



Mapping and Comparing Place Theory, Park Functions, and Quality of Life in Urban Park Studies: A VOS-Based Bibliometric Analysis

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Abstract

Urban Park scholarship has moved beyond a conventional concern with the quantitative provision of green open space toward a more integrated understanding of parks as socio-ecological, experiential, and governance-related urban systems. This study aims to map and compare the theoretical positions of Place Theory, park-function theory, and Quality of Life (QoL) within contemporary urban park research using a VOS-based bibliometric approach. The dataset comprised 532 RIS records retrieved from ScienceDirect, of which 531 unique documents remained after deduplication. Terms were extracted from article titles, keywords, and abstracts, normalized, and analyzed through co-occurrence network and density visualization. The findings reveal seven knowledge clusters: (1) place, placemaking, and spatial experience; (2) urban design, planning, governance, and QoL; (3) green infrastructure, ecology, and resilience; (4) accessibility, health, and equity; and three smaller but emerging clusters related to sociability, geotagging, and big data. The most prominent terms are place, governance, community, sustainability, placemaking, activity, participation, perception, accessibility, health, wellbeing, and urban planning. The analysis indicates that urban parks should not be interpreted merely as green-space units, but as integrated socio-ecological systems linking spatial meaning, environmental performance, inclusive access, public participation, and human wellbeing. The study contributes a bibliometrically informed theoretical framework for strengthening SISTA, an Urban Park Information System, as a decision-support system for evidence-based urban park management.

Keywords: Place Theory; park functions; Quality of Life; urban parks; bibliometric analysis; VOSviewer; green infrastructure; decision support system.

Introduction

Rapid urbanization has intensified environmental degradation, social inequalities, and spatial pressures in cities worldwide, increasing the demand for urban parks that are not only available in sufficient quantity but also capable of delivering ecological, social, cultural, and well-being benefits. Urban parks are increasingly recognized as multifunctional urban infrastructures that support ecosystem services, environmental resilience, recreation, social interaction, public health, and sustainable urban development (Koramaz & Türkoğlu, 2018; Hanif et al., 2024; He et al., 2025). Beyond their physical presence, urban parks contribute to residents' perceptions of urban quality, subjective well-being, environmental satisfaction, and quality of life (Lotfi & Koohsari, 2009; Cabrera-Barona & Merschdorf, 2018; van Dinter et al., 2022). Consequently, urban park evaluation has evolved from a narrow focus on spatial provision toward a multidimensional assessment that integrates environmental performance, human experiences, social functions, and well-being outcomes.

The complexity of urban park evaluation is reflected in the growing diversity of research approaches. Urban planning and spatial analysis studies have developed methods to assess park accessibility, service coverage, spatial distribution, and urban quality indicators through geographic information systems, quality indices, and location-allocation models (Lotfi & Koohsari, 2009; Rigolon & Németh, 2018; Wen et al., 2025; Calka et al., 2025). Recent advances have further enhanced park assessment through fuzzy logic techniques, large-scale geospatial datasets, and behavioral-spatial integration, enabling more reliable evaluations of urban park locations and service effectiveness (Calka et al., 2025; Liu et al., 2026). Simultaneously, participatory approaches have gained prominence as tools for capturing residents' perceptions and spatial preferences, allowing urban park benefits and ecosystem services to be evaluated from a user-centered perspective (Brown et al., 2018; Gottwald et al., 2022). Alongside methodological developments, increasing attention has been directed toward understanding urban parks as places rather than merely physical spaces. Place Theory emphasizes that people develop meanings, attachments, and identities through interactions with their environments. Empirical studies demonstrate that urban parks foster place attachment, place value, and emotional connections that influence how individuals experience and evaluate urban environments (Bazrafshan et al., 2021; Song & Shim, 2021). Research integrating sense of place and ecosystem services further suggests that the benefits generated by urban parks are not solely ecological or functional but are also socially constructed through users' experiences and perceptions (Gottwald et al., 2022).

Moreover, cultural perception and place attachment have been shown to mediate the relationship between park landscapes and human well-being, highlighting the importance of subjective experiences in urban park assessment (Su et al., 2025).

From a functional perspective, urban parks perform multiple ecological, socio-cultural, economic, aesthetic, and resilience-related roles within urban systems. Contemporary planning studies increasingly emphasize the need to integrate sustainability objectives, ecosystem services, residents' preferences, and spatial equity into urban park management (He et al., 2025). In addition, perceptions of safety and personal security have emerged as critical determinants of park use and social inclusiveness, influencing how urban residents interact with and benefit from public green spaces (Šerý et al., 2023). These findings suggest that park functions extend far beyond recreational provision and should be understood as interconnected components of broader urban sustainability agendas.

A parallel stream of literature has focused on the contribution of urban parks to Quality of Life (QoL). Previous studies consistently report positive associations between urban park quality and physical health, psychological well-being, environmental satisfaction, social cohesion, life satisfaction, and overall urban livability (Koramaz & Türkoğlu, 2018; van Dinter et al., 2022; Hanif et al., 2024). Emerging evidence further indicates that park quality is shaped by the interaction between landscape characteristics, user behavior, and emotional responses, reinforcing the multidimensional nature of urban park experiences (Liu et al., 2026). As a result, Quality of Life has become an increasingly important framework for understanding the societal value of urban parks and their contribution to sustainable urban development.

Despite the rapid expansion of urban park research, the literature remains highly fragmented across disciplines such as urban planning, environmental science, public health, sustainability studies, environmental psychology, tourism, and digital geography. Existing studies often focus on specific dimensions of urban parks, including accessibility (Lotfi & Koohsari, 2009), park quality assessment (Rigolon & Németh, 2018; Liu et al., 2026), participatory evaluation (Brown et al., 2018), ecosystem services (Gottwald et al., 2022), place attachment (Bazrafshan et al., 2021; Su et al., 2025), perceived place value (Song & Shim, 2021), personal security (Šerý et al., 2023), urban quality (Cabrera-Barona & Merschdorf, 2018), sustainability-oriented planning (He et al., 2025), and quality-of-life outcomes (Koramaz & Türkoğlu, 2018; Hanif et al., 2024). While these studies collectively demonstrate the multidimensional significance of urban parks, they provide limited understanding of how the concepts of Place Theory, park functions, and Quality of Life are positioned, interconnected, and evolving within the broader scientific literature.

This fragmentation represents both a theoretical and methodological gap. Theoretically, although Place Theory, park-function theory, and Quality of Life are frequently employed to explain urban park values, their conceptual relationships have rarely been examined within a unified analytical framework. Methodologically, previous research has predominantly relied on surveys, participatory mapping, GIS analysis, quality indices, spatial modeling, fuzzy logic, and behavioral assessment techniques (Brown et al., 2018; Rigolon & Németh, 2018; Calka et al., 2025; Liu et al., 2026), with limited attention to the intellectual structure of the field itself. Consequently, there remains insufficient knowledge regarding the dominant research themes, conceptual clusters, and emerging trajectories that connect these theoretical perspectives.

