

Review

Socio-Spatial Inequalities in Access to Urban Public Parks: Implications for Spatial Justice

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Abstract

Urban public parks are vital for recreation, public health, environmental quality, and sustainable urban growth. Yet access to these parks remains uneven across many cities, disproportionately affecting low-income, marginalised, and spatially segregated communities. This study systematically examines socio-spatial disparities in park access and their implications for spatial justice. Using the PRISMA 2020 framework, 108 peer-reviewed articles published between 2000 and 2025 were analysed through thematic narrative synthesis. The results identify key factors shaping accessibility disparities, including socio-economic status, residential location, race and ethnicity, transport infrastructure, urban form, governance, and demographic vulnerability. The most common determinants were socio-economic status (24%), residential location and spatial distribution (20%), race and ethnicity (18%), and urban form and transport systems (17%). Limited park access exacerbates socio-economic inequality, worsens environmental injustice, contributes to health gaps, reinforces spatial segregation, hampers urban sustainability, and marginalises vulnerable populations. The review integrates Spatial Justice Theory, Environmental Justice Theory, and Urban Political Ecology into a comprehensive analytical framework and introduces a conceptual model linking accessibility factors to spatial justice outcomes. These findings underscore the importance of equitable green infrastructure planning, inclusive governance, and improved access in underserved urban areas.

Keywords: urban public parks; park accessibility; spatial justice; environmental justice; socio-spatial inequality; green infrastructure

1. Introduction

Urban green spaces are increasingly vital in modern city planning due to concerns about sustainability, climate change, public health, and urban quality of life [1,2]. Public parks are particularly important, as they provide spaces for recreation, exercise, relaxation, socialising, and environmental initiatives [3,4]. They also play a key role in supporting biodiversity, cooling urban areas, improving air quality, managing floods, enhancing climate resilience, and promoting mental health, while fostering social integration and urban livability [5,6]. Nonetheless, rapid urbanisation, population growth, expanding infrastructure, and changing land use have transformed cityscapes in both developed and developing regions [7,8]. These trends have led to declines in the availability, accessibility, and quality of green spaces, especially in crowded, socio-economically deprived neighbourhoods [9,10]. In many urban areas, public open spaces have been encroached upon by residential, commercial, and infrastructural development, limiting equitable access to



Academic Editor: Hongxu Wei

Received: 4 June 2026

Revised: 6 July 2026

Accepted: 7 July 2026

Published: 14 July 2026

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green recreational areas for low-income and marginalised groups [11]. As a result, ensuring fair access to public parks has become a vital issue in discussions on sustainable urban growth, environmental equity, and spatial justice [10,12]. Public park accessibility generally refers to how easily urban residents can reach, enter, and use public parks and recreational green spaces [13]. Accessibility extends beyond physical proximity to include travel time, connectivity, safety, inclusivity, affordability, usability, environmental quality, and the cultural appropriateness of recreational spaces [14,15]. Existing studies commonly conceptualise accessibility using indicators such as walking distance, service-area coverage, travel time, network accessibility, population-to-park ratios, and GIS-based accessibility modelling approaches [16,17]. Nevertheless, accessibility inequalities remain widespread across many cities globally. Research shows that socio-economic status, race and ethnicity, residential segregation, transport systems, urban morphology, governance systems, and land-use patterns significantly influence accessibility outcomes [18]. These inequalities often manifest as unequal park distribution, disparities in park quality, transport barriers, overcrowding, and exclusion from recreational opportunities, particularly among vulnerable populations, including low-income households, children, older adults, women, and people with disabilities [19–22].

Unequal access to urban public parks has significant environmental, social, and public health implications. Public parks support physical activity, social interaction, psychological restoration, biodiversity conservation, climate regulation, and urban resilience [23,24]. Consequently, limited access to parks may contribute to sedentary lifestyles, mental health challenges, social exclusion, environmental inequality, and reduced urban sustainability [25,26]. Despite growing scholarly attention, evidence on urban public park accessibility remains fragmented across regions, methods, and conceptual perspectives [27]. Many studies continue to emphasise physical proximity to parks while giving limited attention to broader dimensions such as park quality, safety, affordability, inclusivity, and functional usability [28,29]. Existing literature also shows substantial geographical disparities in research coverage. Most studies originate from North America, Europe, and East Asia, while African, Latin American, and many South Asian cities remain underrepresented [30]. This imbalance is problematic because many cities in developing regions are experiencing rapid urbanisation, expansion of informal settlements, infrastructure deficits, governance fragmentation, and increasing socio-economic inequality, all of which significantly influence access to urban public parks [31,32]. Consequently, there remains a limited understanding of the nature, drivers, and implications of park accessibility inequalities within rapidly urbanising cities in developing regions [33].

Although previous studies have examined urban public park accessibility, environmental justice, and GIS-based accessibility assessment, much of the literature has focused on isolated dimensions of accessibility, such as proximity analysis, environmental exposure, or public health outcomes, without adequately integrating the broader socio-spatial processes that shape unequal access [34–36]. Existing reviews remain fragmented and largely focus on isolated dimensions of accessibility, with limited integration of socio-economic inequality, governance systems, transportation infrastructure, and spatial justice within a unified analytical framework. Furthermore, many studies emphasise technical accessibility measurement while paying insufficient attention to how structural inequalities, planning decisions, land markets, and urban governance processes reproduce spatial injustice in access to public parks across different urban contexts [37,38].

This review addresses these gaps by providing a systematic, integrated synthesis of socio-spatial inequalities in urban public park accessibility. It focuses on spatial justice, with urban public park accessibility examined as one of its key dimensions. Specifically, the review seeks to: (a) examine the socio-economic and spatial factors that influence

accessibility to urban public parks; and (b) assess the implications of unequal access to these parks. This review contributes to existing scholarship by integrating Spatial Justice Theory, Environmental Justice Theory, and Urban Political Ecology to develop a multidimensional understanding of inequalities in urban park accessibility. Spatial Justice Theory explains how the spatial distribution of urban resources reflects broader social, political, and economic inequalities within cities [39]. Environmental Justice Theory emphasises equitable access to environmental benefits and protection from environmental burdens, regardless of race, ethnicity, income, or residential location [40]. Urban Political Ecology further examines how governance systems, planning decisions, land markets, and institutional power relations shape the uneven distribution of environmental amenities within urban areas [41]. Collectively, these theoretical perspectives provide an integrated framework for understanding how urban park accessibility reflects broader socio-spatial inequalities and environmental injustice. The remainder of this article is organised as follows. Section 2 describes the methodology; Section 3 presents the results; Section 4 discusses the findings; Section 5 outlines the review's limitations; and Section 6 concludes the study with key contributions, recommendations, and future research directions.

2. Materials and Methods

2.1. Review Design and Reporting Framework

This systematic review adopted the PRISMA 2020 guidelines and Okoli's systematic review framework to ensure transparency, rigour, and replicability throughout the review process. PRISMA provided a structured procedure for study identification, screening, eligibility assessment, and reporting [42]. At the same time, Okoli's framework guided the formulation of the problem, the development of the search strategy, study selection, quality appraisal, data extraction, synthesis, and the interpretation of findings [43]. The review protocol was developed before data collection and guided all stages of study identification, screening, appraisal, and synthesis. Although the protocol was not formally registered, methodological procedures were predefined to minimise review bias. The review employed a qualitative design using thematic narrative synthesis because the included studies applied diverse methodological approaches, including qualitative, quantitative, mixed-methods, GIS-based analyses, and accessibility modelling techniques. This approach enabled the identification and synthesis of co-occurring themes, patterns, and policy implications related to accessibility to urban public parks and spatial justice. To improve methodological rigour, the review also used the 2018 Mixed Methods Appraisal Tool (MMAT) developed by Hong et al. [44] to assess the quality and credibility of the included studies. Overall, the combined frameworks strengthened the reliability, consistency, and academic validity of the systematic review findings.

2.2. Search Strategy

A comprehensive, systematic literature search was conducted to identify peer-reviewed studies examining socio-spatial inequalities in access to urban public parks and their implications for spatial justice. The review followed the PRISMA 2020 guidelines to ensure transparency, consistency, and methodological rigour throughout the search and study selection process. The search drew on three primary bibliographic databases: Scopus, Web of Science, and ScienceDirect. These databases were selected for their extensive coverage of high-quality peer-reviewed literature across urban planning, geography, environmental studies, sustainability science, public health, and spatial analysis. In addition, Google Scholar was used as a supplementary search and discovery tool to enhance the review's comprehensiveness and identify potentially relevant studies that might not have been captured by database-specific searches.

Because Google Scholar indexes a broad range of document types, including reports, conference papers, theses, books, and other non-peer-reviewed materials, records retrieved through this platform were not automatically included in the review. Instead, all studies identified through Google Scholar underwent the same screening, eligibility assessment, and quality appraisal procedures as those retrieved from Scopus, Web of Science, and ScienceDirect. Only studies meeting the predefined inclusion criteria and verified as peer-reviewed journal articles were retained for further analysis. Furthermore, to ensure methodological consistency, only peer-reviewed journal articles published in English were eligible for inclusion in the review. Although Google Scholar indexes publications originating from both English-speaking and non-English-speaking countries, English-language articles from all regions were treated equally during the screening and selection process. Consequently, studies conducted in Asia, Africa, Europe, Latin America, and other regions were classified according to the geographical location of the study rather than the nationality or native language of the authors. This approach minimised inconsistencies in regional comparisons while maintaining uniform eligibility criteria across all databases.

