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Green City Identity:
A Multidimensional and Multiscalar Planning Construct for Sustainable Urban Development in Nairobi

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Abstract
Green City planning emphasises environmental performance, but gives less attention to how greenness is experienced, valued and sustained through ecological, spatial, experiential, social and institutional qualities. This study examined Green City Identity (GCI) in Nairobi City County across urban environments and planning scales. An embedded mixed-methods multiple-case design integrated surveys, field observations, key informant interviews, GIS analysis and document review across 12 environments. Data from 383 respondents and 16 purposively selected key informants were analysed using descriptive statistics, thematic analysis and triangulation. Six dimensions were examined, with manifestation scores ranging from 67.46% to 73.77%. Social and Community Value Identity ranked highest at 73.77%, while Ecological Identity ranked lowest at 67.46%. The findings establish GCI as a multidimensional and multiscalar planning construct that extends Green City assessment beyond ecological performance and provides an integrated basis for planning, managing and sustaining green urban environments in Nairobi, with potential relevance to other rapidly urbanising African cities.

Keywords: Green city identity, green infrastructure, green urbanism, Nairobi, place identity, sustainable urban development, urban planning

INTRODUCTION

Rapid urbanisation has become a defining challenge for contemporary urban planning. Although urban growth creates opportunities for economic development, innovation and social transformation, it also intensifies environmental degradation, climate risks, biodiversity loss, infrastructure deficits, socio-spatial inequalities and pressures on urban liveability (United Nations, 2019; UN-Habitat, 2020; UN-Habitat, 2022; World Bank, 2023). These challenges have increased the need for planning approaches that integrate environmental sustainability with social wellbeing, functional urban systems, and place qualities.

The Green City has emerged as an important planning paradigm in response to these challenges. Green City planning promotes the integration of ecological systems into urban development to improve environmental quality, climate resilience and quality of life (Lehmann, 2011; Beatley, 2012; Waldheim, 2016). Related approaches, including green infrastructure, ecosystem services, nature-based solutions and biophilic urbanism, have further demonstrated the environmental, social and economic functions of urban green systems (Benedict & McMahon, 2006; Carter et al., 2015; European Commission, 2021).

Despite these advances, Green City scholarship has largely evaluated urban greenness through environmental and performance-oriented indicators such as vegetation cover, biodiversity, energy efficiency, ecosystem services, carbon reduction and ecological infrastructure (Jabareen, 2006; Alberti, 2008; Beatley, 2012). These indicators are important for assessing environmental performance, but provide a limited account of how urban greenness is experienced, perceived, valued and incorporated into the

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identity of cities. The research problem is therefore not simply the provision of green infrastructure or environmental performance, but the limited integrated understanding of how ecological, spatial, experiential, social and institutional qualities collectively shape the identity of green urban environments across different urban systems and planning scales.

This perspective provides the basis for Green City Identity (GCI). This paper conceptualises GCI as the distinctive socio-ecological character of a city arising from the interaction of environmental quality, place identity, urban functionality, human experience and planning and management processes. GCI therefore extends conventional Green City thinking by considering how urban greenness is created, experienced and sustained through multiple interrelated dimensions rather than ecological performance alone.

This integrated perspective is particularly relevant in rapidly urbanising African cities, where urban growth is accompanied by environmental degradation, infrastructure deficits, informal development, socio-spatial inequality, institutional fragmentation and increasing pressure on ecological systems (Dahiya, 2012; UN-Habitat, 2022; African Development Bank, 2022). Although green infrastructure, climate resilience and sustainable urban development have increasingly entered urban policy and planning agendas, limited empirical attention has been given to how ecological, visual, mobility, experiential, social and institutional qualities collectively shape the identity of green urban environments.

Nairobi provides a relevant context for examining this gap. Historically, its urban planning incorporated parks, open spaces, road reserves and other landscape elements as part of the spatial structure (White et al., 1948), contributing to the longstanding image of Nairobi as the "Green City in the Sun" (UN-Habitat, 2020). Over time, urban growth, infrastructure expansion and changing land-use patterns have placed increasing pressure on these green and public-space assets, making Nairobi an important context for examining how ecological, spatial, social and institutional qualities contribute to contemporary Green City Identity.

Aim and Objectives of the Research

The overall aim was to examine the manifestation of Green City Identity in Nairobi City County across different urban systems and planning scales.

The specific objectives were to:

i. Assess the manifestation of the six dimensions of Green City Identity across the selected urban environments.
ii. Compare how Green City Identity is expressed across residential neighbourhoods, public and civic spaces, and transport landscapes.
iii. Examine how Green City Identity operates across plot, neighbourhood and city planning scales.

The paper makes three related contributions. First, it advances Green City Identity as a multidimensional planning construct rather than one concerned primarily with ecological performance. Second, it provides empirical support for six interrelated GCI dimensions. Third, it demonstrates their manifestation across different urban systems and planning scales, linking ecological performance with visual character, accessibility, environmental experience, social value, and long-term management and sustainability within an African urban context.

THEORY

This section reviews the evolution of Green City planning, the transition from environmental performance to Green City Identity, and the six dimensions used in the study. It concludes with the research gap, theoretical framework and conceptual framework guiding the empirical analysis.

Green Cities as an Evolving Planning Paradigm

Green City planning has evolved from reconciling urban development with environmental quality towards integrated approaches linking ecological systems, urban form, infrastructure and human wellbeing. Its foundations include the Garden City Movement, ecological planning, sustainable development and landscape urbanism, followed by Green Urbanism, green infrastructure, ecosystem services and nature-based solutions.