Addressing this gap requires a bibliometric perspective capable of systematically examining the knowledge structure of urban park research. Bibliometric science mapping enables the visualization of conceptual relationships through term co-occurrence networks, revealing thematic clusters, research frontiers, and patterns of theoretical convergence and divergence. Such an approach is particularly relevant for identifying how Place Theory, park functions, and Quality of Life interact within the scientific discourse and for establishing an integrated conceptual foundation for urban park evaluation.

Therefore, this article aims to: (1) map the intellectual structure of urban park research based on term co-occurrence patterns; (2) compare the theoretical positions of Place Theory, park functions, and Quality of Life within the bibliometric network; and (3) formulate implications for the development of SISTA (Urban Park Information System) as an integrated decision-support system for evidence-based, sustainable, and multidimensional urban park management. By synthesizing these fragmented research streams, this study contributes to a more comprehensive understanding of urban parks as places, functional systems, and determinants of quality of life.

Literature Review

Place Theory and placemaking

Place Theory understands space not merely as a physical container but as a meaningful environment produced through the interaction between physical form, activity, perception, identity, memory, and social relations. In the context of urban parks, the theory explains why parks with good access, comfort, activities, legibility, safety, and sociability are more likely to generate positive spatial experiences and stronger forms of place attachment (Tuan, 1977; Relph, 1976; Canter, 1977; Rapoport, 1982).

Placemaking extends this theoretical position by emphasizing the active production of public places through design, community participation, social interaction, and everyday use. A successful public place is not defined only by its physical presence, but by its capacity to attract users, support varied activities, enhance social interaction, and build community pride. The four dimensions most relevant to this study are access and linkage, comfort and image, uses and activities, and sociability (Project for Public Spaces, 2009; Carmona, 2021).

Urban park functions and green infrastructure

Urban park functions refer to the ecological and non-ecological roles performed by parks as components of the broader green open space system. Ecological functions include microclimate regulation, shading, oxygen production, stormwater infiltration, habitat provision, pollutant reduction, and environmental-risk mitigation. Non-ecological functions include social, cultural, economic, aesthetic, recreational, and disaster-response roles. Contemporary literature increasingly frames these functions through the concepts of green infrastructure, ecosystem services, and nature-based solutions (Kabisch et al., 2016; Balzan et al., 2021; Puchol-Salort et al.,

2021).

In an evaluative model, park functions provide the basis for measuring objective performance through vegetation structure, facilities, environmental carrying capacity, safety, accessibility, maintenance, and ecological contribution. This perspective is necessary to ensure that park evaluation is not reduced to subjective perception alone, but also accounts for regulatory standards and ecological performance.

Quality of Life and urban wellbeing

Quality of Life is a multidimensional framework for assessing human wellbeing in relation to physical health, psychological condition, social relations, environmental quality, independence, and overall life satisfaction. In urban park research, QoL is particularly relevant because parks contribute to physical activity, stress reduction, social cohesion, psychological restoration, perceived safety, environmental satisfaction, and opportunities for inclusive recreation (World Health Organization, 1996; Lachowycz & Jones, 2013; Jennings & Bamkole, 2019).

The WHOQOL-BREF framework is useful in this context because it covers physical health, psychological health, social relationships, environmental quality, and general health perceptions. Urban parks may influence these domains by providing spaces for exercise, contact with nature, social interaction, aesthetic appreciation, and community participation.

VOS-based bibliometric mapping as a method for theoretical comparison

Visualization of similarities (VOS) is a bibliometric mapping technique used to identify and visualize relationships among terms, authors, documents, journals, citations, or other bibliographic entities. In term co-occurrence analysis, two terms are considered strongly related when they frequently appear together in the same documents. This makes VOS useful for identifying conceptual clusters, thematic density, and the relative position of theories within a research field (Van Eck & Waltman, 2010, 2023).

For theoretical comparison, VOS mapping can reveal whether the concepts of place, placemaking, green infrastructure, ecosystem services, accessibility, health, wellbeing, quality of life, governance, and urban planning form distinct clusters or operate as interconnected domains. The resulting map can then be used to refine the conceptual framework for urban park evaluation and decision support.

Methods

This study employed a bibliometric-conceptual design. The bibliometric component was used to map the structure of literature through term co-occurrence analysis, while the conceptual component was used to compare the theoretical roles of Place Theory, park functions, and Quality of Life in the development of an integrated urban park model.

The dataset consisted of six RIS files exported from ScienceDirect. The search scope covered themes associated with place, placemaking, urban parks, urban green space, governance, sustainability, health, wellbeing, accessibility, public space, and related concepts. A total of 532 records were initially identified; after deduplication, 531 unique documents were retained for analysis. Terms were extracted from titles, keywords, and abstracts, then normalized to reduce variations in spelling and terminology. A co-occurrence matrix was subsequently constructed and visualized as a network map and a density map.

Table 1. Summary of data and VOS analytical procedure

Component	Description
Data source	Six RIS files exported from ScienceDirect
Initial records	532 records
Unique documents after deduplication	531 documents
Unit of analysis	Terms extracted from titles, keywords, and abstracts
Type of visualization	Co-occurrence network and density visualization
Term threshold	Minimum occurrence in four documents; strategic terms were retained to maintain relevance for SISTA
Main outputs	Node terms, co-occurrence edges, cluster summary, network map, and density map

Results

Co-occurrence network

The co-occurrence network shows that place is the most central node and is closely linked to placemaking, community, activity, participation, sustainability, and governance. This indicates that place-based urban park literature does not treat parks merely as design objects; rather, it positions them as public environments shaped by everyday use, community meaning, governance processes, and sustainability agendas.

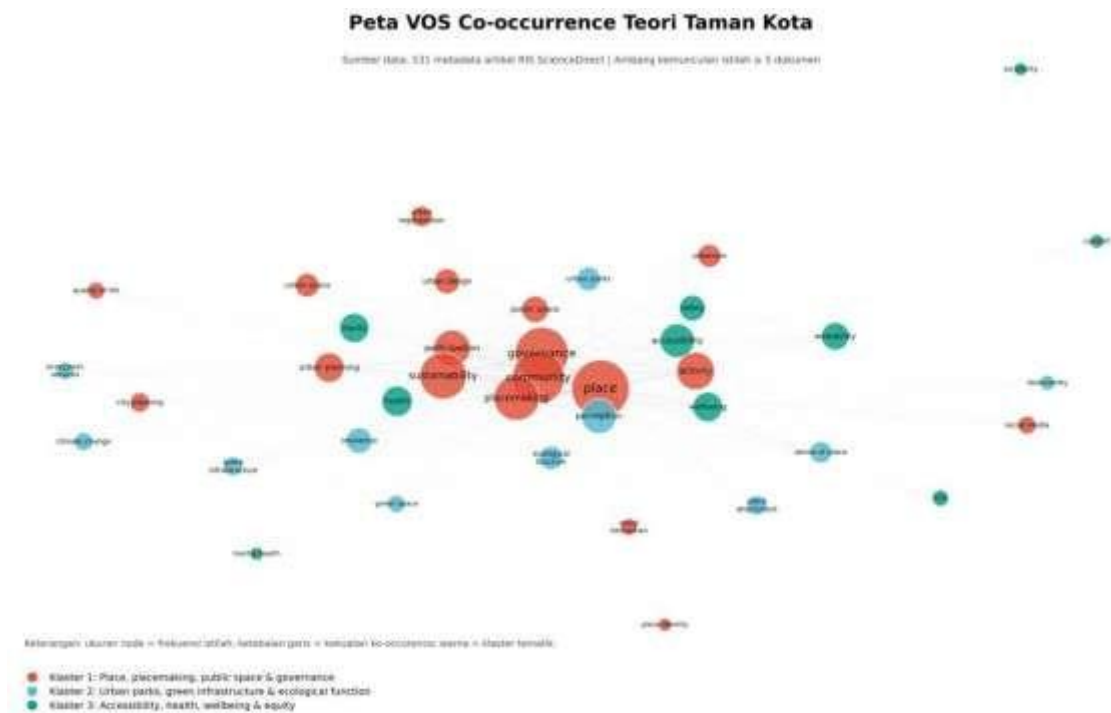


Figure 1. VOS co-occurrence map of urban park theory terms based on ScienceDirect metadata.

