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

Website:www.jriiejournal.com ISSN 2520-7504 (Online) Vol.9, Iss.2, 2025 (pp. 833 - 845)

Effect of Feasibility Study on Success of Slum Upgrading Projects in Rwanda: A Case Study of Busanza Housing Estate Project

Pierre Ndikumana
University of Kigali
Email: ndikumanakevinpierre@gmail.com

Abstract: *This study evaluates the impact of feasibility studies on the success of the Busanza Housing Estate slum upgrading project in Rwanda, focusing on economic, social-cultural, and environmental dimensions. Using a mixed-methods approach, data were collected from 109 participants, including stakeholders, residents, and officials, via surveys, interviews, and document analysis. Descriptive and inferential methods, such as Z-scores and regression analysis, were used to analyze the data. Results show that economic feasibility significantly contributed to financial sustainability, job creation, and investment (mean = 3.78). Social-cultural feasibility helped reduce inequality and encouraged community involvement, leading to strong local support (mean = 3.80). Environmental feasibility proved vital in addressing climate risks and promoting sustainability (mean = 3.77). Strong correlations were found between all three feasibility dimensions and project success. The study recommends incorporating comprehensive feasibility studies in future slum upgrading initiatives for inclusive, sustainable urban development. These findings offer practical guidance for project management and urban planning in Rwanda and similar contexts.*

Keywords: *Feasibility studies, Slum upgrading, Urban development, Project success, Community involvement*

How to cite this work (APA):

Ndikumana, P. (2025). Effect of feasibility study on success of slum upgrading projects in Rwanda: A Case study of Busanza Housing Estate Project. *Journal of Research Innovation and Implications in Education, 9*(2), 833 – 845. **https://doi.org/10.59765/bg6h32**.

1. Introduction

Slum upgrading, which involves improving the living conditions of informal settlements, has become an essential aspect of urban development in Rwanda, especially as rapid urbanization and population growth continue to challenge the housing sector. As one of the fastest-growing economies in Africa, Rwanda faces the dual challenge of addressing its housing deficit and improving the conditions of its informal settlements. Slum upgrading projects, such as the Busanza Housing Estate project, offer promising solutions but also come with socio-economic challenges. Understanding the socio-economic feasibility and the success of such projects is crucial for ensuring that they meet their intended goals and contribute positively to the urban landscape of Rwanda (Niyonsaba, 2019).

Globally, slum upgrading is seen as an effective way to reduce poverty, improve living conditions, and promote sustainable urban development. According to the United Nations Human Settlements Programme (UN-Habitat), approximately 1 billion people worldwide live in slums, with many lacking access to basic services like clean water, sanitation, and electricity. Slum upgrading focuses not only

on physical infrastructure improvement but also on addressing the socio-economic needs of the inhabitants, such as access to affordable housing, education, and healthcare (UN-Habitat, 2020).

The success of slum upgrading projects globally depends largely on their socio-economic feasibility. This includes assessing the ability of the project to provide affordable housing for low-income families, ensuring the participation of the affected communities, and considering factors considering factors such as local employment opportunities, community cohesion, and cultural practices. For instance, in Latin America, the Favela-Bairro Project in Brazil emphasized participatory planning and provided opportunities for local economic development alongside the physical improvement of slums. The success of such projects globally highlights the importance of considering socio-economic factors as integral components of slum upgrading (Chitkara, 2021).

In Africa, rapid urbanization has led to an explosion of informal settlements, making slum upgrading a pressing issue for many governments. The African Development Bank (AfDB) estimates that by 2030, more than 60% of Africa's urban population lived in informal settlements. Consequently, African governments are increasingly investing in large-scale slum upgrading projects to provide better living conditions for millions of urban poor. However, the socio-economic feasibility of these projects remains a significant concern (AfDB, 2020).

In many African countries, including Kenya, Nigeria, and South Africa, slum upgrading programs have faced difficulties due to challenges such as land tenure insecurity, inadequate compensation for displaced families, poor community participation, and financial constraints. For example, in Nairobi, Kenya, the Kibera Slum Upgrading Program faced challenges with the resettlement process, where many residents expressed dissatisfaction with the compensation offered and the size of the newly constructed homes (Rutaremara, 2019).
In many cities in Eastern Africa, governments have embarked on slum upgrading projects that aim to improve infrastructure, provide housing, and create employment opportunities. For example, the Kensup Program in Kenya focuses on upgrading informal settlements through a combination of infrastructural improvement and the provision of affordable housing. However, socio-economic factors such as affordable housing prices, securing land rights for the urban poor, and involving the community in decision-making processes have been significant obstacles to success in the region (Kabera 2020).

Rwanda has made significant strides in addressing its urbanization challenges and the need for slum upgrading, particularly in Kigali, the capital. In response to the growing housing deficit and informal settlements, the Rwandan government has implemented several projects aimed at providing affordable housing and improving living conditions in slums. The National Housing Policy, introduced in 2015, outlines strategies to address the housing deficit, including the upgrading of informal settlements (RHA, 2020).

The government's commitment to sustainable urbanization is evident in various initiatives, such as the Kigali Master Plan, which aims to transform the city into a well-planned, modern urban area. One of the key strategies is slum upgrading, which involves relocating families from flood-prone, unsafe areas to better-planned neighborhoods. For example, the Busanza Housing Estate project is part of the effort to provide safe, affordable housing to families currently living in informal settlements like Bannyahe, which are at risk from flooding and poor living conditions (Nkurunziza ,2019).