Howard's (1902) Garden City concept linked urban development with natural landscapes, open space and environmental health. McHarg's (1969) ecological planning strengthened the role

of environmental systems in shaping development patterns, while landscape urbanism emphasised landscape processes as structuring elements of urban form (Waldheim, 2016). Together, these traditions established green environments as integral to urban planning rather than residual elements.

Sustainable development broadened this perspective by integrating environmental, social, and economic objectives (World Commission on Environment and Development, 1987). Campbell's (1996) Planner's Triangle and Jabareen's (2006) sustainable urban form framework further emphasised reconciliation of these objectives through integrated planning.

Green Urbanism extended this integration to urban organisation and performance. Beatley (2012) emphasises links among ecological systems, land use, transport, housing, and public space, while Lehmann (2011) highlights sustainable mobility, green infrastructure, resource efficiency, and environmentally responsive urban form. Alberti (2008) demonstrates the interdependence of human activities and ecological processes in urban ecosystems. Green infrastructure and ecosystem-services scholarship further shows that connected green networks provide ecological, recreational, health, and social functions (Benedict & McMahon, 2006; Carter et al., 2015).

Collectively, this literature shows that urban greenness extends beyond vegetation to interconnected ecological, spatial and social functions. However, it provides less direct explanation of how green environments become recognisable, meaningful and experienced as part of urban identity.

Green City Performance to Green City Identity

Green City scholarship has developed increasingly sophisticated measures of environmental performance, including vegetation, biodiversity, ecosystem services, carbon reduction, energy efficiency and green infrastructure (Jabareen, 2006; Alberti, 2008; Beatley, 2012). While important, these measures do not fully explain how greenness is perceived, experienced, valued, or incorporated into place identity.

Cities are ecological, spatial, social, cultural and institutional environments, and urban identity develops through interactions among physical form, perception, experience, social practices and planning processes (Lynch, 1960; Relph, 1976; Proshansky et al., 1983; Healey, 1997). Green environments may therefore contribute to identity through ecological qualities, visual character, accessibility, environmental experience, social use and institutional stewardship.

Green City Identity extends this perspective by providing an integrative framework through which ecological, spatial, functional, experiential, social and institutional qualities are considered together. The focus is therefore not simply whether a city is environmentally green, but how green qualities are manifested, experienced and sustained across different urban environments.

Dimensions of Green City Identity

The theoretical synthesis indicates that Green City Identity cannot be explained through ecological performance alone. The five perspectives collectively point to ecological, visual, functional, experiential, social and institutional qualities through which urban greenness is created, perceived, used and sustained. These qualities are consolidated in this paper into six interrelated dimensions of GCI: Ecological Identity; Visual and Symbolic Identity; Accessibility and Mobility Identity; Comfort and Safety Identity; Social and Community Value Identity; and Management and Sustainability Identity.

The six dimensions are analytically distinct but conceptually interrelated. They do not correspond exclusively to individual theories; rather, each dimension draws on several perspectives within the integrated conceptualisation of GCI. The dimensions therefore provide a common analytical structure for examining how green urban environments are manifested across different settings and planning scales.

Ecological Identity represents the environmental foundation of GCI. Drawing from urban ecology, Green Urbanism and green infrastructure scholarship, it concerns the integration and continuity of ecological systems and processes within the urban environment. It encompasses vegetation, urban forests, parks, biodiversity, water systems, green infrastructure, ecological connectivity, and ecosystem functions (Alberti, 2008; Beatley, 2012; Benedict & McMahon, 2006;

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Carter et al., 2015). It therefore considers not only the presence of vegetation but also the functional contribution and connectivity of ecological resources.

Visual and Symbolic Identity concerns the contribution of green qualities to the visual character, recognisability, legibility, and symbolic meaning of urban places. Informed by Place Identity Theory and urban image scholarship, it encompasses landscape character, streetscapes, landmarks, public open spaces, tree-lined avenues and visual coherence (Lynch, 1960; Relph, 1976). In Nairobi, this dimension is particularly relevant to how the "Green City in the Sun" identity is expressed and experienced in the contemporary urban landscape.

Accessibility and Mobility Identity captures the functional relationship between green environments and movement. Drawing from sustainable mobility, spatial planning and Green Urbanism, it concerns the extent to which green spaces and ecological assets are reachable, connected and usable through pedestrian networks, cycling infrastructure, public transport, streets and other mobility systems. It also recognises transport corridors as potential components of green urban identity where landscape, ecological and public-realm functions are integrated.

Comfort and Safety Identity reflects the experiential conditions that influence people's willingness to occupy, use and return to green environments. It encompasses environmental comfort, shade, thermal conditions, cleanliness, maintenance, walkability, lighting and perceived safety. Green infrastructure alone does not guarantee meaningful experience; its value is mediated by the conditions under which people encounter and use it.

Social and Community Value Identity captures the social, cultural and collective meanings generated through interaction with green environments. It encompasses social interaction, recreation, community cohesion, cultural expression, public health, collective wellbeing and place attachment (Proshansky et al., 1983; Healey, 1997). This dimension positions green environments as both ecological and social infrastructure.

Management and Sustainability Identity represents the institutional conditions through which green environments are planned, implemented, coordinated, maintained, and sustained. Drawing from Collaborative Planning Theory and Sustainable Cities Theory, it encompasses planning systems, environmental regulation, institutional coordination, maintenance, stakeholder participation, community stewardship and long-term sustainability (Healey, 1997; UN-Habitat, 2022).

