

Assessing the Contribution of Informal Settlement Upgrading Interventions to Livability: *A Case of Kibra, Nairobi City County*

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Abstract

Rapid urbanization has accelerated the growth of informal settlements and pushed governments to implement upgrading projects. In Nairobi, the informal settlement of Kibra has undergone various interventions. However, their contribution to improving living conditions remains poorly understood. This study assesses the extent to which past upgrading efforts have improved living conditions for informal settlement residents. The study used a descriptive cross-sectional mixed-methods design. Data were collected through household surveys involving 152 households, 22 key informant interviews, field observations, and document analysis. Quantitative data were analyzed using descriptive statistics, while qualitative data underwent thematic analysis. Results indicate improvements in housing quality, basic services, and accessibility following interventions in housing, infrastructure, water, sanitation, environmental management, land tenure, livelihoods, and community participation. However, environmental pollution, safety, and livelihoods showed limited improvement. Integrated, community-based upgrading remains essential for sustainable informal settlement development.

Keywords: Informal settlement upgrading, urban livability, community participation, Kibra, Nairobi

INTRODUCTION

Urbanisation has been a major global driver of economic growth, but it has also increased urban land development, housing demand, and pressure on infrastructure and public services. According to the United Nations, 56.2% of the world's population (4.4 billion people) currently lives in urban areas, a figure projected to increase to 68.0% by 2050 (United Nations, 2022). In many developing countries, urbanisation has occurred much faster than the provision of formal housing. Consequently, about 1.1 billion people live in informal settlements characterised by overcrowding, poor housing, insecure land tenure, inadequate sanitation, and limited access to basic services (UN-Habitat, 2023).

Despite numerous housing and informal settlement upgrading initiatives by governments and development agencies, approximately 24.0% of the world's urban population continues to

live in informal settlements, indicating that many interventions have not substantially improved overall living conditions (World Bank, 2024). While projects have enhanced physical infrastructure such as housing, roads, water supply, and sanitation, their contribution to livelihoods, affordability, and social inclusion has often remained limited, reducing their long-term sustainability (Sharma et al., 2025; Vidya, 2025).

Africa has the highest proportion of people living in informal settlements due to rapid urbanisation and inadequate urban planning. Approximately 56% of the urban population in Sub-Saharan Africa resides in informal settlements, while the continent's urban population is projected to increase from about 704 million in 2023 to 1.4 billion by 2050 (UN-Habitat, 2024). Although numerous upgrading and redevelopment programmes have been implemented, many cities

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continue to experience poor housing, insecure tenure, inadequate infrastructure, and widespread poverty. In some instances, eviction-based approaches have displaced households without providing sustainable alternatives, while weak governance, inadequate financing, and limited community participation have constrained programme effectiveness (Azunre et al., 2025).

In Kenya, urban population growth has accelerated the expansion of informal settlements. The 2019 Kenya Population and Housing Census indicates that 31% of the country's population resides in urban areas (KNBS, 2019). Nairobi, the capital city and economic hub, has a population exceeding 4.4 million, with nearly 60% living in informal settlements occupying less than 10% of residential land (World Bank, 2016).

Kibra has experienced several upgrading interventions under the Kenya Informal Settlements Upgrading Programme (KENSUP) and the Kenya Informal Settlements Improvement Project (KISIP), aimed at improving housing, infrastructure, and access to basic services. However, previous studies indicate that affordability challenges, insecure land tenure, political interference, inadequate public participation, and the high proportion of tenant households, estimated at 80–90%, have limited the effectiveness of these interventions (Ayonga, 2021). Assessing the contribution of past upgrading initiatives to residents' livability can therefore guide future policy and promote sustainable informal settlement transformation.

Problem Statement

Sustainable Development Goal 11 and the New Urban Agenda seek to promote inclusive, safe, resilient, and sustainable cities through adequate housing, secure tenure, quality services, and healthy living environments (United Nations, 2016; UN-Habitat, 2022). Kenya's urban development policies similarly advocate equitable access to housing and basic services.

Despite substantial investments in informal settlement upgrading, many settlements continue to experience overcrowding, poor housing, inadequate sanitation, insecure tenure, unemployment, and poverty. Approximately 60% of Nairobi's population still resides in informal settlements occupying less than 10% of residential

land (World Bank, 2016; KNBS, 2019).

Previous studies have largely focused on physical improvements such as housing, roads, water, and sanitation, with limited attention to livelihoods, social inclusion, community well-being, and resident satisfaction (Nyamu et al., 2025). Most have evaluated individual projects rather than assessing the combined contribution of multiple interventions to multidimensional livability. Consequently, the relationship between informal settlement upgrading and livability remains inadequately understood.

Purpose and Justification

This article assesses the contribution of past informal settlement upgrading interventions to the livability of Kibra. The findings provide evidence on the effectiveness of previous interventions and identify areas requiring further improvement.

The study is justified because informal settlements continue to expand despite substantial investment in upgrading programmes. Its findings will inform policymakers, planners, development partners, and researchers in designing more sustainable, inclusive, and evidence-based informal settlement upgrading strategies.

Study Objectives

- i. To examine the past informal settlement upgrading interventions implemented in Kibra informal settlements.
- ii. To assess the extent to which past informal settlement upgrading interventions have improved the livability status of Kibra informal settlements.
- iii. To identify the factors influencing the effectiveness of past informal settlement upgrading interventions in improving livability in Kibra informal settlements.
- iv. To propose planning and policy strategies for enhancing the effectiveness of future informal settlement upgrading interventions in improving livability in Kibra informal settlements.

THEORY

Theory of Informal Settlements

Charles Stokes (1962) proposed the Theory of Informal Settlements, which explains that rapid rural–urban migration and the inability of low-

income households to afford formal housing compel many residents to settle in informal settlements. The theory classifies residents according to their aspirations and capacity to improve their socio-economic status. While some households gradually integrate into the formal urban economy, others remain trapped in persistent poverty (Stokes, 1962).

Although the theory explains household behaviour and settlement formation, it pays limited attention to the influence of institutions, governance, and urban planning on informal settlement upgrading initiatives.

Livable City Theory

The Livable City Theory by Lennard and Lennard (1995) emphasizes that cities should provide quality housing, accessible streets and public facilities, environmental protection, livelihood opportunities, safety, and spaces that promote social interaction. Urban development should therefore respond to people's needs through equitable access to services, creating healthy and sustainable communities (Lennard & Lennard, 1995).

However, the theory is largely aspirational. While it defines the characteristics of a livable city, it provides limited guidance on overcoming the institutional, political, and socio-economic challenges common in informal settlements of developing countries.

Systems Theory of Planning

The Systems Theory of Planning, developed by Chadwick (1971), views urban areas as interconnected systems in which housing, infrastructure, land use, governance, the environment, and socio-economic activities continuously influence one another. It argues that effective planning requires an integrated approach that considers the relationships among these components rather than addressing problems independently (Chadwick, 1971).

The theory is most appropriate for this study because assessing livability in Kibra requires examining how past informal settlement upgrading interventions have collectively influenced housing, infrastructure, livelihoods, environmental quality, governance, and social well-being as an integrated urban system. Compared with the other theories,

Systems Theory provides a more practical analytical framework by integrating the physical, social, economic, environmental, and institutional dimensions that form the variables examined in this study.

Empirical Literature

Past Informal Settlement Upgrading Interventions

Governments and development agencies have implemented various informal settlement upgrading initiatives, including rehabilitation, sites-and-services schemes, public housing, demolition and relocation with resettlement, land regularisation, and integrated infrastructure development (UN-Habitat, 2022; World Bank, 2024). Recent studies recognise community-based upgrading as more sustainable than demolition-based approaches (UN-Habitat, 2022; World Bank, 2024).

Across Sub-Saharan Africa, interventions have included public housing, informal settlement upgrading, land regularisation, and residential renewal (Azunre et al., 2025). South Africa implemented subsidised housing, while Ghana, Nigeria, and Ethiopia adopted in-situ upgrading, redevelopment, and relocation. However, inadequate funding, weak institutional coordination, limited community participation, and unresolved land tenure have constrained programme success (Azunre et al., 2024; Azunre et al., 2025).

In Kenya, KENSUP (2004/2005) sought to improve livelihoods through housing, tenure security, income generation, and infrastructure (Kenya Informal Settlement Upgrading Programme, 2005). KISIP (2011) complemented these efforts through infrastructure upgrading, tenure security, institutional strengthening, and urban planning (KISIP, 2025). In Kibra, interventions included the Soweto East Pilot Project, Kibera Integrated Water, Sanitation and Waste Management Project, Nairobi Railway Relocation Action Plan, and the NYS Kibera Informal Settlement Upgrade Initiative. By the end of KISIP Phase I, over 1.36 million people had benefited through the construction of roads, footpaths, drainage systems, water pipelines, sewer lines, and processing of 23,000 land titles (KISIP, 2025).