Searches were conducted between August and December 2025. The search strategy combined keywords, synonyms, and Boolean operators related to urban public parks, green spaces, accessibility, spatial inequality, environmental justice, spatial justice, urban planning, and GIS-based accessibility analysis. Boolean operators such as “AND” and “OR” were used to refine search results, while phrase searching and alternative keyword combinations helped capture variations in terminology across databases. To maintain consistency with established systematic review practice, only the first 200 Google Scholar results, sorted by relevance, were screened. The complete search strings used in the database queries are provided in the Appendix A.

2.3. Eligibility Criteria

The review included studies published between 2000 and 2025. The year 2000 was selected as the starting point because it marked significant advances in urban sustainability, environmental justice, and GIS-based accessibility analysis that reshaped research on urban green spaces. During this period, GIS became widely used for analysing spatial accessibility and environmental inequalities, while equitable access to urban green infrastructure gained prominence in planning research [45]. The adoption of the Millennium Development Goals in 2000 further stimulated research on sustainable and equitable urban environments [46]. Consequently, studies published after 2000 provide a consistent methodological and conceptual foundation for this review.

Only peer-reviewed English-language journal articles were included to ensure credibility and scholarly rigour. The inclusion criteria targeted relevant, methodologically rigorous studies aligned with the review’s goals. Selected studies focused on accessibility to urban public parks or green spaces and examined socio-economic, spatial, environmental, transport, governance, or demographic aspects of accessibility. The review also encompassed research on spatial justice, environmental justice, urban inequality, and green infrastructure planning that employed qualitative, quantitative, mixed-methods, GIS-based, or spatial analysis techniques.

Studies were excluded if they focused solely on rural settings or private recreational areas, were not relevant to urban park access or spatial justice, or were conference abstracts, editorials, dissertations, reports, or other non-peer-reviewed sources. Studies lacking a clear methodology or identified as duplicates during screening were also excluded. This process ensured that the final selection of studies directly addressed socio-spatial inequalities in urban public park access and their implications for spatial justice. The search strings used in the database queries are listed in the Appendix A. Literature searches were conducted from

August to December 2025, using the same databases to maintain consistency and reduce temporal bias. For transparency and reproducibility, Table 1 summarises the databases searched and the number of records retrieved before duplicate removal.

Table 1. Databases searched and records retrieved.

Database	Search Period	Records Retrieved
Scopus	August–December 2025	412
Web of Science		365
ScienceDirect		298
Google Scholar		452
Total		1527

Searching across multiple databases enhanced the comprehensiveness of the review by capturing literature from diverse disciplinary fields and reducing the risk of bias associated with reliance on a single database. After removing 287 duplicate records, the remaining studies underwent screening, as presented in Figure 1.

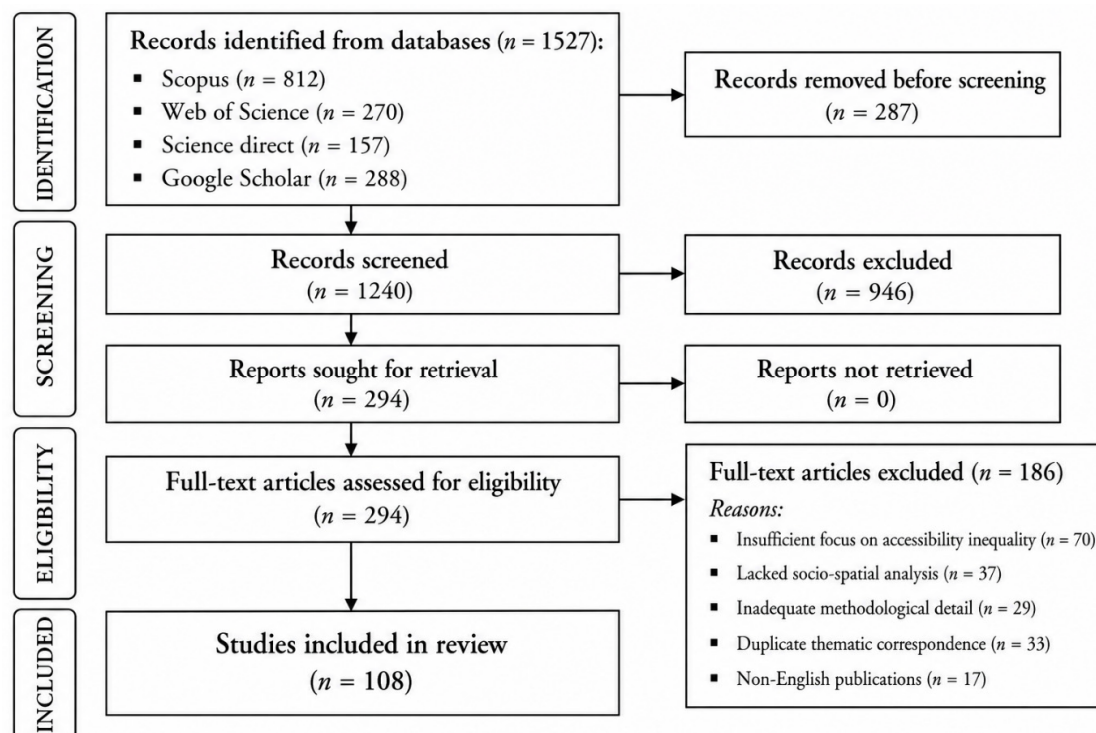


Figure 1. PRISMA-based systematic review strategy. Source: Adapted from Page et al. [42].

2.4. Study Selection Process and Temporal Distribution of Studies

The study selection process followed PRISMA 2020 guidelines, comprising identification, screening, eligibility assessment, and final inclusion. Duplicate studies were removed during screening, and titles and abstracts were screened before full-text assessment (Figure 1). To minimise duplication of evidence, publications from the same authors or research institutions were assessed individually during the full-text review. When multiple publications reported substantially similar datasets, study areas, or findings, they were carefully compared, and only studies that made distinct empirical contributions were retained. This procedure reduced the potential for over-representation of evidence from the same research groups while preserving relevant complementary findings.

Table 2 illustrates the temporal distribution of the 108 studies included in this systematic review. The results reveal a clear and sustained increase in scholarly research on socio-spatial inequalities in access to urban public parks over the 25-year review period. During the first decade (2000–2009), only 18 studies (16.7%) were published, indicating that research on park accessibility, spatial justice, and environmental equity was still emerging. Publication output increased moderately between 2010 and 2019, reflecting growing recognition of the role of urban green spaces in promoting public health, environmental sustainability, and equitable urban development. The most substantial growth occurred between 2020 and 2025, during which 55 studies (50.9%) were published, accounting for more than half of all included studies. This rapid increase demonstrates the expanding global interest in understanding inequalities in access to urban green infrastructure, driven by advances in Geographic Information Systems (GIS), network-based accessibility modelling, environmental justice research, and the increasing integration of spatial equity considerations into sustainable urban planning. The observed publication trend therefore provides empirical support for selecting 2000 as the starting year for this review, as studies published before this period were relatively few and generally preceded the widespread application of contemporary GIS-based accessibility methods, spatial justice frameworks, and sustainability-oriented urban planning approaches that now underpin research in this field.

Table 2. Temporal distribution of the 108 studies included in the systematic review (2000–2025).

Publication Period	Number of Studies	Percentage (%)
2000–2004	7	6.5
2005–2009	11	10.2
2010–2014	15	13.9
2015–2019	20	18.5
2020–2025	55	50.9
Total	108	100.0

2.5. Data Extraction

Data extraction was conducted systematically to ensure consistent collection and organisation of relevant information from the selected studies. A structured framework was developed to record key details on access to urban public parks and spatial justice. The extracted data included author(s), publication year, study location, objectives, research design, data collection methods, accessibility indicators, GIS and spatial analysis techniques, socio-economic and spatial factors influencing accessibility, and implications for spatial justice. When relevant, information on transport, walkability, environmental justice, park distribution, demographic vulnerability, and governance issues was also gathered. The process involved documenting major findings, methodologies, and policy suggestions from each study. Studies were independently screened and assessed against predefined inclusion and exclusion criteria, with titles, abstracts, and full texts evaluated for relevance. To ensure consistency and reduce bias, the review was conducted systematically, and thematic objectives organised the information. This approach facilitated comparisons across regions, methods, and disciplines, enhancing the reliability and transparency of the synthesis. The author performed initial screening, full-text review, data extraction, and thematic coding, while an independent reviewer examined a random 20% sample of studies. Inter-coder agreement was measured using Cohen’s Kappa coefficient, which was 0.84, indicating strong agreement and acceptable reliability. Any coding discrepancies were discussed and resolved through consensus.

2.6. Data Analysis and Synthesis

Data analysis and synthesis employed thematic narrative synthesis to identify recurring themes, spatial patterns, methodological trends, and policy implications across the reviewed studies. This method suited the diverse methodologies found in the literature, including qualitative, quantitative, mixed-methods, GIS-based, and accessibility modelling studies. Data were inductively coded and categorised into themes aligned with the review goals. Themes were refined through iterative comparison to improve analytical consistency and reliability. The coding process involved three stages: first, open coding to identify recurring concepts related to park accessibility, environmental justice, governance, transport, and socio-economic inequality; second, grouping similar codes into broader themes via axial coding; third, consolidating themes into the final framework using selective coding. From 108 studies, 42 initial codes were generated through inductive thematic coding and then grouped into six determinants and eight implications themes. All relevant text segments concerning park accessibility and spatial justice were coded and analysed in NVivo, with matrix coding queries examining theme co-occurrence across studies.

