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Exploring trends in green infrastructure planning: A bibliometric analysis using Scopus data (2015–2025)

Sukurulla Shaikh, Ekta Yadav and Vinay Prakash Kaushik

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Abstract
Purpose: Numerous studies, including conceptual and exploratory research on Green Infrastructure Planning, have been undertaken in the domains of business, management, finance, and economics. Thus, by synthesizing the knowledge structure, this study tries to detect research trends in this domain.
Methodology: A bibliometric study on the subject of Exploring Trends in Green Infrastructure Planning was done out utilizing a dataset of 1,667 documents. This dataset was acquired by a thorough search done on the Scopus database, encompassing the period range from 2015 to 2025.
Finding: The conceptual apparatus indicated the procession in the areas of progression from Green Infrastructure to Sustainable Development Goals, Sustainable Development; Decision Making; Infrastructure Planning and Urban city planning. In addition to uncovering the conceptual framework, this study also discloses the intellectual and social components. Consequently, the research gives vital insights on areas needing further inquiry.
Practical implications: The current study gives crucial insights into the junction of Green Infrastructure Planning, shining light on their interdependence. It underlines the most commonly treated issues in this domain and leads towards probable areas for more investigation.
Originality: A noteworthy contribution to this research is its function in merging the scattered information into this topic. It swiftly identifies and emphasizes vital sources, prominent authors, fundamental work and crucial documents when analyzing the link between Green Infrastructure Planning.

Keywords: Green infrastructure, sustainable development goals, sustainable development, decision making, infrastructure planning

Introduction
Green Infrastructure (GI) is most frequently featured in the guidelines for improving sustainabilities and resilience in urban environments. It aids adaptation to climate change, preservation of biodiversity, and enhancement of human health and well-being (Z.-H. *et al*., 2025) [33] (A. & B., 2019) [1] (S. *et al*., 2024) [22] (K. & C., 2025) [15]. GI may bring direct benefits under several Sustainable Development Goals (SDGs), including those relating to health, clean water, less disparities, sustainable cities, climate action, life underwater, and life on land (Z.-H. *et al*., 2025) [33]. The ecological services Green Infrastructure can provide include stormwater management, air quality improvement, carbon sequestration, and urban cooling (S. *et al*., 2024) [22] (S. & A.N.S., 2017) [21] (D. *et al*., 2018) [7] (K. & G.Y., 2023) [14]. It is considered efficient because of the capability of GI to provide multiple benefits at the same time (S. *et al*., 2024) [22] (D. *et al*., 2018) [7]. One of the good GI planning practices is the merger with other spatial or land use planning instruments (K. & C., 2025) [15] (S. & A.N.S., 2017) [21] (J. *et al*., 2021) [13] (I. *et al*., 2017) [11]. There has been a rising attention to use GI as a nature-based solution to urban problems such as floods, heat islands, and biodiversity loss "(J. *et al*., 2021) [13] (D. *et al*., 2023) [8] (J *et al*., 2023) [12]". Despite their advantages, the implementation of Green Infrastructure still faces certain barriers, including a lack of evidence of its efficiency, lack of integration with spatial planning, and a weak methodology for costing benefits (K. & C., 2025) [15] (S. & A.N.S., 2017) [21] (J. *et al*., 2021) [13]. Policy and regulatory frameworks are often asynchronous, and stronger evidence bases

to support GI planning are needed (K. & C., 2025) [15]. Measurement of environmental efficiency in Green Infrastructure planning can be supported by technological advances, one of which is machine learning algorithms coupled with Data Envelopment Analysis (DEA) (Z.-H. *et al*., 2025) [33]. Other new models and indices are being developed, such as the Green Infrastructure Cost-Effectiveness Ranking Index (GICRI), which is based on the alternatives of measuring Green Infrastructure's cost-effectiveness. Case studies originating from different parts of the world, such as Languedoc- Roussillon in France or the Province of Turin in Italy, shed light on the multiplicity of approaches and methods used in Green Infrastructure planning (A. & B., 2019) [1]. Planning principles and approaches can differ considerably between countries, depending on national policies and local contexts "(I. *in vi*., 2017) [11] (S. *et al*., 2021) [23]". GI planning, ever dynamic and evolving, exists as the lifeblood for fostering sustainable, resilient urban development. While it brings many benefits, it must overcome some challenges for its practical applicability, including the integration of policies, economic evaluations, and stakeholder alignments. Technological and methodological improvements have the potential around the corner for making Green Infrastructure planning more effective and efficient.

