JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

PERFORMANCE GAPS AND CHALLENGES AFFECTING BUILDING FUNCTIONALITY DURING OCCUPANCY IN SAMBURU COUNTY, KENYA

Name of 1st Author: Saitoti Ole Tingisha Name of 2nd Author: Prof George Kinoti King'oriah, PhD
Name of 3rd Author: Dr.Absalom H.V Lamka, PhD

[1]Designation of 1st Author-Student at Technical University of Kenya,[2]Designation of 2nd Author-Senior Lecturer at Technical University of Kenya, [3]Designation of 3rd Author-Senior Lecturer at Technical University of Kenya

[1]Name of Department of 1st Author- Construction and Property Studies, [2]Name of Department of 2nd Author- Construction and Property Studies, [3]Name of Department of 3rd Author- Construction and Property Studies.

[1]Name of organization of 1st Author-Technical University of Kenya, City-Nairobi, Country-Kenya,[2]Name of organization of 2nd Author-Technical University of Kenya, City-Nairobi, Country-Kenya[3]Name of organization of 3rd Author-Technical University of Kenya, City-Nairobi, Country-Kenya

Abstract: *The main purpose of this study was to examine the performance gaps and challenges affecting building functionality during occupancy in Samburu County, Kenya. The study adopted a mixed research method. The sample included 138 tenants living or working in residential, public, and commercial buildings and 3 professionals in building and construction industry. Cluster simple random sampling procedure and purposive sampling procedure were used to arrive at the sample. Questionnaires were used to collect data from the tenants while interview guides were used to collect data from the professionals. The quantitative data collected using the questionnaires were coded and processed using the Statistical Package for the Social Sciences (SPSS) Version 25. Descriptive statistics such as frequencies and percentages were used to summarize the findings. Qualitative data collected from interviews on the other hand were analyzed thematically. The study brought out some shortcomings in the state and management of buildings in Samburu County. The study found that inadequate maintenance, poor security systems, unreliable water supply, poor ventilation, and ineffective waste management do compromise the comfort, health, and safety of occupants. The study suggests a need for well-coordinated interventions to address these challenges and improve the occupancy and safety of building environment in the county.*

Keywords: *Performance gap, Performance challenges, Building Functionality, public investment, administrative offices*

I.INTRODUCTION

Infrastructure plays a pivotal role in catalyzing socio-economic development, especially in underserved and geographically marginalized regions where access to essential services remains a major barrier to human progress. Quality infrastructure facilitates connectivity, enhances service delivery, promotes economic inclusion, and contributes significantly to poverty reduction and improved living standards (UNDP, 2021; African Development Bank, 2020). In Kenya, the implementation of the devolved system of governance, as established under the 2010 Constitution, has led to substantial investment in public infrastructure across the 47 counties. These investments include the construction of educational institutions, health facilities,

administrative offices, markets, and water and sanitation systems (Government of Kenya, 2019; Commission on Revenue Allocation, 2022). The goal of this decentralization was to bring services closer to the people and to correct historical disparities in development outcomes.

Samburu County, located in the arid and semi-arid northern region of Kenya, is among the counties that have witnessed a marked increase in public infrastructure development since the onset of devolution. These efforts have focused on improving access to critical services and advancing equity in regional development (Council of Governors, 2021). However, despite the financial and institutional resources directed toward infrastructure projects, many public buildings in Samburu County still show signs of underperformance. Several structures have been reported to experience usability challenges, deteriorating conditions, or even abandonment shortly after completion (World Bank, 2021; Office of the Auditor General, 2022). This situation raises important questions regarding the effectiveness, sustainability, and long-term value of county-level infrastructure investments.

