Exploring Economic Insights Into Urban Green Spaces: A Bibliometric Perspective

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Abstract. The document delineates the primary domains and recent advancements in exploring the economic insights of green space in urban areas within environmental economics while suggesting potential avenues for future research. The paper aims to achieve three specific objectives: 1) To explore how urban green spaces are currently being evaluated in terms of their economic value,2) To analyze the influential journal, author, and country in the specific domain, 3) To identify the prevalent theme within the research field that capture the attention of other researchers and scholars. The investigation involved the examination of 265 papers sourced from the Scopus databases, spanning the period from 1992 to 2023, through bibliometric analysis. The methodology encompassed selecting, scrutinizing, and categorizing these papers across various dimensions, such as influential authors, journals, countries, co-citations, etc. Also, three principal themes have surfaced as a result of the analysis. The work furnishes researchers and scholars with valuable insights that can catalyze their exploration of fresh perspectives within green infrastructure in urban areas and the research in the context of sustainable economics. Moreover, it equips them with the knowledge to develop innovative strategies, models, and frameworks to amplify economic valuation.

Keywords: Urban greenspace, Sustainability, Bibliometric analysis

1 Introduction

The advancement of modern technology, infrastructure, and rapid urbanization has significantly altered the landscape and distribution of green areas in cities, often due to the expansion of transportation networks such as highways and metro systems (Tian et al., 2020). This shift has led to a noticeable reduction or displacement of green spaces in major metropolitan areas. As urban land is increasingly repurposed to support economic development, it often comes at the cost of environmental quality—resulting in the degradation of ecosystem services, loss of biodiversity, higher levels of air pollution, and intensifying urban heat effects. These environmental changes have been shown to negatively impact human health and overall well-being (Basu & Nagendra, 2021). In light of these challenges, there is a growing recognition of the critical role urban green spaces play in fostering sustainable urban development, emphasizing the urgent need to preserve and expand them within city environments (Yu & Kwan, 2024).

Urban green space is any vegetated land within the urban environment, regardless of its dimensions, roles, functions, etc., including public and private green spaces, such as parks, gardens, forests, roadside trees, tot-lots, playgrounds, etc. Additionally, it encompasses natural water features like rivers, streams, ponds, lakes, etc., referred to as blue spaces (Jennings et al., 2019). These green spaces provide diverse ecological and recreational significance, such as alleviating the urban heat island effect, enhancing groundwater levels, improving air quality, regulating microclimates, reducing excessive vehicular noise, etc.(Dinda & Ghosh, 2021). Furthermore, these ecosystem goods and services positively influence human well-being, offering various socio-cultural and economic benefits. These benefits include providing shade and recreational areas, enhancing aesthetic benefits, increasing property values, decreasing energy consumption (lower dependence on air conditioners), etc. (Byrne et al., 2015). The section emphasizes the vital role of ecosystem services within urban green environments

Ecosystem services encompass the numerous ways nature benefits people and the environment derived directly or indirectly from the environment that positively influence the well-being of individuals (Corvalán et al., 2005). These services can be further classified into provisioning, regulating, cultural, and supporting services (Kumar, 2012). Many

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ecosystem services are directly utilized by the people, making them easy to quantify. For example, products like fruits, timber, and wood can be assigned a monetary value by being sold in the market. Hence, setting a monetary value to the indirect and non-use value of benefits derived from the natural ecosystem is challenging, as valuing air quality improvement is problematic. Multiple researchers argue that focusing solely on monetary valuation overlooks the importance of conserving these services for the well-being of future generations (Rosehan et al., 2020). Since there is no well-established market for many of these resources, economists have introduced various valuation methods to estimate the worth of non-market goods and services. These methods rely on either stated or revealed preferences, including techniques such as contingent valuation, choice experiments, and hedonic pricing, where individuals express their willingness to pay (WTP). Analyzing WTP provides insights into how much people value and are prepared to spend on specific goods and services (Jamean & Abas, 2023a). Arabomen et al. (2019) also found that individuals are willing to pay for the conservation of ecosystem services within urban green spaces.

This review provides a summary of the roles urban green spaces play and examines individuals' willingness to pay for their preservation within urban settings. Although the importance of green areas in cities is increasingly recognized, a more detailed understanding of their specific characteristics is still lacking, which poses a challenge for future planning and development (Schuhmann et al., 2019). Consequently, a growing demand exists for comprehensive research that analyzes the existing literature on urban green spaces. Conducting a bibliometric analysis is essential for systematically mapping the existing body of knowledge, as it facilitates a deeper understanding of the subject's complexities. Moreover, such an analysis can help identify potential areas for future research and development, thereby contributing to the field's continued advancement.

Bibliometric analysis is a quantitative approach used to evaluate research trends and scholarly performance by systematically examining a large volume of academic literature (Zhang & Liang, 2020). This approach utilizes specialized tools such as Biblioshiny, VOSviewer, and Gephi, alongside academic databases including Scopus and Web of Science. In line with this methodology, the current study conducts a bibliometric analysis to examine the existing research on individuals' monetary valuation for the conservation of urban green spaces, or more generally, the economic valuation of these areas. The study aims to address the following research questions.

Q1. How has scholarly work on the economic valuation of urban green spaces evolved, and which publications have played a pivotal role in shaping this field?

Q2. Who are the leading scholars contributing to the study of urban green spaces, and which countries and academic journals have made the most substantial contributions?

Q3. What are the primary research themes and focal areas within the literature on urban green spaces?

The remainder of this paper is organized as follows. Section 2 outlines the conceptual foundation and methodological framework of bibliometric analysis, providing the basis for the study's analytical approach. Section 3 offers a comprehensive review of the existing literature on the economic valuation of urban green spaces, highlighting key developments and scholarly contributions in the field. Section 4 describes the research methodology, including data sources, tools, and analytical procedures. Section 5 presents the results of the bibliometric analysis, identifying influential publications, authors, and thematic trends. Section 6 discusses the findings in detail, emphasizing their implications and the study's overall contributions to the literature. Finally, Section 7 addresses the limitations of the current research and proposes avenues for future investigation.

2 Bibliometric analysis

Bibliometric analysis serves as a methodological tool for evaluating the development and impact of research within a specific discipline by quantitatively examining a large body of scholarly publications (Moral-Muñoz et al., 2020). This approach incorporates both performance analysis and scientific mapping techniques (Gaviria-Marin et al., 2018). Performance analysis focuses on the statistical representation of academic output, enabling the assessment of research productivity and influence within the field. The software produces a range of indicators that offer insights into the reach and influence of existing scholarly publications, including metrics related to publication output, contributing authors, journals, countries, and other relevant dimensions (Cobo et al., 2011). On the other side, Scientific mapping

analysis aims to establish logical connections between research articles using tools like citation analysis, co-citation analysis, thematic clusters, etc. This approach helps to identify intellectual relationships between different research articles within the subject domain (Baker et al., 2021). Within the scope of scientific mapping analysis, citation analysis is utilized to explore the structural relationships among publications, specifically identifying instances where one article references another (Appio et al., 2014). In contrast, co-citation analysis is used to detect studies that share thematic similarities based on their joint citation patterns (Osier, 1996). For this study, the author employed VOSviewer software (version 1.6.15) to perform the bibliometric analysis, encompassing both performance and scientific mapping components. The methodological framework is illustrated in Figure 2.

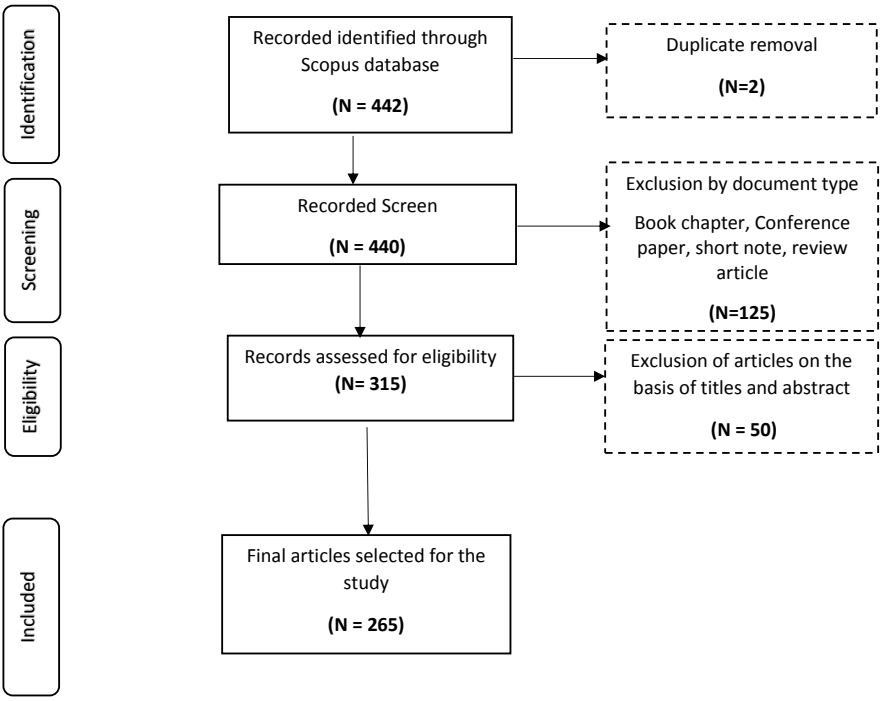

Figure 1. Overview of research methodology adopted

3 Valuation of public preferences for green spaces

The idea of monetary valuation became more widely recognized with the development of consumer theory and microeconomics. It plays a key role in utility theory, helping to explain how individuals make choices based on their personal preferences and financial limitations (Lee & Hatcher, 2001). Building upon these foundations, modern economics has formulated a more systematic interpretation of willingness to pay, which finds application across various research fields and is utilized in diverse analyses, such as economic analysis, market research, and policymaking research (Mandziuk et al., 2021).