The paper discusses the following research questions using bibliometric analysis and systematic review:

1. Which are the most influential authors, journals, Countries based on citation?
2. How the concept of Green Infrastructure evolved over the years?
3. What is the research gap and future scope of research on the topic Green Infrastructure?

The authors use network analysis and descriptive analysis to accomplish their study goals. The second portion of the study paper reviews the literature, while the third and fourth sections deal with research methodology and data analysis, respectively. Findings and outcomes in the parts that follow, conclusions are formed.

Literature Review

A important aspect of the research project, the literature review helps locate existing research on the subject and offers the framework for defining and analyzing the study problem. Additionally, it offers us a greater knowledge of the breadth and limits of past studies and provides information on regions that previous researchers were unaware of. Ideas like sustainable development, circular economy, and smart growth have become fundamental to current environmental challenges because to the conflict and contradiction between socioeconomic development and the natural ecosystem "(Lu *et al*., 2020) [18]; (Shan & Duchi, 2020) [25]; (Solonenko, 2019) [27]. (Thomas & Littlewood, 2010) [29]; (Tran & Beddewela, 2020) [31]; (Villate *et al*., 2020) [32]". One of the primary techniques for attaining sustainable development is green infrastructure, which successfully blends environmental, social, and economic growth "(Ahern, 2011) [2]; (Apostolopoulou & Adams, 2015) [3]; (Cortinovis & Geneletti, 2018) [10]; (De Valck *et al*., 2019) [9]". Planning for green infrastructure entails merging artificial and natural systems to increase ecosystem services, slow down climate change, and safeguard biodiversity. In order to effectively incorporate GI into urban planning and policy for sustainable development, new governance structures and stakeholder participation are necessary "(Sharma *et al*., 2024) [26]; (Pauleit *et al*., 22020) [20]; (Ben Othmen *et al*., 2024) [4]". Green infrastructure is essential in response to climate change "(Geneletti & Zardo, 2016) [10]; (Tak_acs *et al*., 2016) [30]". Green infrastructure has the potential to improve human health and social well-being by fostering social equality, improving landscape aesthetics, enhancing the built environment, and providing an opportunity for people to connect with nature (Coutts & Hahn, 2015; Ko & Son, 2018; Sun *et al*., 2019) [6, 16, 28]. Additionally, the research has examined the exploration of hotspots and development trends for green infrastructure. By reviewing 313 articles from 28 EU member states between 2008 and 2019, (Anastasia Chatzimentor and colleagues, 2020) [5] thoroughly outlined the problem clusters and the most recent scholarly boundaries of green infrastructure research in Europe. The foundation of green infrastructure research is the development and extension of ideas as well as the patterns of study of a particular green infrastructure industry or branch. Accordingly, the present study employed the bibliometrics approach to undertake a multi-dimensional visual analysis of the distribution, frontier, and trend of the literature on green infrastructure "(Latap_ Agudelo *et al*., 2019) [19]; (Lu *et al*., 2019) [17]; (Sana Ben *et al*., 2020) [24]".