Synthesis and Research Gap

The literature reviewed demonstrates substantial development of Green City thinking around ecological performance, green infrastructure, sustainability and urban environmental quality. However, these approaches provide less explicit explanation of how urban greenness becomes recognisable, meaningful, accessible, experienced, socially valued and institutionally sustained as part of urban identity. This constitutes the conceptual gap addressed by this paper.

Theoretical Framework

Green City Identity (GCI) requires a theoretical foundation capable of explaining relationships among environmental conditions, human experience, interconnected urban systems and the institutional processes through which green environments are planned and sustained. No single perspective adequately captures these relationships. The paper therefore draws on Place Identity Theory, Systems Theory, Collaborative Planning Theory, Sustainable Cities Theory and Green Urbanism, which collectively support GCI as an integrated, multidimensional and multiscalar planning construct.

Place Identity Theory explains relationships between people and physical environments. Relph (1976) emphasises the experiential character of place, while Proshansky (1978) and Proshansky et al. (1983) link interaction with physical settings to individual and collective identity. Lynch (1960) highlights imageability and legibility in shaping urban perceptions. Applied to GCI, these perspectives explain how greenness contributes to visibility, recognisability, meaning, use, and attachment, informing its visual, symbolic, and experiential dimensions.

Systems Theory views the city as an interconnected system rather than independent elements. von

Bertalanffy (1968) conceptualises systems through relationships among interacting elements whose connections influence the whole. Applied to urban environments, this perspective highlights relationships among ecological systems, buildings, neighbourhoods, public spaces, mobility networks, communities and institutions. GCI can therefore be understood as an emergent characteristic arising from interactions among these elements and dimensions.

Collaborative Planning Theory adds the institutional and participatory dimension. Healey (1997) emphasises participation, institutional coordination, negotiation and collective action in producing and managing places. Because green environments require continuing planning, maintenance, regulation and stewardship, institutional responsiveness and stakeholder participation support their continuity. This perspective informs the Management and Sustainability Identity dimension.

Sustainable Cities Theory and Green Urbanism provide the broader planning context. Sustainable urban development requires integration of environmental, social and economic objectives (World Commission on Environment and Development, 1987; Campbell, 1996), while Green Urbanism emphasises ecological systems, green infrastructure, sustainable mobility and environmentally responsive urban form (Lehmann, 2011; Beatley, 2012). Together, these perspectives position urban greenness within wider questions of functionality and sustainability.

Taken together, the five perspectives perform complementary functions: Green Urbanism and Sustainable Cities Theory establish the environmental and planning context; Systems Theory explains interdependence; Place Identity Theory explains how environmental qualities become recognisable, meaningful and experienced; and Collaborative Planning Theory addresses the participatory and institutional processes through which they are planned, coordinated and sustained. Their synthesis supports understanding GCI as an emergent condition produced through interactions among ecological, spatial, functional, experiential, social and institutional qualities, while recognising that the perspectives operate at different explanatory levels rather than as interchangeable theories.

Conceptual Framework

The proposed framework positions Green City Identity (GCI) as an integrated, multidimensional, and multiscalar planning construct derived from Green Urbanism, Place Identity Theory, Systems Theory, Collaborative Planning Theory, and Sustainable Cities Theory. It operationalises GCI through six interrelated dimensions: Ecological Identity; Visual and Symbolic Identity; Accessibility and Mobility Identity; Comfort and Safety Identity; Social and Community Value Identity; and Management and Sustainability Identity.

The framework assumes that GCI emerges through interaction among these dimensions rather than from any single attribute. Ecological conditions may strengthen visual character and environmental comfort; accessibility may facilitate use and social interaction; while effective management and sustainability practices may maintain ecological, spatial and social qualities over time.

Figure 1 presents the conceptual framework, showing how the five theoretical perspectives inform the six GCI dimensions and how these dimensions are examined across plot, neighbourhood and city scales and within residential, public/civic and transport environments. Empirical examination integrates survey responses, field observations, key informant evidence and spatial analysis, providing the analytical link between the theoretical conceptualisation of GCI and its examination in Nairobi.

RESEARCH METHODS

This section describes the study area and case selection, research design, data collection, operationalisation, spatial and observational analysis, data analysis, reliability and validity, and ethical procedures.

Study Area and Case Selection

The paper examines Nairobi City County, Kenya, a rapidly urbanising metropolitan area characterised by diverse ecological resources, public open spaces, and contrasting patterns of urban development. Nairobi has historically been associated with the identity of the 'Green City in the Sun', reflecting a planning tradition that incorporates public open spaces, urban forests,