To assess the strength of thematic links, co-occurrence percentages were calculated as the proportion of studies in which two themes co-occurred across the reviewed studies. This percentage was obtained by dividing the number of studies containing both themes by the total number of studies with either theme, then multiplying by 100. Higher percentages indicate stronger thematic connections and more frequent joint appearances in the literature. These values do not imply statistical correlation or causality; they reflect the degree of thematic relatedness among the identified factors and outcomes. For instance, a co-occurrence value of 82% means that the two themes were jointly identified in 82% of the studies where either theme appeared. The reported percentages were based on the number of reviewed publications ($n = 108$) in which each theme was identified during thematic coding. Because individual studies frequently addressed more than one theme, a single publication could contribute to multiple categories. Consequently, the percentages indicate the proportion of publications discussing each theme rather than mutually exclusive categories or the number of coded text segments.

2.7. Theoretical Framework for Analysis

This review was guided by three complementary theoretical frameworks: Spatial Justice Theory, Environmental Justice Theory, and Urban Political Ecology. These frameworks shaped the coding, interpretation, and synthesis of findings on inequalities in access to urban public parks. Spatial Justice Theory helped analyse how the spatial distribution of parks mirrors broader societal inequalities in access to urban resources and opportunities. It was particularly useful for understanding issues related to residential location, park placement, distance, and mobility. Environmental Justice Theory provided insights into socio-economic, racial, and demographic disparities in park accessibility. It underscores the importance of equitable environmental access and helps explain exclusion patterns affecting low-income, minority, and vulnerable groups. Urban Political Ecology offered a perspective on how governance structures, planning choices, institutional capacity, and land-use policies influence the distribution of urban green spaces. It emphasised the impact of power relations and political-economic processes on the creation of accessibility disparities. Table 3 summarises each theory's focus and its application in this review.

Table 3. Application of theoretical frameworks.

Theory	Analytical Focus	Application in Review
Spatial Justice Theory	Spatial distribution of resources	Interpreting unequal park accessibility and spatial exclusion
Environmental Justice Theory	Equity in environmental benefits	Analysing disparities across race, ethnicity, and socio-economic groups
Urban Political Ecology	Governance and power relations	Exploring how institutional and planning factors affect accessibility.

The three theoretical perspectives were not treated as a single unified explanatory model. Instead, they were applied as complementary analytical lenses to interpret different dimensions of the evidence. Applying the theories in this complementary manner enabled the review to accommodate diverse empirical findings across different urban contexts rather than assuming a single explanatory pathway. Furthermore, thematic coding and synthesis were conducted inductively, allowing themes to emerge from the reviewed studies instead of being predetermined by the theoretical framework, thereby minimising the potential for selective interpretation.

2.8. Quality Appraisal and Evidence Assessment

The quality of the 108 reviewed studies was evaluated using the 2018 MMAT, which is suitable for assessing qualitative, quantitative, and mixed-methods research (see Table 4). The assessment covered research objectives, study design, data collection methods, analytical rigour, sampling, reporting of validity and reliability, and the integration of mixed methods. Qualitative ratings reflected the extent to which studies met each criterion. A ‘High’ rating signified clear and consistent reporting across most studies, while a ‘Moderate’ rating indicated some methodological or reporting shortcomings. No study was rated as low in any quality dimension. Following the MMAT guidance, studies meeting all or most methodological criteria were classified as High quality, while those with minor methodological or reporting limitations were classified as Moderate quality. These ratings informed the assessment of the overall strength of the evidence.

Table 4. Methodological quality assessment of reviewed studies.

Quality Dimension	Assessment	Observation
Research objectives	High	Most studies explicitly outlined their objectives and research questions.
Research design	High	Research designs were generally appropriate to the study aims.
Data collection procedures	High	Most studies employed suitable and clearly described data collection methods.
Analytical rigour	High	GIS, statistical, qualitative, and mixed-methods analyses were generally robust.
Sampling procedures	Moderate	Some studies provided limited information on sampling strategies and justification for the sample.
Validity and reliability reporting	Moderate	Reporting of validity and reliability measures was inconsistent across studies.
Integration of mixed-methods components	Moderate	Some mixed-methods studies inadequately integrated qualitative and quantitative findings.

The reviewed studies generally demonstrated good methodological quality. Most clearly articulated their objectives and employed appropriate research designs, data collection procedures, and analytical techniques. The MMAT assessment indicated that 76 studies (70.4%) were of high quality and 32 (29.6%) were of moderate quality, with no studies rated as low quality. The main methodological limitations concerned incomplete reporting of sampling procedures, validity and reliability measures, and the integration of mixed methods. However, these limitations were not considered sufficient to undermine the overall credibility of the evidence. Based on the MMAT appraisal results and the consistency of findings across the 108 reviewed studies, the overall certainty of evidence was assessed as moderate to high. No substantial evidence of reporting bias was identified, although the exclusion of non-English publications and the limited representation of some geographical regions may have influenced the completeness of the evidence base. In addition to assessing methodological quality using the MMAT, the review considered potential reporting bias and the overall certainty of evidence. Reporting bias was assessed qualitatively based on the comprehensiveness of the search strategy, the use of multiple databases, and the application of predefined eligibility criteria. The certainty of the evidence was evaluated based on the methodological quality of the included studies, the consistency of findings, and the convergence of evidence across different geographical and methodological contexts.

3. Results

3.1. Geographic Distribution of Reviewed Studies

Figure 2 shows the regional distribution of the 108 studies reviewed on accessibility to urban public parks and their implications for spatial justice. It displays the proportion of studies from various regions, including North America, Europe, East Asia, Latin America, Africa, South Asia, Australia and New Zealand, as well as global and methodological research.

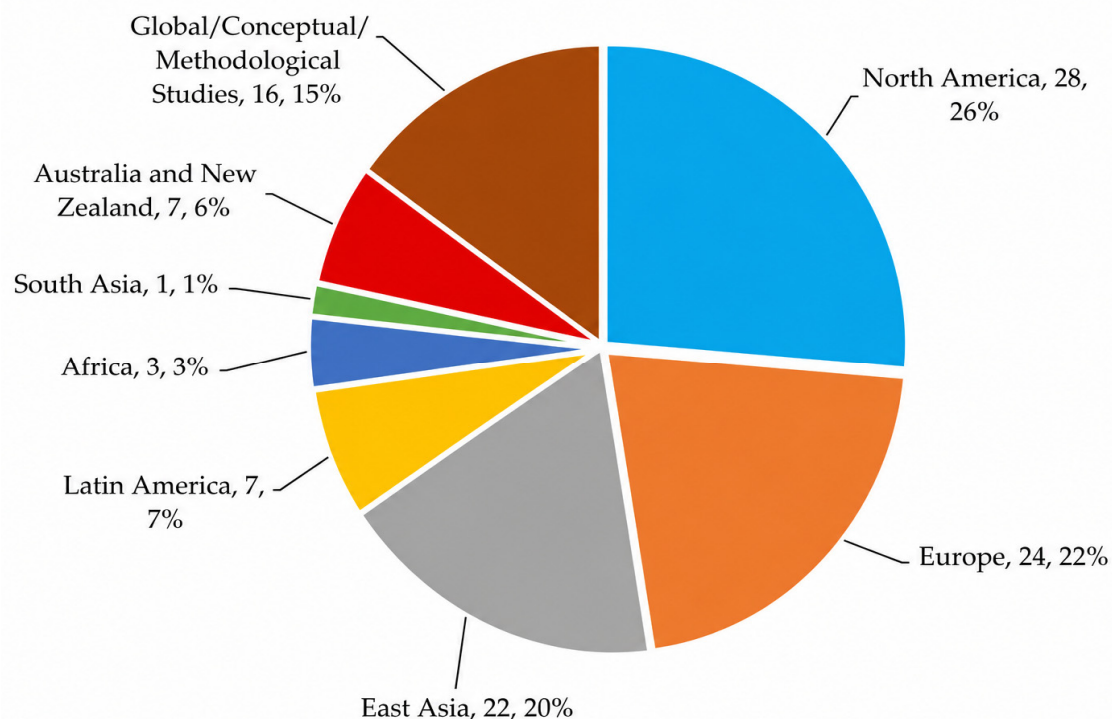


Figure 2. Geographic distribution of the 108 reviewed studies.

The prominence of North American, European, and East Asian studies stems from stronger research funding, greater access to geospatial datasets, advanced GIS capabilities, and longer histories of environmental justice research. By contrast, the underrepresentation of African and South Asian cities highlights significant geographical knowledge gaps, despite their rapid urbanisation, environmental challenges, and rising socio-spatial inequalities. As a result, current insights into urban park accessibility are largely drawn from the Global North, which may limit the extent to which existing theories and policies apply to rapidly growing cities in the Global South.

3.2. *Socio-Economic and Spatial Factors Influencing Accessibility to Urban Public Parks*

3.2.1. Household Income and Socio-Economic Status

Access to urban public parks is strongly influenced by household income and socio-economic status. Studies show that wealthier communities tend to have better access to parks, green spaces, and enhanced recreational facilities than lower-income areas. This pattern arises because socio-economic factors shape where people live, levels of infrastructure investment, mobility options, and political influence in urban planning [47–49]. For example, Abercrombie et al. [50] reported that high-income neighbourhoods in the USA had significantly greater access to parks and physical activity facilities than poorer regions. Similarly, Moore et al. [51] found that parks, sports fields, and leisure facilities are more concentrated in affluent neighbourhoods. Supporting this, Boone et al. [52] showed that in Baltimore, socio-economic disparities shaped park distribution, favouring wealthier communities with better access to recreational spaces.