Research Methodology

In this work bibliometric analysis is done over the literature taken from Scopus database following the systematic procedure. Research technique used is structure and discussed in figure no. 1 below:

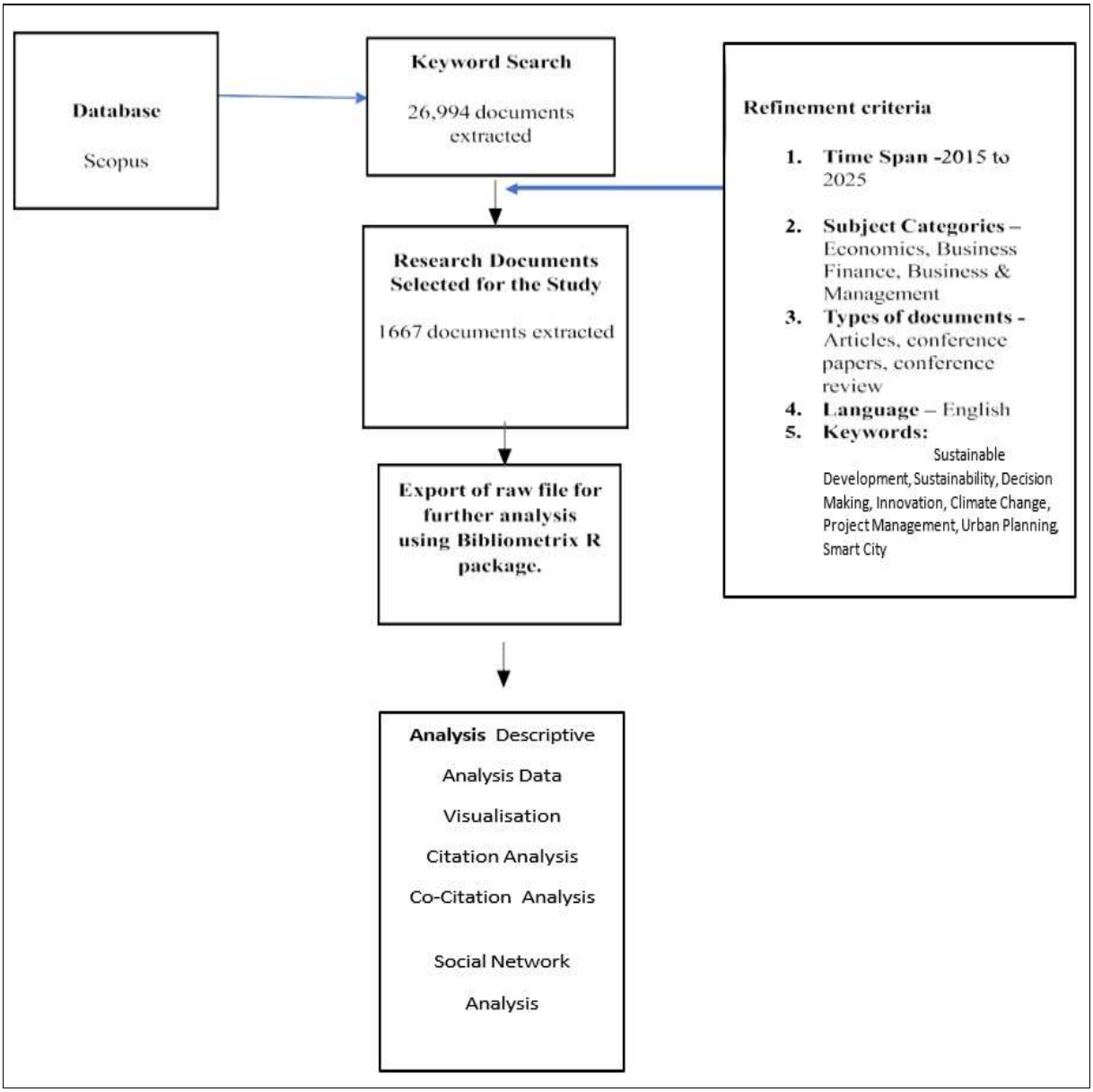


Fig 1: Flowchart for Research Methodology

Primary Database Collection

Many globally reputable databases exist, including Scopus, Web of Science, Google Scholar, and Dimensions; each comprises a wide spectrum of academic publications. Amongst all, Scopus indeed is one of the biggest and most widely used databases, so I opted to work with it. A total of 1,667 results of publications have been retrieved using a list of specified keyword combinations. While searching the databases worldwide, various sets of keywords were used. No filters were applied on the basis of country, language, or any other criteria. Each record of a publication contains useful information, i.e., name of the author, country of origin, number of citations, type of document, and source. This metadata has been further exploited for making analyses.