The concept of individual financial commitment toward the preservation of urban green spaces plays a pivotal role in evaluating their economic worth. This form of economic preference is commonly captured through valuation techniques, which facilitate the quantification of the benefits derived from maintaining ecosystem services. These approaches encompass techniques such as the contingent valuation method (CVM), choice experiments, conjoint analysis, and related methodologies (Malik et al., 2021). The economic valuation of non-marketed goods can be categorized into two methods: direct and indirect valuation methods (Brink, 2012). Direct valuation methods, also known as a stated preference, further branch into contingent valuation methods and choice experiments, while indirect valuation methods, also known as revealed preference methods, encompass Hedonic pricing and replacement cost (Kumar, 2012).

The stated preference methods refer to valuation techniques where individuals elicit their preferences and values for goods, services, or attributes not traded in conventional markets (Kumar, 2012). These techniques require respondents to evaluate a series of hypothetical scenarios, wherein they are asked to express their monetary preferences for various attributes. Stated preference approaches, such as the contingent valuation method (CVM) and choice experiments, offer valuable insights into how individuals assign value to specific features that are not typically reflected in actual market behavior.

In most research studies, the contingent valuation method (CVM) has been employed to estimate the willingness to pay owing to its inherent flexibility and adaptability (Jim, 2004). The CVM technique is widely used and particularly renowned for its applicability in various economic domains such as transportation, environment, market, and research economics. (McFadden & Train, 2017). The first citation to the contingent valuation method, emphasizing the prevention of soil erosion, was made by Ciriacy-Wantrup in 1947. Subsequently, in 1963, Davis pioneered the creation and execution of the contingent valuation method, aiming to extract values directly. Now, most researchers are employing contingent valuation methods. Arabomen et al. (2019) used CVM to value recreational areas in urban parks. Similarly, Buckley et al., 2009 also used CVM for public access and the trek's development in Ireland's low and high-land regions.

While the Choice experiment method was initially limited, it is gaining momentum within environmental economics, market research economics, behavioral economics, etc. The first published reference to a choice experiment study is attributed to Louviere & Woodworth, 1983. Later on, Horne, 2006 used the choice experiment method to identify the attributes of ecosystem services and forest disservices.

The revealed preference methods refer to a valuation technique in which individuals deduce their preferences and values based on their observable behaviours and choices within conventional market settings (Kumar, 2012). In this method, individuals make choices based on the relative information on different goods, services, or attributes. The revealed preference method helps assess market behavior, such as purchasing decisions, consumption patterns, and demand for different products or goods (Caplin & Dean, 2011). Frequently used techniques within this category include hedonic pricing and replacement cost to understand the purchasing and consumption patterns.

In most of the hedonic pricing techniques, the researcher attempts to establish a link between housing prices and the presence of surrounding green spaces (Morancho, 2003). On the other hand, in cost-benefit analysis, researchers endeavour to identify the benefits associated with green spaces and the costs involved in maintaining them (Cilliers, 2021).

Although many valuation studies have concentrated on behavioral factors, only a few have looked more broadly at environmental economics in relation to people's willingness to pay for preserving urban green spaces (Lo & Jim, 2010). Some researchers have pointed out gaps in current valuation methods and stressed the importance of deeper discussion. Engaging in such discourse is crucial for establishing a robust conceptual foundation surrounding the economic valuation of green space conservation. Addressing this need, the present study employs a bibliometric analysis to provide an in-depth overview of the existing literature and to identify prominent themes that have emerged within this research domain.

4 Research Methodology

Bibliometric analysis empowers researchers to grasp the expansion and evolution of their specific field through statistical methods (Zupic & Čater, 2014). A systematic approach was employed via bibliometric analysis to delve

systematically into the literature regarding willingness to pay for conserving urban green spaces (Abhilash et al., 2023). The objective was to provide a comprehensive perspective while indicating potential future research trajectories (Qamar & Samad, 2021). The study adhered to the procedural recommendations that Fahimnia et al. proposed (2015). An outline of the research methodology is explained with the help of Figures 1 and 2.

This study adopts the five-phase bibliometric analysis framework outlined by Fahimnia et al. (2015), comprising the following stages: (1) identification of relevant search keywords, (2) preliminary screening of the collected records, (3) refinement of the dataset, (4) presentation of initial descriptive statistics, and (5) execution of a comprehensive bibliometric examination of the research area. The first three phases are detailed in the current section, while the subsequent stages—steps four and five—are discussed in the results section.

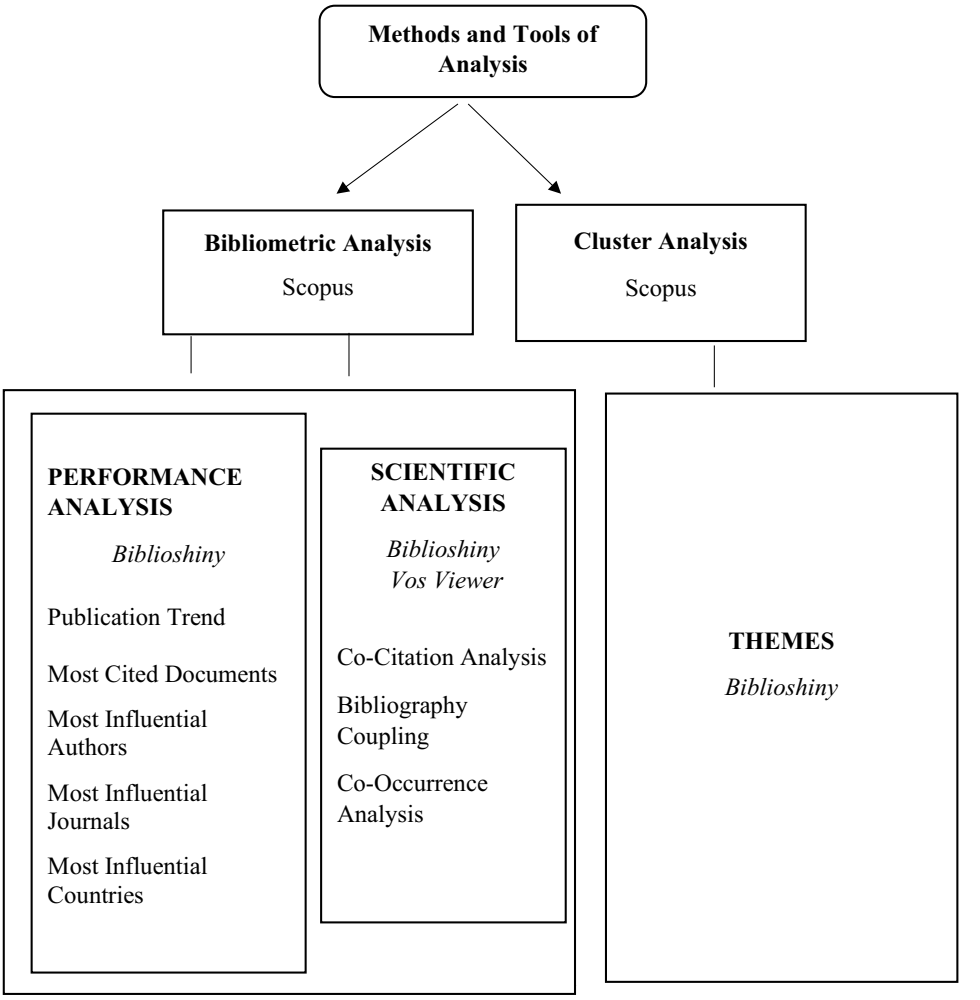

Figure 2. Methodology and Analysis adopted

4.1 Data Collection

In this study, we opted for Scopus as our primary database due to its comprehensive assessment of various databases. Articles were selected based on database credibility, author's information, etc. Scopus is considered an appropriate database for managing scholarly articles (Qamar & Samad, 2021). Both Scopus and Web of Science databases provide research articles and citation analysis. Moreover, the Scopus database encompasses more than 70 million research articles featuring 1.4 billion citations from 1970 onwards (Baier-Fuentes et al., 2018). Elsevier administers it and is the "most extensive abstract and citation repository for peer-reviewed academic journals across disciplines, including medicine, social sciences, science, technology, arts, and humanities." These factors justify our choice of the Scopus database for this study, as it serves as the guiding principle for the bibliometric analysis.

