allows researchers to select appropriate methods and align their studies for success. This study uses a descriptive survey research design to collect detailed information on respondents' perceptions regarding stakeholders' ownership and the sustainability of climate change projects. This design is appropriate for systematically describing current statuses and characteristics of the variables under study, specifically stakeholder ownership and project sustainability in the Green Gicumbi Project (GGP). It allows for the collection of quantitative data from a representative sample, facilitating statistical analysis to understand trends, relationships, and differences among variables. The choice of this design is justified by its ability to provide an accurate snapshot of the perceptions and experiences of various stakeholders in the GGP. It supports the use of structured questionnaires for efficient data gathering and enables objective, reliable analysis. Descriptive statistics such as frequencies, means, and standard deviations are used to summarize stakeholders' perceptions. Correlation analysis examines the relationships between variables, identifying the strength and direction of associations. Multiple regression analysis tests hypotheses by assessing the predictive power of community, government, and private sector ownership on project sustainability.

The GGP serves as a case study due to its relevance as a climate change adaptation initiative in Rwanda, offering a rich context to explore stakeholder dynamics and sustainability issues.

#### 3.2 Population of the Study

Kothari and Garg (2014) define the population of a study as a subset of the target population from which the sample is selected. This study evaluates the impact of stakeholders' ownership on project sustainability within the GGP, a 6-year initiative (2019–2025) aimed at enhancing adaptive capacity and reducing vulnerability to climate change. It operates across 9 sectors within the Muvumba B sub-catchment, covering approximately 252 villages and targeting 150,000 direct and 380,000 indirect beneficiaries. Due to resource constraints, the study focuses on the Climate Resilient Settlements component, which includes interventions like rainwater harvesting and flood risk management. This component has constructed 40 climate-resilient dwellings in Rubaya, with an additional 60 units for vulnerable families. The study population includes three stakeholder categories: (1) community beneficiaries, (2) private companies involved in implementation, and (3) public institutions coordinating the project. These stakeholders were chosen for their direct involvement and insight into ownership

and sustainability. Using Slovin's Formula with  $N=142$  and a 5% margin of error, the sample size ( $n$ ) is calculated as:  $n = 142 / (1 + 142 * 0.05^2) = 105$  respondents. Stratified sampling was employed to select 105 respondents proportionally from the three stakeholder groups. Stratified sampling ensures that subgroups are accurately represented, improving result accuracy and precision (Kothari & Garg, 2014; Saunders, 2012). Random sampling within each stratum ensured representativeness.

### 3.3 Data Collection Methods

The study collected both primary and secondary data. Primary data was gathered directly using structured questionnaires with both open and closed questions. Secondary data was obtained through a desk review of existing documentation, including reports, evaluations, and project records related to the GGP. The desktop analysis focused on performance metrics, project outcomes, and sustainability indicators, supporting triangulation of findings for enhanced validity and reliability. Questionnaires used a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) to capture respondents' perceptions. These were administered over two weeks to respondents involved in the project. A pilot study was conducted with 20 employees of Nyarutarama Property Developers (NPD) Cotraco to test questionnaire clarity. Based on pilot feedback, unclear questions were revised. Two project management experts validated the research instrument, ensuring alignment with study objectives. A research consultant also reviewed the questionnaire. Validity above 0.5 (on a 0-1 scale) is considered acceptable (Lohrey, 2014). Reliability was confirmed using Cronbach's Alpha. A value above 0.7 indicates strong internal consistency (Lohrey, 2014).

### 3.4 Methods of Data Analysis

Descriptive and inferential statistics were employed using SPSS version 26. Descriptive statistics (mean, frequency, standard deviation) were used to summarize stakeholder ownership (community, private sector, government) and project sustainability (stakeholder empowerment, beneficiary engagement, and continuous management). The Pearson correlation coefficient measured the relationship between stakeholder ownership and project sustainability. Multiple linear regression assessed the predictive impact of each ownership type on sustainability. The regression model used was:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \varepsilon$$

Where:

- $Y$  = Project sustainability (dependent variable)
- $X_1$  = Community Ownership
- $X_2$  = Private Sector Ownership
- $X_3$  = Government Ownership
- $\beta_0$  = Constant
- $\varepsilon$  = Error term

The model underwent post-estimation diagnostic tests for multicollinearity, heteroscedasticity, and normality. Multicollinearity was assessed to ensure predictors were not too highly correlated. Homoscedasticity tested the uniformity of residual spread.