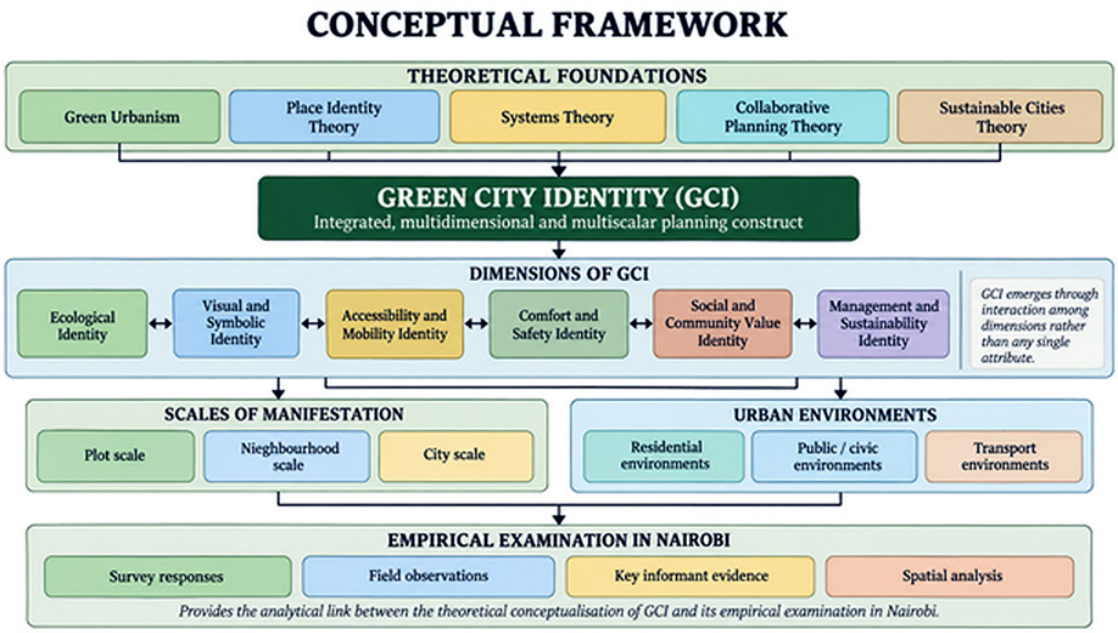


FIGURE 1
Conceptual framework of Green city identity
Source: Author, 2026

tree-lined avenues, and integrated landscape systems. Rapid urbanisation, infrastructure expansion, changing land-use patterns, and population growth have placed increasing pressure on ecological resources and the quality and continuity of green urban environments. These conditions provide an appropriate context for examining how Green City Identity is manifested across urban settings and planning scales.

An embedded mixed-methods multiple-case study design was adopted. Twelve purposively selected case-study environments were examined to capture variation in urban form, socioeconomic context, environmental conditions, and function. The cases were organised into three complementary urban environment categories: five residential neighbourhoods-Muthaiga, Thome, Lang'ata, Umoja and Kaloleni; four public and civic spaces-Aga Khan Walk, KICC Public Open Space, National Museum Grounds and Michuki Memorial Park; and three transport landscapes along the Nairobi-Thika Superhighway-Muthaiga, Roasters and Roysambu interchanges. Residential neighbourhoods were selected to represent everyday and local-scale environments in which green qualities are experienced through housing, streets, neighbourhood spaces and community life. Public and civic spaces were selected to represent collectively accessible environments where ecological, visual, social, recreational and cultural qualities intersect. Transport landscapes were selected to represent mobility-oriented environments in which accessibility, connectivity, environmental quality and public experience interact with metropolitan infrastructure. Together, the three categories enabled comparative examination of how the six GCI dimensions are manifested across contrasting urban functions and planning scales. The cases were therefore selected for their complementary analytical value rather than as statistically representative samples of all urban environments in Nairobi.

Figure 2 summarises the selected case-study environments in Nairobi City County by urban environment category.

The selected environments were also organised analytically according to their planning function and scale. Green Buildings was not treated as a separate sampled case category; plot-scale building and landscape elements were observed across the twelve selected case-study environments and used to interpret GCI at the plot scale. **Table 1** summarises the relationship between the planning domains, scales, and representative case-study environments.

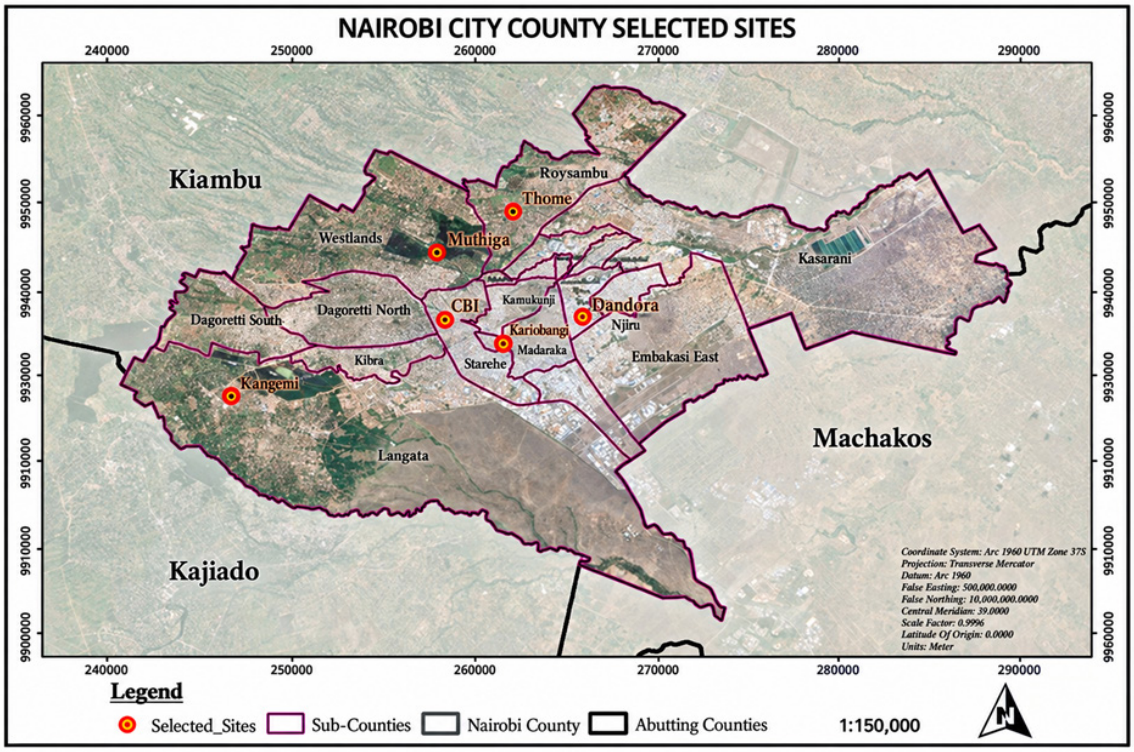


FIGURE 2
Selected case-study environments in Nairobi City County
Source: Author, 2026