Beyond sheer numbers, socio-economic disparities also shape the quality, safety, and usability of green spaces. Rigolon [13], reviewing studies on park accessibility, noted that affluent neighbourhoods typically feature parks with better landscaping, modern recreational facilities, playgrounds, sports amenities, and higher security. By contrast, parks in low-income areas often face overcrowding, poor upkeep, vandalism, and limited recreational options. Hoffmann et al. [53] described this as “green inequality,” in which deprived communities face subpar green environments despite greater environmental and social needs. Moreover, urban governance and planning often reinforce these inequalities. Wolch et al. [23] argued that urban greening projects tend to benefit wealthier communities because their residents have greater political influence and capacity to attract environmental investments. Similarly, Sister et al. [14] observed that Los Angeles’ planning systems historically directed more recreational resources to wealthy neighbourhoods while neglecting low-income minority areas. As a result, socio-economic disparities become embedded within urban spatial structures, shaping environmental accessibility patterns. This trend is also evident in rapidly urbanising cities outside North America. Fan et al. [54] identified significant disparities in park access across Shanghai neighbourhoods. Wüstemann et al. [55] showed that affluent districts in Beijing enjoy better park access than poorer areas. Likewise, Hosseini et al. [56] found that wealthier communities in Tehran have greater access to parks and green infrastructure than lower-income districts.

Socio-economic status also affects transport options, which, in turn, influence access to parks [57]. Wealthier households typically own private vehicles, enabling them to reach distant recreational areas more easily. Conversely, low-income households rely mainly on walking or limited public transport. Studies by Luo et al. [58], Lee and Hong et al. [16], and Zhang and Tan [59] show that accessibility varies significantly across transport modes and mobility opportunities. Similarly, Li et al. [22] found that residents in public housing in deprived neighbourhoods have much poorer access to parks due to concentrated poverty and insufficient recreational infrastructure. Colbert et al. [60] also observed lower levels of accessibility and park use among public housing communities in Auckland.

3.2.2. Race, Ethnicity, and Environmental Justice

Closely linked to socio-economic inequality is the issue of race and ethnicity, which significantly affects access to urban public parks. Environmental justice scholars argue that racial and ethnic disparities in park access are deeply rooted in historical segregation, discriminatory planning, and uneven urban development [6,61]. Consequently, minority groups often have less access to parks and recreational resources than dominant racial groups. Boone et al. [52] found that racial segregation in Baltimore led to unequal park distribution, with predominantly Black neighbourhoods having fewer recreational spaces and poorer environmental amenities than white neighbourhoods. Similarly, Dai [18] identified notable racial disparities in Atlanta, showing that African American communities had lower park accessibility despite higher population densities and greater recreational needs. Wen et al. [62] also found that neighbourhoods with large minority populations generally had less green space than affluent white areas. These disparities are perpetuated by institutional planning and historical urban development patterns. Sister et al. [14] argued that park distribution in Los Angeles was influenced by planning biases favouring wealthy white populations while marginalising minority neighbourhoods. Rigolon [13] concluded that racial inequalities in park access are widespread globally and often intersect with poverty, social exclusion, and neighbourhood deprivation.

Race and ethnicity shape not only physical access to parks but also social experiences within them. Byrne and Wolch [63] highlighted that minority groups may feel excluded, insecure, discriminated against, or lacking a sense of belonging in recreational areas predominantly occupied by other social groups. Similarly, Germann-Chiari and Seeland [64] noted that cultural and ethnic differences influence perceptions of comfort, safety, and inclusiveness in urban green spaces. Additionally, unequal access to parks plays a key role in broader environmental health disparities affecting minority populations. Jennings and Gaither [26] argued that limited access reduces opportunities for physical activity, stress relief, social engagement, and psychological renewal. Likewise, Comber et al. [65] showed that accessibility varies among ethnic and religious groups because residential segregation and transport systems affect mobility options differently. Similar patterns are evident in rapidly urbanising African cities; Azagew and Worku [66] found that socio-economic and ethnic disparities significantly shape park accessibility in Addis Ababa, driven by uneven infrastructure development and spatial segregation.

3.2.3. Residential Location and Spatial Distribution of Parks

Alongside socio-economic and racial inequalities, residential location and the spatial layout of parks are crucial to accessibility. Neighbourhoods vary widely in their green infrastructure and environmental investment, affecting residents' ability to reach recreational spaces within reasonable distances. Jeong [67] found that the spatial arrangement and density of parks in urban areas strongly influence accessibility. Typically, areas near multiple parks have greater accessibility than underserved districts distant from recreational facilities. Talen and Anselin [68] similarly argued that uneven park distribution creates accessibility gaps, with some communities overserved and others underserved. This disparity often mirrors broader socio-spatial differences within cities. Jennings et al. [69] showed that affluent neighbourhoods tend to have larger parks, tree-lined streets, and better recreational environments. By contrast, low-income areas have limited green infrastructure. Similarly, Barbosa et al. [70] identified significant disparities in park accessibility across Scottish cities, particularly between wealthier and deprived neighbourhoods. The influence of residential location on accessibility has also been documented in Latin America and Asia. Dobbs et al. [71] noted that green spaces in Santiago are concentrated in affluent districts, leaving low-income peripheral areas underserved. Likewise, Tan and Samsudin [72]

found that even in well-planned cities such as Singapore, green infrastructure is unevenly distributed across high-density neighbourhoods. Kabisch and Haase [73] observed that socially deprived districts in Berlin lack sufficient green space, despite their high population density and social needs. Méndez-Barrientos et al. [74] argued that historical urban development patterns continue to create inequalities in park access, as wealthy neighbourhoods historically received more environmental investment than marginalised communities.

3.2.4. Distance to Parks

Travel distance, closely linked to residential location, is a key spatial factor shaping access to urban public parks. Residents closer to parks are more likely to visit and use them regularly than those farther away. Talen and Anselin [68] showed that access to playgrounds declines significantly as travel distance increases. Similarly, Dony et al. [75] found that residents are less inclined to use parks beyond a comfortable walking distance, especially when pedestrian infrastructure is lacking. Luo and Wang [76], along with Pham et al. [77], argued that accessibility depends on both travel distance and population demand, as distant parks pose mobility challenges for many urban residents. Distance has an especially strong impact on vulnerable groups such as children, the elderly, low-income households, and people with disabilities, who rely heavily on walking and public transport. Witten et al. [78] linked children's physical activity levels to nearby parks and open spaces. Likewise, Zhang et al. [20] emphasised that elderly residents need parks within short walking distances due to mobility issues. Additionally, Wang et al. [79] showed that accessibility decreases gradually with increasing travel distance, particularly in densely populated urban areas. Overall, proximity remains a vital factor for ensuring effective accessibility and frequent park use.

3.2.5. Street Connectivity and Urban Form

While proximity remains important, accessibility is also strongly shaped by street connectivity and urban form, which affect how easily residents can navigate urban areas to reach parks. Consequently, accessibility depends not only on the locations of parks but also on the structure and efficiency of transport networks. Frank et al. [80] found that neighbourhoods with connected street networks, mixed land use, and high intersection density promote walking and enhance park access. Similarly, Neutens et al. [81] argued that equitable urban service delivery requires urban design that reduces travel burdens and enhances pedestrian accessibility. Conversely, disconnected streets, highways, railways, cul-de-sacs, and inadequate sidewalk systems often create physical barriers that hinder access, even when parks are geographically nearby. Cracu et al. [82] showed that such barriers significantly limit pedestrian mobility and practical access to parks. Likewise, Tannous et al. [83] stressed that network connectivity is crucial for equitable pedestrian access in dense urban areas. Urban form also influences accessibility through land use patterns and development density. Compact, mixed-use developments typically improve access by integrating parks into residential neighbourhoods. At the same time, urban sprawl and segregated land uses increase travel distances and reduce pedestrian access. Recent research by Dai et al. [84] and Zhang and Tan [59] further confirms that accessibility varies with walking scales, modes of slow mobility, travel methods, and spatial contexts.

Figure 3 shows how often six key factors affecting access to urban public parks appear in the literature. The percentages indicate how often these themes are mentioned, as determined by study coding. Since many studies address multiple themes, these percentages reflect their relative importance rather than serving as exclusive categories. Based on thematic analysis, the figure highlights the emphasis on each factor in current research.

This distribution reveals which issues are most closely linked to urban park accessibility and environmental inequality.

Socio-economic status is the most influential factor, identified in 24% of the studies, highlighting that income inequality, poverty, and socio-economic deprivation are the main determinants of unequal access to parks. The literature consistently indicates that low-income communities tend to have limited park access, poorer recreational facilities, and less investment in the environment than wealthier neighbourhoods. The second key factor is residential location, distance, and spatial distribution, accounting for 20% of the studies, emphasising the importance of neighbourhood location and proximity to parks in shaping accessibility. Findings reveal that those living closer to parks, or in urban areas with better amenities, usually have greater access than those in peripheral or underserved neighbourhoods. Race, ethnicity, and environmental justice are covered in 18% of the research, reflecting significant concern about racial segregation, unequal urban planning, and environmental inequality. Studies show that minority communities often face reduced park access due to historical and structural inequalities embedded in urban development. Urban form, street connectivity, and transportation infrastructure account for 17% of the total, underscoring the role of walkability, transportation systems, street networks, and urban design in shaping accessibility. The literature also highlights that connected streets, efficient transit, and compact urban layouts greatly enhance access to recreational areas. The figure further indicates that demographic vulnerability factors, including those affecting children, older people, and gender, account for 13% of the studies. Lastly, planning, governance, and park quality are addressed in 8% of the research.

The co-occurrence matrix in Table 5 quantifies the extent to which the identified factors influencing accessibility to urban public parks co-occur across the reviewed studies. The percentages represent the proportion of reviewed studies in which two variables were simultaneously identified or discussed during thematic coding and synthesis. Because individual studies frequently addressed multiple themes concurrently, the percentages reflect relative thematic associations rather than mutually exclusive relationships. Higher percentages indicate stronger thematic interrelationships among the identified accessibility factors.