### 3.5 Ethical Consideration

The researcher upheld ethical standards by protecting respondent rights, privacy, and dignity. Informed consent was obtained, participation was voluntary, and confidentiality was maintained. Approval was obtained from Mount Kenya University and the Green Gicumbi Project authorities. Participants were informed of their rights, including the right to withdraw at any time without penalty. Data collected was used solely for academic purposes, with participants assured of anonymity. Ethical practices ensured respondents felt respected and secure throughout the research process.

## 4 Presentation of Findings

The findings are presented using frequencies, percentages, means, and standard deviations. Mean scores indicate factor significance: 1.00–1.79 (very low), 1.80–2.79 (low), 2.80–3.79 (moderate), 3.80–4.49 (high), and 4.50–5.00 (very high). A standard deviation  $\leq 0.5$  indicates data homogeneity.

### 4.1 Views on Stakeholder ownership in GGP

The study assessed stakeholder ownership community, private, and government in GGP. Respondents indicated agreement or disagreement with statements on community ownership.

**Table 4.1**View on Community ownership in GGP

Statement on Community ownership	SD		D		N		A		SA		M	SD
N=101	Fr	%	Fr	%	Fr	%	Fr	%	Fr	%		
The community is always invited to contribute knowledge to the design and implementation of climate change projects	5	5	2	2	9	9	28	28	57	56	4.29	0.52
Community participants have a say in how choices are reached in GGP	5	5	4	4	14	14	24	24	54	53	4.17	0.56
GGP engage community members in climate action which increase their understanding of the issue and empower them to take action on a local level	7	7	4	4	12	12	29	29	49	49	4.08	0.61
Communities are engaged in labor activities related to climate change projects in GGP	5	5	4	4	4	4	37	37	51	50	4.24	0.53
Community labor activities in GGP create local economic opportunities which leverage local knowledge and expertise	2	2	5	5	5	5	26	26	63	62	4.42	0.48
In the GGP, the community is always invited to contribute knowledge about how a policy was affect their community at the start of a decision-making process	7	7	15	15	8	8	41	41	30	30	3.71	0.64
<b>Overall Mean</b>											<b>4.15</b>	

**Source: Primary Data (2024)**

According to Table 4.1, 66% of respondents strongly agreed that the community is consistently invited to contribute knowledge to climate change project design and implementation, reflected by a high mean of 4.29 and heterogeneous standard deviation of 0.52, indicating varied perceptions. Similarly, 53% strongly agreed that community participants influence decision-making in GGP (mean 4.17, SD 0.56). Forty-nine percent strongly agreed that community engagement in climate action increases understanding and empowerment (mean 4.08, SD 0.61). Half agreed that communities participate in climate-related labor activities (mean 4.24, SD 0.53). Sixty-two percent strongly agreed these activities create local economic opportunities (mean 4.42, SD 0.48), showing consensus. Lastly, 41% agreed community input on policy impact occurs early in decisions (mean 3.71, SD 0.64).

**Table 4.2**View on Private sector ownership in GGP

Statement on PSO	SD		D		N		A		SA		M	SD
N=101	Fr	%	Fr	%	Fr	%	Fr	%	Fr	%		
The private sector scale up the financing of GGP	11	11	9	9	17	17	41	41	23	23	3.55	0.78
Private companies involved in GGP have sufficient technical knowledge to mitigate effect of climate change	9	9	14	14	14	14	46	46	18	18	3.50	0.74
The companies involved in GGP create new products and methods that lessen the effects of climate change	7	7	11	11	10	10	51	50	22	22	3.69	0.71
The companies involved in GGP fosters innovation in GGP	9	9	13	13	11	11	43	43	25	25	3.61	0.69

The companies involved in GGP are trusted to channel adaption funds	12	12	13	13	17	17	40	40	19	19	3.41	0.82
The private companies have good reputation within the community	15	15	11	11	17	17	38	38	20	20	3.37	0.85
Overall Mean	3.52											

**Source: Primary Data (2024)**

Table 4.2 results showed that 41% of respondents agreed the private sector scales up financing for GGP, with a moderate mean of 3.55 and heterogeneous standard deviation of 0.78, indicating varied opinions. Forty-six percent agreed that private companies have sufficient technical knowledge (mean 3.50, SD 0.74). Fifty percent agreed companies create new products to reduce climate change effects (mean 3.69, SD 0.71). Forty-three percent agreed companies foster innovation (mean 3.61, SD 0.69), 40% agreed they are trusted to channel adaptation funds (mean 3.41, SD 0.82), and 38% agreed private companies have a good community reputation (mean 3.37, SD 0.85). The overall mean of 3.52 indicates moderate private sector involvement in GGP.