Fundamental Keywords

Table 1: List of Primary and Secondary Keywords

Fundamental Keyword	Exploring Trends in Green Infrastructure Planning
Primary Keywords using (AND)	Exploring AND trends AND in green AND infrastructure AND planning
Secondary Keywords using (OR)	“"Sustainable Development”) OR LIMIT-TO (EXACTKEYWORD "Sustainability") OR LIMIT-TO (EXACTKEYWORD, "Decision Making") OR LIMIT-TO (EXACTKEYWORD, "Innovation”) OR LIMIT-TO (EXACTKEYWORD, "Urban Planning") OR LIMIT-TO (EXACTKEYWORD, "Project Management") OR LIMIT-TO (EXACTKEYWORD, "Smart City") OR LIMIT-TO (EXACTKEYWORD, "Climate Change")”

***Source*:** Authors Calculation

Thus, the query for searching the documents in Scopus is:

"ALL (exploring AND trends AND in AND green AND infrastructure AND planning) AND PUBYEAR > 2014 AND PUBYEAR < 2026 AND (LIMIT-TO (SUBJAREA, "BUSI") OR LIMIT-TO (SUBJAREA, "ECON")) AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (EXACTKEYWORD, "Sustainable Development") OR LIMIT-TO (EXACTKEYWORD, "Sustainability") OR LIMIT-TO (EXACTKEYWORD, "Decision Making") OR LIMIT-TO (EXACTKEYWORD, "Innovation") OR LIMIT-TO (EXACTKEYWORD, "Urban Planning") OR LIMIT-TO (EXACTKEYWORD, "Project Management") OR LIMIT-TO (EXACTKEYWORD, "Smart City") OR LIMIT-TO (EXACTKEYWORD , "Climate Change"))"

Initial Search Outcomes

The Scopus database is searched using a variety of keywords relevant to our study to locate publications. Language-based analysis is used to investigate them. With 1,667 publications, English is the most widely used language, followed by Italian.

3) Data analysis and findings

As shown in Figure 2, the data analysis was divided into two main parts: a descriptive analysis and scientific mapping. Descriptive analysis, the first component, examines bibliometric data to identify key features of the dataset, such as authors, documents, and sources/journals. The second is scientific mapping, which uses visualization techniques including factorial analysis, network analysis, three-field plots, and theme maps.