Density visualization

The density visualization indicates that the most intensive thematic area is located around place, governance, community, sustainability, and placemaking. Terms such as geotagging, big data, and sociability are positioned at the periphery of the network. This peripheral position does not imply irrelevance; rather, it suggests emerging research opportunities, particularly for studies integrating social-media data, spatial analytics, and decision-support systems into urban park management.

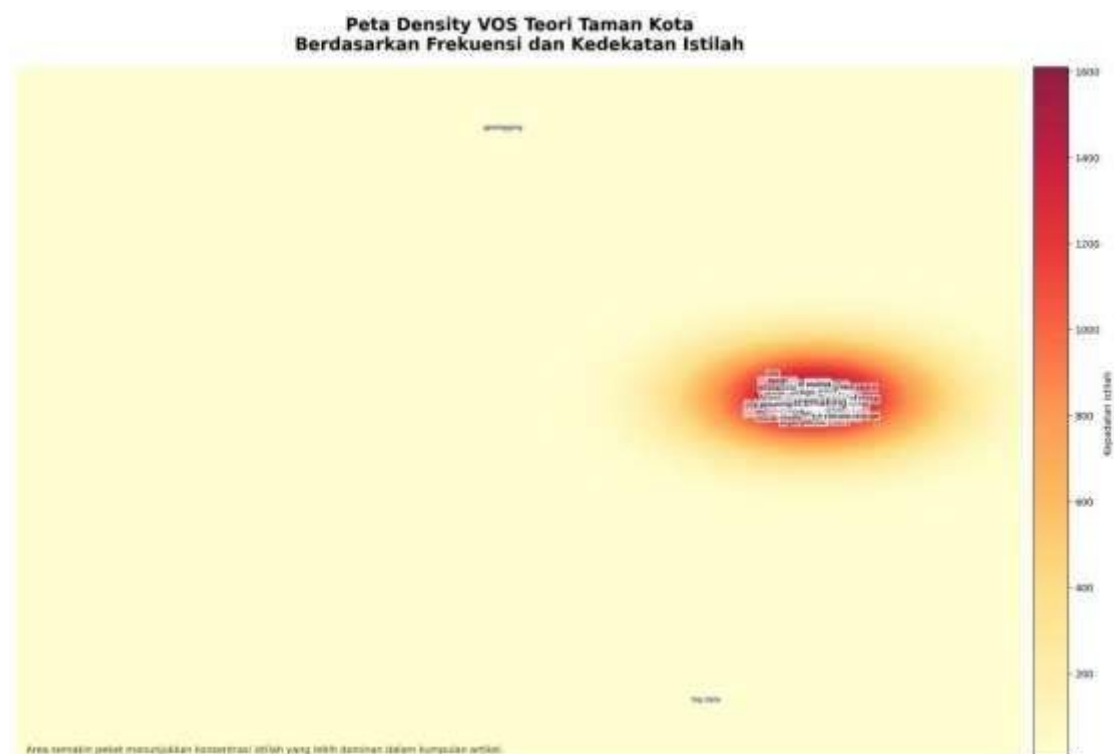


Figure 2. VOS density visualization showing thematic concentration around dominant terms.

Knowledge clusters

Table 2 summarizes the seven clusters identified from the VOS analysis. Four clusters are substantively dominant and directly related to the proposed doctoral framework, while three smaller clusters indicate emerging methodological and conceptual directions.

Table 2. Knowledge clusters generated from the VOS analysis

Cluster	Theme	Main terms
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1	Place, placemaking, and spatial experience	place; community; placemaking; activity; wellbeing; urban parks; ecological function; sense of place
2	Urban design, planning, governance, and QoL	governance; sustainability; participation; urban planning; public space; urban design; urban space; urbanism
3	Green infrastructure, ecology, and resilience	perception; resilience; green infrastructure; climate change; green space; ecosystem services; GIS; urban green space
4	Accessibility, health, and equity	accessibility; health; equity; walkability; safety; comfort; mental health
5	Sociability	sociability
6	Geotagging	geotagging
7	Big data	big data

Dominant terms and strongest co-occurrence links

The fifteen most frequent terms demonstrate that the intellectual center of the field is formed by place, governance, community, sustainability, placemaking, participation, accessibility, health, and wellbeing. These terms show the convergence between spatial experience, ecological function, public health, and governance.

Table 3. Fifteen terms with the highest document frequencies

Term	Documents	Cluster	Average year
place	200	1	2020.11
governance	166	2	2020.49
community	162	1	2020.25
sustainability	125	2	2020.32
placemaking	116	1	2019.97
activity	77	1	2020.55
participation	71	2	2020.55
perception	64	3	2020.56
accessibility	60	4	2020.45
health	47	4	2020.89
wellbeing	44	1	2021.16
urban planning	44	2	2020.70
equity	43	4	2020.28
walkability	37	4	2021.08
public space	34	2	2021.18

Table 4. Ten strongest co-occurrence links

Term 1	Term 2	Link strength
place	placemaking	81
place	community	70
governance	place	62
community	placemaking	55
governance	community	54
governance	sustainability	47
sustainability	community	40
activity	place	35
participation	community	35
place	sustainability	34

Discussion

Theoretical comparison based on VOS results

The VOS results demonstrate that the three theoretical perspectives are not mutually exclusive. Place Theory explains the experiential and meaning-oriented dimension of parks; park-function theory explains ecological, regulatory, and service-oriented performance; and QoL explains the human consequences of park quality in terms of health, wellbeing, equity, comfort, and social relations. Governance and digital-data terms link the three theoretical domains to evidence-based decision making.

Table 5. Theoretical comparison based on VOS-related concepts

Framework	Related VOS terms	Theoretical orientation	Implication for model development
Place Theory	place; placemaking; community; activity; sociability; sense of place; place attachment	Interprets parks as experienced, meaningful, socially used, and identity-forming public places.	Forms the social-perceptual indicators for surveys, geotagging analysis, and user-experience evaluation.