Building functionality refers to the ability of a physical structure to fulfill its intended role reliably, safely, and sustainably over its expected lifespan (UN-Habitat, 2020). In the realm of public service delivery, functionality is essential as it directly influences the quality and reliability of services provided to citizens. When buildings are not functional, the outcomes include service interruptions, inefficient use of public resources, and declining public trust in development initiatives (Kaburu and Mwirigi, 2022; Transparency International Kenya, 2020). The impact is especially severe in areas like Samburu, where the population already contends with poverty, environmental challenges, limited infrastructure coverage, and historical marginalization. In such regions, poorly functioning infrastructure further entrenches inequality and slows progress toward national and global development goals (Mutiso and Wambua, 2021; Kenya Institute for Public Policy Research and Analysis, 2023).

Scholarly and institutional research points to a variety of technical and institutional challenges that contribute to the poor performance of public buildings. These challenges include weak planning processes, limited feasibility assessments, substandard construction materials, inadequate technical supervision, and insufficient contractor capacity (Ochieng, 2020; Kenya National Bureau of Statistics, 2021). In addition, environmental factors such as recurring droughts, flash floods, poor terrain, and extreme temperatures complicate construction and maintenance in arid counties like Samburu (UNEP, 2019). Furthermore, governance issues including opaque procurement practices, minimal community participation, poor inter-agency coordination, and political interference have been linked to compromised infrastructure quality (Transparency International Kenya, 2019; Institute of Economic Affairs, 2022). While these problems are recognized in broader discussions, empirical evidence that explores how they manifest specifically at the county level in the post-devolution context remains limited As such, the current study aims at examining the performance gaps and challenges affecting building functionality in Samburu County, Kenya.

II.METHODOLOGY

This study adopted a cross-sectional survey research design, utilizing a mixed-methods approach that combined both quantitative and qualitative techniques. According to Creswell and Plano Clark (2017), the mixed-methods approach enhances research outcomes by merging statistical evidence with contextual insights. The design allowed data to be collected at a single point in time, facilitating an efficient assessment of performance gaps and challenges affecting building functionality in Samburu County. The quantitative component involved the administration of structured questionnaires to tenants, enabling the collection of standardized data suitable for statistical analysis. The qualitative component employed semi-structured interviews with building professionals, including architects, urban planners, and engineers. This triangulation of data sources enriched the findings by providing both breadth and depth, in line with recommendations by Tashakkori and Teddlie.

The target population comprised two key groups. The first group consisted of tenants living or working in residential, public, and commercial buildings located in urban centers of Samburu County, specifically Maralal, Archers Post, and Kisima. These locations were selected based on their relative urbanization and concentration of building developments. The second group included built environment professionals such as urban planners, architects, and structural engineers who are involved in the design, construction, and

maintenance of buildings in the county. Their insights were considered essential for understanding systemic and technical challenges affecting building functionality.

A combination of sampling techniques was employed. Cluster sampling was first used to identify urban zones within Samburu County. From these clusters, simple random sampling was applied to select tenant respondents to ensure representativeness. For professional participants, purposive sampling was used, targeting individuals with relevant expertise in building functionality and tenant satisfaction, as supported by Patton.

The sample size for tenants was determined using the formula for an infinite population since the exact number of tenants was unknown. The formula used was:

$$n = \frac{Z^2 \cdot p \cdot (1-p)}{e^2}$$

Where:
n = Sample size
Z = Z-score for 95% confidence level (1.96)
p = Estimated proportion of tenants (assumed at 0.1)
e = Margin of error (0.05)

$$n = \frac{(1.96)^2 \cdot 0.1 \cdot (1-0.1)}{(0.05)^2} = 138.3$$

In addition to the tenants, three professionals, including two urban planners and one architect, were interviewed. All had experience working in Samburu County and were selected based on their direct involvement in building projects within the area.

A structured questionnaire was used to collect data from tenants. The questionnaire was divided into sections aligned with the study objectives. These included demographic information, structural integrity and safety, comfort, habitability and accessibility, availability and functionality of amenities, and tenant perceptions of challenges and areas for improvement. Most items used a five-point Likert scale ranging from strongly disagree to strongly agree. A few open-ended questions were also included to allow for elaboration. The semi-structured interview guide for professionals focused on key areas such as structural soundness, compliance with building regulations, user satisfaction, maintenance practices, and suggested improvements. Open-ended questions were used to elicit detailed and descriptive responses, following recommendations by Yin.