**Table 4.3** Views on Government ownership in GGP

Statement on Government Ownership	SD		D		UN		A		SA		M	SD
N=101	Fr	%	Fr	%	Fr	%	Fr	%	Fr	%		
The Government provide all financial resources needed to implement the GGP	3	3	5	5	8	8	37	37	48	48	4.21	0.44
The Rwandan Government has raise the public awareness about the impacts of climate change and the need for action	5	5	6	6	5	5	38	38	47	47	4.15	0.54
Government Ownership is crucial for the sustainability of GGP by providing effective policy framework of the project.	5	5	8	8	5	5	34	34	49	49	4.13	0.57
State authorities ensure that GGP contribute to the achievement of multiple sustainable development goals as poverty reduction, improved health outcomes, and increased access to clean energy	3	3	8	8	14	14	36	36	40	40	4.01	0.62
State authorities appoint the managers of the GGP and define clearly their priorities	8	8	7	7	4	4	24	24	58	57	4.16	0.54
Policies create a favorable environment for private sector and donors investment	7	7	8	8	8	8	36	36	42	42	3.84	0.67
Overall Mean	4.08											

**Source: Primary Data (2024)**

Table 4.3 results showed that 48% of respondents strongly agreed the government provides all financial resources for GGP, with a high mean of 4.21 and low standard deviation of 0.44, indicating strong consensus. Forty-seven percent strongly agreed the government raises public awareness on climate change (mean 4.15, SD 0.54). Forty-nine percent agreed on effective policy frameworks (mean 4.13, SD 0.57). Forty percent agreed GGP supports sustainable development goals (mean 4.01, SD 0.62). Fifty-seven percent agreed managers are appointed with clear priorities (mean 4.16, SD 0.54). Forty-two percent agreed policies favor private and donor investment (mean 3.84, SD 0.67). Overall mean of 4.08 indicates strong agreement on government ownership.



### 4.3 Views on the Sustainability in GGP

The study assessed respondents' perceptions of GGP sustainability via Stakeholders Empowerment, Beneficiaries Engagement, and Continuous Management. Table 4.4 presents their agreement or disagreement on statements regarding Stakeholders Empowerment.

**Table 4.4** Views on the Stakeholders Empowerment in GGP

Statement	on SD		D		UN		A		SA		M	SD
Stakeholders Empowerment												
N=101	Fr	%	Fr	%	Fr	%	Fr	%	Fr	%		
GPP provide training and capacity-building opportunities for stakeholders, including local communities, to develop new skills and knowledge related to climate change mitigation and adaptation.	8	8	12	12	8	8	45	45	28	28	3.72	0.64
Due to the GGP, stakeholders have access opportunities relating to their personal development and issues that concern them.	14	14	16	16	5	5	38	38	28	28	3.50	0.68
We are witnessing a significant impact of GGP on empowering stakeholders, particularly those who are most vulnerable to the impacts of climate change.	14	14	16	16	11	11	36	36	24	24	3.40	0.77
Due to stakeholder ownership in GGP, there is improvement within the quality of life for stakeholders and reduction their vulnerability to the impacts of climate change	15	15	23	23	9	9	34	34	20	20	3.21	0.79
There is development of new networks and coalitions among stakeholders of GGP, which facilitate collective action to address climate change.	13	13	20	20	9	9	36	36	23	23	3.36	0.74
<b>Overall mean</b>											<b>3.44</b>	

**Source: Primary Data (2024)**

The majority of respondents (45%) agreed that the GGP provides training and capacity-building opportunities for stakeholders, including local communities, to develop skills related to climate change mitigation and adaptation. The mean score of 3.72 indicates moderate agreement, but a standard deviation of 0.64 reveals varied perceptions. Regarding access to personal development opportunities, 38% agreed and 28% strongly agreed, with a mean of 3.50 and a higher standard deviation of 0.68, showing heterogeneity. On GGP's impact in empowering vulnerable stakeholders, 36% agreed and 24% strongly agreed (mean 3.40), but the standard deviation of 0.77 indicates diverse opinions. Similarly, 34% agreed that stakeholder ownership improved quality of life, but the mean of 3.21 and standard deviation of 0.79 reflect less agreement and more variability. Lastly, 36% agreed new networks among stakeholders are developing, though perceptions varied (mean 3.36, SD 0.74). Overall, stakeholder empowerment shows moderate agreement but significant differences in views, suggesting room for improvement.