However, the socio-economic feasibility of slum upgrading in Rwanda is not without challenges. Many displaced families face difficulties in affording new housing, and there are concerns about the adequacy of compensation for their original properties. Additionally, the relocation process can disrupt livelihoods, as many residents of informal settlements depend on local, informal economies. For slum upgrading projects to be successful, they must address these socio-economic factors by ensuring that displaced families are provided with adequate compensation, access to job opportunities, and affordable housing options. Furthermore, community involvement in the planning process is crucial to ensuring that the needs and expectations of the residents are met, fostering a sense of ownership and minimizing resistance to relocation (Niyonsaba, 2019).

1.1Statement of the Problem

The Busanza Housing Estate project in Kigali's Kicukiro District was developed to relocate 1,416 families from the high-risk Bannyahe slum in Gasabo District into planned housing. While 1,260 units with key amenities were constructed, the project has faced significant resistance. Many residents cited inadequate compensation, preferring financial support over housing, and expressed dissatisfaction with the size and value of the new homes. Police involvement during relocation exposed socio-economic tensions (Ministry of Infrastructure, 2023).

The core problem is whether the project adequately addressed the socio-economic needs of slum dwellers through its feasibility assessments. Although feasibility studies were conducted, concerns remain about their practical effectiveness particularly in ensuring community

acceptance, fair compensation, and sustainable integration. Resident dissatisfaction suggests that the socio-economic feasibility was either under-evaluated or poorly applied. (Nyiraneza, 2022).

1.2 General Objective

The general objective of this study is to assess the effect of feasibility study on success of the Busanza Housing Estate slum upgrading project in Rwanda.

1.2.1 Specific objectives of the Study

1. To assess the effect of the economic feasibility study on the success of the Busanza Housing Estate project.

2. To evaluate the Effect of the social- Cultural feasibility study on the success of the Busanza Housing Estate project.

3. To examine the effect of the environmental feasibility study on the success of the Busanza Housing Estate project

2. Literature Review

This section critically examines the existing literature relevant to the socio-economic feasibility and success of slum upgrading projects, with a specific focus on the Busanza Housing Estate project in Rwanda. The aim is to analyze various theories, models, and studies that contribute to understanding the challenges, benefits, and success factors of slum upgrading and urban development projects. This review identifies the gaps in existing literature and highlights the significance of this research in the context of Rwanda's urban transformation.

2.1 Conceptual Review

2.1.1 Economic Feasibility

Economic feasibility plays a vital role in evaluating the financial viability and long-term sustainability of large-scale infrastructure projects, particularly in urban development and housing projects. A well-conducted economic feasibility study helps determine whether a project can generate adequate returns on investment while ensuring financial sustainability throughout its lifecycle. It involves assessing costs, revenues, market demand, and potential risks, ensuring that the project remains financially viable in both the short and long term. According to the World Bank (2020), a comprehensive cost-benefit analysis is essential in determining the economic feasibility of housing projects, as it helps in forecasting future financial outcomes and avoiding unnecessary financial burdens. In the context of Rwanda, similar successful initiatives, such as the Kigali Green City project, demonstrate the significance of robust economic assessments. These studies not only improve financial management but also reduce the risk of project failure by identifying potential economic challenges early in the planning phase. Effective economic feasibility analyses ensure that housing projects deliver long-term value to all stakeholders involved, from developers to residents. By identifying financial risks and ensuring a well-balanced budget, these studies play a crucial role in mitigating financial losses, optimizing resource allocation, and maximizing economic benefits for both the local community and investors (World Bank, 2020).

2.1.2 Social-Cultural Feasibility

Social-cultural feasibility goes beyond the economic and logistical aspects of a project to focus on the cultural and social dynamics within the affected communities. It assesses how development projects align with or potentially disrupt the social and cultural fabric of local populations, especially marginalized or displaced groups. A successful social-cultural feasibility study ensures that a project respects cultural norms, traditions, and values, while promoting inclusion and active community participation. According to Mitlin & Satterthwaite (2019).

2.1.3 Environmental Feasibility

Environmental feasibility involves assessing the long-term environmental impacts of a project and ensuring that it is sustainable, minimizing harm to the environment while promoting eco-friendly practices. According to the UN-Habitat (2019), incorporating sustainable environmental practices such as the use of renewable resources, green construction techniques, and effective waste management systems is essential for modern urban development. Projects that prioritize environmental feasibility are designed with the goal of minimizing pollution, reducing energy consumption, and enhancing the overall environmental quality of the area. Sustainable housing practices can also help mitigate the effects of climate change by reducing the carbon footprint of development projects and promoting resource conservation.

Research on projects such as the Gikondo slum upgrading in Rwanda underscores the importance of integrating a thorough environmental feasibility study into the planning process. These projects tend to be more resilient to climate change, reduce environmental degradation, and align with broader sustainable development goals. For instance, by ensuring proper waste disposal systems, implementing

energy-efficient infrastructure, and utilizing green building methods, such projects not only meet immediate housing needs but also contribute to long-term environmental sustainability. Environmental feasibility is, therefore, crucial in ensuring that housing projects do not just cater to present demands but also create a positive legacy for future generations, safeguarding the environment and promoting ecological resilience (UN-Habitat, 2019).