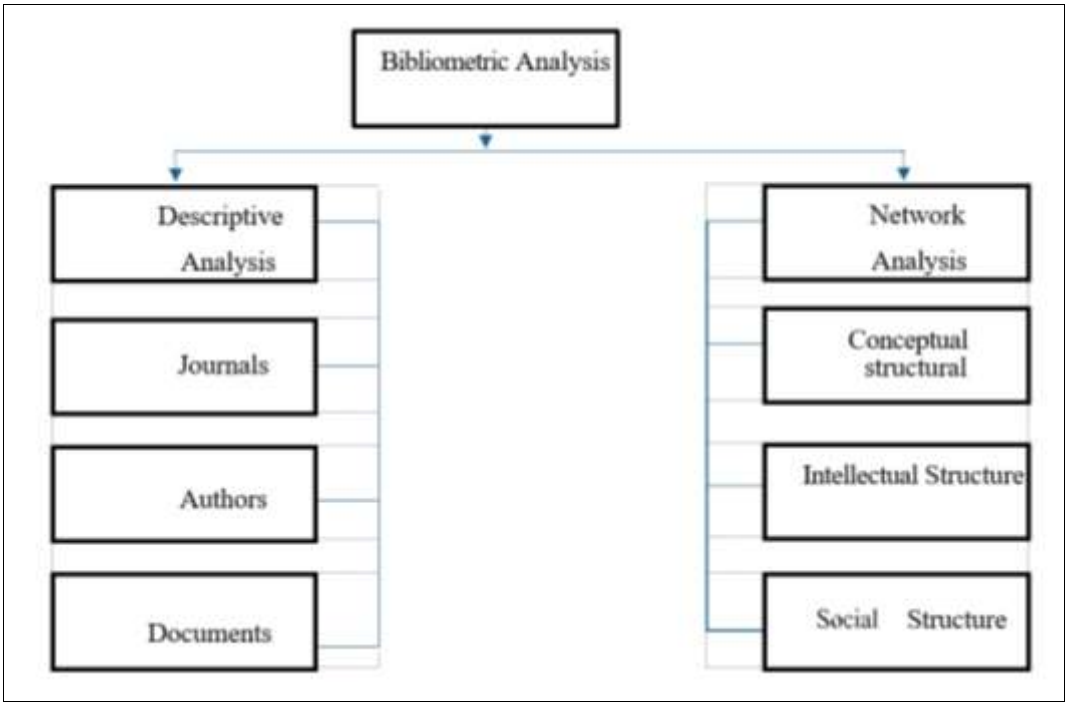


Fig 2: Bibliometric Analysis

Descriptive Analysis Data Set

Table 2 below summarizes the chosen sample data set of 1,667 documents used for the investigation. These research papers are published across 428 sources within the period frame of the years 2015 to 2025 suggesting Green Infrastructure has lately garnered interest in the academic field in the previous decades. Documents' average citations score is 43.25 coupled with cooperation index 2.99 implying Green Infrastructure is hugely investigated over past one decade by scholars working with each other.

Table 2: Description

Description	Results
Main information about data	
Timespan	2015:2025
Sources (Journals, Books, etc)	428
Documents	1667
Average years from publication	20.41
Average citations per documents	2.99
Average citations per year per doc	43.25
References	174144
Document types	
Article	1346
Document contents	
Keywords Plus (ID)	6976

Author's Keywords (DE)	5084
Authors	
Authors	5056
Authors of single-authored documents	136
Authors collaboration	
Single-authored documents	139
Co-Authors per Documents	3.75

Three field plots

Figure 3 below displays the three field plots illustrating the link between the chosen three fields namely Authors, keywords and countries utilized for the study based on Sankey plots. The left slide of the field indicates Authors, the center field represents keywords, and the right-side field represents counties. Influential work is done by the writers using keywords "sustainability", "sustainable development". "Climate Change", "Circular Economy", "Innovation" and "Smart City". Moreover, Major effort is given by established nations like China, India, UK, Australia, USA and Italy. Hong Kong, Iran and Turkey suggesting underdeveloped countries still lack in the area of Green Infrastructure.