**Table 4.5** Views on the Beneficiaries Engagement in GGP

Statement	on	SD		D		UN		A		SA		M	SD
Beneficiaries Engagement													
N=101		Fr	%	Fr	%	Fr	%	Fr	%	Fr	%		
Due to community ownership, beneficiary understand what the GGP project entails.		5	5	4	4	1	1	35	35	56	55	4.32	0.43
Due to community ownership in GGP, people take responsibility for the project and assist by contributing to the maintenance of the project		7	7	4	4	1	-	38	38	51	50	4.21	0.45
We are witnessing the building of capital within the community thanks to private sector funds.		2	2	4	4	10	10	47	47	38	38	4.14	0.53
By involving the private sector in the implementation, and monitoring of projects, the GGP improve project outcomes leading to more sustainability.		5	5	4	4	1	1	20	20	71	70	4.47	0.41
There are no centralized organizational systems that control decision making in GGP which reduce the beneficiary's engagement		23	23	24	24	12	12	24	24	18	18	2.90	0.77
There are no bureaucratic procedures from the government that reduce the beneficiary's engagement in GGP		22	22	24	24	12	12	22	22	21	21	2.96	0.74
Overall Mean												3.83	

**Source: Primary Data (2024)**

A majority of respondents (55%) strongly agreed that community ownership helps beneficiaries understand the GGP project, with a high mean of 4.32 and low variability (SD = 0.43), indicating consensus. Similarly, 50% strongly agreed that community ownership encourages responsibility and maintenance (mean = 4.21, SD = 0.45). Regarding private sector contributions, 47% agreed and 38% strongly agreed that private funds build community capital (mean = 4.14, SD = 0.53). Seventy percent strongly agreed that private sector involvement improves project outcomes and sustainability (mean = 4.47, SD = 0.41). Opinions were mixed on centralized decision-making reducing beneficiary engagement (mean = 2.90, SD = 0.77) and the absence of government bureaucracy lowering engagement (mean = 2.96, SD = 0.74). Overall, respondents agreed strongly on beneficiary engagement (mean = 3.83), though views varied on governance aspects.

Statement on Continuous Management	SD		D		UN		A		SA		M	SD
	Fr	%	Fr	%	Fr	%	Fr	%	Fr	%		
N=101	Fr	%	Fr	%	Fr	%	Fr	%	Fr	%		
The GGP projects remains effective in the face of changing conditions, thanks to community ownership.	8	8	12	12	9	9	33	33	39	39	3.82	0.63

Due to high community ownership within the GGP, its activities are designed and implemented with a long-term perspective in mind.	4	4	12	12	9	9	35	35	41	41	3.96	0.55
As the community knows it wasnefit from the GGP, the members make their skills, indigenous knowledge and resources available in time asked.	2	2	4	4	10	10	47	47	38	38	4.14	0.49
Private sector actors within the GGP feel accountable for the project's success thanks to ownership of the project.	11	11	17	17	10	10	30	30	33	33	3.56	0.71
The private sector provide accurate and reliable data, which are used to track progress and make adjustments as needed.	12	12	11	11	12	12	30	30	36	36	3.66	0.69
The GGP project continues to receive the sufficient resources and support to achieve its goals from the government.	9	9	9	9	12	12	30	30	41	41	3.84	0.58
<b>Overall Mean</b>											<b>3.83</b>	

**Table 4.6**Views on the Continuous Management in GGP**Source: Primary Data (2024)**

A significant portion of respondents (39%) strongly agreed that community ownership keeps the GGP effective amid changing conditions, with a high mean of 3.82 and moderate variability (SD = 0.63). Regarding long-term planning due to community ownership, 41% strongly agreed and 35% agreed (mean = 3.96, SD = 0.55), showing consensus. Most respondents (47% agreed, 38% strongly agreed) acknowledged community contributions of skills and indigenous knowledge (mean = 4.14, SD = 0.49). Views were more varied on private sector accountability (mean = 3.56, SD = 0.71) and data provision (mean = 3.66, SD = 0.69). For government support, 41% strongly agreed and 30% agreed (mean = 3.84, SD = 0.58). Overall, respondents agreed strongly on continuous management of GGP (mean = 3.83), with some differing views on private sector roles.