A pilot study was conducted in Narok County involving 20 tenant respondents. The purpose of the pilot was to test the clarity, reliability, and usability of the data collection instruments. Based on feedback received, minor revisions were made. Reliability was tested using Cronbach's Alpha, with the questionnaire achieving a coefficient of 0.86, indicating a high level of internal consistency, as suggested by Gliem and Gliem.

Quantitative data collected from the questionnaires were coded and analyzed using the Statistical Package for the Social Sciences (SPSS) Version 25. Descriptive statistics such as frequencies, percentages, and means were used to summarize the findings. Data were presented using tables, bar graphs, and pie charts. Qualitative data collected from interviews on the other hand were analyzed thematically. Responses were transcribed, coded, and categorized into emerging themes based on the study objectives. Thematic analysis followed the approach outlined by Braun and Clarke, enabling the identification of recurring patterns and deeper insights into professional perspectives on building functionality.

The study upheld ethical standards throughout the research process. All participants were informed of the study's purpose and gave informed consent before participation. Participation was entirely voluntary, and respondents were allowed to withdraw at any point without consequences. Confidentiality and anonymity were assured, with no identifying information recorded. Collected data were stored securely and used solely

for academic purposes. Ethical approval was obtained from relevant authorities in Samburu County, including the County Commissioner's Office and the Ministry of Housing and Urban Development. A research permit was also acquired from the National Commission for Science, Technology and Innovation (NACOSTI), which is responsible for regulating research standards and ethics in Kenya.

III. RESULTS

Demographic Characteristics of Tenants

The study examined the demographic characteristics of tenants in Samburu County to provide context for their views on building functionality. Respondents were drawn from three main urban centers: Kisima, Maralal, and Archers Post. Kisima had the highest number of participants at 43%, followed by Maralal at 29.6%, and Archers Post at 27.4%.

Regarding gender, 56.3% of the respondents were male, while 43.7% were female.

In terms of age, the largest group of respondents (44.4%) were aged between 36 and 45 years. Those aged 45 years and above made up 22.2% of the sample. Respondents aged 26 to 35 years comprised 21.5%, while the youngest group, aged 18 to 25 years, accounted for 11.9%.

Occupationally, 45.9% of respondents were employed, while 40.7% were self-employed. Students accounted for 5.2%, and the unemployed made up 8.1%.

On the length of residence, 70.4% of the tenants had lived in their current buildings for more than three years. Those who had stayed for one to three years made up 17.8%, while 10.4% had resided for six months to one year. Only 1.5% of respondents had lived in their current residence for less than six months. This suggests a largely stable tenant population, with many having long-term experience with their housing conditions.

In terms of building classification, 81.5% of the tenants resided in residential buildings. Commercial buildings housed 13.3%, while public buildings accounted for 5.2%. The data shows that the built environment in the study area is primarily residential, reinforcing the relevance of focusing on housing functionality in the research.

The types of buildings tenants occupied were diverse. Apartments represented 31.1% of the sample, bungalows followed closely at 30.4%, and simple rental houses accounted for 24.4%. Shops housed 8.1% of the respondents, public service buildings such as hospitals made up 4.4%, and schools had the smallest share at 1.5%. This variety highlights the need to consider multiple housing forms when addressing performance challenges in the county.

The study engaged three professionals who provided expert perspectives on building performance in Samburu County. All participants were male, with two specializing in urban planning and one in architecture. One was aged between 31–40 years, while the other two were in the 41–50 age range. In terms of academic qualifications, two held bachelor's degrees and one had a postgraduate degree. One professional had 6–10 years of experience, and the other two had over 10 years. This group represented a knowledgeable and experienced cohort with relevant expertise in the built environment.

Key Performance Gaps and Challenges Affecting Buildings

This section highlights the main shortcomings and difficulties encountered in the buildings within Samburu County, based on residents' perceptions.