2.1.4 Success of the Slum Upgrading projects

The success of a slum upgrading project is measured by how effectively it addresses the multifaceted challenges faced by marginalized communities, transforming their living conditions, and contributing to the overall development of the area. Key indicators of success include the improvement in housing quality, access to basic services such as water, sanitation, and electricity, and the long-term socio-economic benefits for residents. According to Mitlin & Satterthwaite (2019), this involves adopting green construction methods, promoting waste management practices, and enhancing climate resilience. Economic feasibility is another critical element projects must be financially sustainable and capable of delivering adequate returns on investment while remaining accessible to low-income residents. For instance, the Busanza Housing Estate slum upgrading project would be deemed successful if it leads to improved housing, infrastructure, and community integration, while promoting environmental sustainability and providing economic opportunities for the residents. By achieving these objectives, slum upgrading projects contribute to the broader goal of inclusive urban development, where all members of society can access improved living standards and participate in the socio-economic benefits of development (Mitlin & Satterthwaite, 2019; UN-Habitat, 2019).

2.2Theoretical Review

This study explores the socio-economic feasibility and success of the Busanza Housing Estate project, a significant slum upgrading initiative in Rwanda. It aims to understand the complex dynamics involved in such urban transformation efforts. Several theoretical frameworks underpin this study, providing a structured approach to analyzing how various socio-economic factors influence the success of the project. The primary theories relevant to this study are the Sustainable Livelihoods Theory, Social Exchange Theory and Urban Political Economy Theory**.**

2.1.5 Sustainable Livelihoods Theory

The Sustainable Livelihoods Theory developed by the UK Department for International Development in 1999, provides a holistic approach to understanding how people's livelihoods are shaped by access to various forms of capital financial, human, social, natural, and physical. SLF is useful in assessing the long-term sustainability and impact of development projects, such as the Busanza Housing Estate. By focusing on the interaction between these various forms of capital, helps assess the sustainable impact of the housing estate project.

This theory is directly relevant to the first objective, which focuses on evaluating the economic feasibility of the Busanza Housing Estate project. Sustainable Livelihoods Theory provides a comprehensive framework for understanding the long-term economic sustainability of the housing project by examining the various forms of capital available to the displaced families. One of the key components of this theory is the focus on financial capital**,** which encompasses income generation, employment opportunities, and access to resources that can improve the economic conditions of individuals and communities. In the context of the Busanza Housing Estate project, this theory can be applied to assess how the new housing model enhances the livelihoods of displaced families, both in terms of financial stability and income opportunities.

2.1.6 Social Exchange Theory

Social Exchange Theory**,** proposed by George Homans in 1958, examines human behavior in terms of a cost-benefit analysis. People make decisions based on the perceived rewards and costs of their actions. This theory is particularly relevant in understanding how individuals or communities assess their involvement in development projects, such as the Busanza Housing Estate. SET suggests that decisions are influenced by the social relationships and benefits perceived by individuals in exchange for their participation.

This Theory directly linked to the second objective, which focuses on evaluating the influence of social-cultural feasibility on the success of the Busanza Housing Estate project. Social Exchange Theory examined human behavior through a cost-benefit analysis, where individuals make decisions based on the perceived rewards and costs of their actions. In the context of slum upgrading, this theory helps to understand how displaced families assess the social and cultural costs of relocation and whether the benefits of improved housing and living conditions outweigh these costs.

2.2 Empirical Review

This section examines existing literature and empirical studies on the role of feasibility study; economic, social, and environmental in the success of slum upgrading projects. It explores the relationship between these variables from a global perspective, identifies gaps in current research, critiques existing studies, and highlights their relevance to the present study on the Busanza Housing Estate in Rwanda. The review also explicates the usefulness of these studies in understanding the links between the independent variables such as Economic feasibility, Social Feasibility and Environmental feasibility and the dependent variable which are success of slum upgrading projects.

2.2.1 Economic Feasibility and Success of Slum Upgrading Projects

Economic feasibility plays a crucial role in determining the viability of slum upgrading projects, particularly in developing countries where resources are often limited. Global studies, such as those by Raziq & Ahmad (2020), emphasize that assessing financial viability is critical for attracting investment and ensuring the sustainability of housing projects. These studies argue that economic feasibility study provide insights into market demand, investment risks, and potential financial returns, which are necessary to secure funding and guarantee that projects can sustain themselves in the long term.

In Africa, Azzam & Ghaith (2020) highlight that economic feasibility study must account for unique challenges such as informal markets, financial constraints, and the difficulty in accessing credit for housing projects. For instance, Gichuki et al. (2021) found that in Kenya, slum upgrading projects that conducted thorough economic feasibility assessments were better equipped to attract private investment, leading to higher success rates. However, projects that lacked proper financial analysis often faced challenges in securing funds and failed to deliver on their objectives.

2.2.2 Social Feasibility and Success of Slum Upgrading Projects

Social feasibility study examine how well a slum upgrading project aligns with the needs and expectations of the local community, which is crucial for ensuring long-term success. Patricie (2022) argues that involving communities in the planning and design of housing projects fosters a sense of ownership and enhances project sustainability. This aligns with Anderson & Ostrom (2019)**,** who stress that social feasibility assessments are essential to ensure that the new developments meet the social, cultural, and economic needs of the residents.