TABLE 1
Green city planning domains, planning scales and representative case-study environments

Green City Planning Domain	Planning Scale	Representative Case-Study Environments
Green Buildings	Plot	Represented through building and landscape elements observed across all selected case-study environments.
Green Neighbourhoods	Neighbourhood	Muthaiga, Thome, Lang'ata, Umoja and Kaloleni
Green Infrastructure	City	Aga Khan Walk, KICC Grounds, National Museum Grounds and Michuki Memorial Park
Green Transport	City	Muthaiga Interchange (Exit 3), Roasters Interchange (Exit 5) and Roysambu Interchange (Exit 6)

Source: Field survey, 2026

Research Design
The embedded mixed-methods design integrated quantitative, qualitative, observational, documentary, and spatial evidence to examine the six GCI dimensions across the selected environments (Yin, 2018; Creswell & Plano Clark, 2018).

Data Collection
Primary data were collected through structured questionnaires, key informant interviews, and field observations. Secondary data were obtained from planning, environmental and institutional documents, remotely sensed data, existing urban maps and other relevant spatial sources.

A total of 383 valid survey responses were obtained across the twelve case-study environments. The quantitative sample size was informed by Cochran's (1977) formula for large populations, which yielded a planning target of approximately 384 respondents. Because the case-study environments

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were purposively selected, this calculation was used as a sample-size planning benchmark rather than as evidence of statistical representativeness of all urban environments in Nairobi. Respondents were selected within the case-study environments using systematic sampling to capture residents, visitors, workers or employees, traders or business operators, commuters or pedestrians, and other users of the selected environments. This captured diverse everyday interactions with green urban environments. The distribution of respondents across the twelve sites is presented in **Table 2**.

The distribution of respondents across the case-study environments was not treated as an equal-allocation design. Variation in respondent numbers reflects the application of systematic sampling across the selected environments. The purpose was to obtain user perspectives across contrasting urban environments rather than statistically representative samples for individual sites. The principal quantitative analysis therefore focuses on the combined sample, while site-level findings are interpreted as contextual patterns rather than statistically representative estimates.

The qualitative component comprised 16 purposively selected key informants. Six of the 16 key informants were drawn from the Nairobi City County Planning Department, NEMA, KURA, KeNHA, NMK and KICC. The remaining 10 key informants were distributed across professionals such as urban planners, architects, landscape architects, environmental practitioners, and community representatives. Selection was based on professional knowledge, institutional responsibilities, or direct experience relevant to urban planning, environmental management, infrastructure, landscape, and community use.

Measurement and Operationalisation

The survey instrument was developed from the conceptual framework and literature supporting the six GCI dimensions: Ecological Identity; Visual and Symbolic Identity; Accessibility and Mobility Identity; Comfort and Safety Identity; Social and Community Value Identity; and Management and Sustainability Identity. Each dimension was operationalised through observable and perceptual attributes. Ecological Identity addressed vegetation, biodiversity, green infrastructure, ecological connectivity, and environmental conditions; Visual and Symbolic Identity considered landscape character, streetscapes, landmarks, imageability, and recognisability; and Accessibility and Mobility Identity examined access, walkability, connectivity, and relationships between green assets and movement systems.

TABLE 2

Green city planning domains, planning scales and representative case-study environments

Case-study Environment	Type of Urban Environment	Respondents (n)	Percentage (%)
Michuki Memorial Park	Public/civic space	30	7.8
National Museum Grounds	Public/civic space	40	10.4
KICC Public Open Space	Public/civic space	40	10.4
Aga Khan Walk	Public/civic space	40	10.4
Thika Road Exit 3- Muthaiga	Transport landscape	30	7.8
Thika Road Exit 5- Roasters	Transport landscape	30	7.8
Thika Road Exit 6 - Roysambu	Transport landscape	28	7.3
Muthaiga	Residential neighbourhood	13	3.4
Thome	Residential neighbourhood	38	9.9
Umoja	Residential neighbourhood	31	8.1
Kaloleni	Residential neighbourhood	23	6.0
Lang'ata	Residential neighbourhood	40	10.4
Total		**383**	**100.0**

Source: Field survey, 2026

Comfort and Safety Identity addressed environmental comfort, shade, thermal conditions, cleanliness, maintenance, lighting, and perceived safety. Social and Community Value Identity covered social interaction, recreation, community cohesion, cultural activities, place attachment, and collective use, while Management and Sustainability Identity addressed maintenance, institutional responsiveness, planning and regulatory processes, stakeholder participation, environmental management, and long-term stewardship.

Survey items used a five-point Likert scale ranging from very low to very high manifestation. The questionnaire was pre-tested to improve clarity, relevance, and consistency, and indicators were reviewed against the conceptual framework.