4.2 Design search queries or keywords

The search terms are extracted from academic literature relevant to the research field. The keywords used in the study include "Urban green space" OR "Green area" OR "Urban parks" OR "Urban forest" OR "Urban trees" AND "Willingness to pay" OR "Valuation" OR "Monetary valuation" OR "Payment card."

4.3 Data filtration and refinement

This study provides an extensive compilation of academic journals that have made the most substantial contributions to the field of urban green space research. The search criteria were limited to information found within article titles, abstracts, and keywords. Additionally, the scope of document types was restricted exclusively to peer-reviewed research articles, thereby excluding conference proceedings, review papers, and books. The process began by identifying the research areas and relevant keywords and retrieving articles from the Scopus database. Initially, 442 articles were retrieved from the Scopus database, after applying further selection criteria, including the period from 1992 to 2023, and subject domain criteria such as Environmental science (273), Social Science (128), Economics, Econometrics and Finance (52), Energy (29), Business, Management and Accounting (17), along with the language criterion of English and only published articles were selected, resulting in a final count of 315 articles. Essential information of the articles published in the Scopus database is presented in Table 1.

Research procedure	Description
Selection of databases	Searches were performed in Scopus database
Criteria	Environmental science, Social Science, Economics, Econometrics and Finance, Energy, Business, Management and Accounting
Document type (filter)	Article
Language	Research article published in the English Language were considered
Timeframe	1992 to 2023
Search criteria	Keywords, title, abstract

Search terms	Urban green space, green area, Urban parks, Urban Forest, Urban trees, Willingness to pay, Valuation, Monetary valuation, Payment card.
Inclusion criteria	Paper focused on willingness to pay for urban green space, Scopus listed Q1 & Q2 journals
Exclusion criteria	Duplicity, paper not falling under focus area, Q3 & Q4 journals were removed, excluded conference papers, review articles, and books
Data analysis	Using Bibliometrix called Biblioshiny and VOS viewer

Table 1. Key information of the articles published in Scopus database

Furthermore, data filtration of articles based on title and abstract, and finally, 265 articles were retrieved from the databases. The research articles for bibliometric analysis were downloaded as a CSV file containing the author's name, article title, publication source, affiliations, and many more. Figure 1 illustrates the step-by-step process of data filtration and refinement of articles.

5 Results

The initial segment quantitatively analyzes the literature using VOSviewer software to visually depict the knowledge terrain pertinent to the research topic of willingness to pay for conserving urban green space. Additionally, a performance analysis was employed for citation analysis. Subsequently, an extensive scientific mapping analysis was undertaken, incorporating techniques such as co-citation, bibliographic coupling, co-authorship, and co-occurrence keyword assessment. The search procedure was carried out in August 2023, and after applying the author's inclusion and exclusion criteria, 265 papers were selected (Figure 1).

5.1 Performance of bibliometric analysis (Citation analysis)

5.1.1 Publication trend

Fig 3 illustrates the progression of yearly publication in the realm of research centered on willingness to pay for conserving urban green space. The timeframe spans from 1992 to 2023, unveiling two distinct phases. Initially, from 1992 to 2010, the articles encompassed the nascent phase of this conceptual area, characterized by a limited volume of publications. However, from 2011 to 2023, there has been a remarkable surge in published works. Notably, 2021 stands out with the highest count of publications, closely followed by 2023. The accumulation of research articles until August 2023 represents a peak in publication volume compared to the previous year. It's worth observing that the annual publication figures are comparatively too modest when contrasted with other domains within the realm of environmental economics, underscoring the notion that research on willingness to pay for conserving urban green space remains an untapped potential.

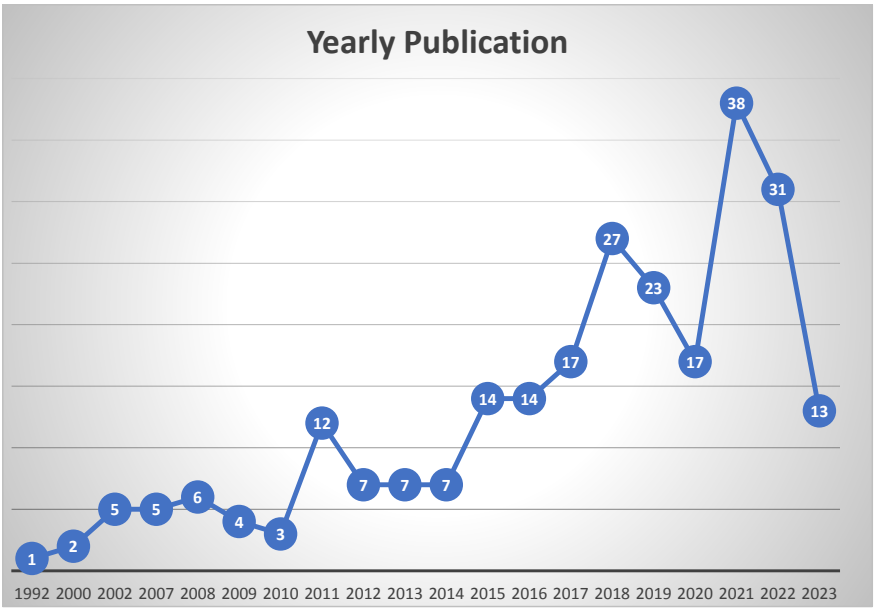

Figure 3. Year-wise trend of publication

5.1.2 Most-cited documents.

Table 2 highlights the top five articles, each having received more than 300 citations. The articles are listed in descending order based on the number of citations they have accumulated. The article by Bateman et al. (2013) holds the highest citation count, with 763 citations. This article highlights the importance of ecosystem services and the necessity to safeguard wildlife species by accounting for the impact of climate change. The second most cited article, authored by Tyrväinen & Miettinen (2000), has accrued 442 citations. This article underscores the significance of urban forest amenities within metropolitan areas. Another notable contribution by Kong et al. (2007) garnered 376 citations. This employs a hedonic price model to expound upon the significance of urban green spaces in society. Another two additional articles, by Morancho (2003) and James et al. (2009), secure the fourth and fifth positions with 319 and 305 citations each. As some of the earliest empirical studies, these papers underscore the critical role of urban green spaces in promoting environmental sustainability.

Rank	Documents	Source	Citations
1	Bringing ecosystem services into economic decision-making: Land use in the United Kingdom, (Bateman et al., 2013)	Science	763

2	Property prices and urban forest amenities, (Tyrväinen & Miettinen, 2000)	Journal of Environmental Economics and Management	442
3	Using GIS and landscape metrics in the hedonic price modeling of the amenity value of urban green space: A case study in Jinan City, China, (Kong et al., 2007)	Landscape and Urban Planning	376
4	A hedonic valuation of urban green areas, (Morancho, 2003)	Landscape and Urban Planning	319
5	Towards an integrated understanding of green space in the European built environment, (James et al., 2009)	Urban Forestry and Urban Greening	305

Table 2 Most cited documents

5.1.3 Most Influential Authors

In this segment, we delve into the influential authors in the field of economic valuation of urban green space. The study employs the number of publications as the primary metric to assess author contributions. The leading five authors are depicted in Table 3 and Table 4, featuring their publications and total citation counts. Jim C.Y. is identified as the most prolific contributor in terms of publication output, having authored eight papers. He is followed by Chen W.Y., Escobedo F.J., and Kronenberg J., each with six publications, while Barton D.N. and Czembrowski P. have each contributed four publications to the field. However, Jim CY also claims the highest influence in citations received, totaling 1161 citations, followed by Chen WY with 960 citations, Tyrvainen L with 917 citations. The findings reveal that only a limited number of authors have produced a substantial volume of publications and citations. To expand the scope of this knowledge domain, researchers should consider collaborating to augment their publication output. Simultaneously, emerging authors are making their presence felt, and it is expected that a growing number of scholars will contribute to this field, further propelling its advancement in the near future.