In African settings, Banerjee & Morella (2021) observe that community participation is key to ensuring that slum upgrading projects are socially acceptable and sustainable. For example, in Kenya, Gichuki et al. (2021)

In Rwanda, Nkurunziza (2019) underscores the importance of involving local communities in setting priorities and designing infrastructure. Projects that engaged residents in these processes were more likely to succeed and maintain community support. However, Kativhu et al. (2019**)** point out that challenges such as financial limitations and insufficient technical expertise may undermine the effectiveness of social feasibility studies, especially when addressing diverse community needs.

While many studies highlight the importance of social feasibility, they often fail to address the challenges that arise when communities are not adequately prepared to engage in complex decision-making processes. Additionally, there is a lack of research on how social feasibility assessments can be effectively integrated with economic and environmental assessments in slum upgrading projects.

2.2.3 Environmental Feasibility and Success of Slum Upgrading Projects

Environmental feasibility study is becoming increasingly important as urban areas face environmental degradation and the challenges posed by climate change. Global studies, such as those by Ciochetti & Malizia (2020)**,** highlight that environmental feasibility is crucial in ensuring that urban development projects are sustainable and do not contribute to ecological harm. These studies emphasize the need for assessing the environmental impact of construction, waste management, water supply, and green spaces in the planning stages.

In Africa, environmental sustainability is a key concern, especially in rapidly urbanizing slum areas. Ekemode & Ogunba (2018) note that environmental feasibility study is critical to prevent projects from exacerbating problems like flooding, pollution, and deforestation. In countries such as Kenya, Patricie (2022) suggests that integrating environmental concerns into slum upgrading projects not only contributes to sustainability but also aligns with global climate change mitigation efforts.

In Rwanda, Pedo et al. (2018) point out that the government's emphasis on sustainability requires that environmental feasibility study for slum upgrading projects consider issues such as waste management, water conservation, and energy efficiency. The Rwanda Green Growth and Climate Resilience Strategy emphasizes the

importance of sustainable urban development, which is relevant for projects like the Busanza Housing Estate.

This empirical review highlights the importance of economic, social, and environmental feasibility study in the success of slum upgrading projects, drawing from global, African, Eastern African, and Rwandan perspectives. While existing studies emphasize the need for comprehensive feasibility assessments to ensure project sustainability, there are notable gaps in integrating these studies holistically and addressing the external challenges that often hinder their implementation. The findings from this review are particularly relevant to the Busanza Housing Estate project in Rwanda, where the integration of these feasibility study is critical to achieving sustainable outcomes. Future research should focus on how to effectively combine economic, social, and environmental feasibility to improve the success rates of slum upgrading initiatives in resource-constrained settings.

3 Methodology

The methodology for this study employed a mixed-methods approach**,** combining both qualitative and quantitative research to provide a comprehensive assessment of the impact of the feasibility studies. The study involved data collection through surveys, interviews, and document analysis. It included sampling techniques to capture perspectives from various stakeholders, including relocated residents, project managers, urban planners, and government officials. The collected data analyzed using appropriate statistical and thematic analysis methods to draw insights into the socio-economic feasibility and success of the project.

3.1 Research Design

According to Saunders and Miller (2019), the research design outlines how the study conducted, setting clear boundaries for the focus and approach of the research. It acts as a blueprint for gathering, analyzing, and interpreting data. For this study, the research design was descriptive and Inferential Analysis.

3.2Target Population

The target population for this study includes all individuals and groups who are directly or indirectly benefiting from the Busanza Housing Estate slum upgrading project. The study aims to capture a comprehensive view of the impact of the project on various stakeholders. The total population under

3.3 Sample Size of the Study

To determine the appropriate sample size for this study, Cochran's formula was applied: $n = N / [1 + (N – 1) e^2]$, where N is the population size and e is the margin of error. With a target population of 150 individuals and a 5% margin of error (e = 0.05), the calculation resulted in a sample size of approximately 109 respondents. This ensures a 95% confidence level in the study's findings. The use of this statistical method allows for accurate representation of the population while maintaining reliability and precision in data collection and analysis.

3.4 Data Collection Instruments

For this study, a combination of qualitative and quantitative. Data collected through structured questionnaires, Observation and document analysis. Questionnaires used for quantitative data, and document analysis provided qualitative insights

3.3.1 Validity

For this study, the validity of the research instruments, specifically the questionnaires and interview guides, ensured through a systematic process involving multiple validation strategies:
The instruments are designed after reviewing relevant literature and consulting experts in slum upgrading, socio-economic impacts, and urban development. This ensured the questions comprehensively address key areas aligned with the study's objectives.

A panel of experts in urban planning and socio-economic research evaluated the instruments for clarity, bias, and relevance. Their feedback will refine the questions, ensuring they measure the intended constructs effectively. The instruments aligned with the study's conceptual framework, ensuring that they focus on key socio-economic constructs, such as community livelihoods, economic viability, and social integration of displaced populations.

The instruments' validity assessed by comparing the results with established, valid external measures, such as national standards or findings from similar studies on slum upgrading.
The instruments evaluated for construct validity through correlational analysis with established measures of community satisfaction or housing quality. High correlation provided evidence of construct validity.
Through these processes, the study ensured that the research instruments are valid, reliable, and accurately reflect the socio-economic impacts of the Busanza Housing Estate slum upgrading project.

3.3.2 Reliability

In this study, the reliability of the research instruments ensured using the following strategies: The same set of questionnaires administered to the same respondents at two different times, with correlation analysis used to assess consistency. Interviews and focus groups were independently coded to ensure consistency in data interpretation.
A pilot test with a small sample evaluated the clarity and relevance of the instruments, refining them for the main study and Data from multiple sources (households, officials, leaders, developers) will be cross-verified for consistency.