Park functions	green infrastructure; ecological function; ecosystem services; biodiversity; resilience; climate change; green space	Interprets parks as ecological infrastructure supporting microclimate regulation, infiltration, biodiversity, and ecosystem services.	Forms the physical-regulatory indicators and modelbase in SISTA.
Quality of Life	health; wellbeing; mental health; comfort; safety; accessibility; equity; walkability; quality of life	Interprets the contribution of parks to physical, psychological, social, and environmental wellbeing.	Functions as an impact or outcome variable explaining the benefits of parks for residents.
Governance and SISTA	governance; participation; urban planning; sustainability; GIS; big data; geotagging	Interprets the need for data integration, rules, scenarios, and evidence-based decision making.	Forms the decision-support framework linking database, modelbase, and decision-making base.

Place Theory emerges as the most prominent theoretical anchor. The term place appears in 200 documents and has strong links with placemaking, community, activity, sustainability, and governance. This suggests that the urban park literature increasingly views parks as socially produced public places rather than isolated physical amenities. The strong link between place and community further confirms that the meaning of parks is closely associated with social use, attachment, identity, and participation.

Park-function theory appears primarily through the green infrastructure and ecosystem-services cluster. Terms such as ecological function, resilience, climate change, GIS, green space, and urban green space indicate that parks are increasingly interpreted as components of urban ecological systems. This strengthens the need to evaluate parks not only by appearance or user satisfaction, but also by vegetation structure, climate performance, hydrological capacity, biodiversity support, and disaster-mitigation potential.

Quality of Life does not appear as a single dominant node but is distributed across health, wellbeing, mental health, accessibility, equity, walkability, safety, and comfort. This distribution suggests that QoL operates as an outcome framework that connects the physical condition of parks and the lived experiences of users. In other words, high-performing parks are those that translate ecological and spatial quality into tangible wellbeing benefits.

The governance cluster indicates that urban park management requires institutional and policy integration. Terms such as governance, sustainability, participation, urban planning, and public space show that park evaluation should be linked to planning instruments, community participation, and public-sector decision making. This provides a strong basis for positioning SISTA as an integrative decision-support system.

Supporting journal examples

Table 6 presents selected studies that substantiate the theoretical comparison. The examples show how place and placemaking research emphasizes meaning, identity, participation, and governance; park-function research emphasizes ecological services, green infrastructure, resilience, and nature-based solutions; and QoL research emphasizes health, wellbeing, equity, and environmental satisfaction.

Table 6. Selected journal examples supporting the theoretical comparison

No.	Author(s) and year	Article/journal	Main focus	Relevance to theoretical comparison
1	Sime (1986)	Creating places or designing spaces? / Journal of Environmental Psychology	Relationship between spatial design and place formation	Establishes that public space should be understood as meaningful place, not merely physical design.
2	Serag El Din et al. (2013)	Principles of urban quality of life for a neighborhood / HBRC Journal	Urban QoL principles at the neighborhood scale	Supports QoL as an outcome of environmental and spatial quality.
3	Zamanifard et al. (2018)	Towards a framework of public space governance / Cities	Public space governance	Links place quality with governance, participation, and public management.
4	Gulsrud et al. (2018)	Innovative urban forestry governance in Melbourne? / Environmental Research	Green placemaking as a nature-based solution	Bridges Place Theory, governance, urban forestry, and ecological functions.

5	Sen & Nagendra (2020)	Local community engagement, environmental placemaking and stewardship by migrants / Landscape and Urban Planning	Environmental placemaking and community stewardship	Demonstrates how community attachment strengthens green-space conservation.
6	Zhao et al. (2021)	Evaluating green resource branding using user-generated content data / Urban Forestry & Urban Greening	Geotagged and user-generated content data	Relevant to using social media and geotagging for understanding park impressions.
7	Balzan et al. (2021)	Assessing urban ecosystem services to prioritise nature-based solutions / Nature-Based Solutions	Ecosystem services and nature-based solutions	Strengthens the ecological-function dimension of parks.
8	Klein et al. (2021)	Engaging the unengaged / Urban Forestry & Urban Greening	Perceptions of social access to urban public space	Links accessibility, equity, sense of place, and wellbeing.
9	Aly & Dimitrijevic (2022)	Systems approach to the sustainable management of urban public parks / Urban Forestry & Urban Greening	Systemic park management	Supports SISTA as an integrated database-modelbase-decisionbase framework.
10	Knibbe & Horstman (2022)	Overcoming the tragedy of urban commons / Health & Place	Urban commons, collective practices, and healthy city ecology	Frames parks as shared spaces influencing urban health and social cohesion.
11	Carmona (2023)	Coding urban design / Progress in Planning	Place-focused urbanism and design governance	Strengthens place as a basis for regulation, design, and urban governance.
12	Namaz & Tvergyak (2023)	Uncovering deep place meanings in urban wellbeing / City and Environment Interactions	Place meanings and urban wellbeing	Connects sense of place to wellbeing and QoL.
13	Amirzadeh & Sharifi (2024)	The evolutionary path of place making / Land Use Policy	Evolution of placemaking theory	Shows the shift from physical design to social, digital, and resilient placemaking.
14	Fernandez-Osso Fuentes et al. (2024)	Conceptualizing digital placemaking in nature for wellbeing/ Technological Forecasting and Social Change	Digital placemaking, nature connectedness, and wellbeing	Relevant to integrating digital platforms, nature experience, and QoL.
15	Glowczynski (2024)	Human-place-technology relations in the digital placemaking process / Geoforum	Human-place-technology relations	Supports SISTA and social big data as bridges between user experience and decision making.
16	Mateo-Babiano & Fong (2024)	Integrating multiculturalism in public space policy and place governance / Urban Governance	Multiculturalism, public-space policy, and place governance	Strengthens inclusivity and governance in park management.
17	Meetiayagoda et al. (2024)	Relationship between sense of place and co-creation process / Land Use Policy	Sense of place and co-creation	Supports participatory and user-oriented park development.
18	Puchol-Salort et al. (2021)	An urban planning sustainability framework / Sustainable Cities and Society	Blue-green urban design and ecosystem services	Links ecological functions, urban systems, and sustainability.
19	Lachowycz & Jones (2013)	Towards a better understanding of the relationship between Greenspace and health / Landscape and Urban Planning	Greenspace and health	Supports the park-health-QoL relationship.

20	Kabisch et al. (2016)	Nature-based solutions to climate change mitigation and adaptation in urban areas / Ecology and Society	Nature-based solutions in urban areas	Supports interpreting parks as climate-adaptation and resilience infrastructure.
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Implications for the Development of SISTA

The VOS results strengthen the positioning of SISTA as an integrative decision-support instrument. In the doctoral framework, SISTA consists of a database, modelbase, rule-based decision component, scenario-based evaluation, and decision output. The bibliometric findings suggest that each component should be connected to the relevant theoretical domain and supported by spatial, social, ecological, and policy data.