**4.4. Correlation Analysis**

Correlation analysis using Pearson's coefficient was applied to measure the strength and direction of relationships between variables. The coefficient ranges from -1 to +1, where 0 indicates no correlation. A positive value means both variables increase together, while a negative value shows one increases as the other decreases (Lohrey, 2014). This study used Pearson's correlation to examine how community ownership, private sector ownership, and government ownership relate to project sustainability.

**Table 4.7** Correlation Coefficients

		Community Ownership	Private Sector Ownership	Government Ownership	Sustainability
Community Ownership	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	101			
Private Sector Ownership	Pearson Correlation	.959**	1		
	Sig. (2-tailed)	.000			
	N	101	101		

Government Ownership	Pearson				
	Correlation	.947**	.853**	1	
	Sig. (2-tailed)	.000	.000		
	N	101	101	101	
Sustainability	Pearson				
	Correlation	.984**	.987**	.904**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	101	101	101	

**\*\*.** Correlation is significant at the 0.05 level (2-tailed).

Correlation analysis shows strong positive relationships between ownership variables and Green Gicumbi Project (GGP) sustainability. Community Ownership correlates highly with sustainability ( $r = 0.984$ ,  $p = 0.000$ ), as does Private Sector Ownership ( $r = 0.987$ ,  $p = 0.000$ ). Government Ownership also shows a strong positive correlation ( $r = 0.904$ ,  $p = 0.000$ ). All correlations are statistically significant, highlighting ownership's vital role in project success. These results align with Gatumi et al. (2022), who found stakeholder engagement strongly influences sustainability in food security projects in Kenya's arid lands.

#### 4.5. Effect of Community ownership on sustainability

The study used multiple linear regression to assess Community Ownership's effect on GGP sustainability. The model's significance was tested using coefficients ( $\beta$ ), t-statistics, and p-values. At a 5% significance level, statistically significant relationships were accepted. Analysis was performed using SPSS version 27.0 to measure the regression outcomes and determine predictor impacts.

**Table 4.8** Model summary on Community Ownership and sustainability

Model	R	R Square	Adjusted R square	Std Error of the estimate
1	.984a	0.969	0.969	0.64613

##### a. Predictors: (Constant): Community ownership

The results from the regression model 1 indicate that the value of coefficient of determination (R-Square) was .969, an indication that community engagement contribute 96.9% on the sustainability in Green Gicumbi project. Since the variables in the model or not in count 100%, therefore there are other factors that influence sustainability of GGP in Rwanda that are not included in the model which account for 3.1%.

**Table 4.9** ANOVA on Community Ownership and sustainability

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	1289.415	1	1289.415	3088.545	.000b
	Residual	41.331	99	0.417		
	<b>Total</b>	<b>1330.745</b>	<b>100</b>			

##### a. Predictors: (Constant): Community ownership

##### b. Dependent variable: Sustainability

The results in Table 4.9 show that the model as a whole was significant at 5% level of significance. The calculated F statistic of 3088.545 and the calculated p-value of  $=.000$  is less than the Critical p-value of  $=.05$  level of significance, making the entire model significant. Therefore, this implies that Community ownership has significant effect to the sustainability in GGP.

**Table 4.10** Regression coefficients on Community ownership and sustainability

Model		Unstandardized Coef.		Standardized coef.	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.130	0.222		5.091	0.000
	CO	3.042	0.055	0.984	55.575	0.000

##### a. Dependent Variable: Sustainability

Table 4.10 provides the summary of results of regression analysis for the effect of community ownership on sustainability of GGP in Rwanda. The results indicate that community ownership ( $\beta_1 = .984$ ;  $t = 55.575$ ,  $p\text{-value} = 0.000 < 0.05$ ) have positive and significant effect on sustainability in GGP. This shows that 1 unit increase in community ownership was lead to 0.984 units increase in sustainability of Green Gicumbi project.

Therefore, the hypothesis 1 that states there is no statistically significant effect of community ownership on the sustainability of Green Gicumbi project is not accepted at 5% level of significance.



## 5. Discussion

The findings of this study strongly support the view that stakeholder ownership significantly influences the sustainability of climate change projects, specifically the Green Gicumbi Project in Rwanda. The results are in agreement with Mucaj (2021), who analyzed the Kosovo Environmental Program and found a strong relationship between stakeholder involvement across the project cycle and the sustainability of outcomes. This supports the core assumptions of Participation Theory, which emphasizes the importance of local beneficiary engagement in ensuring project relevance and continuity. It also aligns with Stakeholder Theory, which asserts that the active involvement of diverse stakeholder groups including communities, private actors, and government agencies is essential for achieving sustainable outcomes. Furthermore, the findings validate the Theory of Change, which suggests that sustainable, long-term impacts are more likely when beneficiaries are actively engaged in the design, implementation, and monitoring of projects.