Livability Improvements from Informal Settlement Upgrading

Global studies report mixed outcomes on the contribution of informal settlement upgrading to livability. Sharma et al. (2025) found improvements in housing, water supply, sanitation, and environmental health, but limited progress in employment, affordable housing, and social inclusion. Similarly, Vidya (2025) observed that while renewal programmes improved the physical environment, they displaced vulnerable households and weakened social networks where community participation was limited.

In Africa, upgrading success largely depends on governance, community participation, and tenure security (Gulyani & Bassett, 2007). Although housing and water services improved quality of life, projects lacking poverty reduction and livelihood components proved less sustainable. In contrast, Azunre et al. (2025) found that even well-governed projects in Ghana and Nigeria achieved limited livelihood improvements without integrated economic development. The difference partly reflects methodology, with Gulyani and Bassett (2007) focusing on physical infrastructure, while Azunre et al. (2025) adopted a multidimensional livability framework.

In Kibra, UN-Habitat (2025) reported improvements in water supply, sanitation, roads, drainage, and community infrastructure, although sustainability depended on continuous community participation. Meredith and MacDonald (2017) and Mitra et al. (2017) similarly reported improved infrastructure, reduced flooding, enhanced safety, and stronger community resilience. However, they concluded that infrastructure alone cannot substantially improve livability without addressing livelihoods, governance, and social cohesion. Likewise, Nyamu et al. (2025) found that limited attention to employment and enterprise development reduced the long-term impact of upgrading programmes.

Factors Influencing Intervention Effectiveness

Community participation remains a key determinant of successful informal settlement upgrading (Turley et al., 2021). Projects implemented with active community involvement generally achieve more sustainable outcomes than top-down interventions.

Land tenure security encourages household investment in housing and supports long-term infrastructure development (Mang'ira, 2020). Successful programmes therefore address tenure alongside infrastructure and livelihoods rather than in isolation. Good governance and institutional coordination further strengthen implementation by improving collaboration between governments, communities, and local leadership (Patel, 2013). In Kenya, inadequate funding, tenure disputes, and weak stakeholder engagement continue to delay upgrading programmes (Mang'ira, 2020).

Although Mang'ira (2020) identifies tenure security as the primary success factor, Nyamu and Obala (2024) argue that community participation is equally important, noting that secure tenure alone did not prevent project delays in Soweto East where community trust was lacking. Meredith and MacDonald (2017) likewise found that adaptive management, institutional support, and continuous community participation significantly improved infrastructure delivery and resident satisfaction.

Planning and Policy Strategies for Livability

UN-Habitat (2025) recommends integrating housing improvements within broader regeneration programmes that combine physical, economic, social, environmental, and governance interventions. Similarly, Mang'ira (2020) proposes the Tenure–Infrastructure–Livelihoods (TIL) Nexus, integrating secure land tenure, infrastructure provision, and livelihood improvement for sustainable transformation.

In Kenya, Majale (2008) found that collaboration among communities, local authorities, the private sector, and NGOs enhanced employment generation and project sustainability. Nyamu and Obala (2024) recommend institutionalising meaningful public participation, integrating livelihoods into project design, and strengthening stakeholder partnerships. Kenya's National Informal Settlement Upgrading and Prevention Strategy (2024–2034) similarly advocates integrated planning, improved governance, sustainable financing, employment creation, stakeholder participation, and coordinated institutional frameworks (Ministry of Lands, 2024).

Research Gaps

Previous studies have largely focused on physical infrastructure improvements such as housing, roads, water, and sanitation, while giving limited attention to livelihoods, social inclusion, community well-being, and residents' satisfaction. Most have also applied housing, informal settlement, or urban development theories independently, with limited use of integrated planning theories.

This study adopts the Systems Theory of Planning because it integrates housing, infrastructure, livelihoods, governance, and environmental quality in assessing livability. Although previous scholars have evaluated individual upgrading projects in Kibra, few have comprehensively assessed the combined contribution of past interventions to overall livability. This study addresses that gap by providing a holistic assessment of previous interventions and proposing planning and policy strategies for improving future informal settlement upgrading initiatives.

Conceptual Framework

The conceptual framework illustrates the

relationship between informal settlement upgrading interventions and livability, while showing the factors influencing intervention effectiveness. It guides the assessment of how upgrading initiatives contribute to improved living conditions in Kibra (**Figure 1**).

RESEARCH METHODS

Research Design

This study employed a descriptive cross-sectional survey using mixed methods (Kothari, 2004; Creswell & Creswell, 2018). The design enabled comprehensive data collection from diverse respondents on informal settlement upgrading interventions and their contribution to livability. Quantitative methods gathered data on housing, infrastructure, environment, safety, and well-being through structured questionnaires, while qualitative methods generated in-depth information through Key Informant Interviews (KIIs) and document analysis on implementation challenges and planning strategies. The mixed-methods approach enhanced validity through methodological triangulation, enabling a comprehensive understanding of livability.

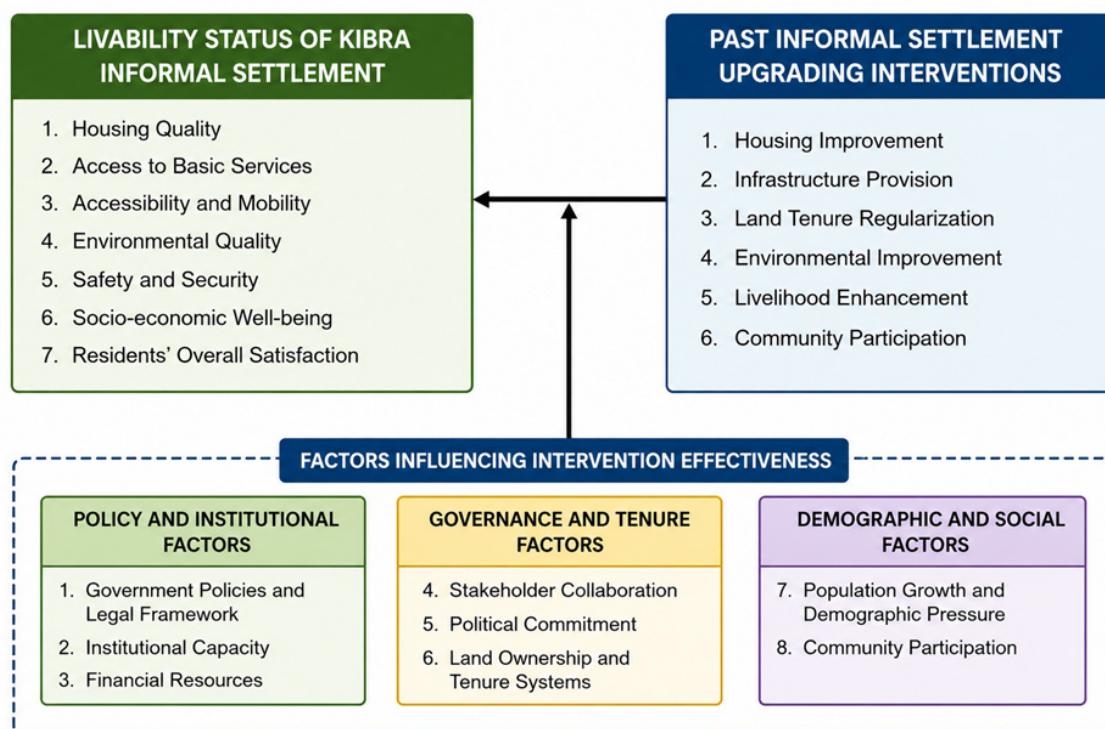


FIGURE 1

Conceptual framework for assessing upgrading interventions and livability

Source: Author's conceptualization based on reviewed literature, 2026

Location of the Study

The study was conducted in Kibra Informal Settlement, Kibra Sub-County, Nairobi City County, approximately 5 km southwest of Nairobi's Central Business District (CBD). Kibra occupies about 2.5 km² and comprises Gatwekera, Lindi, Makina, Laini Saba, Kianda, Mashimoni, Kisumu Ndogo, Soweto East, Soweto West, and Silanga villages. The settlement was purposively selected because of its history of multiple upgrading interventions, including KENSUP, KISIP, the Kibera Integrated Water, Sanitation and Waste Management Project, and the Nairobi Railway Relocation Programme. Despite these interventions, Kibra continues to experience poor housing, inadequate sanitation, insecure land tenure, environmental degradation, unemployment, poverty, and inadequate access to basic services. Household surveys were undertaken in Gatwekera, Lindi, Makina, Silanga, and Laini Saba to capture spatial and socio-economic variations.

Figure 2 shows the location of Kibra Informal Settlement and the villages covered during the household survey.