Rank	**Authors**	**Number of Publications**	**Year**	**Total Citation**
1	Jim CY	8	2006,2008,2009,2010,2011, 2015,2022	1161
2	Chen WY	6	2006, 2008, 2009,2011,2015	960
2	Escobedo FJ	6	2011, 2015,2018,2020,2021,	456
2	Kronenberg J	6	2016, 2017, 2019, 2021	223
3	Barton DN	4	2018, 2020,2022,2023	56
3	Czembrowski P	4	2016, 2019	125

Table 3. Most influential author (based on number of publications)

Rank	**Authors**	**Number of Publications**	**Total Citation**
1	Jim CY	8	1161
2	Chen WY	6	960
3	Tyrväinen L	4	917
4	Escobedo FJ	6	456
5	Lo AY	4	257
6	Kronenberg J	6	223

Table 4. Most influential authors (based on citations received)

5.1.4 Most Influential Journals

Using bibliometric analysis and methodology, this section systematically explores the source of journals from which publications have originate. The goal is to pinpoint the source journals that hold paramount importance and serve as representative contributors to the field. This section presents the leading journals contributing to the economic valuation of urban green spaces, as detailed in Tables 5 and 6.

"Landscape and Urban Planning" stands out as the most impactful journal based on citation count, achieving a Q1 ranking with a total of 2,554 citations. "Urban Forestry and Urban Greening" is followed closely, with 1993 citations. Additionally, "The Journal of Environmental Management," "Ecological Economics," and "Ecosystem Services" are Q1 journals that have citations of more than 600 in the field of economic valuation of urban green spaces. However, "Urban Forestry and Urban Greening" claims the highest influence in terms of publication, with forty-six articles, followed by "Landscape and Urban Planning" with twenty-three articles, "Sustainability" with twenty articles, "Ecological Economics" and "Ecosystem Services" with fourteen articles each. The results reveal a scarcity of articles within the top-tier environmental economics journals. Nevertheless, there has been a swift surge in the count of articles appearing in esteemed journals, particularly from 2018 onwards.

Name of Journals	**h_index**	**g_index**	**m_index**	**Total Citations**	**Quartile Ranking**
Landscape and Urban Planning	17	23	0.531	2554	Q1
Urban Forestry and Urban Greening	23	43	1.045	1913	Q1
Journal of Environmental Management	10	12	0.333	1161	Q1
Ecological Economics	10	14	0.556	785	Q1
Ecosystem Services	12	14	1.091	666	Q1

Table 5. Most influential journals (in terms of number of citations received)

Name of Journals	h_index	g_index	m_index	Number of Publications	Quartile Ranking
Urban Forestry and Urban Greening	23	43	1.045	46	Q1
Landscape and Urban Planning	17	23	0.531	23	Q1
Sustainability (Switzerland)	10	17	1.25	20	Q1
Ecosystem Services	12	14	1.091	14	Q1
Ecological Economics	10	14	0.556	14	Q1

Table 6. Most influential journals (in terms of number of publication)

5.1.5 Most influential countries.

This section analyzes the leading countries in the field of economic valuation of urban green spaces, based on both the volume of publications and the frequency of citations. The United States ranks highest in terms of publication volume, contributing 1,352 articles, followed by the United Kingdom (553), China (355), Germany (297), and Italy (288). In terms of citation impact, Hong Kong leads with 1,156 citations, followed by Finland with 938, as indicated in Tables 7 and 8, the United States accounts for 895 citations, followed by Spain with 806 and Germany with 647. These findings reveal that more than half of the total publications originate from these five countries, underscoring their significant contribution to the development, progression, and enrichment of the scholarly literature in this research area.

Moreover, these results are poised to inspire research scholars to make informed decisions regarding collaborations on diverse research projects, further contributing to the development prospects within this area of knowledge.

Rank	Country's name	Number of Publications	Citation Received
1	USA	1352	895
2	United Kingdom	553	572
3	China	355	460
4	Germany	297	647
5	Italy	288	

Table 7. Most influential country (based number of publications)

Rank	Country's name	Number of Publications	Citation Received
1	Hong Kong	277	1156
2	Finland	243	938
3	USA	553	895
4	Spain	271	806
5	Germany	297	647

Table 8. Most influential countries (based citations received)

5.2 Scientific mapping analysis

Scientific mapping analysis visually represents bibliometric documents, illustrating a systematic and intellectual connection between the existing documents.

5.2.1 Co-citation analysis

The co-citation analysis comprises a network encompassing the most frequently cited references, the most commonly co-cited authors, and the most co-cited journals.

5.2.1.1 Network of most cited references

Co-citation analysis examines cases in which two articles are cited together by a third publication. Following Fahimnia et al. (2015), "co-citation of two articles occurs when they are referenced in the bibliography of another article." The diagram in Figure 4 illustrates the network of the most frequently cited references.

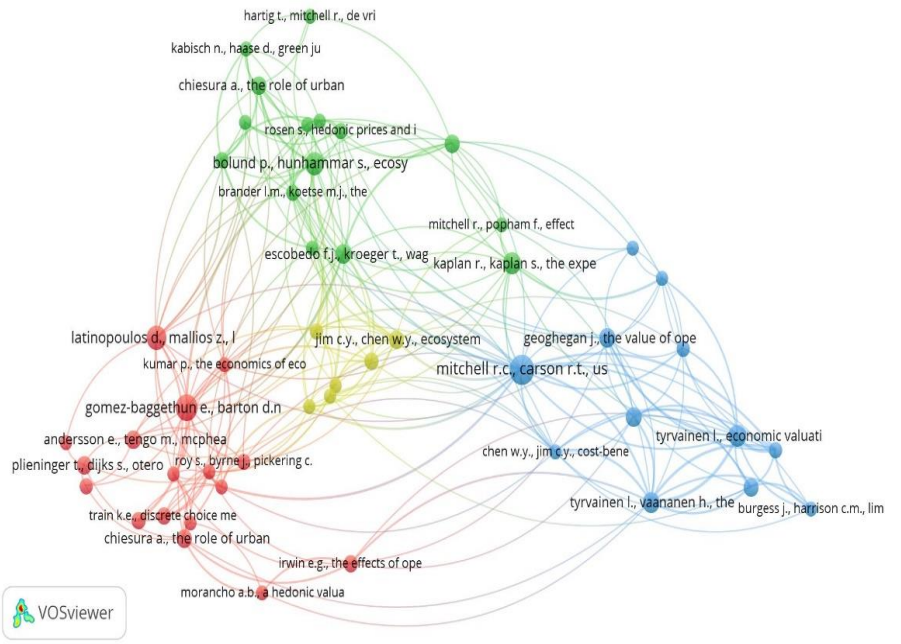

Figure 4. Network of cited references

5.2.1.2 Most Frequently Co-Cited Authors

This section applies co-citation analysis to authors, aiming to evaluate them based on the frequency of their citations. The analysis covered 204 cited documents, identifying a total of 19,605 authors. To ensure a focused and meaningful investigation, the scope was limited to authors with a minimum of 20 citations.

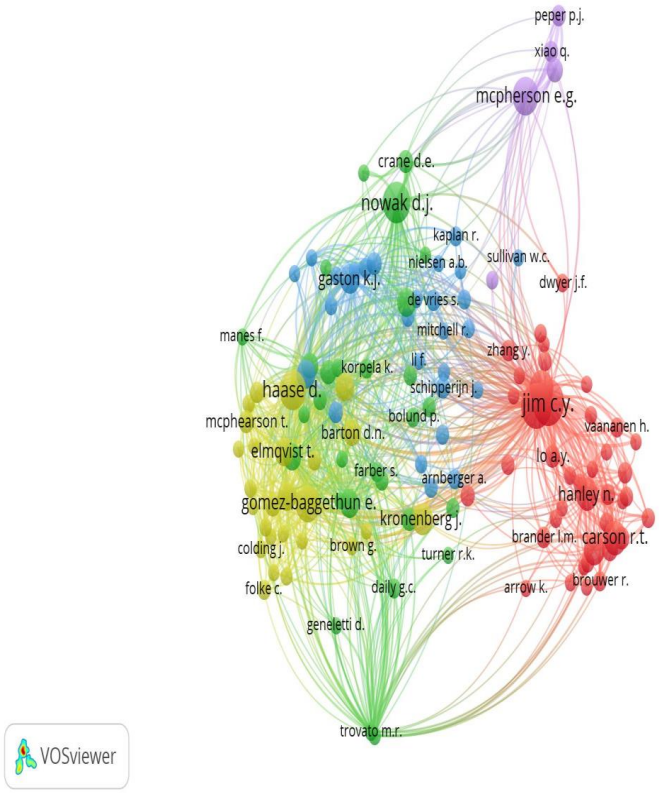

Figure 5. Network connections of co-cited authors

5.2.1.3. Most Co-Cited Journals

This section presents a co-citation analysis of journals related to the economic valuation of urban green spaces, emphasizing those with the highest citation counts. Figure 6 illustrates the co-citation network of the most frequently cited journals, each meeting the criteria of a minimum of two citations and at least one source. The analysis includes 68 out of the 265 articles, indicating that Landscape and Urban Planning holds the highest citation count with 2,562 citations, followed by Urban Forestry and Urban Greening with 1,925 citations, and the Journal of Environmental Management with 1,163 citations, as depicted in Figure 6.