Spatial and Observational Analysis

Field observation documented vegetation, landscape structure, accessibility, circulation, public-space conditions, environmental comfort, safety, social use, and maintenance, supported by photographic documentation. Spatial data were drawn from Nairobi City County plans, existing urban maps, satellite imagery, field GPS measurements, and site verification. ArcGIS was used to examine proximity, accessibility, and connectivity of green assets through spatial and network-based analysis, providing evidence for interpreting the ecological, accessibility, visual, and functional dimensions of GCI.

Relevant planning policies, development plans, and institutional documents were reviewed to contextualise planning intentions, environmental management, infrastructure provision, and institutional responsibilities. Documentary evidence supported triangulation and interpretation rather than serving as a separate quantitative dataset.

Data Analysis

Quantitative survey data were analysed through descriptive statistics and presented using frequencies, percentages, means, and standard deviations to compare the relative manifestation of the six GCI dimensions. Responses on the five-point Likert scale were expressed as normalised percentage indices using the formula: Index Score (%) = (Mean Score / 5) × 100, where 5 represents the maximum possible score. Values therefore range from 20% to 100%, with higher scores indicating stronger perceived manifestation.

Qualitative evidence from interviews, observations, photographs and documentary sources was analysed thematically around the six GCI dimensions. GIS-based spatial and proximity analyses provided evidence on environmental and locational patterns. The quantitative, qualitative and spatial evidence were triangulated through side-by-side comparison of convergent and divergent findings across the selected urban environments and planning scales, enabling survey-based manifestation scores to be interpreted alongside observed site conditions, informant perspectives and spatial patterns.

Reliability, Validity and Trustworthiness

The questionnaire was pre-tested to improve clarity, consistency and reliability. Internal consistency of the multi-item GCI dimensions was assessed using Cronbach's alpha based on the 383 valid responses. The coefficients were 0.863 for Ecological Identity, 0.858 for Visual and Symbolic Identity, 0.809 for Accessibility and Mobility Identity, 0.788 for Comfort and Safety Identity, 0.642 for Social and Community Value Identity, and 0.859 for Management and Sustainability Identity. The overall 41-item GCI instrument recorded a Cronbach's alpha of 0.943. These coefficients indicate good to strong internal consistency for five dimensions, while the lower coefficient for Social and Community Value Identity warrants cautious interpretation.

Content validity was addressed by aligning questionnaire items with the conceptual framework and supporting literature. Formal construct-validity testing, such as exploratory or confirmatory factor analysis, was not undertaken in this paper; consequently, the findings are interpreted as empirical evidence of manifestation of the proposed dimensions rather than as formal statistical validation of the measurement structure.

Trustworthiness was strengthened by triangulating survey findings with key informant interviews, field observations, GIS analysis and document review. Comparison of these sources during interpretation helped identify convergent patterns and contextual differences across the selected environments.

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Ethical Considerations

A research permit was obtained from the National Commission for Science, Technology and Innovation (NACOSTI), with clearance also sought from the Department of Urban and Regional Planning, University of Nairobi, and the supervisors. Participation in surveys and interviews was voluntary, with respondents informed of the research purpose before data collection. Consent procedures were followed, information was treated confidentially, and respondents and informants were not individually identified. The research complied with relevant institutional requirements for academic research and data collection.

RESULTS

The results are presented in two stages: first, the overall manifestation of the six Green City Identity dimensions; and second, contextual patterns across residential, public/civic and transport environments and across the three planning scales.

Manifestation of the Dimensions of Green City Identity

The analysis examined the relative manifestation of the six dimensions of Green City Identity across the selected case-study environments as illustrated in **Table 3**.

The six dimensions recorded mean scores between 67.46% and 73.77%. Social and Community Value Identity recorded the highest score (73.77%), followed by Accessibility and Mobility Identity (72.78%) and Visual and Symbolic Identity (71.81%). Comfort and Safety Identity recorded 69.72%, while Management and Sustainability Identity and Ecological Identity recorded 68.26% and 67.46%, respectively. The relatively narrow range of mean scores indicates that the six dimensions were comparatively close in their reported levels of manifestation, with no single dimension substantially exceeding the others.

Figure 3 illustrates the relative manifestation of the six Green City Identity dimensions in Nairobi.

The spatial analysis showed that GCI was manifested differently across residential neighbourhoods, public and civic spaces, and transport landscapes. In the residential environments, manifestations reflected combinations of private and public landscapes, neighbourhood open spaces, accessibility, and community use. Field observations indicated stronger ecological and visual characteristics in Muthaiga, associated with mature vegetation and private landscapes, while Thome, Lang'ata, Umoja and Kaloleni demonstrated varying relationships among residential form, landscape, mobility and community use.

Public and civic spaces demonstrated GCI through combinations of accessibility, visual character, recreation, ecological quality and cultural meaning. Field observations indicated pedestrian accessibility and urban visual character at Aga Khan Walk, ecological and recreational functions at Michuki Memorial Park, and combinations of cultural, civic, landscape and social functions at the National Museum Grounds and KICC Public Open Space.