Population and Sampling

The study population comprised households in Kibra Informal Settlement together with

key stakeholders involved in the planning, implementation, and management of informal settlement upgrading interventions. According to the 2019 Kenya Population and Housing Census, Kibra Sub-County has an estimated population of 185,777 people (KNBS, 2019). Households were selected as the primary unit of analysis because they directly experience the benefits of upgrading interventions and are best placed to assess improvements in livability. Key informants included representatives from government institutions, community organisations, NGOs, academia, and the private sector.

The sample size for the household survey was determined using Yamane's (1967) simplified sample size formula, as presented in **Figure 3**.

The calculated sample size was 156 households. Following non-response and data cleaning, 152 completed household questionnaires were retained for analysis. In addition, 22 Key Informant Interviews (KIIs) were conducted with representatives from government institutions, community organisations, NGOs, academia, and the private sector to complement and validate the household survey findings through methodological triangulation.

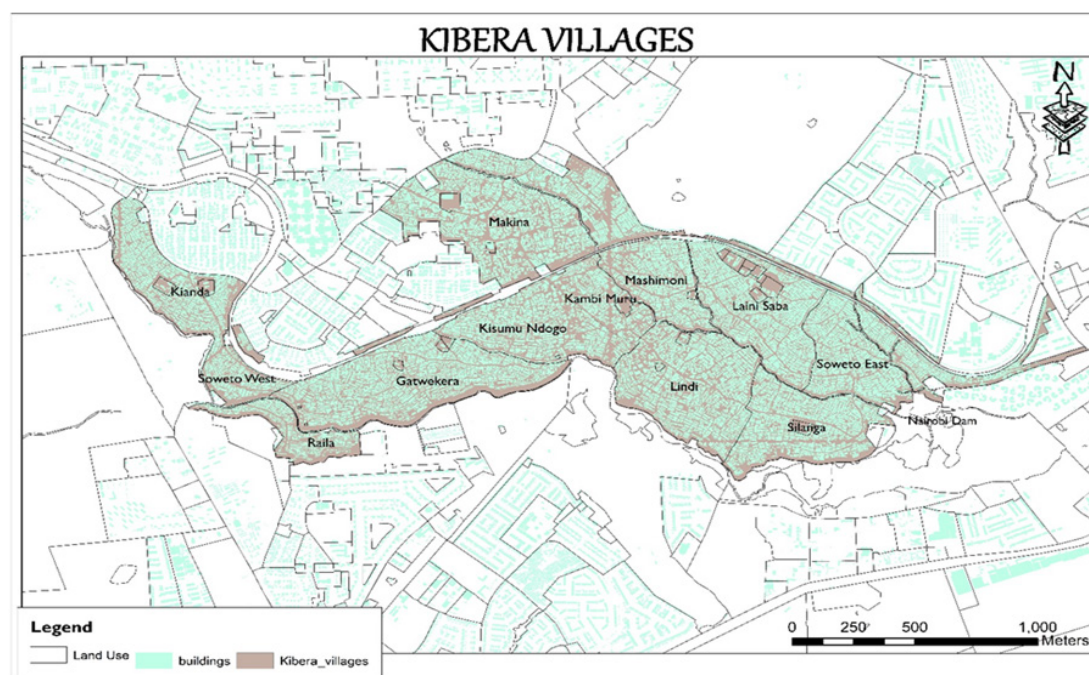


FIGURE 2
 Location of Kibra Informal Settlement and study villages
Source: Author, based on Nairobi spatial data, 2026

$$n = \frac{N}{1 + Ne^2}$$

Where:

n = sample size

N = population size (185,777)

e = level of precision (0.08)

Substituting values:

$$n = \frac{185,777}{1 + 185,777(0.08)^2} \approx 156$$

FIGURE 3

Sample size calculation using Yamane's formula for study

Source: Adapted from Yamane (1967)

Inclusion and Exclusion Criteria

Participants comprised household heads or adults aged 18 years and above who had resided in Kibra for at least five years, ensuring adequate experience with upgrading interventions. Key informants were required to have direct involvement in the planning, implementation, management, or evaluation of upgrading programmes. Visitors, temporary residents, minors, non-residents, and stakeholders without active involvement in upgrading initiatives were excluded.

Data Collection Techniques

The study employed both primary and secondary data collection methods. Secondary data were obtained from government reports, census publications, journal articles, policy documents, project reports, and publications from KNBS, the State Department for Housing, KENSUP, KISIP, Nairobi City County, UN-Habitat, and the World Bank. These sources provided historical context, planning frameworks, and policy information that supported interpretation of the field findings.

Primary data were collected using structured household questionnaires, Key Informant Interviews, field observations, and photographic documentation. Household questionnaires collected information on socio-economic

characteristics, housing conditions, infrastructure, environmental quality, safety, income sources, and residents' perceptions of upgrading interventions. KIIs provided insights into policies, stakeholder coordination, funding, implementation challenges, and future planning strategies. Field observations and photographic documentation verified housing conditions, roads, drainage, sanitation, waste management, accessibility, and other physical characteristics observed during the survey.

Data Analysis Techniques

Quantitative data were coded and analysed using IBM SPSS and Microsoft Excel. Descriptive statistics, including frequencies, percentages, means, and cross-tabulations, were used to characterise respondents and assess the contribution of upgrading interventions to livability. The results were presented using tables, charts, and graphs.

Qualitative data from KIIs and field observations were transcribed, categorised, and analysed thematically. Themes were organised around housing, infrastructure, land tenure, environmental quality, community participation, institutional challenges, and planning. Quantitative and qualitative findings were integrated through

analytical triangulation to strengthen validity and provide a comprehensive understanding of how informal settlement upgrading interventions have influenced livability in Kibra.

RESULTS

Past Informal Settlement Upgrading Interventions Implemented in Kibra Informal Settlement

Respondents were asked to identify the informal settlement upgrading interventions implemented in Kibra over the years. Since respondents could identify more than one intervention, multiple responses were allowed. The findings are presented under housing improvement, road and access infrastructure, water supply and sanitation, drainage and environmental improvement, land tenure regularization, livelihood and economic empowerment programmes, and community participation.

Housing Improvement

The study assessed respondents' views on housing improvement programmes implemented in Kibra.

Figure 4 presents respondents' acknowledgement of housing improvement programmes implemented in Kibra.

The findings indicate that 79.6% of respondents acknowledged the implementation of housing improvement programmes in Kibra, while 20.4% reported that they had not experienced any

housing improvement interventions.

Road and Access Infrastructure Improvement

The study also examined respondents' views on road and access infrastructure improvement.

Figure 5 presents respondents' acknowledgement of road and access infrastructure improvement programmes.

The findings show that 89.5% of respondents reported that road and access infrastructure improvement works had been implemented, while 10.5% had not experienced such interventions.

Water Supply and Sanitation Improvement

The study further assessed respondents' views on water supply and sanitation improvement programmes.

Figure 6 presents respondents' acknowledgement of water supply and sanitation improvement programmes.

The findings indicate that 84.9% of respondents acknowledged improvements in water supply and sanitation, while 15.1% reported that such interventions had not benefited their areas.

Drainage and Environmental Improvement

Respondents also identified drainage and environmental improvement programmes implemented within Kibra.

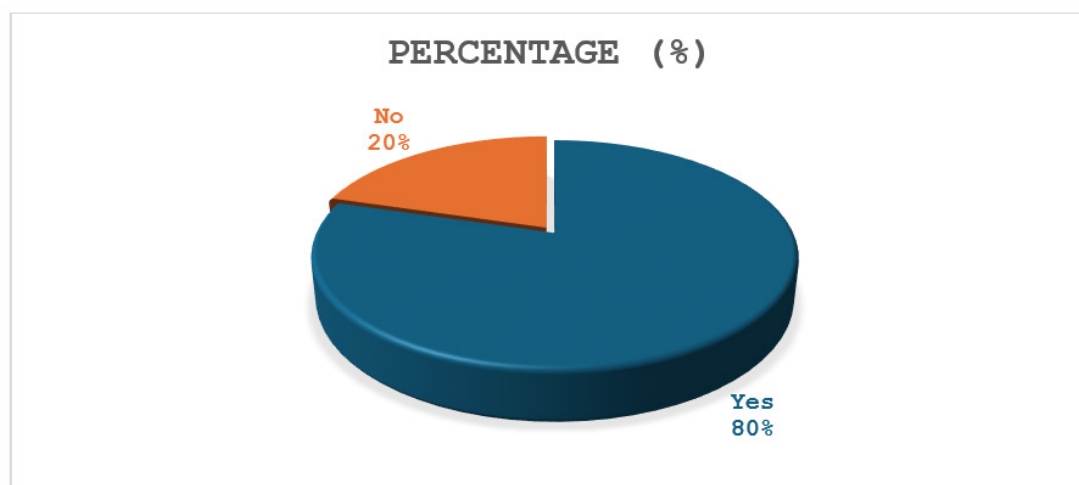


FIGURE 4

Percentage of respondents acknowledging implementation of housing improvement programmes in Kibra