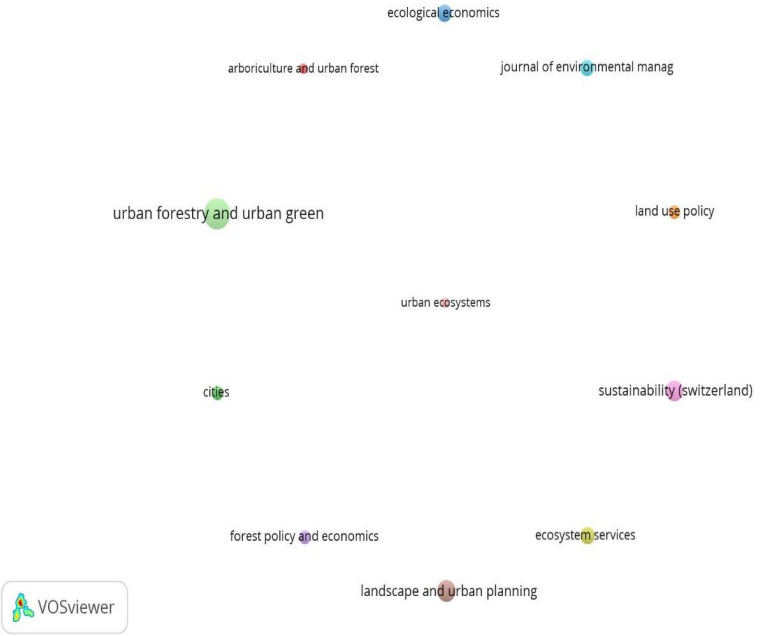

Figure 6. Network of most co cited journals

5.2.2 Bibliographic Coupling

Bibliographic coupling serves as a methodological framework focusing on analysing articles, authors, and countries as a fundamental unit of analysis.

5.2.2.1 Bibliographic Coupling of Countries

This section examines bibliographic coupling based on countries that have contributed at least one publication and exhibit a cumulative link strength of 50 or more. Figure 7 provides a visual representation of the bibliographic coupling among these countries. The results highlight that the United States and the United Kingdom are leading contributors in the field and maintain strong connections with other nations.

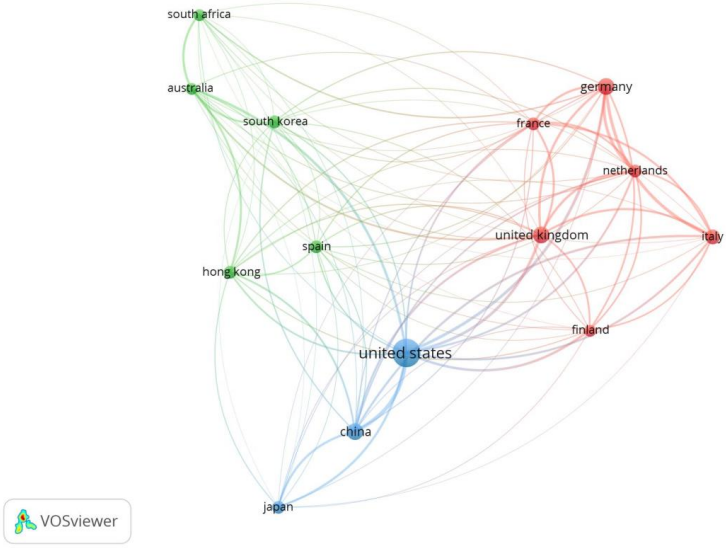

Figure 7. Bibliographic coupling of countries

5.2.2.2 Bibliographic Coupling of Articles

In this section, bibliographic coupling focuses on the articles with a minimum of two citations; out of 265 articles, 230 met the criteria. Notably, a subset of 230 articles exhibits robust interconnectedness. Within this, the work of Lo & Jim (2010) emerges as the most intricately linked article with others, followed by Tian et al. (2020) contribution, as represented in Figure 8

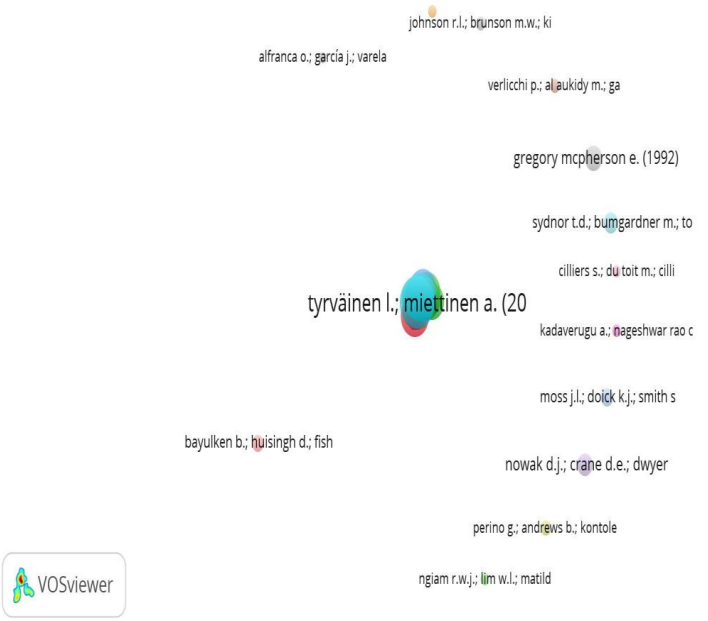

Figure 8. Bibliographic coupling of articles

5.2.2.3 Bibliographic Coupling of Journals

Figure 9 illustrates the network relationships among journals that have published at least one article within this research area. Of the 82 journals contributing a total of 265 articles, only 60 demonstrate significant interconnections within the network.

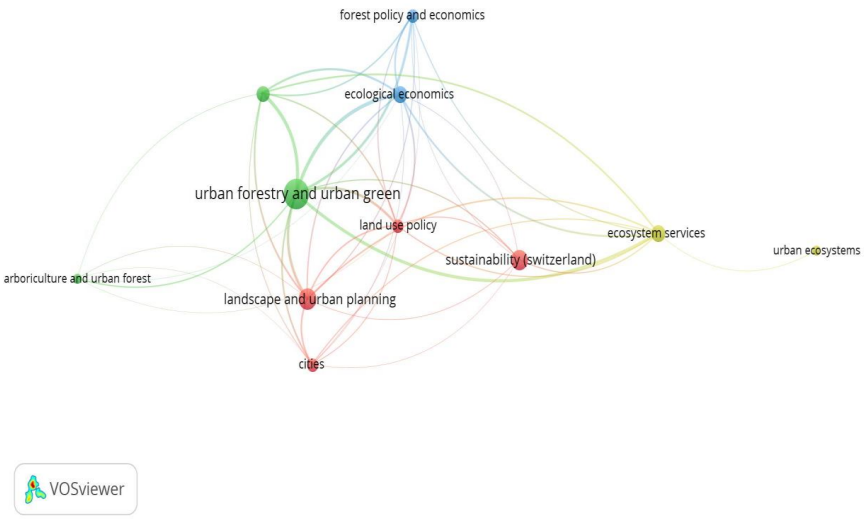

Figure 9. Bibliographic coupling of Journals

5.2.3 Co-occurrence analysis of keywords

The research explores the co-occurrence of keywords related to the economic valuation of urban green spaces. Figure 10 underscores the prevalent keywords frequently employed in urban green spaces literature. The outcomes unveil notable terms such as "Green space, ecosystem service, urban area, willingness to pay, valuation, and urban planning." Among the many keywords used, a total of 1,976 were gathered from the final set of 235 documents. Of these, 1,000 showed strong connections. Due to the large number of keywords in each cluster, the author highlights the most important ones in Figure 10.