The transport landscapes along the Nairobi-Thika Superhighway demonstrated another expression of GCI through landscape treatment, planting, environmental buffers, visual quality

TABLE 3

Descriptive statistics of the six dimensions of Green city identity

Dimension	Mean (%)	Standard Deviation	Rank
Social and Community Value Identity	73.77	13.11	1
Accessibility and Mobility Identity	72.78	12.92	2
Visual and Symbolic Identity	71.81	14.67	3
Comfort and Safety Identity	69.72	12.70	4
Management and Sustainability Identity	68.26	15.09	5
Ecological Identity	67.46	15.65	6

Source: Field survey, 2026

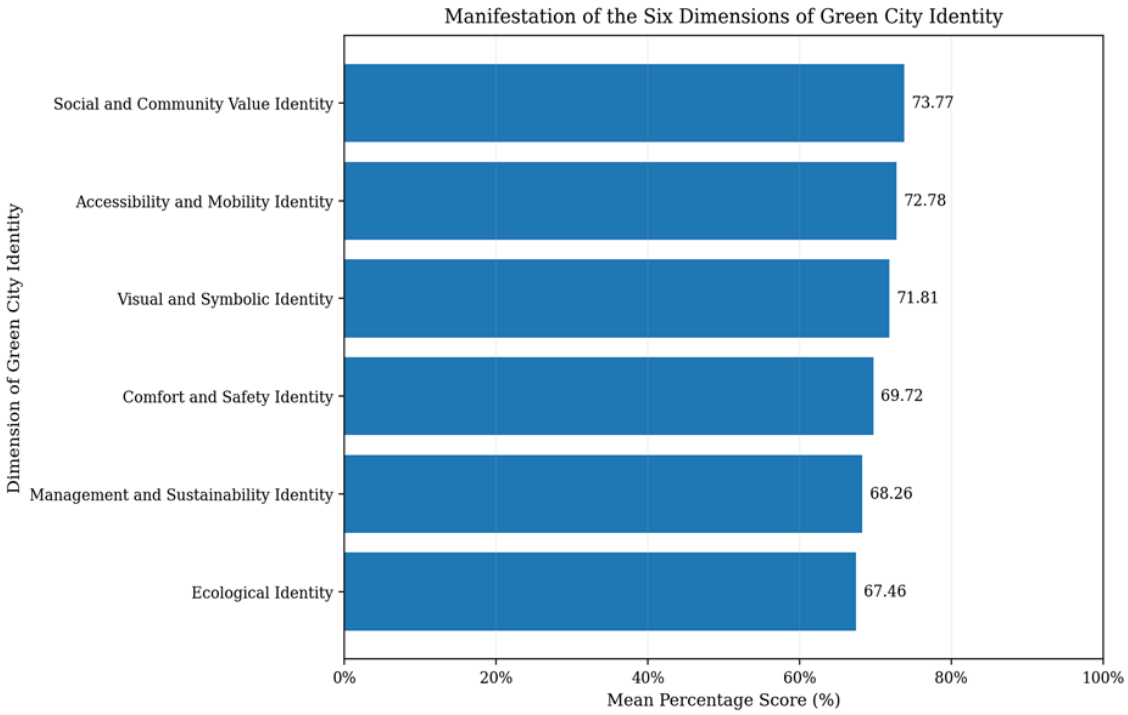


FIGURE 3
Manifestation of the six dimensions of green City identity in Nairobi
Source: Field Survey, 2026

and relationships between mobility and the public realm. Field observations indicated that these elements contributed to the environmental and public-realm character of the transport environments, suggesting that transport corridors can form part of the wider urban landscape through which green identity is experienced.

These case-level patterns were also interpreted alongside evidence from the 16 key informants, whose perspectives were used to contextualise issues relating to planning, environmental management, infrastructure, landscape and community use. Qualitative evidence contextualised these patterns across residential, public/civic and transport environments, highlighting greenery and landscape character, social and recreational use, and persistent gaps in shade, maintenance and environmental comfort.

Across the case environments, the six dimensions therefore appeared in different combinations rather than through a uniform physical form. The findings also indicate manifestation across plot, neighbourhood and city scales: building landscapes and private green spaces contribute at plot level; streets, public spaces and local movement networks shape neighbourhood experience; while ecological systems, public spaces and metropolitan transport corridors contribute to wider city-scale connectivity and image.

DISCUSSION

This section interprets the principal findings in relation to the theoretical perspectives and reviewed literature, with particular attention to the six GCI dimensions, differences among urban environment categories, multiscalar expression and planning implications.

The findings indicate that Green City Identity is broader than ecological greenness alone. The relatively high scores for Social and Community Value Identity, Accessibility and Mobility Identity, and Visual and Symbolic Identity suggest that green urban environments acquire identity through how they are used, accessed, and perceived, as well as through ecological characteristics. This is consistent with Place Identity Theory, which emphasises relationships between people, physical settings, and meaning (Relph, 1976; Proshansky et al., 1983), and Collaborative Planning Theory, which recognises the social and collective production of place (Healey, 1997). Because Social and Community

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Value Identity recorded the lowest internal-consistency coefficient (Cronbach's alpha = 0.642), its first-place ranking is interpreted descriptively and with caution rather than as evidence that it is statistically distinct from the other dimensions.

The high score for Accessibility and Mobility Identity reinforces Green Urbanism's emphasis on integrating green infrastructure with movement systems and urban connectivity (Beatley, 2012; Lehmann, 2011). Similarly, the prominence of Visual and Symbolic Identity supports Lynch's (1960) emphasis on imageability and the role of physical environments in shaping urban perception. These findings indicate that GCI is communicated partly through visible landscape character and accessibility. This is consistent with empirical evidence from Nairobi. Odhengo et al. (2024) found that accessibility, quality, safety, and management significantly shape the use and perceived value of urban green spaces, while Mbugua et al. (2024) reported that location, accessibility, security, and infrastructure influenced visitors' use and satisfaction with green spaces in Nairobi. These findings support the interpretation of Accessibility and Mobility Identity and Comfort and Safety Identity as integral rather than secondary aspects of GCI.