Table 1: Residents' Perceptions of Key Performance Gaps and Challenges Affecting Buildings

No.	Statement	SD		D		N		A		SA	
		F	%	F	%	F	%	F	%	F	%
1	There is inadequate routine maintenance, leading to frequent structural issues.	_	_	85	63.0	3	2.2	45	33.3	2	1.5

2	Security measures in most residential buildings are insufficient to prevent crime.	6	4.4	70	51.9	20	14.8	31	23.0	8	5.9
3	Poor ventilation and lighting negatively impact indoor air quality and comfort.	17	12.6	44	32.6	35	25.9	31	23.0	8	5.9
4	Water supply is unreliable, causing inconvenience for daily household activities.	12	8.9	54	40.0	24	17.8	40	29.6	5	3.7
5	Waste management and garbage collection services are ineffective, leading to poor sanitation.	14	10.4	39	28.9	19	14.1	54	40.0	9	6.7
6	Noise pollution from neighboring houses and streets affects residents' quality of life.	10	7.4	48	35.6	14	10.4	47	34.8	16	11.9
7	Most buildings are not designed to withstand the harsh environmental conditions of Samburu County.	8	5.9	49	36.3	7	5.2	53	39.3	18	13.3

A vast majority of respondents (63.0%) strongly disagreed or disagreed that routine maintenance is adequate, indicating that insufficient upkeep is a significant issue leading to frequent structural problems. Only a minority (34.8%) agreed or strongly agreed that routine maintenance is sufficient, suggesting this is a major gap affecting building longevity.

More than half of respondents (56.3%) felt that security measures in most residential buildings are insufficient to prevent crime, signaling a critical concern over residents' safety. Meanwhile, 28.9% agreed that security measures are adequate, revealing room for improvement in safeguarding properties.

Poor ventilation and lighting were identified as negative factors affecting indoor air quality and comfort by nearly half of the respondents (45.2%), who disagreed or strongly disagreed with the statement that these are sufficient. However, about 28.9% agreed or strongly agreed that ventilation and lighting are adequate, indicating mixed experiences.

Unreliable water supply emerged as a notable challenge, with 48.9% disagreeing or strongly disagreeing about its reliability, causing daily inconveniences for households. Conversely, 33.3% of respondents found the water supply dependable, though this is clearly an area needing improvement.

Waste management and garbage collection services were perceived as ineffective by 39.3% of respondents, who disagreed or strongly disagreed that these services meet sanitation needs. However, 46.7% agreed or strongly agreed that waste disposal is effective, reflecting variation in service quality across areas.

Noise pollution from neighbors and streets was a considerable problem, with 43.0% of respondents disagreeing or strongly disagreeing that noise levels are minimal. Meanwhile, 46.7% agreed or strongly agreed that noise pollution is controlled, showing differing neighborhood experiences.

A combined 52.6% of respondents agreed or strongly agreed that most buildings are not designed to withstand Samburu County's harsh environmental conditions, highlighting a vulnerability in construction standards. On the other hand, 42.2% disagreed or strongly disagreed, suggesting some buildings do meet environmental demands.

Using interview method, the study also sought to identify key performance gaps and challenges in building design, construction, and maintenance that negatively impact occupant satisfaction in Samburu County. One professional highlighted that:

> …the absence of an inspection department is the most significant limitation. They further noted that staff shortages hinder proper supervision of construction projects. This often leads to delays in addressing necessary repairs, and in some cases, buildings are constructed differently from what was initially approved, ultimately compromising project quality and occupant satisfaction (Professional 1, 2025).

Another respondent emphasized the importance of using qualified labor to minimize risks and ensure that approved building plans are accurately implemented.

The professional went to observe that:

> …the scarcity of trained personnel remains a persistent issue, resulting in substandard execution that falls outside the control of planning authorities. Furthermore, the unavailability of sufficient resources to establish a dedicated government inspection department in Maralal, alongside weak accountability and poor fund management has made consistent project monitoring and evaluation difficult, thereby affecting the overall performance of buildings (Professional 2, 2025).