3.4Data Analysis

Data analysis is a vital part of this study, as it helps to interpret the collected data and draw meaningful conclusions about the socio-economic impact of the Busanza Housing Estate project. The following data analysis techniques employed in this study: descriptive statistics**,** correlation analysis**,** and regression analysis**.**

3.4.1 Correlation Analysis

Correlation analysis conducted to measure the strength and direction of the relationship between two continuous variables. The Pearson correlation coefficient (r) used for this purpose.

Pearson Correlation Coefficient (r):

The coefficient ranges from -1 to 1, where -1 indicates a perfect negative correlation, 1 indicates a perfect positive correlation, and 0 indicates no correlation.
Formula: $r = \frac{(\sum(Xi-\bar{X})(Yi-\bar{Y}))}{\sqrt{(\sum (Xi-\bar{X})\text{^}2\ (Yi-\bar{Y})\text{^}2\ )}}$
Where Xi and Yi are the individual sample points, and $\bar{x}$ and $\bar{Y}$ are the mean values of the x and y variables, respectively.

Multiple Regression Model:

Multiple regression employed to predict the value of a dependent variable based on more independent variables.
The regression equation is $Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$
Where Y is the dependent variable, (Success of the Busanza Housing Estate Project with its components**)** α is the intercept, β is the beta coefficient (slope), X is the independent variable (Economic Feasibility, Social – Culture Feasibility and Environmental Feasibility) and ϵ is the error term.

Statistical Tests

- T-test used to compare the means of two groups of variables. It is appropriate when comparing two distinct groups to understand if there are significant differences between them.
- In Testing ANOVA was used when comparing means among more than two groups. This test is ideal for assessing the impact of multiple independent variables on the dependent variable.

4 Results and Discussion

This Section presents the findings of the study on the effect of feasibility study on the success of the Busanza Housing Estate slum upgrading project in Rwanda. The study focused on economic, social-cultural, and environmental feasibility. A total of 154 respondents, including stakeholders and community members, participated. Descriptive statistics analyzed respondents' views on key aspects such as economic management and social acceptance. The study achieved a 100% response rate and used Z-score statistics with the Z 0.975 score for hypothesis testing to assess the significance of the findings.

4.1 Findings

4.1.1 Descriptive Analysis of Feasibility Study and Success of Slum Upgrading Projects

This section examines respondents' perceptions of how feasibility studies influenced the success of the Busanza Housing Estate slum upgrading project in Rwanda. Using descriptive statistics and a five-point Likert scale, the study assessed views on economic, socio-cultural, and environmental feasibility. Findings indicate a generally positive perception of feasibility studies in guiding project outcomes. Economic feasibility, especially financial accountability and investment attraction, had the highest mean score (M = 4.09), highlighting its perceived significance. Environmental factors, including risk mitigation (M = 3.94) and access to accurate data (M = 3.78), were also rated highly, indicating their contribution to sustainable implementation. However, mixed views on community engagement and training reveal gaps in the application of social feasibility. These findings suggest that while feasibility studies supported the project's overall success, inconsistent execution in some areas affected community acceptance. Tables 1 to 4 summarize the key dimensions and respondents' perceptions of their impact on project performance.

Table 1: Respondent View on Effect of Economic feasibility study and the success of the Busanza Housing Estate project

Questions Items	N	Mean	Std. Deviation
The costs of the project have been well-managed, and the project has stayed within the allocated budget.	109	3.82	1.241
The initial cost analysis of the Busanza Housing Estate project was accurate and realistic.	109	3.80	1.161
The economic analysis considered long-term financial sustainability, including future maintenance costs.	109	3.79	1.187
The economic feasibility of the project has played a crucial role in its overall success.	109	3.78	1.166
The economic benefits of the project, such as job creation and business opportunities, are significant for Busanza community.	109	3.72	1.195
The Busanza Housing Estate project has the potential to attract substantial investment growth in the area.	109	3.71	1.204
Valid N (listwise)	109		

Source: Field data 2025

The descriptive statistics in Table 1 provide a comprehensive view of respondents' perceptions of the economic feasibility and success of the Busanza Housing Estate project. The respondents generally agree that the economic feasibility study has positively impacted the success of the Busanza Housing Estate project. The mean values range from 3.71 to 3.82**,** indicating moderate to strong agreement with the various statements. For instance, respondents believe that the costs of the project have been well-managed and stayed within budget **(**mean = 3.82**),** and that the initial cost analysis was accurate and realistic **(**mean = 3.80**).** Additionally, the economic analysis's focus on long-term financial sustainability **(**mean = 3.79**)** and the project's role in creating economic benefits like job opportunities **(**mean = 3.72**)** are seen as significant factors in its success. While there is some variability in responses, as indicated by the standard deviations ranging from 1.161 to 1.241**,** the overall sentiment is that the economic feasibility study has played a crucial role in the project's success and its potential for future growth.