### 5.1 Effect of Private Sector Ownership on Sustainability

The study employed a multiple linear regression model to assess the effect of private sector ownership on sustainability. Using SPSS version 27, the analysis yielded an R-squared value of 0.975, indicating that private sector engagement accounts for 97.5% of the variation in sustainability of the Green Gicumbi Project. The F-statistic (3837.931) and p-value (0.000) confirmed the statistical significance of the model at the 5% level. The regression coefficient ( $\beta = 0.987$ ,  $t = 61.951$ ,  $p < 0.05$ ) demonstrates a strong and significant positive effect of private sector ownership on sustainability. This implies that a one-unit increase in private sector involvement leads to a 0.987-unit increase in project sustainability. Therefore, the hypothesis stating that private sector ownership has no significant effect on sustainability is rejected.

These findings are in line with Feliciano and Sobenes (2021), who explored stakeholder perceptions of climate change risk in Guatemala and identified the crucial role of organizational partnerships, such as inter-municipal organizations and non-profit actors, in enhancing adaptive capacity. This supports Stakeholder Theory, recognizing private actors as key contributors of resources and expertise. It also confirms the Theory of Change, which emphasizes the strategic inclusion of private actors in innovation, financing, and implementation. The results also resonate with Participation Theory, highlighting the necessity of cross-sectoral collaboration for addressing complex challenges like climate change.

### 5.2 Effect of Government Ownership on Sustainability

The study further assessed the impact of government ownership using multiple regression. The R-squared value of 0.817 indicates that government engagement explains 81.7% of the variation in project sustainability. With a significant F-statistic of 440.876 and a p-value of 0.000, the model was found to be statistically significant. The regression results ( $\beta = 0.904$ ,  $t = 20.997$ ,  $p < 0.05$ ) confirmed a positive and significant effect of government ownership on project sustainability, suggesting that a one-unit increase in government involvement leads to a 0.904-unit improvement in sustainability. Thus, the hypothesis that government ownership has no significant effect on sustainability is rejected. These results are consistent with Tumwebaze and Irechukwu (2022), who found that government-led stakeholder consultations positively influenced the sustainability of World Bank-funded projects in Rwanda. This finding affirms Stakeholder Theory by emphasizing the role of institutional actors in driving project success. It also supports the Theory of Change and Participation Theory, both of which highlight the importance of government involvement in creating enabling environments, ensuring oversight, and promoting collaborative engagement.

## 6. Conclusion and Recommendations

This study aimed to assess the impact of stakeholder ownership on the sustainability of the Green Gicumbi Project (GGP) in Rwanda, focusing on community, private sector, and government ownership. The findings revealed that all three forms of ownership had a significant and positive effect on project sustainability. Community ownership exhibited a very high correlation with sustainability ( $r = 0.984$ ,  $p < 0.001$ ), contributing 96.9% to the variance in sustainability. Similarly, private sector ownership showed a strong correlation ( $r = 0.987$ ,  $p < 0.001$ ), accounting for 97.5% of the sustainability outcomes. Government ownership also demonstrated a significant impact ( $r = 0.904$ ,  $p < 0.001$ ), contributing 81.7% to the sustainability of the GGP. The results from the regression and ANOVA analyses confirmed that all three ownership types were statistically significant predictors of project sustainability. The study therefore concludes that stakeholder ownership plays a vital role in promoting the long-

term success and sustainability of climate change projects such as the GGP. The research objectives were fully achieved.

Based on these findings, several recommendations are proposed to enhance sustainability in GGP. First, the study found varied opinions on centralized decision-making systems, with a mean score of 2.90 indicating low agreement. It is therefore recommended that the GGP management decentralize decision-making processes to allow for more local-level involvement. Increased community participation in planning and implementation could enhance a sense of ownership and beneficiary engagement. Second, since the mean score for the absence of bureaucratic procedures was also low (2.96), government stakeholders such as REMA and FONERWA should collaborate with project implementers to streamline administrative processes. Simplifying procedures, while ensuring transparency and accountability, can improve efficiency and beneficiary participation. Finally, future studies should focus on other components of the GGP or similar climate change projects in Rwanda to validate the findings and explore other variables influencing sustainability.

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