The co-occurrence analysis shows that socio-economic status has the strongest thematic connections with planning and governance (81%), race and ethnicity (82%), and residential location and spatial distribution (79%). This suggests that income inequality and socio-economic deprivation are closely tied to environmental injustice, unequal access to parks, and disparities in the governance of urban green infrastructure. The findings also reveal a strong link between race, ethnicity, environmental justice, and planning and governance factors (77%), as well as residential location (73%), pointing to the influence of historical segregation, discriminatory planning, and uneven environmental investments on access outcomes. Furthermore, residential location and urban form are highly interconnected (75%), highlighting the importance of spatial organisation, transport networks, and walkability in accessing parks. Demographic vulnerability is notably associated with socio-economic inequality (76%) and transport systems (70%), demonstrating how children, older adults, women, and mobility-limited groups face compounded access challenges due to intersecting socio-economic and infrastructural issues. Overall, the matrix illustrates that accessibility inequality is complex and shaped by a web of interconnected socio-economic, spatial, infrastructural, demographic, and governance factors.

Table 5. Co-occurrence matrix of accessibility determinants.

Factors	Socio-Economic Status	Race, Ethnicity & Environmental Justice	Residential Location, Distance & Spatial Distribution	Urban Form, Street Connectivity & Transportation	Demographic Vulnerability	Planning, Governance & Park Quality
Socio-Economic Status	—	82%	79%	74%	76%	81%
Race, Ethnicity & Environmental Justice	82%	—	73%	58%	71%	77%
Residential Location, Distance & Spatial Distribution	79%	73%	—	75%	61%	72%
Urban Form, Street Connectivity & Transportation	74%	58%	75%	—	70%	74%
Demographic Vulnerability	76%	71%	61%	70%	—	56%
Planning, Governance & Park Quality	81%	77%	72%	74%	56%	—

Note: Percentages represent the proportion of the 108 reviewed publications in which two themes were identified simultaneously during thematic coding. Since individual publications commonly addressed multiple themes, these values represent thematic co-occurrence rather than statistical association or mutually exclusive frequencies.

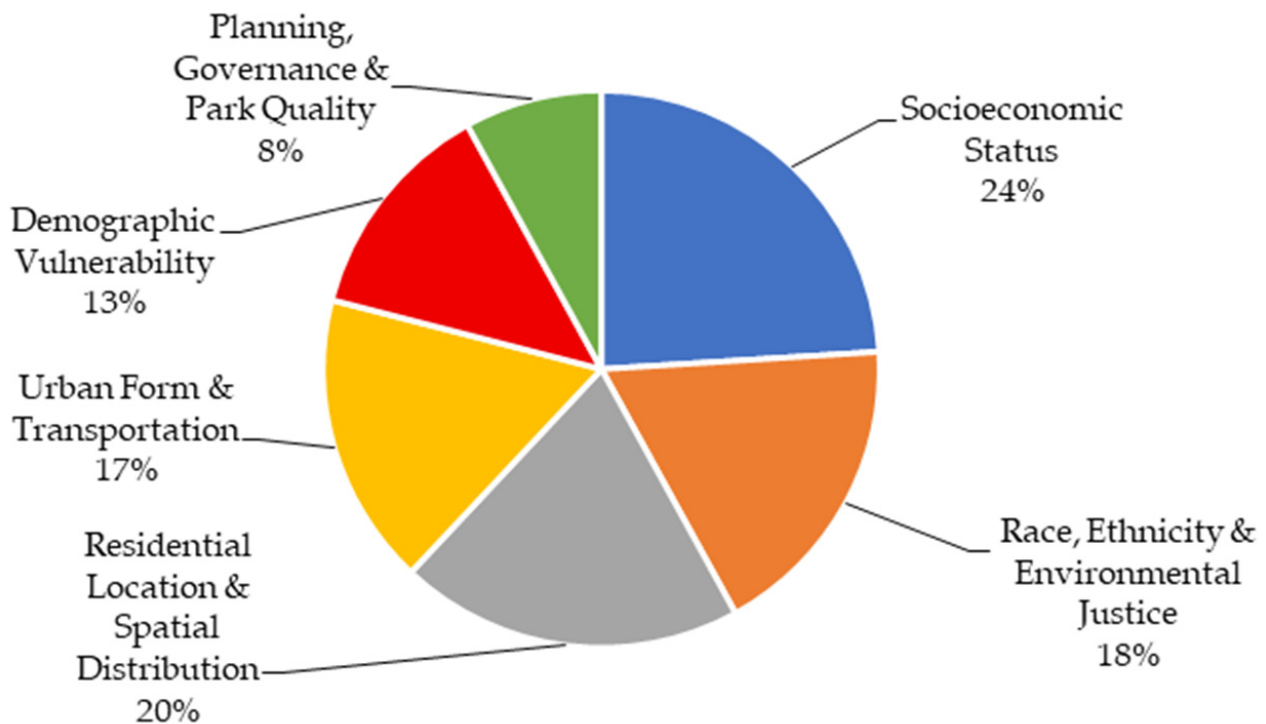


Figure 3. Accessibility determinants identified in the reviewed literature.

3.3. Implications of Unequal Accessibility to Urban Public Parks on Spatial Justice

3.3.1. Reinforcement of Socio-Economic Inequality

Unequal access to urban public parks significantly reinforces socio-economic disparities within cities. Wealthier neighbourhoods consistently enjoy better parks, higher-quality green spaces, improved recreational facilities, and safer environments than low-income areas [13,85]. This uneven distribution of environmental resources leads to disparities in recreation, physical activity, social interactions, and environmental health. The presence of superior parks in affluent areas also promotes uneven urban development, as environmental features often boost property values, attract investment, and make neighbourhoods more desirable [86,87]. Conversely, deprived neighbourhoods with limited green infrastructure tend to face declining environmental quality and reduced public funding. Urban greening projects can unintentionally worsen socio-economic inequality through green gentrification, which raises land prices and displaces low-income residents from upgraded areas [23,88]. Institutional barriers further hinder efforts to implement park-focused policies to reduce environmental inequities [27,89]. Therefore, unequal park access perpetuates cycles of urban poverty and social exclusion, as disadvantaged groups remain separated from environmental and recreational benefits. This situation undermines spatial justice by concentrating environmental amenities within socially privileged communities.

3.3.2. Intensification of Environmental Injustice

Unequal access to urban public parks exacerbates environmental injustice in cities. Environmental justice focuses on the equitable distribution of environmental benefits and burdens across all populations, regardless of race, ethnicity, or socio-economic status. However, many studies show that minority and marginalised communities often have less access to parks due to historical segregation, discriminatory urban planning, and uneven infrastructure investment [18,52,62]. Sister et al. [14] found that park distribution in Los Angeles reflected long-standing planning inequalities that favoured wealthy white neighbourhoods and excluded minorities from adequate recreational infrastructure. Similarly,

Méndez-Barrientos et al. [74] showed that past planning decisions continue to influence current environmental inequalities in many cities. As a result, minority communities frequently lack access to environmental amenities that are more readily available in socially dominant neighbourhoods. Marginalised populations often face not only fewer parks but also lower-quality green spaces characterised by overcrowding, poor maintenance, insecurity, vandalism, and limited recreational options [13,53]. Byrne and Wolch [63] also observed that racial minorities and women may feel excluded, insecure, and unwelcome in urban recreational areas.

3.3.3. Health Inequalities and Reduced Quality of Life

Another key consequence of unequal access is the widening of health disparities among city residents. Urban public parks are vital for encouraging physical activity, reducing stress, restoring mental health, and fostering social well-being [90,91]. Access to green spaces is linked to better mental health, reduced anxiety, stronger social bonds, and a lower risk of chronic diseases [90]. Exposure to natural environments notably diminishes health inequalities, especially for low-income groups [25]. Proximity to urban green spaces positively affects both physical and mental health [92,93], and proximity to parks has been associated with better mental health outcomes among city populations [94]. As a result, unequal access leads to disparities in physical and psychological health, as underserved communities have fewer opportunities for recreation, exercise, and contact with nature. Additionally, limited access to green spaces exacerbates environmental health inequalities, as vulnerable groups often live in neighbourhoods plagued by pollution, overcrowding, and inadequate recreational infrastructure [26]. In sum, uneven distribution of parks not only represents spatial injustice but also directly fuels broader public health disparities in urban areas [95].

3.3.4. Unequal Mobility and Transportation Opportunities

Unequal access to urban public parks exacerbates spatial injustice by creating disparities in mobility and transport options. Accessibility depends not only on the physical location of parks but also on residents' ability to reach them safely and easily. Research by Frank et al. [80], Guo et al. [58], Xing et al. [16], and Cracu et al. [82] shows that transport infrastructure, walkability, street connectivity, and mobility systems are crucial determinants of accessibility. Residents in neighbourhoods with disconnected street layouts, poor pedestrian facilities, limited public transport, and few mobility options often experience reduced access, even when parks are nearby [96]. This issue particularly affects low-income groups, the elderly, children, women, and those without private vehicles, who rely heavily on walking and public transport [20,21,97].

3.3.5. Spatial Segregation and Urban Fragmentation

The literature also shows that unequal access to green spaces leads to spatial segregation and fragmentation in cities. Parks and green infrastructure tend to be concentrated in wealthy, central neighbourhoods, leaving peripheral and disadvantaged communities underserved [14,71,73]. This uneven distribution creates environmentally unequal urban landscapes, in which some populations enjoy better environmental quality and recreational options than others. Such socio-spatial differences in green infrastructure contribute to fragmented urban environments and create disparities in access to ecosystem services and environmental amenities [69]. Similarly, socio-economic differences significantly influence the distribution of parks across cities [56,98]. These patterns highlight that unequal accessibility supports residential segregation and environmental polarisation in urban areas. Additionally, peripheral neighbourhoods with limited access to parks often face broader

infrastructural marginalisation, including inadequate transport, poor public services, and environmental decline.