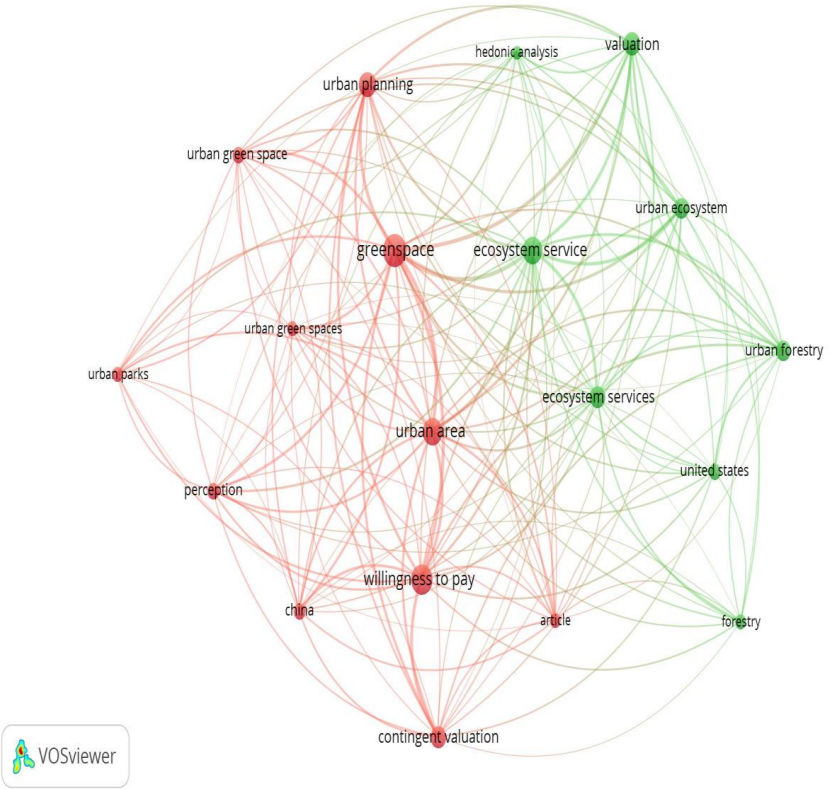

Figure 10. Co-occurrence of keywords network

5.2.4 Co-authorship analysis

The co-authorship network analysis reveals the connections among authors and the collaboration patterns between countries. Figures 11 and 12 illustrate the network analysis of authors and countries. The findings underscore a notable lack of collaboration and interconnectedness within author and country co-authorship networks in the context of the monetary valuation of green spaces. However, in contrast, the study identifies noteworthy International collaboration within distinct realms of environmental economics. The study has been taken under Co-authorship, and countries: two countries have been taken as the minimum criteria. Out of 66 countries, only 40 met the required threshold for inclusion based on co-authorship data. Similarly, when looking at authorship by country, only 6 out of 265 countries reached the minimum of two published documents to be considered.

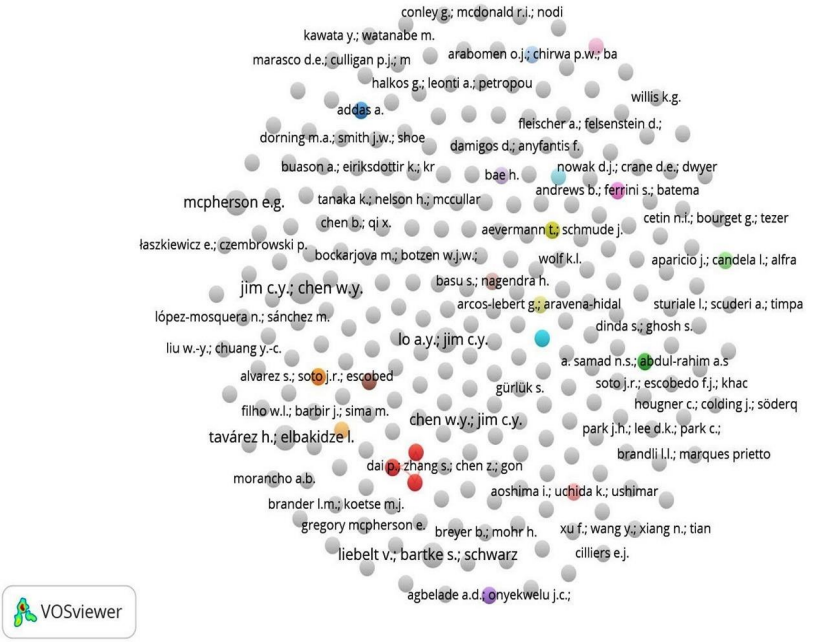

Figure 11 Co-authorship network collaboration

Figure 12 Co-authorship network collaboration

5.2.5. Cluster Analysis

Bibliometric Coupling and Thematic Groupings in Contemporary Research
The methodological approach entails grouping articles into thematic clusters by examining their titles within a defined period (Donthu et al., 2021; Zupic & Čater, 2015). These clusters are formed through bibliographic coupling, enabling the identification of publications that focus on related thematic areas based on shared citation patterns. The author aims to explore a wide range of themes and current trends within a field; this technique, as suggested by Secundo et al. (2019) and Nagariya et al. (2020), proves highly beneficial.

Initially, this analysis yielded four clusters comprising 38 articles (only considering articles with citations more than 12 and the year between 2019 and 2023), as these articles were grouped because they had the most shared references and similar topics. To ensure accuracy, a detailed quality check was carried out to better define and present the key themes emerging in this area of research. Consequently, it effectively synthesizes the insights within this knowledge area. The depiction of these clusters is presented in Table 9.

Cluster 1: Urban green spaces and Ecosystem service

The First cluster focuses on the correlation between urban green spaces and ecosystem service. The standout contributors in this cluster include Basu & Nagendra (2021) and Diluiso et al. (2021). Their investigations cover a range of dimensions, highlighting significant ecosystem services within green areas like parks and emphasizing the pivotal role these services play in urban development. Bockarjova et al. (2020) explored public perception regarding the critical determinants of urban nature's value, encompassing study attributes, nature types, and ecosystem services. The findings underscored the prominence of regulatory and cultural services as crucial factors in urban green spaces. Escobedo et al. (2020) and Fruth et al. (2019)addressed the critical facet of environmental sustainability in

metropolitan settings. They emphasized the indispensable contribution of urban green spaces in augmenting the cities' economic and ecological sustainability. Ultimately, the papers in this cluster collectively accentuate the significance of ecosystem services within urban green spaces. The first cluster is presented in Table 9.

Documents	Normalized Local Citation Score
Basu S, 2021, Urban for Urban Greening	1
Diluiso F, 2021, Land Use Policy	1
Bockarjova M, 2020, Ecol Econ	1
Salata S, 2020, Sustainability	1
Sabyrbekov R, 2020, Landsc Urban Plann	1
Rall E, 2019, Urban For Urban Greening	1
Escobedo Fj, 2020, Urban Ecosyst	1
Fruth E, 2019, Land Use Policy	1

Table 9: Urban green spaces and Ecosystem service (Cluster 1)

Cluster 2: Willingness to pay for Green spaces

The cluster focuses on the willingness to pay for green spaces where Zambrano-Monserrate et al. (2021) and Zhang et al. (2021) have a hedonic price model to show the relationship between the increase in house price surrounding green spaces and found that there is a heterogeneous demand for urban green spaces by urban residents. They are ready to pay more to get houses near green spaces. Sylla et al. (2019) and Lagbas (2019) used the economic valuation method to analyse different socio-economic characteristics to understand the factors that influence the willingness to pay and found that income is the main factor for the willingness to pay for green spaces. Thus, this cluster represents the monetary value for sustainable green spaces and is presented in Table 10.

Documents	Normalized Local Citation Score
Zambrano-Monserrate Ma, 2021, For Policy Econ	1
Zhang Y, 2021, J Clean Prod	1
Kalfas D, 2022, Sustainability	1
Lagbas Aj, 2019, J Urban Manag	1
Kim H-S, 2019, Landsc Urban Plann	1
Sylla M, 2019, Sustainability	1
Liebelt V, 2018, Eur Plann Stud	1
Liebelt V, 2019, Sustainability	1

Table 10: Willingness to pay for green spaces (Cluster 2)

Cluster 3: Sustainability of Biodiversity in Urban Green Spaces

The cluster highlights the role of urban green spaces in supporting biodiversity sustainability. It underscores the connection between these green areas and the broader goal of achieving sustainable human development. This area is rooted in the realms of ecosystem services and sustainability science. The investigation employs questionnaires and scenario simulations, such as assessing residents' engagement in sports activities or gauging their physical and mental well-being, alongside simulations of factors like temperature and climate. This theme's central concern is the inhabitants' welfare and emotional state (Kim et al., 2020). In this context, the importance of having a variety of urban green spaces is recognized, and the theme provides clear guidance on how to make the best use of them (Sultana & Selim, 2021). The ultimate objective here is to employ urban green spaces to enhance human well-being, signifying the overarching aspiration of this thematic exploration. Thus, this cluster represents the sustainability of biodiversity in urban green spaces and is presented in Table 11.

Documents	Normalized Local Citation Score
Kim Js, 2021, J Destin Mark Manage	1
Sultana R, 2021, Ecol Soc	1
Mäntymaa E, 2021, Landsc Urban Plann	1
Tibesigwa B, 2020, Cities	1
Dinda S, 2021, Int J Geoher Parks	1
Dymek D, 2021, Sustainability	1
Phillips A, 2021, Sustainability	1
Dai P, 2019, Sustainability	1
Riechers M, 2019, Sustainability	1

Table 11: Sustainability of Biodiversity in Urban Green Spaces (Cluster 3)

6 Discussion And Contribution

The study contributes multiple theoretical perspectives to the realm of economic valuation of urban green space research. The study gathered 265 articles from the Scopus database and carried out a bibliometric analysis. To answer the first two research questions, the initial part focused on performance analysis, mainly looking at citation patterns. The study first summarizes the development of yearly publication trends as depicted in Figure 2, most influential authors, and countries. Furthermore, It explored this subject domain's frequently used keywords and key research themes. The findings show that Jim CY and Chen WY are the most impactful authors in this area, while the United States and the United Kingdom lead in the number of published works.