Source: Field Survey, 2026

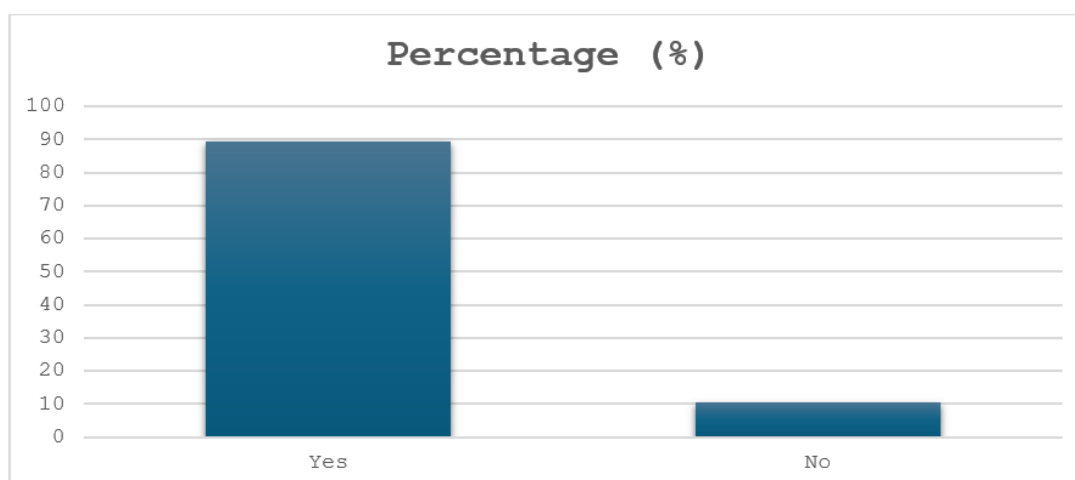


FIGURE 5

Percentage of respondents acknowledging implementation of road and access infrastructure improvement programmes

Source: Field survey, 2026

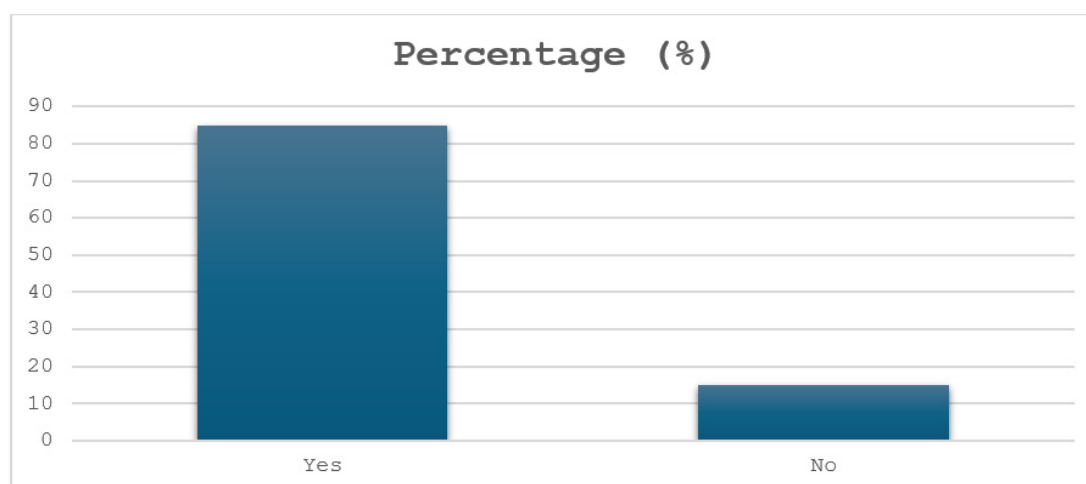


FIGURE 6

Percentage of respondents acknowledging water supply and sanitation improvement programmes

Source: Field survey, 2026

The findings show that drainage improvement and environmental rehabilitation programmes had been implemented to reduce flooding, improve waste management, and enhance environmental conditions. Respondents also reported the continued existence of blocked drainage systems and indiscriminate waste disposal during rainy seasons.

Land Tenure Regularization

The study examined respondents' views on land tenure regularization programmes.

The findings indicate that land tenure regularization was among the interventions introduced through

informal settlement upgrading programmes, although its implementation remained limited. Respondents also identified land ownership insecurity as a continuing challenge affecting housing improvement.

Livelihood and Economic Empowerment Programmes

The study assessed respondents' views on livelihood and economic empowerment programmes.

Table 1 presents respondents' responses on livelihood and economic empowerment programmes.

TABLE 1

Livelihood and economic empowerment programmes in Kibra Informal Settlement

Response	Frequency (n=152)	Percentage (%)
Yes	82	53.9
No	70	46.1
Total	152	100

Source: Field Survey, 2026

The findings indicate that 53.9% of respondents acknowledged livelihood and economic empowerment programmes, while 46.1% reported that they had not benefited from such interventions. Respondents identified youth empowerment initiatives and vocational training among the programmes implemented.

Community Participation

The study also assessed respondents' views on community participation during implementation of informal settlement upgrading programmes.

Table 2 presents respondents' responses on community participation in informal settlement upgrading.

The findings show that 67.8% of respondents acknowledged community participation during implementation of informal settlement upgrading projects, while 32.2% believed that residents were inadequately involved. One key informant from a community-based organization stated:

"The community was not adequately consulted during the Soweto East upgrading. Most decisions were made by the government and developers, and residents only learned about the plans when construction began. This created mistrust and resistance."

Extent to Which Past Informal Settlement Upgrading Interventions Have Improved the

Livability Status of Kibra Informal Settlement

The study assessed the extent to which past informal settlement upgrading interventions have improved the livability status of Kibra. The findings are presented under housing quality, access to basic services, accessibility and mobility, environmental quality, safety and security, socio-economic well-being, and overall residents' satisfaction.

Housing Quality

The study assessed respondents' views on improvements in housing quality resulting from past informal settlement upgrading interventions.

Figure 7 presents respondents' views on the extent of improvement in housing quality.

The findings indicate that 48.7% (n = 74) of respondents believed housing quality had improved to a moderate extent, while 28.3% (n = 43) reported improvements to a low extent. Only 13.8% (n = 21) considered the improvements to be great.

Access to Basic Services

The study also assessed respondents' views on improvements in access to basic services.

Figure 8 presents respondents' views on improvements in access to basic services.