Table 2: Respondents View on the effect of Social-Cultural feasibility study and the success of the Busanza Housing Estate project

Questions Items	N	Mean	Std. Deviation
The socio-cultural feasibility of the project has been a key factor in its success.	109	3.86	1.213
The project was successful in reducing social inequality by providing affordable housing options.	109	3.85	1.223
Local residents have been meaningfully involved in decision-making processes related to the project.	109	3.82	1.241
The social benefits of the project, such as improved living conditions and community development, are evident in the local area.	109	3.79	1.240
The local community has generally accepted the project and its objectives.	109	3.76	1.239
The project has effectively addressed social risks, such as displacement or disruption of local communities.	109	3.74	1.125
Valid N (listwise)	109		

Source: Field data 2025

The descriptive statistics in Table 2 provide an overview of respondents' perceptions of the socio-cultural feasibility and its impact on the success of the Busanza Housing Estate project. The respondents generally agree that the social-cultural feasibility study has played a significant role in the success of the Busanza Housing Estate project. The mean scores for the various aspects range from 3.74 to 3.86, indicating moderate to strong agreement with the statements. Respondents strongly believe that the socio-cultural feasibility was key to the project's success (mean = 3.86) and that it helped reduce social inequality by providing affordable housing (mean = 3.85). Additionally, local residents were viewed as meaningfully involved in decision-making processes (mean = 3.82), and the social

benefits, such as improved living conditions and community development, were considered evident (mean = 3.79). The local community's acceptance of the project and its objectives also received positive feedback (mean = 3.76). Moreover, respondents felt that the project effectively addressed social risks, such as displacement or disruption of local communities (mean = 3.74). While the standard deviations range from 1.125 to 1.241, indicating some variability in responses, the overall sentiment is that the social-cultural feasibility study has contributed significantly to the success of the project by enhancing community involvement and addressing social issues.

Table 3: Respondent Review on the effect of Environmental feasibility study and the success of the Busanza Housing Estate project

Questions Items	N	Mean	Std. Deviation
The project has taken proactive steps to mitigate climate change impacts through the design and implementation of the housing.	109	3.83	1.198
Environmental safeguards, such as waste management and water conservation practices, have been well-implemented in the project.	109	3.80	1.208
The project has positively contributed to environmental sustainability in the area, for example through green building practices or energy efficiency.	109	3.79	1.187
The environmental feasibility of the project has played a crucial role in its overall success.	109	3.77	1.176
The environmental impact assessment conducted for the Busanza Housing Estate project effectively identified potential environmental risks.	109	3.75	1.090
The project has followed environmental regulations and policies strictly throughout its implementation.	109	3.73	1.184
Valid N (listwise)	109		

Source: Field data 2025

The respondents generally agree that the environmental feasibility study has played a significant role in the success of the Busanza Housing Estate project. The mean scores, ranging from 3.73 to 3.83, suggest moderate to strong agreement with the various environmental factors assessed. For instance, the project's proactive steps to mitigate climate change impacts, through thoughtful design and implementation, received the highest mean of 3.83, indicating strong approval. Additionally, respondents viewed the environmental safeguards, such as waste management and water conservation practices, as well-implemented (mean = 3.80**)** and acknowledged the project's contribution to environmental sustainability, such as through green building and energy-efficient practices (mean = 3.79). The environmental feasibility study was also seen as crucial to the overall success of the project (mean = 3.77), and the environmental impact assessment was deemed effective in identifying potential risks (mean = 3.75). Adherence to environmental regulations throughout the project's implementation was supported by a mean of 3.73. While there is some variability in responses, as indicated by standard deviations ranging from 1.090 to 1.208, the general sentiment remains positive, highlighting that environmental considerations were essential to the project's success and sustainability.

Table 4: Respondent view of effect of feasibility study on Overall Success of the Busanza Housing Estate Project

Questions Items	N	Mean	Std. Deviation
The goals of the Busanza Housing Estate project, such as providing affordable housing and improving living conditions, have been successfully achieved.	109	3.93	1.136
The project was completed within the planned budget without significant cost overruns.	109	3.86	1.236
The project was completed on time as per the original schedule.	109	3.83	1.288
The housing built under the Busanza Housing Estate project is sustainable, considering factors like affordability, long-term livability, and resilience to climate change.	109	3.80	1.238
Valid N (listwise)	109		

Table 4 provides descriptive statistics on the overall success of the Busanza Housing Estate project, Respondents generally view the Busanza Housing Estate project as successful, with the feasibility studyplaying a key role in its achievement. The mean scores, ranging from 3.80 to 3.93, indicate strong to moderate agreement with various aspects of the project's success. The highest mean of 3.93 reflects strong agreement that the project's goals, such as providing affordable housing and improving living conditions, have been successfully achieved. The project's completion within budget was also positively viewed (mean = 3.86), although there is some variability in responses, as reflected in the standard deviation of 1.236. Similarly, the project was considered to be completed on time, with a mean of 3.83, though the higher standard deviation (1.288) suggests varying opinions on this. Respondents also agreed that the housing is sustainable, considering factors like affordability, long-term livability, and resilience to climate change (mean = 3.80). While there is some variation in responses, the overall sentiment is that the project has been successful in meeting its goals, and the feasibility study were instrumental in ensuring this outcome.

4.2 Inferential Analysis

This section presents the inferential analysis of the relationship between feasibility studies and the success of the Busanza Housing Estate slum upgrading project in Rwanda. Correlation and regression analysis were employed to assess how economic, socio-cultural, and environmental feasibility dimensions' influence project outcomes. The results show a strong positive correlation between these feasibility dimensions and project success, with regression analysis indicating that all three dimensions significantly predict success. Economic feasibility had the greatest impact. The model's R-squared value reflects a good fit, and p-values ($p < 0.05$) confirm statistical significance. Detailed results are provided in Tables 5 to 7.