Table 7. Implications of VOS findings for SISTA structure

SISTA component	Role	Supporting VOS terms
Database	Stores spatial park data, facilities, vegetation structure accessibility, geotagging records, survey results, and social metadata.	place; accessibility; geotagging GIS; social media
Modelbase	Contains models for evaluating park function, place quality, QoL, gap analysis, IPA, KDE, and path analysis	Ecological function; green infrastructure; health wellbeing; quality of life
Rule-based decision	Integrates green open space regulations, park-function standards, improvement priorities, and hard constraints.	governance; urban planning sustainability; resilience
Scenario-based evaluation	Simulates park interventions based on priority scores user needs, ecological functions, and spatial access.	participation; equity walkability; safety; comfort
Decision output	Produces composite park-performance scores, priority rankings, design recommendations, and management strategies.	community; placemaking ecosystem services; mental health

The novelty of the proposed framework lies in integrating bibliometric knowledge mapping, theoretical synthesis, social-digital data, spatial analysis, and decision-support logic. The peripheral position of geotagging and big data in the VOS network indicates a promising research gap: while these terms are not yet central to the field, they can provide innovative tools for capturing public impressions, behavioral patterns, and spatial preferences in urban parks.

By combining Place Theory, park functions, QoL, geotagging, and SISTA, the proposed model enables a more comprehensive assessment of urban parks. Such an assessment can identify not only which parks are physically deficient, but also which parks are socially underused, perceptually weak, ecologically limited, inaccessible, or unable to support wellbeing.

Updated Integrative Framework

The updated framework conceptualizes urban parks as data-informed socio-ecological systems. The first layer is park function, covering vegetation structure, facilities, ecological performance, aesthetics, socio-cultural use, economic potential, and disaster-mitigation capacity. The second layer is Place Theory, covering accessibility, comfort and image, uses and activities, and sociability. The third layer is Quality of Life, covering physical health, psychological health, social relationships, environmental quality, and general wellbeing. The fourth layer is governance and SISTA, which integrates analytical results into evidence-based recommendations.

Conceptually, park functions provide the physical and ecological capacity of the park; place quality determines how the park is experienced, used, and socially valued; QoL indicates the wellbeing outcomes of park quality; and SISTA transforms data and analytical results into actionable management decisions. From this perspective, an ideal urban park is not only a green area that satisfies a minimum area requirement, but also a multifunctional public place that is ecologically effective, accessible, safe, comfortable, active, inclusive, meaningful, and capable of improving residents' quality of life.

Discussion

The bibliometric analysis reveals a significant transformation in the intellectual structure of urban park research. While early studies primarily focused on the physical provision of green spaces and recreational facilities, contemporary scholarship increasingly conceptualizes urban parks as multidimensional socio-ecological systems. The dominance of the term *place* and its strong co-occurrence with *community*, *placemaking*, *activity*, *governance*, and *sustainability* suggest that urban park research has moved beyond infrastructure-oriented paradigms toward frameworks that emphasize human experience, social interaction, environmental performance, and institutional governance. This evolution reflects broader changes in urban studies, where the quality of public spaces is increasingly evaluated through their capacity to generate social value, ecological resilience, and human well-being simultaneously.

The central position of *place* within the network confirms the growing importance of Place Theory as a foundational framework in urban park studies. The strong associations between place, community, activity, and wellbeing indicate that parks are no longer viewed merely as physical landscapes but as socially constructed environments where meanings, identities, and emotional attachments are continuously produced. This finding

supports the argument that successful urban parks derive their value not only from design quality but also from the experiences and relationships they facilitate. Such an interpretation is consistent with evidence showing that interactions with urban parks strengthen place attachment and emotional bonds across different cultural contexts, thereby reinforcing the role of parks as meaningful public places rather than simple recreational facilities (Bazrafshan et al., 2021).

The prominence of place-related concepts also reflects the increasing recognition of subjective experiences in urban park evaluation. Research has demonstrated that users assign different meanings and values to urban parks depending on their social backgrounds, motivations, and patterns of use. Song and Shim (2021) found significant differences between residents' and tourists' perceptions of urban parks, suggesting that place value is not a fixed attribute but a socially constructed phenomenon. Similarly, Su et al. (2025) demonstrated that cultural perception and place attachment mediate the relationship between landscape quality and wellbeing. Together with the findings of Bazrafshan et al. (2021), these studies explain why place-related concepts occupy a central position within the bibliometric network and why contemporary urban park scholarship increasingly focuses on experiential dimensions alongside physical characteristics.

The strong relationship between place and community observed in the network further indicates that urban parks function as arenas for social interaction, civic engagement, and collective identity formation. Community-related concepts have become increasingly prominent because urban parks are now recognized as important components of social infrastructure. Brown et al. (2018) demonstrated that participatory mapping techniques effectively capture community perceptions of park benefits, while Gottwald et al. (2022) showed that ecosystem services are often interpreted and valued through place-based experiences. These findings suggest that urban park planning can no longer rely solely on technical assessments of land use and environmental performance but must also consider how communities perceive, use, and assign meaning to public green spaces.

The emergence of placemaking as a major conceptual node reinforces this interpretation. Placemaking emphasizes the active role of users in shaping public spaces through participation, social interaction, and everyday activities. The strong links between placemaking, participation, community, and governance indicate that contemporary urban park research increasingly supports collaborative planning approaches. Rather than being passive recipients of planning interventions, residents are increasingly viewed as co-producers of place. This trend reflects broader shifts toward participatory urban governance and aligns with the growing emphasis on inclusive and people-centered planning approaches identified by Brown et al. (2018) and He et al. (2025).

Another important finding concerns the central role of governance in connecting multiple thematic clusters. Governance is strongly associated with sustainability, participation, urban planning, and community, suggesting that urban park quality is increasingly understood as a product of institutional capacity, stakeholder collaboration, and evidence-based decision-making. The findings of He et al. (2025) support this interpretation by demonstrating that residents' preferences play a crucial role in sustainable park planning. Similarly, Brown et al. (2018) emphasized that participatory approaches improve the legitimacy and effectiveness of urban park management. The prominence of governance within the network therefore reflects a growing recognition that sustainable urban parks require not only ecological and social functions but also effective institutional arrangements.

The governance cluster further illustrates the integration of sustainability principles into urban park research. Sustainability appears closely linked with place, governance, and community, indicating that sustainable urban parks are increasingly conceptualized as socio-ecological systems rather than isolated green infrastructures. This finding is consistent with the arguments of Gottwald et al. (2022), who integrated ecosystem services with sense-of-place theory, and He et al. (2025), who highlighted the need to balance ecological objectives with residents' expectations. Consequently, sustainability emerges not merely as an environmental concern but as a multidimensional concept encompassing ecological resilience, social inclusion, cultural identity, and human wellbeing.

The green infrastructure cluster highlights the continued relevance of Park Function Theory. Terms such as ecological function, resilience, climate change, ecosystem services, and green infrastructure demonstrate that urban parks continue to be valued for their environmental contributions. However, the network structure suggests that ecological functions are increasingly interpreted within broader socio-ecological contexts. Zhu et al. (2020) demonstrated that urban park vitality is shaped by interactions among recreational service supply, user demand, and spatial connectivity, while Gottwald et al. (2022) showed that ecosystem services acquire greater significance when linked to place meanings. These findings indicate that ecological functions and social experiences should not be treated as separate dimensions but as interconnected components of urban park systems.