TABLE 2

Community participation in informal settlement upgrading programmes

Response	Frequency (n=152)	Percentage (%)
Yes	103	67.8
No	49	32.2
Total	152	100

Source: Field Survey, 2026

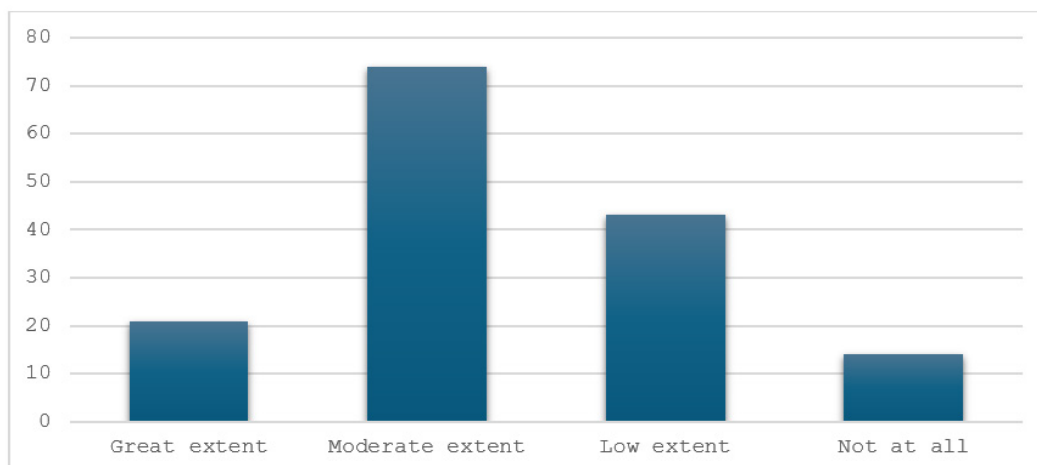


FIGURE 7
Extent of improvement in housing quality
Source: Field survey, 2026

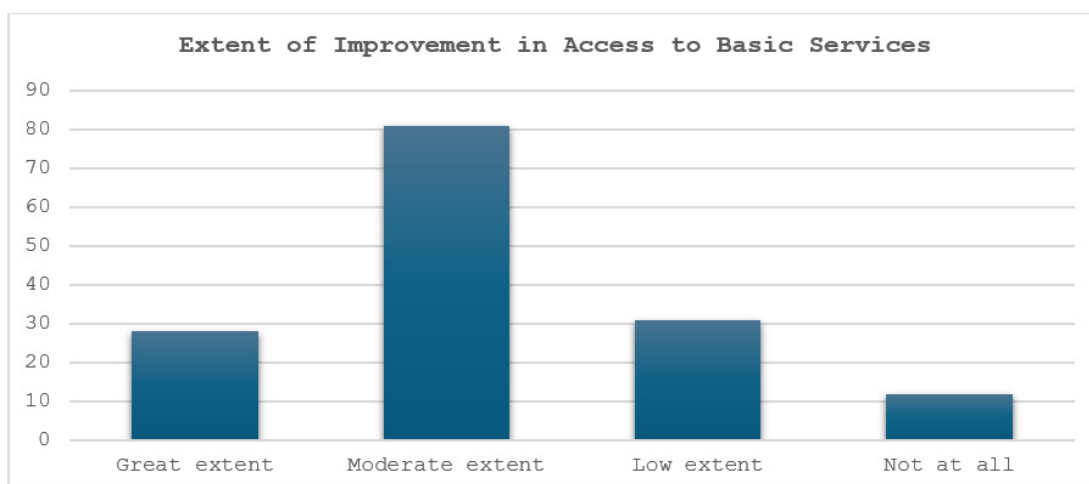


FIGURE 8
Extent of improvement in access to basic services
Source: Field survey, 2026

The findings show that 53.3% (n = 81) of respondents reported moderate improvements in water supply, sanitation, electricity, and waste management services. However, 28.3% (n = 43) indicated that improvements were either low or absent.

Accessibility and Mobility

The study further assessed respondents' views on accessibility and mobility within the settlement.

Figure 9 presents respondents' views on improvements in accessibility and mobility.

The findings indicate that 50.0% (n = 76) of

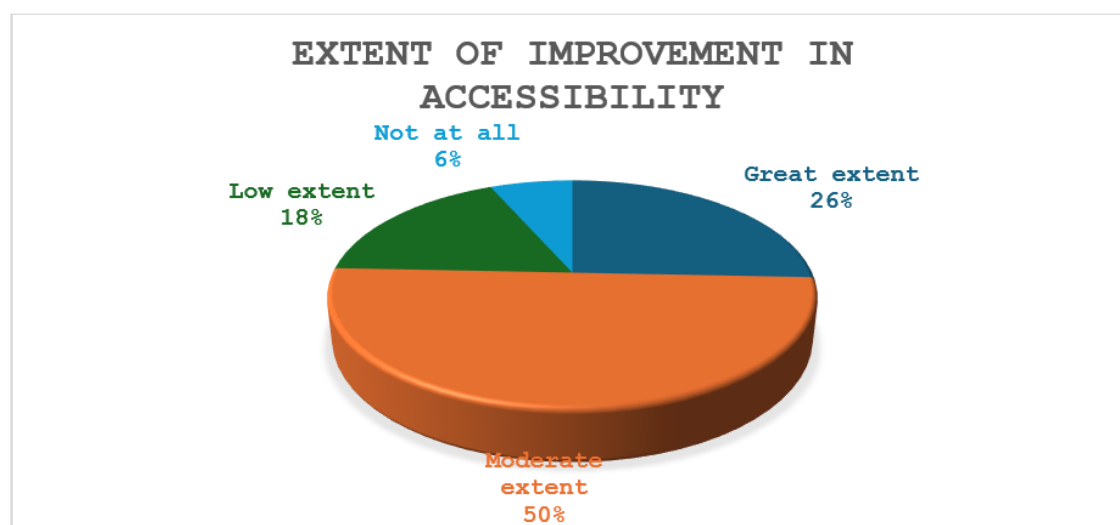
respondents reported moderate improvements in accessibility, while 25.7% (n = 39) believed the improvements were substantial. Respondents also acknowledged improved roads, footpaths, and connectivity within the settlement.

Environmental Quality

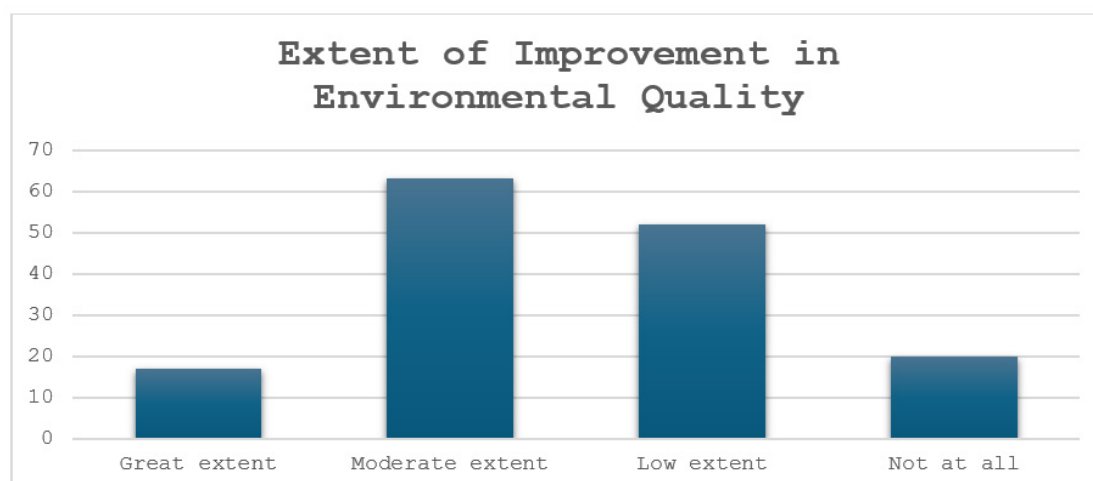
The study assessed respondents' views on changes in environmental quality following upgrading interventions.

Figure 10 presents respondents' views on improvements in environmental quality.

The findings show that 41.4% of respondents

**FIGURE 9**

Extent of improvement in accessibility and mobility

Source: Field survey, 2026**FIGURE 10**

Extent of improvement in environmental quality

Source: Field survey, 2026

believed environmental quality had improved to a moderate extent, while 47.4% indicated that improvements were either low or absent. Respondents identified poor waste management, pollution, and blocked drainage systems as continuing environmental challenges.

The study also documented selected environmental conditions observed within Kibra during fieldwork.

Figure 11 illustrates environmental conditions observed during the field survey.

Safety and Security

The study assessed respondents' views on improvements in safety and security.

Figure 12 presents respondents' views on improvements in safety and security.

The findings indicate that 36.8% of respondents reported moderate improvements in safety and security, while 51.4% believed improvements were either low or nonexistent. Respondents associated insecurity with unemployment, crime, drug abuse, and inadequate street lighting.



FIGURE 11
Environmental conditions observed in Kibra Informal Settlement
Source: Field survey, 2026

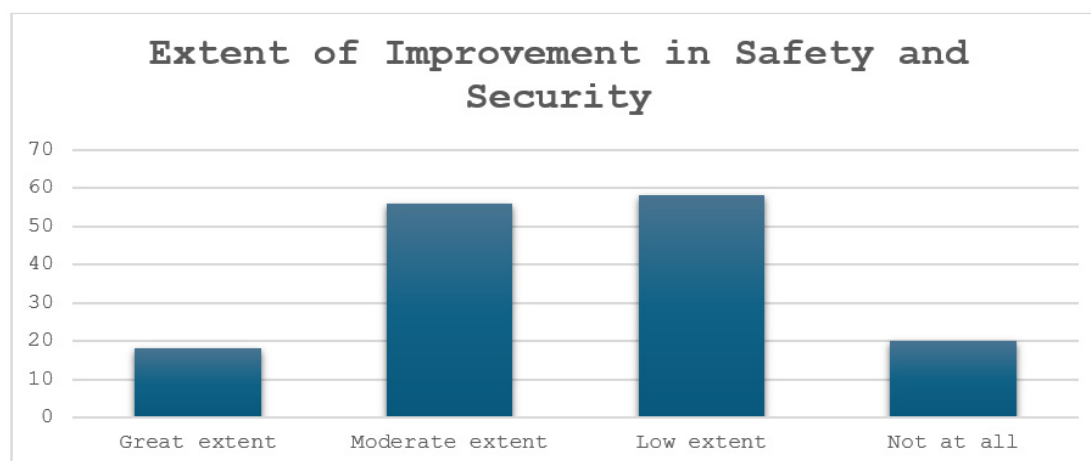


FIGURE 12
Extent of improvement in safety and security
Source: Field survey, 2026

Socio-economic Well-being

The study assessed respondents' views on changes in socio-economic well-being.

Figure 13 presents respondents' views on socio-economic well-being.

The findings indicate that 32.2% of respondents reported moderate improvement in socio-economic well-being, while 57.9% believed livelihoods had improved only to a low extent or not at all. Respondents identified unemployment, low household income, and persistent poverty as major challenges.