3.3.6. Undermining Urban Sustainability and Livability

Unequal access to urban public parks also hampers broader urban sustainability and livability goals. Parks play a key role in ecological sustainability by supporting biodiversity, cooling cities, sequestering carbon, managing stormwater, and improving air quality [99]. They also promote social sustainability by encouraging community interaction, providing recreational spaces, and fostering social cohesion. However, the uneven distribution of green infrastructure concentrates environmental benefits in wealthier neighbourhoods [100]. This leaves disadvantaged communities with lower environmental resilience, stronger urban heat island effects, and poorer ecological conditions. Such disparities create environmentally unequal cities in which sustainability benefits are not fairly shared among residents. Tannous et al. [83] and Jin and Yang [84] emphasised that equitable planning of green infrastructure and connected mobility is crucial for fostering sustainable, inclusive urban development.

3.3.7. Marginalisation of Vulnerable Social Groups

Unequal access to urban public parks disproportionately affects vulnerable social groups, exacerbating social exclusion and limiting urban inclusivity. Children, older adults, women, people with disabilities, and public housing residents often face barriers related to mobility, safety, reliance on transport, and inadequate infrastructure [101,102]. Limited access to parks among young people poses a significant environmental justice challenge, as children in deprived neighbourhoods often lack safe, accessible recreational spaces [57,97]. Similarly, older adults in dense urban areas face reduced access due to mobility challenges and insufficient pedestrian infrastructure [20,103,104]. Socio-spatial and gender-based barriers also affect older adults' use of parks [21]. Additionally, public housing residents are often at a disadvantage because these developments are typically located in underserved neighbourhoods with poor environmental infrastructure and limited green space [22,60].

3.3.8. Weakening the “Right to the City”

Finally, unequal access to urban public parks undermines the broader principle of the “right to the city,” which promotes fair access to urban resources, public spaces, and opportunities for all city residents [105,106]. Equitable access to public amenities is a core element of socially fair urban planning [81]. Likewise, fair park provision is crucial for fostering inclusive urban citizenship and environmental justice [27]. When certain social groups are routinely excluded from high-quality recreational spaces due to poverty, segregation, poor planning, or inadequate infrastructure, urban citizenship is experienced unevenly across populations. This breaches spatial justice, as environmental benefits remain largely concentrated in privileged areas [26,107,108], while marginalised groups continue to face environmental deprivation [109,110]. Figure 4 illustrates how unequal access to urban parks affects spatial justice. It highlights key themes from the literature, including socio-economic inequality, environmental injustice, health disparities, mobility inequality, spatial segregation, and reduced urban sustainability. Percentages represent the proportion of publications reporting each implication during thematic coding. Multiple implications may have been identified within a single publication.

The figure indicates that socio-economic inequality is the leading issue, accounting for 24% of the findings. Environmental injustice follows at 20%, reflecting that racial minorities and marginalised groups often face limited park access due to historical segregation and biased planning. Health inequalities are 18%, linking unfair access to disparities in physical activity and mental health. Mobility and accessibility issues account for 15%. In contrast,

spatial segregation, at 13%, reflects uneven park distribution, with wealthier areas more privileged and poorer areas underserved. Urban sustainability concerns make up 10%. The co-occurrence matrix in Table 6 shows how often the implications of unequal access to urban parks co-occur across studies. Percentages indicate the proportion of studies that discuss two implications simultaneously. Since many studies address multiple aspects of spatial injustice, these figures reflect thematic interconnectedness rather than exclusive categories. Higher percentages imply stronger links, with over 70% indicating strong ties and 40–69% moderate relationships. The data are based on coding and synthesising all 108 studies.

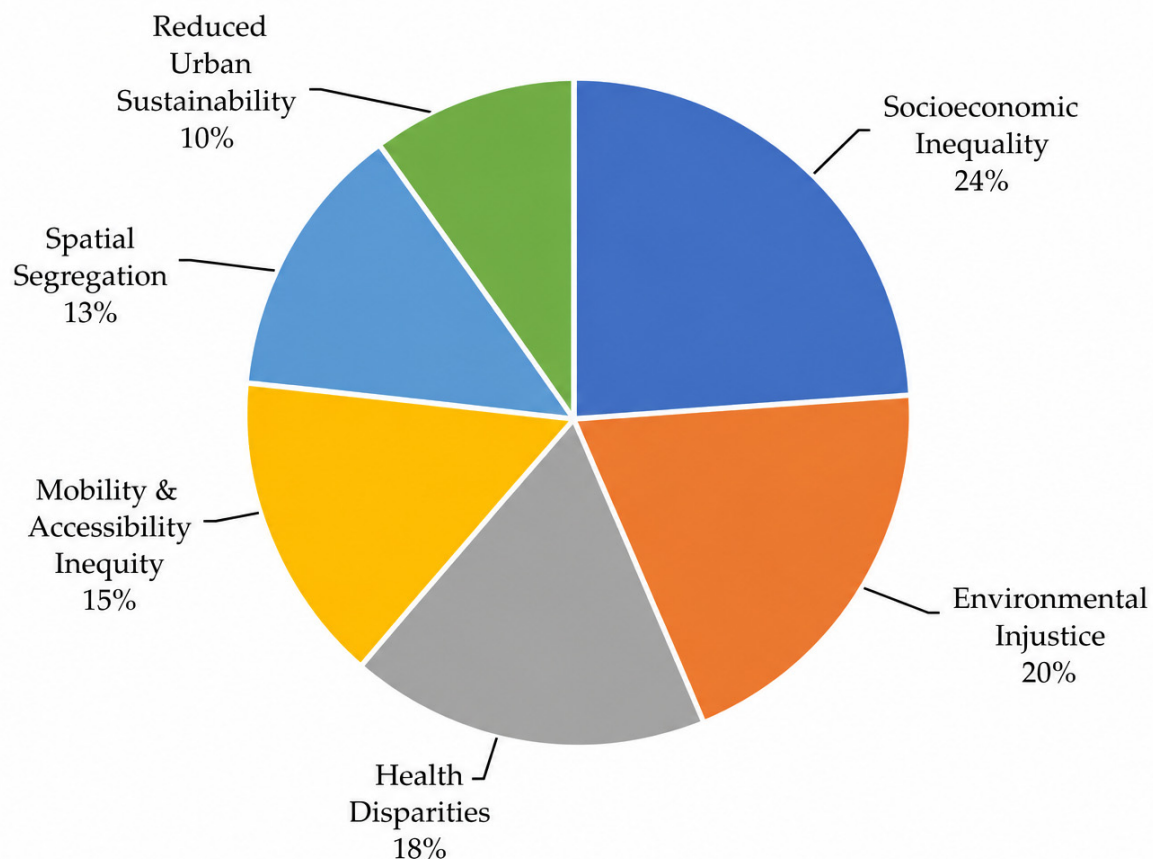


Figure 4. Spatial justice implications across the 108 reviewed publications.

The co-occurrence analysis shows that the implications of unequal access to urban public parks are closely interlinked throughout the reviewed literature. Socio-economic inequality shows particularly strong associations with environmental injustice (84%), spatial segregation (81%), and the marginalisation of vulnerable groups (79%), indicating that unequal park access disproportionately disadvantages low-income and socially marginalised populations. Environmental injustice also co-occurs substantially with spatial segregation (80%) and the erosion of the “right to the city” (79%), suggesting that historical planning inequalities and uneven environmental investment contribute to broader forms of socio-spatial exclusion. Health inequalities strongly co-occur with socio-economic inequality (78%) and environmental injustice (76%), reflecting the role of unequal park access in shaping disparities in physical activity, psychological restoration, and environmental well-being. Similarly, mobility inequality is strongly associated with spatial segregation (74%) and the marginalisation of vulnerable populations (71%), indicating that transport infrastructure and walkability significantly shape accessibility outcomes.

Table 6. Co-occurrence matrix of spatial justice outcomes.

Implications	Socio-Economic Inequality	Environmental Injustice	Health Inequalities	Mobility Inequality	Spatial Segregation	Reduced Urban Sustainability	Marginalisation of Vulnerable Groups	Weakening the Right to the City
Socio-economic Inequality	—	84%	78%	73%	81%	62%	79%	76%
Environmental Injustice	84%	—	76%	58%	80%	74%	77%	79%
Health Inequalities	78%	76%	—	55%	61%	73%	75%	57%
Mobility Inequality	73%	58%	55%	—	74%	52%	71%	59%
Spatial Segregation	81%	80%	61%	74%	—	76%	78%	81%
Reduced Urban Sustainability	62%	74%	73%	52%	76%	—	57%	72%
Marginalisation of Vulnerable Groups	79%	77%	75%	71%	78%	57%	—	80%
Weakening the Right to the City	76%	79%	57%	59%	81%	72%	80%	—

Note: Percentages indicate the proportion of reviewed studies in which two themes were identified simultaneously during coding and synthesis. Higher percentages indicate stronger thematic associations across the literature. The percentages do not represent statistical correlations or causal relationships.

3.4. Conceptual Framework Linking Urban Park Accessibility and Spatial Justice

Figure 5 presents a conceptual framework that synthesises the evidence reviewed in this study and illustrates how inequalities in urban public park accessibility arise and shape spatial justice outcomes. The framework treats park accessibility as a multidimensional concept shaped by socio-economic, spatial, and governance-related factors. Rather than viewing accessibility solely in terms of physical proximity to parks, it emphasises that access is influenced by broader structural conditions that determine who can reach, use, and benefit from urban green spaces.