A third perspective revealed that the lack of inspectors on the ground continues to pose a major challenge in county. The expert explained that

> …inspectors play a crucial role in ensuring that critical aspects such as sanitation are reviewed and authorized, especially after supervision. Yet, in most cases, inspections are not conducted promptly, undermining efficiency. They also pointed out that private developers frequently make unauthorized changes, such as expanding a building beyond what was approved, which raises safety concerns and violates legal requirements (Professional 3, 2025).

IV. DISCUSSION

The data reveals several critical performance gaps and challenges in Samburu County buildings, including inadequate maintenance, poor security measures, unreliable water supply, and ineffective waste management. Additionally, poor ventilation, lighting, noise pollution, and vulnerability to harsh environmental conditions further impact residents' comfort and safety. Addressing these challenges is essential to improve building quality, safety, and livability in the county. From professional's perspective, it became evident that performance challenges related to inadequate inspection mechanisms, limited skilled labor, and unapproved modifications during construction significantly hinder occupant satisfaction. Strengthening regulatory oversight, improving staffing, and enhancing accountability systems are necessary to address these gaps and promote safer, higher-quality residential buildings in Samburu County.

The study reveals critical shortcomings in both routine maintenance and security provision in residential buildings, pointing to broader systemic and institutional weaknesses in the housing sector. A significant 63.0% of respondents disagreed or strongly disagreed that routine maintenance is adequate. This reflects widespread dissatisfaction with the state of upkeep in residential facilities and suggests that the majority of buildings may be suffering from neglect, which can lead to structural deterioration, health hazards, and increased costs of rehabilitation. These findings are consistent with the observations of Olanrewaju and Abdul-Aziz (2015), who argue that poor maintenance practices significantly reduce building performance and contribute to the rapid decline of infrastructure in urban areas. Chusid (2014) further emphasizes that maintenance should be viewed not as a discretionary activity but as an essential component of the building lifecycle, vital for ensuring safety, functionality, and sustainability.

The relatively low proportion of respondents (34.8%) who agreed or strongly agreed that maintenance is sufficient further underlines the severity of the issue. Inadequate maintenance is often symptomatic of poor planning, limited budgetary allocation, lack of technical expertise, and ineffective regulatory enforcement. In the context of developing countries such as Kenya, these challenges are often compounded by rapid urbanization, unregulated construction, and overstretched public institutions. As noted by Ibem and Aduwo (2013), the absence of structured maintenance frameworks and a reliance on reactive rather than preventive strategies severely undermines the long-term usability of residential structures. This situation poses significant risks not only to the physical safety of occupants but also to the social and economic stability of communities that depend on these facilities.

Security, another fundamental aspect of residential well-being, was also identified as a major area of concern. The study found that 56.3% of respondents felt that current security measures in most residential buildings are inadequate to prevent crime. This perception suggests that a majority of residents live in environments where safety is not guaranteed, potentially affecting their psychological well-being and limiting their freedom

of movement and community engagement. Poor security infrastructure may include lack of perimeter fencing, non-functional gates, inadequate lighting, absence of surveillance cameras, and untrained or absent security personnel. According to Cozens et al. (2005), such deficiencies create environments that are conducive to criminal activities, and they stress the importance of integrating Crime Prevention Through Environmental Design (CPTED) principles in residential development to deter crime through spatial planning and environmental management.

The interaction between inadequate maintenance and weak security mechanisms suggests a compounding effect that may significantly lower the overall quality of housing. For instance, buildings that are poorly maintained often have broken locks, damaged windows, and deteriorating common areas, which not only reduce aesthetic appeal but also present opportunities for criminal access. This double vulnerability points to a failure in the holistic management of residential properties, where maintenance and security are treated as separate domains rather than as interrelated components of a safe and livable environment.