Overall Residents' Satisfaction

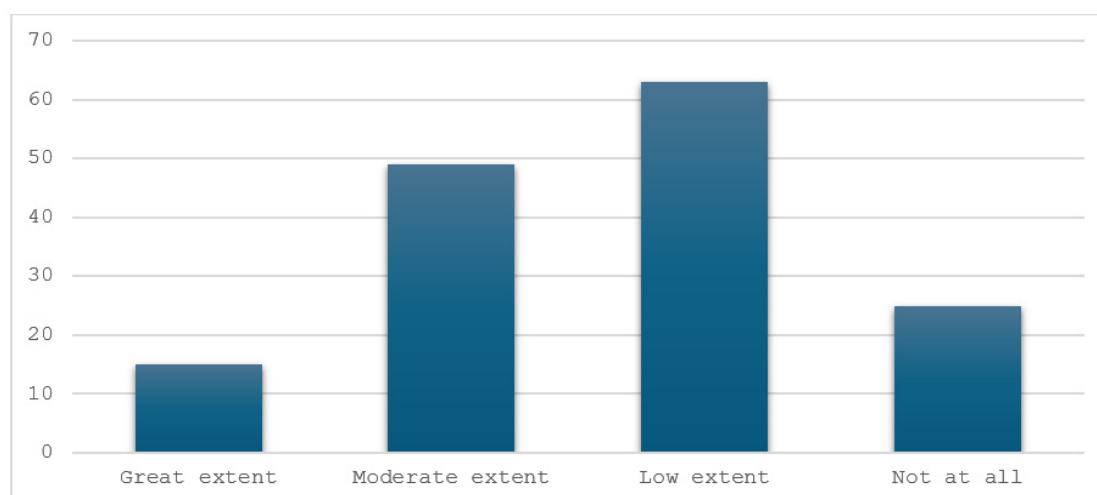
The study assessed respondents' overall satisfaction with improvements in livability resulting from

past informal settlement upgrading interventions.

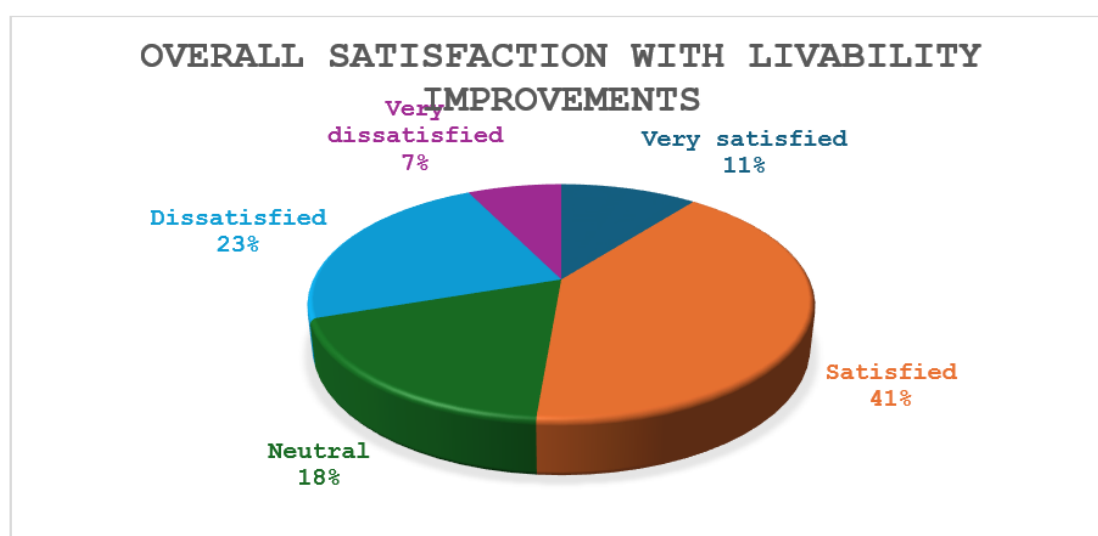
Figure 14 presents respondents' overall satisfaction with improvements in livability.

The findings indicate that 40.8% of respondents were satisfied with the improvements in livability resulting from past informal settlement upgrading interventions, while 30.3% expressed dissatisfaction. Respondents acknowledged improvements in infrastructure and housing but also identified unemployment, insecurity, inadequate sanitation, and overcrowding as continuing challenges.

Factors Influencing the Effectiveness of Past Informal Settlement Upgrading Interventions in Improving Livability in Kibra Informal

**FIGURE 13**

Extent of improvement in socio-economic well-being

Source: Field survey, 2026**FIGURE 14**

Overall residents' satisfaction with livability improvements

Source: Field survey, 2026

Settlement

Respondents were asked to indicate the extent to which various factors influenced the effectiveness of past informal settlement upgrading interventions in improving livability in Kibra Informal Settlement. The findings are presented under community participation, government policies and legal framework, institutional capacity, financial resources, land ownership and tenure security, stakeholder collaboration, political commitment, and population growth.

Community Participation

The study assessed respondents' views on the influence of community participation on the effectiveness of informal settlement upgrading interventions.

Figure 15 presents respondents' views on the influence of community participation.

The findings indicate that 77.0% of respondents believed community participation highly influenced the effectiveness of informal settlement upgrading interventions. Respondents reported

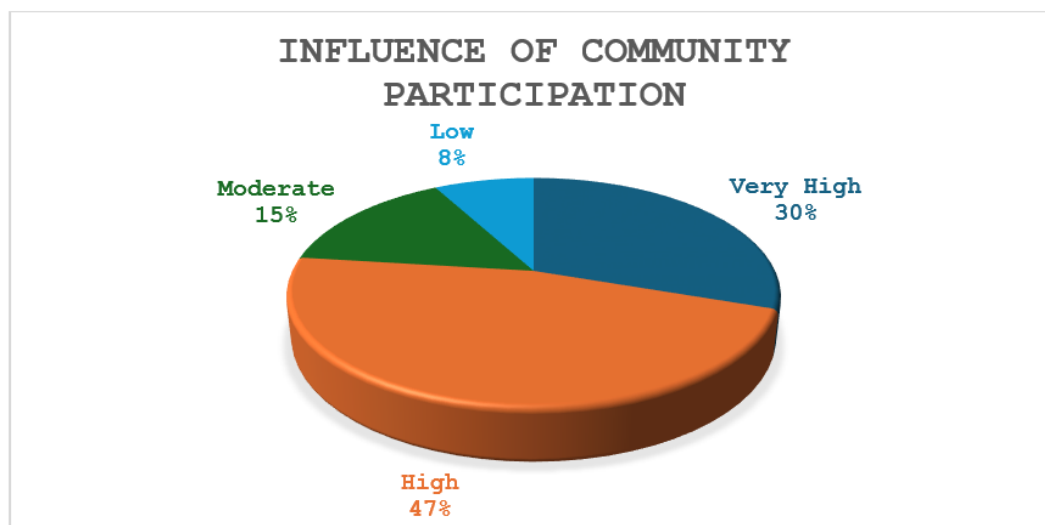


FIGURE 15
Influence of community participation on intervention effectiveness
Source: Field survey, 2026

that projects involving residents during planning and implementation were better accepted by the community.

Government Policies and Legal Framework

The study also assessed respondents' views on the influence of government policies and the legal framework.

Table 3 presents respondents' views on the influence of government policies and the legal framework.

The findings show that 70.4% of respondents considered government policies and the legal framework to have a high influence on the success of informal settlement upgrading programmes. Respondents also identified policy inconsistencies, delayed implementation, and inadequate enforcement as factors affecting project implementation.

Institutional Capacity

The study assessed respondents' views on the influence of institutional capacity.

Table 4 presents respondents' responses on institutional capacity.

The findings indicate that 67.1% of respondents believed institutional capacity strongly influenced project effectiveness. Respondents identified weak coordination among implementing agencies,

delayed project completion, and inadequate monitoring as institutional challenges.

Financial Resources

The study assessed respondents' views on the influence of financial resources.

Table 5 presents respondents' responses on the influence of financial resources.

The findings indicate that 79.6% of respondents regarded adequate financial resources as a major determinant of successful informal settlement upgrading interventions. Respondents reported that funding shortages delayed project implementation, reduced project coverage, and limited maintenance of completed infrastructure.

Land Ownership and Tenure Security

The study assessed respondents' views on the influence of land ownership and tenure security.

Figure 16 presents respondents' views on the influence of land ownership and tenure security.

The findings show that 76.3% of respondents considered land ownership and tenure security to be major determinants of successful informal settlement upgrading. Respondents reported that insecure tenure discouraged investment in housing improvement and contributed to conflicts during project implementation.