6.1 Implication 1: Publication trends

This study offers several theoretical insights into urban green space research. To answer the first two research questions, the first part focused on performance analysis, specifically looking at citation data. As depicted in Figure 2, the development of yearly publishing trends shows a constant trajectory till 2010; after 2011, there has been a steady increase in the number of studies published on urban green spaces. The findings further reveal that 2022 experienced a notable upsurge in publications and citations.

The study also highlights the top five authors who have contributed the most published work in this field of research. It was ascertained that Jim CY occupied the lead with eight papers, closely followed by Chen WY, Escobedo FJ, and

Kronenberg J, each contributing six documents. The findings also bring attention to the citation table, which shows that Jim CY secured the foremost position, garnering 1161 citations from eight articles, thus establishing him as a prominent and influential figure within the subject domain.

The research investigation also examines the distribution of publications and countries. Significantly, the United States leads in the number of published articles, totaling 1,352, with the United Kingdom following behind with 553 publications. In terms of citations, Hong Kong takes the lead with a total of 1156 citations, closely followed by Finland with 938 citations and the United States with 895 citations. Detailed data is provided in Tables 6 and 7, serving as a valuable resource for the researchers in this field.

6.2 Implication 2: Quality of journal and publications

The study highlights a detailed list of journals that have had the greatest influence based on citation counts. Landscape and Urban Planning is leading the list with 2554 citations across 23 articles. Following closely is Urban Forestry and Urban Greening securing the second spot with 1913 from 46 documents. The third, fourth, and fifth rankings are held by the Journal of Environmental Management, Ecological Economics, And Ecosystem Services, respectively, regarding the most cited articles in these journals. Consequently, the study urges scholars to conduct robust theoretical frameworks and undertake meticulously executed empirical investigations concerning urban green space within environmental economics.

7 Limitations and Future Research Agenda

The study has undertaken an exhaustive examination of the literature about urban green spaces. Nonetheless, It is important to recognize the limitations associated with this study that should be taken into account in subsequent research. Primarily, the study relied solely on one database, Scopus, for data retrieval. It excluded other prominent databases, such as Web of Science, PubMed, etc., to avoid duplication of articles. Secondly, the study has been confined to published research articles for analysis. For future investigations, there is potential to incorporate a broader array of document types such as review articles, book chapters, conference proceedings, and research notes to enhance the depth and understanding of the knowledge area. The study area has used keywords "urban green space" OR "green area" OR "urban parks" OR "urban forest" OR "urban trees" AND "willingness to pay" OR "valuation" OR "monetary valuation" OR "payment card" for data collection. Future research can use additional keywords for more robust results. Despite the outlined constraints, this research provides significant insight into the current advancements within urban green space. It is considered a valuable resource for navigating research in these fields.

8 Suggestions for future studies

In this part, the authors suggest ways to spot what's missing in current research and share ideas for where future studies could go. The findings from network analysis underscore limited collaborative efforts at basic levels among countries and authors, Consequently, this study encourages researchers to delve into areas like institutional collaboration, the influence of research scholars within this research domain.

The graphical representation of different trends of the article underscores the fact that this particular research field remains insufficiently explored. Hence, the study stands to establish a valuable groundwork that researchers can use a basis for conducting a comprehensive analysis on the economic valuation of urban green spaces.

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The authors have no competing interests to declare that are relevant to the content of this article

Author's Contribution
Tincy Thankachan: Conceived and designed the analysis, collected the secondary data, analyzed and interpreted the data, wrote the paper.
Tijo George: Analyzed and interpreted the data, screening of first draft paper.
Dr. Mahesh E: Analyzed and interpreted the data, screening of second draft paper and final revision of the paper.

Data availability statement
Data will be made available on request.

References

1. Abhilash, A., Shenoy, S. S., & Shetty, D. K. (2023). Overview of corporate governance research in India: A bibliometric analysis. *Cogent Business & Management*, *10*(1). https://doi.org/10.1080/23311975.2023.2182361
2. Appio, F. P., Cesaroni, F., & Di Minin, A. (2014). Visualizing the structure and bridges of the intellectual property management and strategy literature: A document co-citation analysis. *Scientometrics*, *101*(1), 623–661. https://doi.org/10.1007/s11192-014-1329-0
3. Arabomen, O. J., Chirwa, P. W., & Babalola, F. D. (2019). Willingness to pay for environmental services provided by trees in core and fringe areas of Benin City, Nigeria 1. *International Forestry Review*, *21*(1), 23–36. https://doi.org/10.1505/146554819825863717
4. Baier-Fuentes, H., Merigó, J. M., Amorós, J. E., & Gaviria-Marín, M. (2018). International entrepreneurship: A bibliometric overview. *International Entrepreneurship and Management Journal*, *15*(2), 385–429. https://doi.org/10.1007/s11365-017-0487-y
5. Baker, H. K., Kumar, S., & Pandey, N. (2021). Forty years of the Journal of Futures Markets : A bibliometric overview. *Journal of Futures Markets*, *41*(7), 1027–1054. https://doi.org/10.1002/fut.22211
6. Basu, S., & Nagendra, H. (2021). Perceptions of park visitors on access to urban parks and benefits of green spaces. *Urban Forestry & Urban Greening*, *57*, 126959. https://doi.org/10.1016/j.ufug.2020.126959
7. Bateman, I. J., Harwood, A. R., Mace, G. M., Watson, R. T., Abson, D. J., Andrews, B., Binner, A., Crowe, A., Day, B. H., Dugdale, S., Fezzi, C., Foden, J., Hadley, D., Haines-Young, R., Hulme, M., Kontoleon, A., Lovett, A. A., Munday, P., Pascual, U., … Termansen, M. (2013). Bringing ecosystem services into economic decision-making: Land use in the United Kingdom. *Science*, *341*(6141), 45–50. https://doi.org/10.1126/science.1234379
8. Bockarjova, M., Botzen, W. J. W., & Koetse, M. J. (2020). Economic valuation of green and blue nature in cities: A meta-analysis. *Ecological Economics*, *169*, 106480. https://doi.org/10.1016/j.ecolecon.2019.106480
9. Brink, P. ten. (2012). *The economics of ecosystems and biodiversity in national and international policy making*. Routledge.
10. Buckley, C., van Rensburg, T. M., & Hynes, S. (2009). Recreational demand for farm commonage in Ireland: A contingent valuation assessment. *Land Use Policy*, *26*(3), 846–854. https://doi.org/10.1016/j.landusepol.2008.10.013
11. Byrne, J. A., Lo, A. Y., & Jianjun, Y. (2015). Residents' understanding of the role of green infrastructure for climate change adaptation in Hangzhou, China. *Landscape and Urban Planning*, *138*, 132–143. https://doi.org/10.1016/j.landurbplan.2015.02.013

12. Caplin, A., & Dean, M. (2011). Search, choice, and revealed preference. *Theoretical Economics*, *6*(1), 19–48. https://doi.org/10.3982/te592

13. Cilliers, J. (2021). Towards green(er) cities: Contextualizing green benefits for urban spaces and contemporary societies. *Urban Planning*, *6*(4), 1–3. https://doi.org/10.17645/up.v6i4.4821

14. Ciriacy-Wantrup, S. V. (1947). Capital returns from soil-conservation practices. *Journal of Farm Economics*, *29*(4), 1181. https://doi.org/10.2307/1232747

15. Cobo, M. J., López-Herrera, A. G., Herrera-Viedma, E., & Herrera, F. (2011). An approach for detecting, quantifying, and visualizing the evolution of a research field: A practical application to the Fuzzy Sets Theory field. *Journal of Informetrics*, *5*(1), 146–166. https://doi.org/10.1016/j.joi.2010.10.002

16. Corvalán, C., Hales, S., McMichael, A. J., Butler, C., (Program), M. E. A., & Organization, W. H. (2005). *Ecosystems and human well-being: Health synthesis*. World Health Organization

17. Davis, R. K. (1963). Recreation planning as an economic problem. *Nat. Resources J.*, *3*, 239.

18. Diluiso, F., Guastella, G., & Pareglio, S. (2021). Changes in urban green spaces' value perception: A meta-analytic benefit transfer function for European cities. *Land Use Policy*, *101*, 105116. https://doi.org/10.1016/j.landusepol.2020.105116

19. Escobedo, F. J., Bottin, M., Cala, D., & Sandoval Montoya, D. L. (2020). Spatial literacy influences stakeholder's recognition and mapping of peri-urban and urban ecosystem services. *Urban Ecosystems*, *23*(5), 1039–1049. https://doi.org/10.1007/s11252-020-00962-y