Table 5: Correlations Analysis

		Economic feasibility	Social- Cultural feasibility	Environmental feasibility
Economic feasibility study	Pearson Correlation	1	.960**	.964**
	Sig. (2-tailed)		.000	.000
	N	109	109	109
Social- Cultural feasibility	Pearson Correlation	.960**	1	.972**
	Sig. (2-tailed)	.000		.000
	N	109	109	109
Environmental feasibility study	Pearson Correlation	.964**	.972**	1
	Sig. (2-tailed)	.000	.000	
	N	109	109	109

Source: Field data 2025

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

The correlation analysis reveals very strong positive relationships between the three-feasibility study economic, social-cultural, and environmental indicating that improvements in one area are strongly associated with

improvements in the others. The Pearson correlation between the economic and social-cultural feasibility study is 0.960**,** suggesting a very strong positive relationship. Similarly, the correlation between economic and environmental feasibility study is 0.964, while the relationship between the social-cultural and environmental feasibility study is 0.972, both indicating equally strong positive associations. The p-values of 0.000 for all correlations confirm that these relationships are statistically significant. These findings suggest that the economic, social-cultural, and environmental aspects of the Busanza Housing Estate project are highly interconnected, and changes in one feasibility area are likely to impact the others.

Table 6: Model *Summary*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.986[a]	.973	.972	.202

Source: Field data 2025

Table 6 provides The model summary indicates that the regression model fits the data exceptionally well. With a correlation coefficient (R) of 0.986, there is a very strong positive relationship between the feasibility study and the success of the Busanza Housing Estate project. The R^2 value of 0.973 reveals that 97.3% of the variation in the project's success is explained by the economic, social-cultural, and environmental feasibility studies. Additionally, the standard error of the estimate of 0.202 suggests that the model's predictions are quite accurate, as the observed values are relatively close to the predicted values. Overall, these results show that the regression model is highly effective in predicting the success of the Busanza Housing Estate project.

Table 7: Regression Coefficients Results

Model	Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1 (Constant)	.103	.074		1.388	.000
Economic feasibility study	.601	.069	.562	8.707	.000
Social- Cultural feasibility	.507	.071	.065	7.140	.000
Environmental feasibility study	.361	.076	.368	4.777	.000

Source: Field data 2025

a. Dependent Variable: success of the Busanza Housing Estate project.

The coefficients table shows that all three independent variables, economic feasibility study, social-cultural feasibility study, and environmental feasibility study, have a statistically significant positive impact on the success of the Busanza Housing Estate project. The economic feasibility study has the strongest effect, with a coefficient of 0.601 and a standardized beta of 0.562, indicating a moderate to strong positive influence on project success. The social-cultural feasibility study, with a coefficient of 0.507 and a smaller standardized beta of 0.065, also has a positive impact, but its effect is weaker compared to the economic feasibility. Environmental feasibility, with a coefficient of 0.361 and a beta of 0.368, has a moderate impact on the project's success. All variables have p-values of 0.000, confirming that their effects are statistically significant. This suggests that improvements in economic, social-cultural, and environmental feasibility are all likely to enhance the success of the project, with economic feasibility being the most influential factor.

5 Conclusion and Recommendations

This section summarizes the findings, conclusions, and recommendations from the study on the socio-economic feasibility and success of the Busanza Housing Estate slum upgrading project in Rwanda**.** The research explored the impact of economic, social-cultural, and environmental feasibility on the project's success. It provided insights into how these factors interrelate and influence outcomes. Recommendations for project managers, policymakers, and stakeholders are provided, along with suggestions for future research on socio-economic feasibility and project management in slum upgrading projects.

5.1Conclusion

The study involved 109 respondents, with complete data from both males and females. Normality tests (Kolmogorov-Smirnov and Shapiro-Wilk) showed p-values above 0.05, confirming the data's normal

distribution. Respondents agreed that the economic feasibility study positively impacted the Busanza Housing Estate project's success, citing effective cost management, long-term financial sustainability, job creation, and investment growth. The social-cultural feasibility study was seen as crucial, reducing social inequality, promoting community involvement, and improving living conditions. The environmental feasibility study also played a key role, with respondents noting climate change mitigation efforts, waste management, and compliance with environmental regulations. The project was considered successful, providing affordable, sustainable housing within budget and on time. Regression and correlation analyses revealed a strong relationship between the feasibility studies and project success, with all three feasibility dimensions significantly influencing outcomes. T-test and ANOVA results confirmed the statistical significance of these findings. The findings of this study highlight that the socio-economic feasibility, including economic, social-cultural, and environmental feasibility studies, significantly contributed to the overall success of the Busanza Housing Estate project. The high mean scores for each feasibility category indicate that sound financial management, social inclusivity, and environmental sustainability were critical to the project's success. Moreover, the project has provided key lessons on the importance of considering these three dimensions in future slum upgrading projects. However, challenges related to financial sustainability, community engagement, and long-term environmental impact need to be addressed to ensure the continued success and replicability of such projects.

5.2 Recommendations

Based on the findings of this study, several strategies and suggestions can be made to address the key challenges and gaps identified during the Busanza Housing Estate slum upgrading project. These recommendations aim to further enhance the socio-economic feasibility of future housing projects and contribute to their long-term success. The recommendations are outlined as follows:

1. It is recommended that project managers continue to place a strong emphasis on the accurate and realistic analysis of project costs, ensuring effective budgeting and financial sustainability throughout the project lifecycle. Future projects should consider developing detailed long-term financial plans, including maintenance costs.