The comparatively lower scores for Ecological Identity and Management and Sustainability Identity are also significant. The ecological result does not imply that ecological resources are unimportant; rather, their perceived manifestation was weaker relative to the social, accessibility, and visual dimensions. Ecological resources may be present without being continuous, functionally integrated, or consistently experienced across urban environments. This distinction is important because GCI depends not only on the presence of ecological assets but also on their integration with wider urban functions. The lower Management and Sustainability Identity score similarly highlights the importance of maintenance, institutional coordination, regulation, participation, and long-term stewardship in sustaining green urban environments (Healey, 1997; UN-Habitat, 2022). This also resonates with Odhengo et al. (2024), who identified effective management and inclusive design as important conditions for maximising the benefits of urban green spaces in Nairobi.

The spatial evidence further demonstrates that GCI is contextual and multiscalar. Residential neighbourhoods primarily express combinations of everyday greenery, neighbourhood accessibility, comfort and community use; public and civic spaces bring ecological, visual, recreational, cultural and social functions into closer interaction; while transport landscapes demonstrate how mobility infrastructure can contribute to green identity through planting, landscape treatment and environmental buffering. These differences support the Systems Theory perspective that urban environments comprise interconnected elements rather than isolated units (von Bertalanffy, 1968). GCI also operates across plot, neighbourhood and city scales: plot-level landscape qualities contribute to local experience, neighbourhood networks connect green and social spaces, and city-level infrastructure and ecological systems influence continuity and connectivity.

Taken together, the findings provide empirical support for GCI as a multidimensional and multiscalar planning construct. The six dimensions are analytically distinct but interrelated, providing complementary perspectives on how green urban environments are created, perceived, experienced and sustained. The results should not, however, be interpreted as demonstrating causal relationships among the dimensions. GCI is neither synonymous with vegetation quantity nor reducible to visual appearance; it encompasses ecological, spatial, experiential, social and institutional qualities.

CONCLUSION

This paper conceptualised and examined Green City Identity (GCI) as a multidimensional and multiscalar planning construct across selected urban environments in Nairobi City County. The analysis integrated five complementary theoretical perspectives and examined six interrelated dimensions across residential, public/civic and transport environments.

The findings demonstrate that all six dimensions were manifested, although their relative expression varied. Social and Community Value Identity recorded the highest mean score (73.77%), followed by Accessibility and Mobility Identity (72.78%) and Visual and Symbolic Identity (71.81%), while Ecological Identity recorded the lowest (67.46%). This indicates that GCI extends beyond ecological attributes to encompass how

green environments are accessed, perceived, experienced, socially valued, and managed.

The findings further show that GCI is manifested differently across residential neighbourhoods, public and civic spaces, and transport landscapes, as well as across plot, neighbourhood, and city scales. It is therefore not a uniform physical condition but an expression of interconnected ecological, spatial, experiential, social and institutional qualities within particular urban contexts.

The paper addresses the identified conceptual gap by bringing these qualities together within a single multidimensional and multiscalar planning construct. Its theoretical contribution extends Green City thinking beyond ecological provision and environmental performance to encompass how green urban environments are perceived, used, experienced, socially valued and sustained. The framework therefore provides a basis for examining GCI as an integrated urban condition.

Limitations

The study was based on twelve purposively selected environments in Nairobi City County, so the findings should not be generalised statistically to all urban environments or cities. Respondent numbers also varied across individual sites and were intended to provide contextual case coverage rather than representative site-level estimates. Although the six dimensions showed generally acceptable internal consistency, Social and Community Value Identity recorded a lower Cronbach's alpha (0.642) and should be interpreted cautiously. Formal construct-validity testing was not undertaken; accordingly, the results provide empirical evidence of the manifestation of the proposed dimensions rather than formal statistical validation of the GCI measurement structure.

RECOMMENDATIONS

i. *Integrate GCI into urban planning and design*. The Nairobi City County Government should incorporate the six GCI dimensions into planning, landscape, public-space, and infrastructure decisions. This would move green planning beyond isolated interventions towards integrated urban environments.
ii. *Strengthen management and long-term stewardship*. Given the comparatively lower manifestation of Management and Sustainability Identity (68.26%), the Nairobi City County Government and relevant public-space and infrastructure agencies should prioritise maintenance, institutional coordination, stakeholder participation, monitoring, and long-term stewardship to sustain green urban qualities.
iii. *Strengthen multiscalar green connectivity.* Relevant county and national planning, roads and infrastructure institutions should treat residential neighbourhoods, public and civic spaces, and transport landscapes as interconnected elements across plot, neighbourhood and city scales, with greater attention to green networks, pedestrian accessibility, landscape treatment and public-space continuity.
iv. *Improve ecological integration*. Given the comparatively lower Ecological Identity (67.46%), planning interventions should strengthen the continuity, functional integration and everyday experience of green infrastructure by connecting ecological resources with public spaces, movement systems and neighbourhood environments.

Future Research

Future research should test and refine the six-dimensional GCI framework using larger, comparative samples in other Kenyan and comparable urban contexts. Exploratory and confirmatory factor analysis, longitudinal assessment and more balanced site-level sampling would help evaluate construct validity, temporal change and the wider applicability of the framework.

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