TABLE 3

Influence of government policies and legal framework

Response	Frequency	Percentage (%)
Very High	39	25.7
High	68	44.7
Moderate	30	19.7
Low	15	9.9
Total	152	100

Source: Field Survey, 2026**TABLE 4**

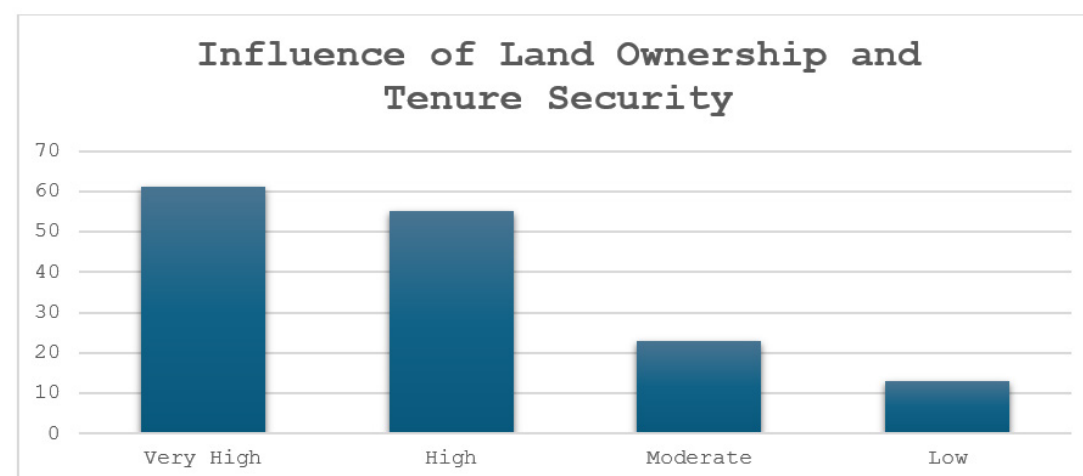
Influence of institutional capacity on intervention effectiveness

Response	Frequency	Percentage (%)
Very High	33	21.7
High	69	45.4
Moderate	34	22.4
Low	16	10.5
Total	152	100

Source: Field Survey, 2026**TABLE 5**

Influence of financial resources on intervention effectiveness

Response	Frequency	Percentage (%)
Very High	58	38.2
High	63	41.4
Moderate	22	14.5
Low	9	5.9
Total	152	100

Source: Field Survey, 2026**FIGURE 16**

Influence of land ownership and tenure security

Source: Field survey, 2026

One government official involved in KISIP implementation stated:

"Land tenure regularization has been the most difficult aspect of upgrading. The process is slow because of complex historical claims, and without titles, residents are reluctant to invest in housing improvements."

Stakeholder Collaboration

The study assessed respondents' views on the influence of stakeholder collaboration.

Figure 17 presents respondents' views on the influence of stakeholder collaboration.

The findings reveal that 71.0% of respondents believed collaboration among government agencies, NGOs, community organizations, and development partners significantly influenced project effectiveness. Respondents reported that coordinated implementation improved resource utilization and reduced duplication of activities.

Political Commitment

The study assessed respondents' views on the influence of political commitment.

Figure 18 presents respondents' views on the influence of political commitment.

The findings indicate that 69.0% of respondents

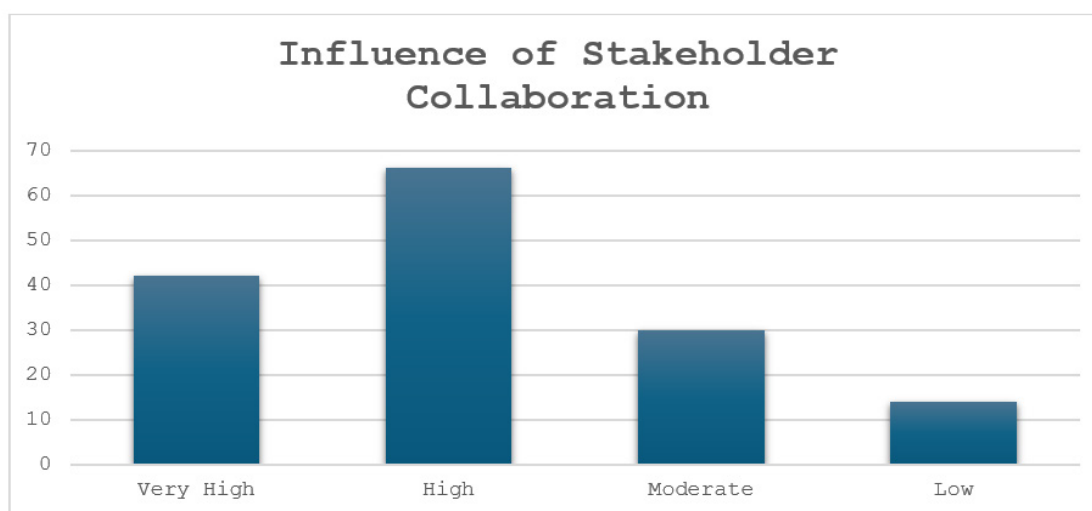


FIGURE 17

Influence of stakeholder collaboration on intervention effectiveness

Source: Field survey, 2026

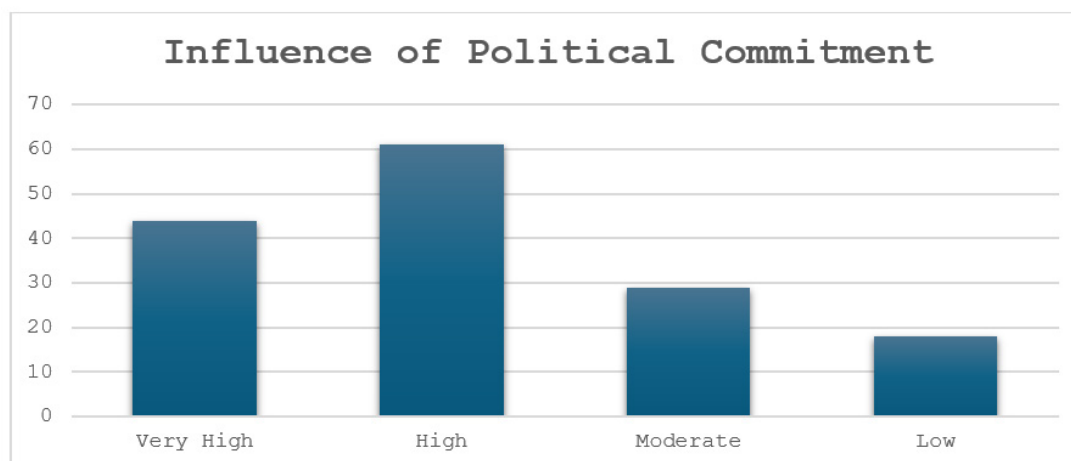


FIGURE 18

Influence of political commitment on intervention effectiveness

Source: Field survey, 2026

believed political commitment greatly influenced the success of informal settlement upgrading interventions. Respondents reported that political goodwill accelerated project implementation, while changes in political leadership interrupted ongoing programmes.

Population Growth and Demographic Pressure

The study assessed respondents' views on the influence of population growth and demographic pressure.

Figure 19 presents respondents' views on the influence of population growth and demographic pressure.

The findings indicate that 79.6% of respondents viewed rapid population growth as one of the greatest challenges affecting the effectiveness of informal settlement upgrading interventions. Respondents reported that continued population increase placed pressure on housing, infrastructure, sanitation, and other urban services.

DISCUSSION

The findings on past informal settlement upgrading interventions indicate that physical interventions, including housing improvement, roads, water supply, sanitation, drainage, and environmental rehabilitation, were widely implemented in Kibra. However, livelihood and economic empowerment programmes reached only about

half of the respondents, suggesting that socio-economic interventions received considerably less attention than physical improvements. These findings are consistent with Meredith and MacDonald (2017), who reported that KENSUP substantially improved infrastructure and community facilities in Kibra, and with Sharma et al. (2025), who found that upgrading programmes primarily prioritize physical infrastructure over livelihood development. However, the findings contradict Majale (2008), who argued that successful upgrading requires integrating physical development with employment creation and local economic empowerment. The findings also support the Systems Theory of Planning (Chadwick, 1971), which argues that housing, infrastructure, livelihoods, governance, and environmental management function as interconnected components of an urban system. Consequently, improvements in physical infrastructure alone cannot produce sustainable improvements in livability without simultaneous investment in socio-economic development, secure tenure, and community participation.