2. Local authorities should ensure that future projects include comprehensive social and cultural assessments, prioritizing community engagement and minimizing displacement by Conduct thorough social assessments at the beginning of projects and ensure that local communities are actively involved in planning and decision-making.

3. Environmental agencies should ensure that each housing project is designed with the long-term sustainability of the environment in mind, including proactive measures for climate change mitigation, waste management, water conservation, and energy efficiency by Strengthen environmental impact assessments and ensure the strict adherence to environmental regulations throughout the project. Integrate green building practices into the design and construction stages.

4. It is recommended that investors and developers take an integrated approach when conducting feasibility studyto ensure all aspects of the project are addressed from the outset. By Encourage developers to consider the synergy between the economic, social, and environmental feasibility aspects in project planning.

5. Future projects should focus on creating inclusive platforms where stakeholders, including community members, are given a voice in shaping the project's direction. This includes continuous feedback and regular updates during the project implementation.

References

Amin, M. E. (2005). *Social science research on conception, methodology and analysis*. Kampala: Makerere University Printer.

Anderson, C., & Ostrom, E. (2019). Social feasibility and community participation in urban housing projects. *Urban Studies, 56*(10), 1955-1970.

APHRC. (2014). *Population and health dynamics in Nairobi informal settlements: Report of the Nairobi cross-sectional slums survey (NCCS) 2012*. Nairobi:

Arimah, B. C. (2011). Slums as expressions of social exclusion: Explaining the prevalence of slums in African countries. *UN-HABITAT, Nairobi*.

Azzam, F., & Ghaith, M. (2020). Economic feasibility of slum upgrading in Sub-Saharan Africa. *Journal of Urban Development, 32*(3), 45-60.

Banerjee, S., & Morella, E. (2021). Community participation in slum upgrading projects in East Africa. *Habitat International, 58*, 40-50.

Barasa, F., & Jelagat, T. (2013). Community participation in project planning, management and implementation: Building the foundation for sustainable development. *International Journal of Current Research, 5*(02), 398-401.

Bokea, D. (2012). Factors influencing project implementation of community-based projects: A survey of banana projects in Kisii County, Kenya (Masters). Kenyatta University.

Ciochetti, B., & Malizia, E. (2020). Environmental impacts and sustainability in urban development. *Journal of Urban Planning, 22*(4), 33-48.

Dhubhain, A. N., Flechard, M., Moloney, R., O'Connor, D., & Crowley, T. (2008). Social impacts of forestry: A case study approach. *Socio-Economic Aspects No. 3 COFORD*.

Ekemode, M., & Ogunba, D. (2018). Environmental feasibility of slum upgrading in African cities. *International Journal of Environmental Research, 45*(1), 12-26.

Ehigiator, P. (2013). An investigation into the role of slum community-based institutions in tackling the challenges of slums in developing nations: The case of Lagos state, Nigeria (Masters). Malmö University, Sweden.

Freire, P. (1997). *Mentoring the mentor: A critical dialogue with Paulo Freire*. Counterpoints: Studies in the Postmodern Theory of Education, Vol 60. ISBN 0-8204-3798-0.

Gichuki, A., Ochieng, D., & Wambugu, M. (2021). Economic feasibility of slum upgrading: Lessons from Kenya. *Development Policy Review, 40*(2), 21-35.

Goldfrank, B. (2012). Participatory budgeting and urban sustainability: Reviewing lessons from Latin America. Paper presented at the International Sociological Association Forum, Buenos Aires, Aug 1-4, 2012.

Huchzermeyer, M. (2008). Slum upgrading in Nairobi within the housing and basic services market: A housing rights concern. *Journal of Asian and African Studies, 43*(1), 19-39.

Jackson, E. (2013). Interrogating the theory of change: Evaluating impact investing where it matters most. *Journal of Sustainable Finance & Investment, 3*(2), 95-110.

Jacob, P. (2011). The successes and shortcomings of participatory slum-upgrading in Villa 31. *Independent Study Project (ISP) Collection*. Paper 1037.

Kates, R. (2011). What kind of a science is sustainability science? *Proceedings of the National Academy of Science, 108*(49),

Kimei, M. (2014). Influence of community participation on sustainability of constituency development fund projects in Tinderet Constituency, Nandi County, Kenya (Masters). The University of Nairobi.

Limo, K. (2013). Assessment of predictors of sustainability in community development projects: A survey of CDF funded projects in Nyeri Town Constituency, Kenya (Masters). Kenyatta University.

Mitlin, D., & Satterthwaite, D. (2019). Social sustainability and slum upgrading. *Urban Studies, 56*(10), 1955-1970.

Munsaka, E. (2019). Slum upgrading and urban transformation in developing countries. *Journal of Urban Studies, 44*(5), 67-81.

Muiruri, F. (2018). Economic feasibility of urban housing projects in Rwanda. *Rwanda Economic Review, 24*(2), 59-75.

Pedo, G., et al. (2018). Green growth in urban development: Rwanda's commitment to sustainable slum upgrading. *Rwanda Environmental Review, 22*(2), 10-18.

Patricie, T. (2022). Community engagement in slum upgrading projects in Africa. *International Journal of Housing and Urban Development, 34*(3), 93-104.

UN-Habitat. (2019). *Environmental sustainability in urban housing projects*. Nairobi: United Nations Human Settlements Programme.