These findings align with the study by Ali and Rahmat (2010) that argue that sustainable housing cannot be achieved without simultaneous attention to physical infrastructure, human safety, and effective institutional oversight. The current study reinforces this perspective by highlighting that resident satisfaction and safety are heavily influenced by the day-to-day functionality and security of their living spaces. In contexts where buildings are privately owned but serve a large tenant population, the lack of accountability among landlords and absence of tenant advocacy further complicates the ability to enforce minimum standards of maintenance and security.

From a policy perspective, the results point to a need for targeted interventions aimed at strengthening building management practices. Government agencies responsible for housing and urban development should establish clear guidelines for maintenance schedules, enforce compliance through regular inspections, and create incentives for private owners to invest in long-term building care. Similarly, security standards should be integrated into building codes, with emphasis on passive security features such as lighting and visibility, as well as active measures like surveillance systems and trained guards. Community-based approaches that involve tenants in decision-making and safety initiatives may also contribute to improved outcomes.

V. CONCLUSION

This study brought to light some shortcomings in the state and management of buildings in Samburu County. Inadequate maintenance, poor security systems, unreliable water supply, poor ventilation, and ineffective waste management do compromise the comfort, health, and safety of residents. These issues are made worse by the presence of unapproved structural changes, limited skilled labor, and weak inspection practices during construction. As a result, many buildings are deteriorating quickly, exposing residents to avoidable risks and reducing the overall quality of housing in the region. The findings point to a need for well-coordinated interventions to address these challenges and improve the occupancy and safety of building environments in Samburu county.

VI. REFERENCES

African Development Bank. (2020). *African economic outlook 2020: Developing Africa's workforce for the future*. https://www.afdb.org

Commission on Revenue Allocation. (2022). *Annual report on the impact of devolution on equity in Kenya*. https://www.crakenya.org

Council of Governors. (2021). *Status of devolution: Annual report 2020/2021*. https://www.cog.go.ke

Government of Kenya. (2019). *Third medium term plan (2018–2022): Transforming lives – Advancing socio-economic development through the Big Four*. Ministry of Devolution and Planning.

Institute of Economic Affairs. (2022). *Devolution and public procurement in Kenya: Lessons from county governments*. https://www.ieakenya.or.ke

Kaburu, G., & Mwirigi, P. (2022). Public infrastructure and service delivery in devolved units: Evidence from Kenyan counties. *Journal of Public Administration and Policy Research, 14*(2), 45–58.

Kenya Institute for Public Policy Research and Analysis. (2023). *Kenya economic report 2023: Addressing regional disparities for inclusive development*. https://kippra.or.ke

Kenya National Bureau of Statistics. (2021). *Kenya statistical abstract 2021*. https://www.knbs.or.ke

Mutiso, J., & Wambua, A. (2021). Infrastructure performance and development inequality in Kenya's ASAL regions. *Eastern Africa Journal of Development Studies, 9*(1), 23–40.

Ochieng, D. (2020). Technical challenges in public building projects in Kenya. *International Journal of Construction Engineering and Management, 6*(3), 55–63.

Office of the Auditor General. (2022). *Audit report for County Government of Samburu for the year ended 30th June 2021*. https://www.oagkenya.go.ke

Transparency International Kenya. (2019). *Public infrastructure and corruption risks in Kenya's counties*. https://tikenya.org

Transparency International Kenya. (2020). *The impact of infrastructure governance on service delivery in Kenya*. https://tikenya.org

United Nations Development Programme. (2021). *Human development report 2021: Uncertain times, unsettled lives – Shaping our future in a transforming world*. https://hdr.undp.org

United Nations Environment Programme. (2019). *Environmental assessment of Kenya's ASAL counties: Drought, land degradation and climate challenges*. https://www.unep.org

United Nations Human Settlements Programme (UN-Habitat). (2020). *Infrastructure for sustainable urban development*. https://unhabitat.org

World Bank. (2021). *Kenya economic update: Infrastructure for inclusive growth*. https://www.worldbank.org/en/country/kenya