The findings on the extent of livability improvements reveal that housing quality, accessibility, and access to basic services improved to a moderate extent following past upgrading interventions. In contrast, environmental quality, safety and security, socio-economic well-being, and overall resident satisfaction recorded comparatively lower levels of improvement. These

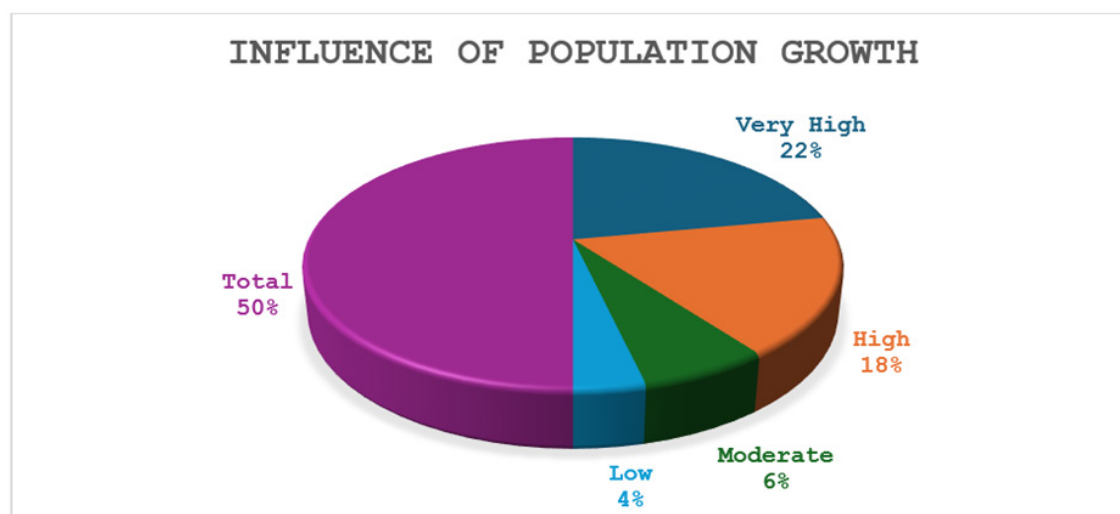


FIGURE 19
 Influence of population growth and demographic pressure
 Source: Field survey, 2026

findings agree with Azunre et al. (2025), Vidya (2025), and Nyamu et al. (2025), who found that although informal settlement upgrading enhances housing and infrastructure, improvements in livelihoods, environmental management, and social well-being remain limited where interventions are implemented in isolation. However, the findings differ from Gulyani and Bassett (2007), who reported broader improvements in quality of life following upgrading initiatives in some African cities. The difference may be explained by Kibra's exceptionally high population density, persistent tenure insecurity, rapid population growth, and institutional capacity constraints, which continue to exert pressure on infrastructure and public services despite substantial investments. The findings therefore reinforce the Systems Theory of Planning by demonstrating that improvements in selected urban components cannot generate balanced livability outcomes unless environmental, economic, governance, and social dimensions are addressed simultaneously.

The findings on factors influencing the effectiveness of informal settlement upgrading interventions identify financial resources, land ownership and tenure security, community participation, institutional capacity, stakeholder collaboration, political commitment, and population growth as the major determinants of successful implementation. Financial resources, tenure security, and population growth emerged as the most influential factors. These findings strongly support Mang'ira (2020), who identified secure land tenure as a prerequisite for successful upgrading, and Turley et al. (2021), who emphasized the importance of community participation in sustaining development outcomes. The findings also agree with Meredith and MacDonald (2017), who found that adaptive management and continuous stakeholder engagement enhanced project implementation in Kibra. However, they differ slightly from Patel (2013), who emphasized governance and community participation as the dominant determinants of success. The prominence of financial limitations and tenure insecurity in this study reflects the unique realities of Kibra, where resource constraints, unresolved land ownership, and rapid population growth continue to undermine the long-term effectiveness of upgrading programmes. These findings further validate Systems Theory by demonstrating that intervention effectiveness depends on the

interaction of multiple institutional, financial, social, political, and environmental factors rather than any single determinant.

The findings on planning and policy strategies demonstrate strong support for integrated upgrading approaches that combine housing improvement, infrastructure development, livelihood enhancement, environmental management, secure land tenure, effective governance, stakeholder collaboration, and meaningful community participation. These findings are consistent with UN-Habitat (2025), Mang'ira (2020), Nyamu and Obala (2024), and Kenya's National Informal Settlement Upgrading and Prevention Strategy (2024–2034), all of which advocate comprehensive, participatory, and multisectoral approaches to informal settlement transformation. The findings equally reinforce Chadwick's Systems Theory of Planning (1971), which views cities as interconnected systems requiring coordinated interventions across multiple sectors. The study therefore contributes empirical evidence from Kibra that isolated physical upgrading produces only moderate improvements in livability, whereas integrated interventions addressing physical, economic, environmental, institutional, and governance dimensions offer greater potential for achieving sustainable improvements in informal settlement livability.

CONCLUSION

The study established that past informal settlement upgrading interventions in Kibra, including housing improvements, infrastructure development, water and sanitation projects, environmental management, land tenure initiatives, livelihood programmes, and community participation, have contributed to moderate improvements in the settlement's livability. Improvements were most evident in housing quality, accessibility, and access to basic services, while environmental quality, safety and security, and socio-economic well-being recorded comparatively lower levels of improvement.

However, the effectiveness of these interventions has been constrained by inadequate funding, insecure land tenure, weak institutional coordination, rapid population growth, limited community participation, and inconsistent policy

implementation. These findings indicate that, although significant progress has been made, the interventions have not adequately addressed the multidimensional challenges facing Kibra residents. If these constraints remain unresolved, poor housing conditions, inadequate services, environmental degradation, and socio-economic inequalities will continue to undermine residents' quality of life.

The findings further confirm the applicability of the Systems Theory of Planning (Chadwick, 1971), demonstrating that improvements in one dimension, such as housing and infrastructure, reinforce improvements in others, including accessibility, environmental quality, governance, and livelihoods. Conversely, failure to adequately address any one dimension undermines overall livability, confirming that informal settlement upgrading requires integrated rather than isolated sectoral interventions.

This study also contributes to knowledge by empirically demonstrating how multiple informal settlement upgrading interventions collectively influence multidimensional livability in Kibra, moving beyond previous studies that focused primarily on individual projects or physical infrastructure. The mixed-methods approach and triangulation further provide a practical framework for evaluating similar upgrading programmes in other informal settlements.

Overall, the study concludes that sustainable improvement of livability in informal settlements requires integrated, participatory, and well-coordinated planning and policy interventions that simultaneously address housing, infrastructure, livelihoods, environmental management, land tenure, governance, and community participation to achieve sustainable, inclusive, and livable informal settlements.

Study Limitations

The cross-sectional design captures perceptions at a single point, limiting causal inference and change tracking. Self-reported perceptions are subject to recall and social desirability bias. Sampling from census data may not account for population transience. Establishing direct causal attribution between specific interventions and outcomes remains challenging despite triangulation.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations are proposed to enhance the effectiveness of future informal settlement upgrading interventions and promote sustainable improvements in livability within Kibra and other informal settlements with similar characteristics.

Implications for Policy

- i. Government should adopt integrated informal settlement upgrading policies that simultaneously address housing, infrastructure, land tenure, livelihoods, environmental management, and community participation rather than isolated sectoral interventions.
- ii. The National Informal Settlement Upgrading and Prevention Strategy should be fully implemented through sustainable financing mechanisms and strengthened institutional coordination among government agencies and development partners.
- iii. Policies should institutionalise meaningful community participation throughout the planning, implementation, monitoring, and evaluation of upgrading programmes.
- iv. Land tenure regularisation should be prioritised to enhance tenure security, encourage household investment, and support long-term upgrading initiatives.
- v. National and county governments should promote balanced regional development and economic decentralisation to reduce rapid population growth and pressure on informal settlements.

Recommendations for Planning Practice

- i. Planners should adopt integrated planning approaches that simultaneously address housing, infrastructure, environmental management, livelihoods, and governance.
- ii. Community participation should be institutionalised throughout the entire project cycle rather than being limited to stakeholder consultation.
- iii. Physical infrastructure upgrading should be implemented alongside livelihood enhancement programmes to improve long-term socio-economic well-being.
- iv. Planning agencies should strengthen stakeholder collaboration, project coordination, and monitoring to improve

- implementation efficiency and sustainability.
- v. Environmental management measures, including waste management, drainage improvement, and public open spaces, should be incorporated into all informal settlement upgrading projects.

Future Research Directions

- i. Longitudinal studies should be undertaken to monitor changes in livability over time and establish causal relationships between upgrading interventions and outcomes.
- ii. Comparative studies across informal settlements in Kenya and other developing countries should be conducted to identify contextual factors influencing intervention effectiveness.
- iii. Further research should examine the relationship between land tenure security and household investment in housing improvement.
- iv. Studies should investigate the potential of digital technologies to enhance community participation and stakeholder engagement in informal settlement upgrading.
- v. Cost-benefit analyses of different upgrading approaches should be undertaken to guide planning decisions and resource allocation.

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