The presence of resilience and climate-change-related terms further supports this interpretation. Urban parks are increasingly recognized as nature-based solutions that contribute to climate adaptation, biodiversity conservation, and environmental risk reduction. Contemporary urban challenges such as heat stress, flooding, and environmental degradation have elevated the strategic importance of green infrastructure within urban planning agendas. The clustering of resilience with ecosystem services and sustainability therefore reflects an expansion of urban park research beyond recreational functions toward broader questions of environmental governance and urban resilience.

Accessibility remains another dominant theme within the intellectual structure of urban park research. The strong presence of accessibility, walkability, equity, and health indicates that access to urban parks continues to be regarded as a critical determinant of urban quality and social justice. Lotfi and Koohsari (2009) argued that accessibility represents an important bridge between objective spatial conditions and subjective evaluations of urban quality of life. Their work established the foundation for subsequent studies examining how spatial

accessibility influences wellbeing, environmental satisfaction, and social inclusion.

Recent methodological developments have significantly expanded accessibility research. Rigolon and Németh (2018) introduced GIS-based quality indicators for evaluating urban parks, while Calka et al. (2025) demonstrated how fuzzy logic approaches can improve the reliability of park location analyses. Furthermore, Wen et al. (2025) highlighted the potential of mobility-based approaches for understanding urban park centrality, and Wu et al. (2026) applied multi-source mobility data to assess elderly walkability to parks. Collectively, these studies illustrate a transition from static accessibility measures toward more dynamic analyses that incorporate human mobility patterns and behavioral data.

The emergence of walkability within the accessibility cluster further emphasizes the growing concern with spatial equity. Access to urban parks is no longer evaluated solely through distance measures but increasingly through considerations of mobility, inclusiveness, and user characteristics. The work of Wu et al. (2026) is particularly important because it demonstrates how different demographic groups experience accessibility in distinct ways. This suggests that future urban park planning should move beyond generalized accessibility standards and adopt more user-sensitive approaches capable of addressing the needs of diverse populations.

The health and wellbeing cluster provides strong evidence for the increasing importance of Quality of Life (QoL) as a conceptual framework in urban park research. Unlike place or governance, QoL appears as a distributed concept linked to health, wellbeing, accessibility, comfort, equity, and safety. This distribution indicates that QoL functions as an overarching outcome framework that integrates multiple dimensions of park performance. Koramaz and Türkoğlu (2018) demonstrated that urban parks contribute significantly to residents' quality of life, while Hanif et al. (2024) identified a wide range of QoL indicators associated with park use. These findings help explain why wellbeing-related concepts occupy increasingly central positions within the network.

The growing prominence of wellbeing also reflects a broader shift toward human-centered planning. Van Dinter et al. (2022) showed that sense of place contributes to life satisfaction through interactions between park characteristics and individual experiences. Similarly, Zhao (2020) found that quality of life is strongly influenced by the degree to which urban parks satisfy residents' cultural service expectations. These findings suggest that urban park evaluation should extend beyond physical and ecological indicators to include psychological, social, and cultural dimensions of wellbeing.

Recent studies have further expanded this perspective by incorporating emotional wellbeing into urban park assessment. Zhao et al. (2025) demonstrated that urban parks positively influence emotional wellbeing across different cultural settings, while Liu et al. (2026) proposed an integrated framework combining landscape characteristics, behavioral patterns, and emotional responses. These studies indicate that emotional experiences constitute an essential component of urban park quality and help explain the growing prominence of wellbeing-related concepts within contemporary urban park scholarship.

The role of place attachment in linking environmental quality and wellbeing deserves particular attention. Bazrafshan et al. (2021) showed that place attachment emerges through repeated interactions with urban parks, while Su et al. (2025) demonstrated that place attachment mediates relationships between landscape characteristics and wellbeing outcomes. Van Dinter et al. (2022) similarly identified sense of place as an important determinant of life satisfaction. Together, these findings suggest that place attachment functions as a critical mechanism through which environmental qualities are translated into tangible wellbeing benefits.

Another notable finding concerns the convergence of subjective and objective approaches to urban park evaluation. Traditional planning approaches often prioritized measurable indicators such as accessibility, vegetation cover, and facility provision. However, the presence of perception, place attachment, wellbeing, and community within the network indicates that subjective experiences are increasingly regarded as equally important. Cabrera-Barona and Merschdorf (2018) argued that urban quality emerges through interactions between objective spatial conditions and subjective perceptions. The observed network structure strongly supports this argument by demonstrating that objective and subjective dimensions are increasingly integrated within contemporary urban park research.

The appearance of safety-related concepts within the accessibility and wellbeing cluster further highlights the multidimensional nature of park quality. Šerý et al. (2023) emphasized that perceptions of personal security significantly influence park use and public-space experiences. Safety affects not only physical accessibility but also psychological comfort, social participation, and perceived wellbeing. The integration of safety with accessibility and health therefore indicates that urban park quality should be evaluated through a comprehensive framework encompassing physical, social, and psychological dimensions.

The peripheral position of geotagging and big data is equally significant. Although these concepts currently occupy marginal positions within the network, they represent important emerging research directions. Advances in location-based technologies, social-media analytics, and artificial intelligence are creating new opportunities for understanding urban park use. The studies of Wen et al. (2025), Wu et al. (2026), and Calka et al. (2025) collectively demonstrate how advanced spatial analytics can support more accurate assessments of accessibility, mobility, and park-service provision. These developments suggest that future urban park research will increasingly integrate conventional survey methods with digital data sources.

Taken together, the bibliometric findings reveal a clear process of theoretical convergence among Place Theory, Park Function Theory, and Quality of Life. Place Theory explains how individuals experience and assign meaning to urban parks (Bazrafshan et al., 2021; Song & Shim, 2021; Su et al., 2025). Park Function Theory explains how parks generate ecological services, resilience, and environmental benefits (Gottwald et al., 2022; He et al., 2025; Zhu et al., 2020). Quality of Life frameworks explain how these experiences and functions contribute to wellbeing,

health, and life satisfaction (Koramaz & Türkoğlu, 2018; Zhao, 2020; Hanif et al., 2024; Liu et al., 2026). Rather than representing competing perspectives, these frameworks collectively describe different dimensions of the same socio-ecological phenomenon.

This convergence provides a strong theoretical foundation for the development of SISTA (Urban Park Information System). The place cluster contributes indicators related to user experience, place attachment, participation, and community engagement. The park-function cluster contributes ecological performance, resilience, and environmental-quality indicators. The Quality of Life cluster contributes measures of wellbeing, health, accessibility, equity, and satisfaction. Governance, GIS, mobility analytics, geotagging, and big-data approaches provide the institutional and technological infrastructure required to integrate these dimensions into an evidence-based decision-support system.

Overall, the study demonstrates that contemporary urban park research has evolved from fragmented investigations of accessibility, recreation, ecology, and wellbeing toward a more integrated understanding of urban parks as socio-ecological systems. The intellectual core of the field is increasingly shaped by interactions among place, governance, sustainability, accessibility, and wellbeing. By revealing these relationships through bibliometric mapping, this study contributes to a more comprehensive conceptual framework for urban park evaluation and provides an evidence-based foundation for integrated urban park planning and management.