20. Fahimnia, B., Sarkis, J., & Davarzani, H. (2015). Green supply chain management: A review and bibliometric analysis. *International Journal of Production Economics*, *162*, 101–114. https://doi.org/10.1016/j.ijpe.2015.01.003

21. Fruth, E., Kvistad, M., Marshall, J., Pfeifer, L., Rau, L., Sagebiel, J., Soto, D., Tarpey, J., Weir, J., & Winiarski, B. (2019). Economic valuation of street-level urban greening: A case study from an evolving mixed-use area in Berlin. *Land Use Policy*, *89*, 104237. https://doi.org/10.1016/j.landusepol.2019.104237

22. Gaviria-Marin, M., Merigo, J. M., & Popa, S. (2018). Twenty years of theJournal of Knowledge Management: A bibliometric analysis. *Journal of Knowledge Management*, *22*(8), 1655–1687. https://doi.org/10.1108/jkm-10-2017-0497

23. Horne, P. (2006). Forest owners' acceptance of incentive based policy instruments in forest biodiversity conservation – a choice experiment based approach. *Silva Fennica*, *40*(1). https://doi.org/10.14214/sf.359

24. Jamean, E. S., & Abas, A. (2023a). Valuation of visitor perception of urban forest ecosystem services in Kuala Lumpur. *Land*, *12*(3), 572. https://doi.org/10.3390/land12030572

25. James, P., Tzoulas, K., Adams, M. D., Barber, A., Box, J., Breuste, J., Elmqvist, T., Frith, M., Gordon, C., Greening, K. L., Handley, J., Haworth, S., Kazmierczak, A. E., Johnston, M., Korpela, K., Moretti, M., Niemelä, J., Pauleit, S., Roe, M. H., … Ward Thompson, C. (2009). Towards an integrated understanding of green space in the European built environment. *Urban Forestry & Urban Greening*, *8*(2), 65–75. https://doi.org/10.1016/j.ufug.2009.02.001

26. Jennings, V., Browning, M. H. E. M., & Rigolon, A. (2019). *Urban green spaces: Public health and sustainability in the United States*. Springer.

27. Jim, C. Y. (2004). Green-space preservation and allocation for sustainable greening of compact cities. *Cities*, *21*(4), 311–320. https://doi.org/10.1016/j.cities.2004.04.004

28. Kim, H., Shoji, Y., Tsuge, T., Aikoh, T., & Kuriyama, K. (2020). Understanding services from ecosystem and facilities provided by urban green spaces: A use of partial profile choice experiment. *Forest Policy and Economics*, *111*, 102086. https://doi.org/10.1016/j.forpol.2019.102086

29. Kong, F., Yin, H., & Nakagoshi, N. (2007). Using GIS and landscape metrics in the hedonic price modeling of the amenity value of urban green space: A case study in Jinan City, China. *Landscape and Urban Planning*, *79*(3–4), 240–252. https://doi.org/10.1016/j.landurbplan.2006.02.013

30. Kumar, P. (2012). *The economics of ecosystems and biodiversity: Ecological and economic foundations*. Routledge.

31. Lagbas, A. J. (2019). Social valuation of regulating and cultural ecosystem services of Arroceros Forest Park: A man-made forest in the city of Manila, Philippines. *Journal of Urban Management*, *8*(1), 159–177. https://doi.org/10.1016/j.jum.2018.09.002

32. Lee, K. H., & Hatcher, C. B. (2001). Willingness to pay for information: An analyst's guide. *Journal of Consumer Affairs*, *35*(1), 120–140. https://doi.org/10.1111/j.1745-6606.2001.tb00105.x

33. Lo, A. Y., & Jim, C. Y. (2010). Willingness of residents to pay and motives for conservation of urban green spaces in the compact city of Hong Kong. *Urban Forestry & Urban Greening*, *9*(2), 113–120. https://doi.org/10.1016/j.ufug.2010.01.001

34. Louviere, J. J., & Woodworth, G. (1983). Design and analysis of simulated consumer choice or allocation experiments: An approach based on aggregate data. *Journal of Marketing Research*, *20*(4), 350. https://doi.org/10.2307/3151440

35. Malik, A., Zubair, M., & Manzoor, S. A. (2021). Valuing the invaluable: Park visitors' perceived importance and willingness to pay for urban park trees in Pakistan. *Ecosphere*, *12*(1). https://doi.org/10.1002/ecs2.3348

36. Mandziuk, A., Fornal-Pieniak, B., & Ollik, M. (2021). The willingness of inhabitants in medium-sized city and the city's surroundings settlements to pay for recreation in urban forests in Poland. *iForest - Biogeosciences and Forestry*, *14*(5), 483–489. https://doi.org/10.3832/ifor3758-014

37. McFadden, D., & Train, K. (2017). *Contingent valuation of environmental goods: A comprehensive critique*. Edward Elgar Publishing.

38. Moral-Muñoz, J. A., Herrera-Viedma, E., Santisteban-Espejo, A., & Cobo, M. J. (2020). Software tools for conducting bibliometric analysis in science: An up-to-date review. *El Profesional de La Información*, *29*(1). https://doi.org/10.3145/epi.2020.ene.03

39. Morancho, A. B. (2003). A hedonic valuation of urban green areas. *Landscape and Urban Planning*, *66*(1), 35–41. https://doi.org/10.1016/s0169-2046(03)00093-8

40. Qamar, Y., & Samad, T. A. (2021). Human resource analytics: A review and bibliometric analysis. *Personnel Review*, *51*(1), 251–283. https://doi.org/10.1108/pr-04-2020-0247

41. Rosehan, N. S., Abas, A., & Aiyub, K. (2020). Studies on the cultural ecosystem services in malacca city. *Planning malaysia*, *18*(12). https://doi.org/10.21837/pm.v18i12.749

42. Schuhmann, P. W., Skeete, R., Waite, R., Lorde, T., Bangwayo-Skeete, P., Oxenford, H. A., Gill, D., Moore, W., & Spencer, F. (2019). Visitors' willingness to pay marine conservation fees in Barbados. *Tourism Management*, *71*, 315–326. https://doi.org/10.1016/j.tourman.2018.10.011

43. Sultana, R., & Selim, S. A. (2021). Residents' perceptions of the role and management of green spaces to provide cultural ecosystem services in Dhaka, Bangladesh. *Ecology and Society*, *26*(4). https://doi.org/10.5751/es-12656-260405

44. Sylla, M., Lasota, T., & Szewrański, S. (2019). Valuing environmental amenities in peri-urban areas: Evidence from Poland. *Sustainability*, *11*(3), 570. https://doi.org/10.3390/su11030570

45. Tian, Y., Wu, H., Zhang, G., Wang, L., Zheng, D., & Li, S. (2020). Perceptions of ecosystem services, disservices and willingness-to-pay for urban green space conservation. *Journal of Environmental Management*, *260*, 110140. https://doi.org/10.1016/j.jenvman.2020.110140

46. Tyrvainen, L., & Miettinen, A. (2000). Property prices and urban forest amenities. *Journal of Environmental Economics and Management*, *39*(2), 205–223. https://doi.org/10.1006/jeem.1999.1097

47. Van Eck, N. J., & Waltman, L. (2014). CitNetExplorer: A new software tool for analyzing and visualizing citation networks. *Journal of Informetrics*, *8*(4), 802–823. https://doi.org/10.1016/j.joi.2014.07.006

48. Yu, C., & Kwan, M.-P. (2024). Dynamic greenspace exposure, individual mental health status and momentary stress level: A study using multiple greenspace measurements. *Health & Place*, *86*, 103213. https://doi.org/10.1016/j.healthplace.2024.103213

49. Zambrano-Monserrate, M. A., Ruano, M. A., Yoong-Parraga, C., & Silva, C. A. (2021). Urban green spaces and housing prices in developing countries: A Two-stage quantile spatial regression analysis. *Forest Policy and Economics*, *125*, 102420. https://doi.org/10.1016/j.forpol.2021.102420

50. Zhang, K., & Liang, Q.-M. (2020). Recent progress of cooperation on climate mitigation: A bibliometric analysis. *Journal of Cleaner Production*, *277*, 123495. https://doi.org/10.1016/j.jclepro.2020.123495

51. Zhang, Y., Zhang, T., Zeng, Y., Yu, C., & Zheng, S. (2021). The rising and heterogeneous demand for urban green space by Chinese urban residents: Evidence from Beijing. *Journal of Cleaner Production*, *313*, 127781. https://doi.org/10.1016/j.jclepro.2021.127781

52. Zupic, I., & Čater, T. (2014). Bibliometric methods in management and organization. *Organizational Research Methods*, *18*(3), 429–472. https://doi.org/10.1177/1094428114562629