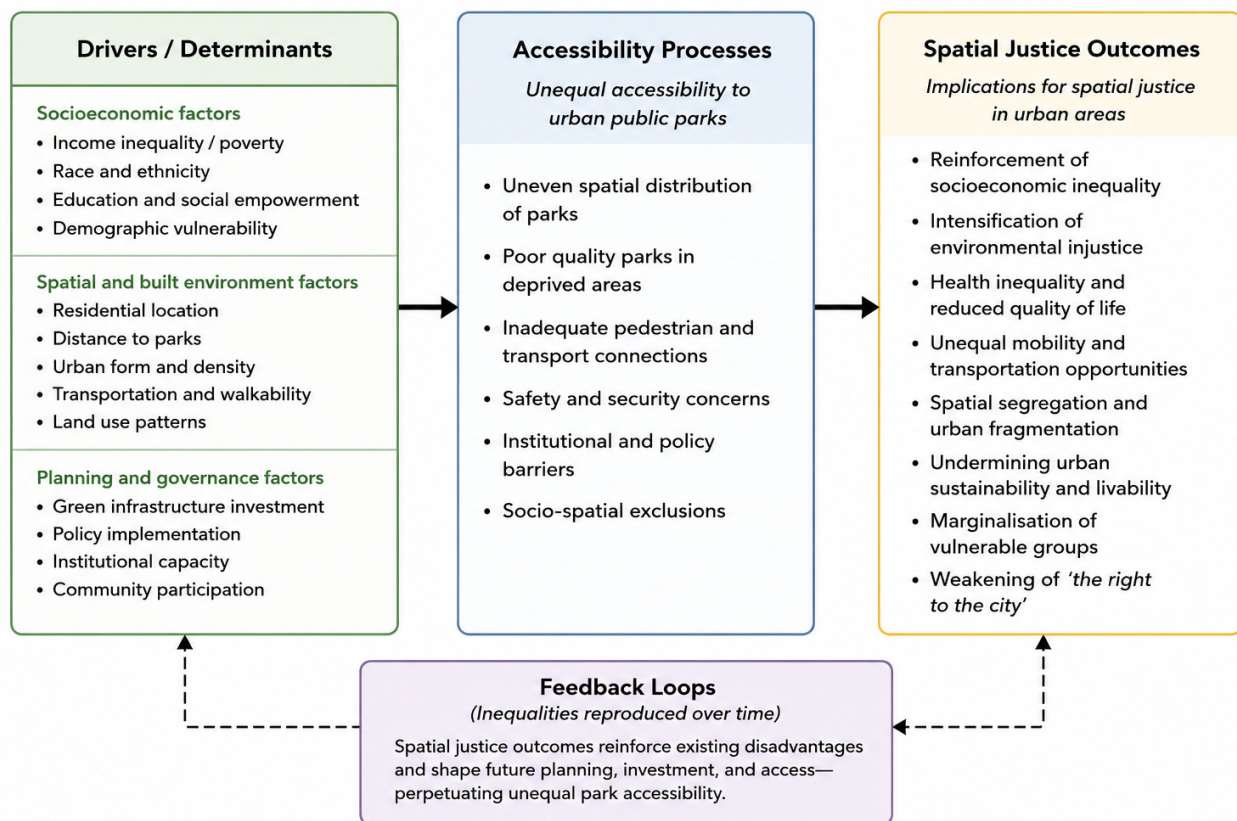


Figure 5. Conceptual framework of urban park accessibility and spatial justice.

Solid arrows indicate directional relationships, whereas dashed arrows represent feedback loops. The framework recognises three interconnected determinants. The first concerns socio-economic factors such as income inequality, race and ethnicity, education, social empowerment, and demographic vulnerability. These factors shape residential choices, mobility options, and access to environmental amenities across groups. The second category covers spatial and built-environment aspects, including residential location, proximity to parks, urban design, street connectivity, transport infrastructure, and land-use patterns. These factors influence the physical distribution and accessibility of parks across urban areas. The third category focuses on planning and governance, including green infrastructure investments, policy enforcement, institutional capacity, and community engagement. These governance factors affect resource distribution and the prioritisation of access in urban planning.

The framework shows that these factors shape access to urban public parks through multiple accessibility processes. These include uneven spatial distribution of parks, poor quality in disadvantaged neighbourhoods, inadequate pedestrian and transport links, safety concerns, institutional barriers, and socio-spatial exclusion. Together, these factors produce unequal access across population groups, depending on their socio-economic

status, mobility, and location. Such disparities give rise to a range of spatial justice issues, including the reinforcement of socio-economic gaps, worsening environmental injustice, health inequalities, limited mobility options, spatial segregation, reduced urban sustainability, and the marginalisation of vulnerable groups. Ultimately, the framework highlights that accessibility inequalities extend beyond environmental availability, affecting social inclusion, public health, and overall urban livability.

A key aspect of the framework is the feedback loop, which emphasises the evolving and self-reinforcing nature of accessibility disparities. Spatial justice outcomes can shape future planning priorities, investment choices, and neighbourhood development paths, thereby perpetuating existing disadvantages over time. As a result, unequal park accessibility stems from both broader socio-spatial processes and mechanisms that sustain urban inequalities. The framework highlights the need for integrated planning and governance strategies that target the root structural causes of accessibility gaps to foster more equitable, inclusive, and sustainable cities. Following the synthesis of findings and the development of the conceptual framework, the review assessed potential reporting biases and the overall certainty of the evidence base.

4. Discussion

This review demonstrates that disparities in access to urban public parks are shaped by a mix of socio-economic, demographic, spatial, infrastructural, and governance factors. While previous studies have identified gaps in access to green spaces [13,23,26], this review expands understanding by showing that these inequalities are complex and shaped not only by park locations but also by transport systems, urban design, governance, and demographic vulnerabilities. Co-occurrence analysis indicates that these factors interact and reinforce one another, framing access as a matter of spatial justice rather than mere proximity. Socio-economic status is the most critical factor shaping access inequality, with low-income communities typically experiencing poorer park access, lower-quality recreational areas, and less environmental investment than wealthier neighbourhoods [13,23,52,85]. These disparities persist because socio-economic disadvantages influence residential choices, mobility, and political influence within planning processes [14,62]. Consequently, accessibility inequalities reflect broader urban development patterns and resource allocation, aligning with Environmental Justice Theory, which argues that environmental benefits are often distributed unevenly among socio-economic groups [40].

The interpretation of equitable park accessibility also varies across countries at different stages of development. In many developed countries, where park provision is relatively adequate, spatial justice concerns increasingly focus on park quality, safety, inclusiveness, accessibility for vulnerable groups, and the effects of green gentrification [13,23,27]. Conversely, in developing countries, accessibility inequalities are more strongly associated with rapid urbanisation, inadequate green infrastructure, informal settlements, weak planning institutions, and limited public investment [31,33,55,66,71]. These findings suggest that equitable park accessibility should be assessed not only in terms of physical proximity but also within broader socio-economic, institutional, and developmental contexts [39–41].

The diversity of findings across the reviewed studies indicates that no single theoretical perspective fully explains urban park accessibility inequalities, reinforcing the value of applying complementary theoretical lenses that are sensitive to different urban and institutional contexts. The review also highlights the persistent impact of race and ethnicity on accessibility outcomes. Minority groups frequently experience reduced park access due to historical segregation, discriminatory planning, and uneven infrastructure growth [18,63,74]. Similar trends have been documented across regions [51,52,73]. By contrast, some studies suggest a relatively equitable spatial distribution of parks, although

disparities in park quality, safety, and usability persist [13,64]. These varied findings indicate that accessibility should be assessed not only by distance but also by qualitative factors that affect access.

Although the reviewed literature generally indicates that socio-economically disadvantaged communities experience poorer access to urban public parks, this relationship is not universal. Several studies report that some deprived neighbourhoods may exhibit relatively high physical accessibility because of historical planning legacies, compact urban form, or centrally located green spaces [13,69,73]. However, these apparent exceptions often involve parks with poorer maintenance, limited recreational facilities, safety concerns, or lower perceived usability, thereby reducing the actual benefits derived from physical proximity [13,63]. These findings demonstrate that accessibility should not be assessed solely in terms of distance or proximity but also in relation to park quality, functionality, safety, and user experience. Consequently, spatial justice is best understood as a multidimensional concept whose outcomes vary according to local urban, social, and institutional contexts.

Residential location, spatial distribution, urban form, and transport networks all play key roles in shaping accessibility. GIS-based studies and models consistently show that residents of peripheral and underserved neighbourhoods have lower accessibility than those in central, well-connected areas [15,75,76]. Methodological advances, such as advanced floating catchment area and multimodal models, have further highlighted spatial inequalities [17,58,77]. Moreover, factors such as walkability, street connectivity, public transport, and active mobility infrastructure significantly influence accessibility outcomes [82,83]. These elements are particularly important for vulnerable groups, including children, older adults, women, people with disabilities, and low-income families [20–22]. For example, children's access largely depends on neighbourhood design, safety, and parental perceptions of risk [78,101]. Overall, these findings suggest that accessibility is both spatially defined and closely linked to mobility.

The review underscores the crucial role of governance structures and planning practices. It shows that the links among socio-economic inequality, environmental injustice, and governance indicate that disparities in access are directly connected to planning choices, land-use decisions, institutional capacity, and investment focus [27,100]. This aligns with Urban Political Ecology, which emphasises that environmental resource distribution is driven by political, economic, and institutional processes rather than neutral planning. As a result, unequal access to parks mirrors deeper power dynamics within urban governance [66]. The findings also highlight significant implications for spatial justice. Restricted access to urban parks fuels socio-economic inequality, environmental injustice, health disparities, and spatial segregation [25,26,91]. Poor accessibility hampers physical activity, recreation, social interaction, and psychological recovery, worsening health and well-being inequalities [25,59,94]. These issues often reinforce each other, creating cumulative disadvantages for marginalised groups. From a spatial justice standpoint, unequal access is thus more a form of socio-spatial exclusion than merely a shortage of green spaces [39]. Overall, the results strongly support integrating Spatial Justice Theory, Environmental Justice Theory, and Urban Political Ecology. These perspectives collectively explain how inequalities in accessibility arise from the interplay of socio-economic factors, spatial arrangements, governance, and institutional power. The persistence of these disparities shows that achieving fair access requires more than simply increasing the number of parks. It calls for integrated planning strategies that address distribution, quality, connectivity, and social inclusion.