Conclusion

The VOS analysis of 531 unique ScienceDirect documents shows that urban park studies are structured around several major knowledge clusters: place, placemaking, and spatial experience; urban design, planning, governance, and QoL; green infrastructure, ecology, and resilience; and accessibility, health, and equity. The most prominent terms are place, governance, community, sustainability, placemaking, activity, participation, perception, accessibility, health, wellbeing, and urban planning.

The theoretical comparison demonstrates that Place Theory explains the experiential and meaning-making dimensions of parks; park-function theory explains ecological and regulatory performance; and QoL explains the impacts of parks on human wellbeing. Rather than competing perspectives, these theories are complementary and should be integrated into a single model for evaluating and managing urban parks.

The study contributes an updated bibliometrically informed framework that integrates Place Theory, park functions, QoL, social big data, geotagging, and SISTA as a decision-support system. The peripheral position of geotagging and big data in the VOS map highlights an important novelty: future urban park management can be strengthened by combining conventional spatial and ecological data with social-digital evidence of user impressions and activities.

References

1. Aly, D., & Dimitrijevic, B. (2022). Systems approach to the sustainable management of urban public parks. *Urban Forestry & Urban Greening*, 68, 127482. <https://doi.org/10.1016/j.ufug.2022.127482>
2. Amirzadeh, M., & Sharifi, A. (2024). The evolutionary path of place making: From late twentieth century to post-pandemic cities. *Land Use Policy*, 141, 107124. <https://doi.org/10.1016/j.landusepol.2024.107124>
3. Balzan, M. V., Zulian, G., Maes, J., & Borg, M. (2021). Assessing urban ecosystem services to prioritise nature-based solutions in a high-density urban area. *Nature-Based Solutions*, 1, 100007. <https://doi.org/10.1016/j.nbsj.2021.100007>
4. Bazrafshan, M., Tabrizi, A. M., Bauer, N., & Kienast, F. (2021). Place attachment through interaction with urban parks: A cross-cultural study. *Urban Forestry & Urban Greening*, 61, 127103. <https://doi.org/10.1016/j.ufug.2021.127103>
5. Brown, G., Rhodes, J., & Dade, M. (2018). An evaluation of participatory mapping methods to assess urban park benefits. *Landscape and Urban Planning*, 178, 18–31. <https://doi.org/10.1016/j.landurbplan.2018.05.018>
6. Cabrera-Barona, P. F., & Merschdorf, H. (2018). A conceptual urban quality space-place framework: Linking geo-information and quality of life. *Urban Science*, 2(3), 73. <https://doi.org/10.3390/urbansci2030073>
7. Calka, B., Siok, K., Szostak, M., Bielecka, E., Kogut, T., & Zhran, M. (2025). Improvement of the reliability of urban park location results through the use of fuzzy logic theory. *Sustainability*, 17(2), 521. <https://doi.org/10.3390/su17020521>
8. Canter, D. (1977). *The psychology of place*. Architectural Press.
9. Carmona, M. (2021). *Public places urban spaces: The dimensions of urban design*. Routledge.
10. Carmona, M. (2023). Coding urban design: Constructing a wireframe for a place-focused urbanism. *Progress in Planning*, 176, 100775. <https://doi.org/10.1016/j.progress.2023.100775>
11. Carmona, M., Tiesdell, S., Heath, T., & Oc, T. (2008). *Public places urban spaces: The dimensions of urban design*. Architectural Press.
12. Chiesura, A. (2004). The role of urban parks for the sustainable city. *Landscape and Urban Planning*, 68(1), 129–138. <https://doi.org/10.1016/j.landurbplan.2003.08.003>
13. Fernandez-Osso Fuentes, M. J., Keegan, B. J., Jones, M. V., & MacIntyre, T. E. (2024). Conceptualizing digital placemaking in nature for wellbeing. *Technological Forecasting and Social Change*, 204, 123440. <https://doi.org/10.1016/j.techfore.2024.123440>
14. Glowczynski, M. (2024). Human-place-technology relations in the digital placemaking process. *Geoforum*, 149, 103950. <https://doi.org/10.1016/j.geoforum.2024.103950>