5. Limitations

Although this review employed multiple internationally recognised databases, including Scopus, Web of Science, ScienceDirect, and Google Scholar, only peer-reviewed journal articles published in English were included. Restricting the review to English-language publications ensured methodological consistency and facilitated comparison across studies. However, this approach may have excluded relevant evidence published in other languages, particularly from regions where urban planning and environmental research are commonly disseminated through local-language journals. Although Google Scholar broadened the geographical coverage of the review by identifying English-language publications from non-English-speaking countries, the exclusion of non-English publications may have introduced a degree of linguistic bias into the evidence base.

The review synthesised evidence derived from diverse methodological approaches, including qualitative, quantitative, mixed-methods, GIS-based, and spatial modelling studies. Although thematic narrative synthesis enabled the integration of this heterogeneous evidence, methodological differences among the included studies may have influenced the consistency of reported findings.

Furthermore, despite the comprehensive search strategy, the reviewed literature remained disproportionately concentrated in North America, Europe, and East Asia, with comparatively fewer studies originating from Africa, Latin America, and South Asia. Consequently, some findings may be less generalisable to rapidly urbanising cities in developing countries where governance structures, planning systems, and socio-economic conditions differ substantially. Future systematic reviews could strengthen the global evidence base by incorporating multilingual databases, translated publications, and greater representation of studies from underrepresented regions.

6. Conclusions

This systematic review examines the socio-economic and spatial factors that affect access to urban public parks and how unequal access affects spatial justice in cities. It shows that interconnected factors, including household income, race and ethnicity, residential location, transport, urban layout, governance, and planning, shape park accessibility. The results indicate that low-income communities, racial minorities, children, the elderly, and residents of marginalised neighbourhoods face disproportionate barriers, perpetuating urban inequality and environmental injustice. The review also highlights that unequal park access leads to several spatial justice issues, including health disparities, lower quality of life, segregation, limited mobility, environmental exclusion, and challenges to urban sustainability. Although progress has been made in GIS-based accessibility and spatial equity analysis, much of the research focuses on North America, Europe, and East Asia, with few studies from fast-urbanising regions such as Africa and South Asia.

(a) *Contributions to Knowledge*

This review enhances existing scholarship by offering a comprehensive, integrated synthesis of socio-spatial inequalities in access to urban public parks and their impact on spatial justice in cities. It advances understanding by showing that accessibility inequalities are multidimensional, shaped by interactions among socio-economic factors, race and ethnicity, residential location, transport infrastructure, urban form, governance systems, and demographic vulnerability. Unlike many previous studies that focused mainly on physical proximity or technical accessibility, this review incorporates broader socio-spatial, infrastructural, governance, and political-economic aspects of accessibility inequality. It also contributes theoretically by combining Spatial Justice Theory, Environmental Justice Theory, and Urban Political Ecology into a unified framework for analysing unequal

access to urban parks. This integration reveals how accessibility inequalities mirror broader processes of environmental injustice, uneven urban growth, governance fragmentation, and institutional exclusion. Additionally, the review develops a conceptual model illustrating the links among accessibility factors, socio-spatial inequalities, and spatial justice outcomes. It further synthesises diverse evidence from different regions, highlighting key conceptual, methodological, and geographical gaps that warrant greater scholarly attention, particularly in rapidly urbanising cities in the Global South.

(b) Contributions to Practice

The review's findings have significant implications for urban planning, environmental management, public health, and governance. It shows that ensuring fair access to urban public parks goes beyond simply increasing the number of parks or their proximity; it requires integrated, inclusive planning that addresses transport, park quality, safety, connectivity, inclusivity, and the needs of vulnerable groups. The review emphasises the need to incorporate principles of spatial and environmental justice into urban development and green infrastructure. Urban planners and policymakers should focus on equitably distributing parks, especially in low-income, marginalised, and underserved neighbourhoods. It also highlights the importance of improving transport links, walkability, and universal access to help children, older adults, women, and people with disabilities reach and use parks effectively. Additionally, the review advocates participatory, community-centred planning that involves residents in decisions about green spaces. Using GIS-based accessibility analysis, spatial equity metrics, and integrated land-use planning can enable a more evidence-based, fair distribution of green spaces. Finally, the review notes that governance, land markets, and planning institutions are crucial in shaping accessibility, underscoring the need for better institutional coordination, equitable policies, and inclusive governance frameworks.

(c) Recommendations

The study suggests that urban governments and planning bodies should implement green infrastructure policies that promote spatial equity, with a focus on underserved and socio-economically disadvantaged communities. Urban planning must incorporate accessibility metrics, transport links, demographic vulnerabilities, and park quality into green space planning and resource allocation. Policymakers are also encouraged to enhance participatory planning to involve local communities in decisions about park development, maintenance, and management. Furthermore, investing in transport infrastructure, improving walkability, and adopting inclusive urban design can help address mobility barriers to park access. Planners should develop strategies to combat environmental injustice, reduce spatial segregation, and address the unequal distribution of green recreational spaces. In fast-growing cities, especially in the Global South, stronger governance, coordinated land-use planning, and sustainable development policies are crucial to ensuring equitable access to public parks. Urban authorities should set minimum standards, such as ensuring that all residents can reach a public park within a reasonable walking distance.

(d) Future Research

Future research should prioritise longitudinal and comparative studies to analyse how park accessibility patterns evolve over time across different urban areas. Greater attention is needed in rapidly urbanising regions of Africa, South Asia, and Latin America, where data is scarce despite growing inequalities and environmental challenges. Studies should include multidimensional assessments of accessibility, covering park quality, safety, inclusivity, usability, cultural relevance, and mobility barriers. Research should also examine how governance, policies, political decisions, and community involvement shape the equitable

distribution of green spaces. Topics such as climate change adaptation, green gentrification, mobility justice, disability-inclusive planning, and smart-city technologies warrant greater focus. Methodologically, combining GIS models, participatory mapping, mixed-methods approaches, and interdisciplinary theories will help elucidate the complex socio-spatial processes that affect park access and justice.

Funding: This research received no external funding.

Data Availability Statement: Data will be provided on request.

Acknowledgments: During the preparation of this manuscript, the author used Grammarly (Version 6.8.263) and ChatGPT (version GPT-5.5) for language and grammar editing. The author has reviewed and edited the output and takes full responsibility for the content of this publication.

Conflicts of Interest: The author declares no conflicts of interest.

Appendix A

1. Scopus Search String

```
TITLE-ABS-KEY(
(
"urban public park*" OR
"urban park*" OR
"public green space*" OR
"urban green space*" OR
"urban open space*" OR
"green infrastructure" OR
"recreational green space*"
)
AND
(
access* OR
accessibility OR
"park accessibility" OR
"spatial accessibility" OR
walkability OR
connectivity OR
proximity OR
"travel distance" OR
"service area" OR
"floating catchment area" OR
GIS
)
AND
(
"spatial justice" OR
"environmental justice" OR
inequality OR
inequity OR
segregation OR
exclusion OR
marginalisation OR
deprivation OR
```

"social justice" OR
 "socio-spatial inequality"
)
 AND
 (
 governance OR
 planning OR
 "urban form" OR
 transportation OR
 mobility OR
 "park quality" OR
 "green space quality"
)
)

2. *Web of Science*

TS=(
 (
 "urban public park*" OR
 "urban park*" OR
 "urban green space*" OR
 "public green space*" OR
 "urban open space*" OR
 "green infrastructure"
)
 AND
 (
 accessibility OR
 access* OR
 walkability OR
 connectivity OR
 proximity OR
 "spatial accessibility" OR
 "GIS accessibility" OR
 "floating catchment area"
)
 AND
 (
 "spatial justice" OR
 "environmental justice" OR
 inequality OR
 inequity OR
 segregation OR
 exclusion OR
 marginalisation OR
 deprivation
)
 AND
 (
 governance OR
 planning OR

transportation OR
 mobility OR
 “urban form” OR
 “park quality”
)
)

3. *ScienceDirect*

(
 “urban public parks” OR
 “urban parks” OR
 “urban green spaces” OR
 “public green spaces” OR
 “urban open spaces” OR
 “green infrastructure”
)
 AND
 (
 accessibility OR
 “park accessibility” OR
 “spatial accessibility” OR
 walkability OR
 proximity OR
 connectivity OR
 GIS OR
 “floating catchment area”
)
 AND
 (
 “spatial justice” OR
 “environmental justice” OR
 inequality OR
 inequity OR
 segregation OR
 exclusion OR
 deprivation
)
 AND
 (
 governance OR
 planning OR
 mobility OR
 transportation OR
 “park quality” OR
 “urban form”
)

4. *Google Scholar*

(
 “urban public parks” OR
 “urban parks” OR

“urban green spaces” OR
 “public green spaces”
)
 AND
 (
 accessibility OR
 walkability OR
 proximity OR
 connectivity OR
 GIS OR
 “floating catchment area”
)
 AND
 (
 “spatial justice” OR
 “environmental justice” OR
 “socio-spatial inequality” OR
 segregation OR
 deprivation
)
 AND
 (
 governance OR
 planning OR
 transportation OR
 mobility OR
 “park quality”
)

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