15. Gottwald, S., Albert, C., & Fagerholm, N. (2022). Combining sense of place theory with the ecosystem services concept: Empirical insights and reflections from a participatory mapping study. *Landscape Ecology*, 37(2), 633–655. <https://doi.org/10.1007/s10980-021-01362-z>
16. Gulsrud, N. M., Hertzog, K., & Shears, I. (2018). Innovative urban forestry governance in Melbourne? Investigating green placemaking as a nature-based solution. *Environmental Research*, 161, 158–167. <https://doi.org/10.1016/j.envres.2017.11.005>
17. Hanif, A., Jabbar, M., & Mohd Yusoff, M. (2024). Exploring key indicators for quality of life in urban parks of Lahore, Pakistan: Toward the enhancement of sustainable urban planning. *International Journal of Sustainable Development and World Ecology*, 31(7), 959–976. <https://doi.org/10.1080/13504509.2024.2359040>
18. He, B., Wang, S., Xiong, Q., Zhao, Z., & Hou, Y. (2025). Urban park planning for sustainability: Resident insights from China's major cities. *Land*, 14(1), 128. <https://doi.org/10.3390/land14010128>
19. Jennings, V., & Bamkole, O. (2019). The relationship between social cohesion and urban green space: An avenue for health promotion. *International Journal of Environmental Research and Public Health*, 16(3), 452. <https://doi.org/10.3390/ijerph16030452>
20. Kabisch, N., Frantzeskaki, N., Pauleit, S., Naumann, S., McKenna, D., Artmann, M., Haase, D., Knapp, S., Korn, H., Stadler, J., Zaunberger, K., & Bonn, A. (2016). Nature-based solutions to climate change mitigation and adaptation in urban areas: Perspectives on indicators, knowledge gaps, barriers, and opportunities. *Ecology and Society*, 21(2), 39. <https://doi.org/10.5751/ES-08373-210239>
21. Klein, W., Dove, M. R., & Felson, A. J. (2021). Engaging the unengaged: Understanding residents' perceptions of social access to urban public space. *Urban Forestry & Urban Greening*, 59, 126991. <https://doi.org/10.1016/j.ufug.2021.126991>
22. Knibbe, M., & Horstman, K. (2022). Overcoming the tragedy of urban commons: Collective practices for a healthy city ecology in disadvantaged neighborhoods. *Health & Place*, 75, 102777. <https://doi.org/10.1016/j.healthplace.2022.102777>
23. Koramaz, E. K., & Türkoğlu, H. (2018). Measuring and understanding urban parks' contribution to quality of life in Istanbul. *Social Indicators Research*, 138(1), 335–351. <https://doi.org/10.1007/s11205-017-1657-6>
24. Lachowycz, K., & Jones, A. P. (2013). Towards a better understanding of the relationship between greenspace and health: Development of a theoretical framework. *Landscape and Urban Planning*, 118, 62–69. <https://doi.org/10.1016/j.landurbplan.2012.10.012>
25. Lotfi, S., & Koohsari, M. J. (2009). Analyzing accessibility dimension of urban quality of life: Where urban designers face duality between subjective and objective reading of place. *Social Indicators Research*, 94(3), 417–435. <https://doi.org/10.1007/s11205-009-9438-5>
26. Liu, J., Wang, H., Cheng, Y., Sun, Y., & Yang, C. (2026). Urban park quality assessment: A synergy-differentiation approach integrating landscape, behavior and emotion. *Journal of Cleaner Production*, 543, 147633. <https://doi.org/10.1016/j.jclepro.2026.147633>
27. Mateo-Babiano, I., & Fong, A. (2024). Integrating multiculturalism in public space policy and place governance. *Urban Governance*, 4(1), 56–67. <https://doi.org/10.1016/j.ugj.2024.01.001>
28. Meetiyagoda, L., Mahanama, P. K. S., Ley, A., & Amarawickrama, S. (2024). Relationship between sense of place and co-creation process: A systematic literature review. *Land Use Policy*, 136, 106961. <https://doi.org/10.1016/j.landusepol.2023.106961>
29. Namaz, L., & Tvergyak, K. K. (2023). Uncovering deep place meanings in the context of urban wellbeing: The case study of Budapest. *City and Environment Interactions*, 17, 100095. <https://doi.org/10.1016/j.cacint.2022.100095>
30. Project for Public Spaces. (2009). *What makes a successful place?* Project for Public Spaces.
31. Puchol-Salort, P., O'Keeffe, J., van Reeuwijk, M., & Mijic, A. (2021). An urban planning sustainability framework: Systems approach to blue-green urban design. *Sustainable Cities and Society*, 66, 102677. <https://doi.org/10.1016/j.scs.2020.102677>
32. Rapoport, A. (1982). *The meaning of the built environment: A nonverbal communication approach*. Sage.
33. Relph, E. (1976). *Place and placelessness*. Pion.
34. Rigolon, A., & Németh, J. (2018). A quality index of parks for youth (QUINPY): Evaluating urban parks through geographic information systems. *Environment and Planning B: Urban Analytics and City Science*, 45(2), 275–294. <https://doi.org/10.1177/0265813516672212>
35. Sari, S. (2026). *Proposal disertasi: Pemodelan taman Kota Malang ditinjau dari teori place, fungsi taman, dan quality of life*. Doctoral Program in Environmental Science, Graduate School, Universitas Brawijaya.
36. Sen, A., & Nagendra, H. (2020). Local community engagement, environmental placemaking and stewardship by migrants: A case study of lake conservation in Bengaluru, India. *Landscape and Urban Planning*, 204, 103933. <https://doi.org/10.1016/j.landurbplan.2020.103933>
37. Serag El Din, H., Shalaby, A., Farouh, H. E., & Elariane, S. A. (2013). Principles of urban quality of life for a neighborhood. *HBRC Journal*, 9(1), 86–92. <https://doi.org/10.1016/j.hbrcj.2013.02.007>
38. Šerý, M., Brisudová, L., Buil-Gil, D., Kimic, K., Polko, P., & Solymosi, R. (2023). The perception of personal security in urban parks: A comparative analysis of research methods. In *Placemaking in Practice* (Vol. 1, pp. 290–308). Brill. https://doi.org/10.1163/9789004542389_017
39. Sime, J. D. (1986). Creating places or designing spaces? *Journal of Environmental Psychology*, 6(1), 49–63. [https://doi.org/10.1016/S0272-4944\(86\)80034-2](https://doi.org/10.1016/S0272-4944(86)80034-2)

40. Song, H., & Shim, C. (2021). Comparing resident and tourist perceptions of an urban park: A latent profile analysis of perceived place value. *Journal of Sustainable Tourism*, 29(7), 1180–1192. <https://doi.org/10.1080/09669582.2021.1872586>
41. Su, C., Wang, X., Wang, Y., Chen, Y., Dai, F., & Chen, X. (2025). Mediating roles of cultural perception and place attachment in the landscape–wellbeing relationship: Insights from historical urban parks in Wuhan, China. *Land*, 14(6), 1176. <https://doi.org/10.3390/land14061176>
42. Tuan, Y. F. (1977). *Space and place: The perspective of experience*. University of Minnesota Press.
43. Van Dinter, M., Kools, M., Dane, G., Weijs-Perrée, M., Chamilothoni, K., van Leeuwen, E., Borgers, A., & van den Berg, P. (2022). Urban green parks for long-term subjective well-being: Empirical relationships between personal characteristics, park characteristics, park use, sense of place, and satisfaction with life in The Netherlands. *Sustainability*, 14(9), 4911. <https://doi.org/10.3390/su14094911>
44. Van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, 84, 523–538. <https://doi.org/10.1007/s11192-009-0146-3>
45. Van Eck, N. J., & Waltman, L. (2023). *VOSviewer manual*. Centre for Science and Technology Studies, Leiden University.
46. Wen, N., Yin, H., Ma, Z., Peng, J., Tang, K., Yao, D., Xiang, G., Xu, L., Ye, J., & Yu, H. (2025). Correction to: Central place theory based on mobile signal data: The case of urban parks in Beijing and Changsha. *Land*, 14(5), 673. <https://doi.org/10.3390/land14051113>
47. World Health Organization. (1996). *WHOQOL-BREF: Introduction, administration, scoring and generic version of the assessment*. World Health Organization.
48. Wu, M., Zheng, K., Chen, J., Zhang, J., Li, M., & Wu, S. (2026). Assessing elderly walkability to urban parks using mobility analysis and multi-source data: A case study of central Fuzhou, China. *Scientific Reports*, 16(1), 13685. <https://doi.org/10.1038/s41598-026-41060-x>
49. Zamanifard, H., Alizadeh, T., & Bosman, C. (2018). Towards a framework of public space governance. *Cities*, 78, 155–165. <https://doi.org/10.1016/j.cities.2018.02.010>
50. Zhao, L. (2020). Study of factors influencing quality of life through matches between demand and satisfaction of cultural services in urban parks. *Journal of Urban Planning and Development*, 146(3), 04020022. [https://doi.org/10.1061/\(ASCE\)UP.1943-5444.0000576](https://doi.org/10.1061/(ASCE)UP.1943-5444.0000576)
51. Zhao, M., Lu, H., Liang, J., & Chan, C.-S. (2021). Evaluating green resource branding using user-generated content data: The case study of a greenway in eastern Guangzhou, China. *Urban Forestry & Urban Greening*, 66, 127395. <https://doi.org/10.1016/j.ufug.2021.127395>
52. Zhao, Z., He, Q., Zhang, Y., Liu, S., & Yang, Y. (2025). Assessing cross-cultural urban park emotional wellbeing impact in Shanghai and London. *Scientific Reports*, 15(1), 18892. <https://doi.org/10.1038/s41598-025-03599-z>
53. Zhu, J., Lu, H., Zheng, T., Rong, Y., Wang, C., Zhang, W., Yan, Y., & Tang, L. (2020). Vitality of urban parks and its influencing factors from the perspective of recreational service supply, demand, and spatial links. *International Journal of Environmental Research and Public Health*, 17(5), 1615. <https://doi.org/10.3390/ijerph17051615>