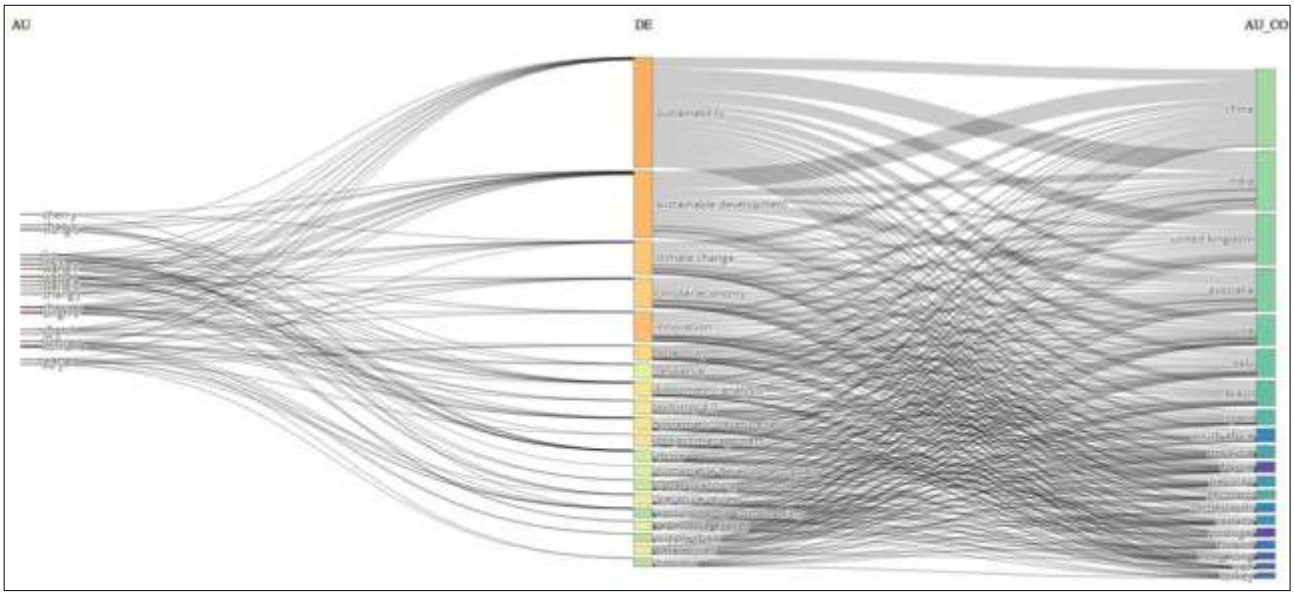
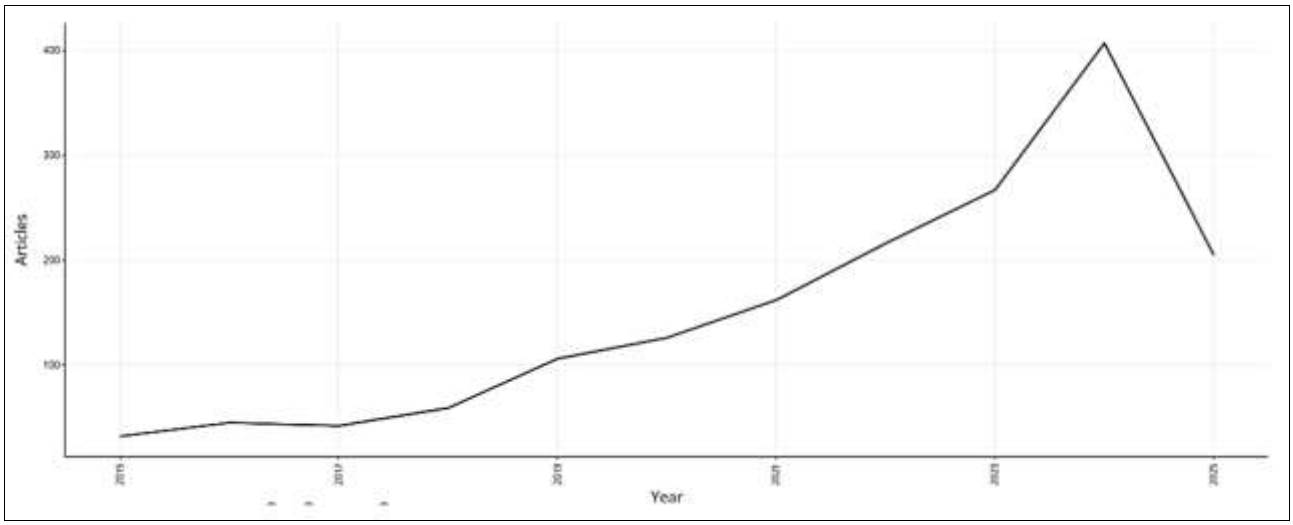


Fig 3: Three field plots

Periodic Trend

Periodic trends of the study on the theme Green Infrastructure are illustrated with the assistance of the yearly scientific production graph below (figure 4). Trend reveals that issue GI has garnered interest from the researchers' post-year 2015 and ever then there has been a growing trend in the number of publications published. Sharp growth in the output of research papers is noticed in the year 2019,2021 and 2023. Year 2020 significant spike might be attributed to pandemic COVID 19 which again compelled the globe to recognize sustainable and decisive development as an effective plan. Thus, GI in the area of study is an ever-increasing issue which generates pace financial anguish. No distinct average citation trend can be observed as represented in figure 5. The average number of citations experienced a growing trend during the period 2018-2025. However, pace of growth has been minimal. Post 2024 there is little decline in the average number of citations.



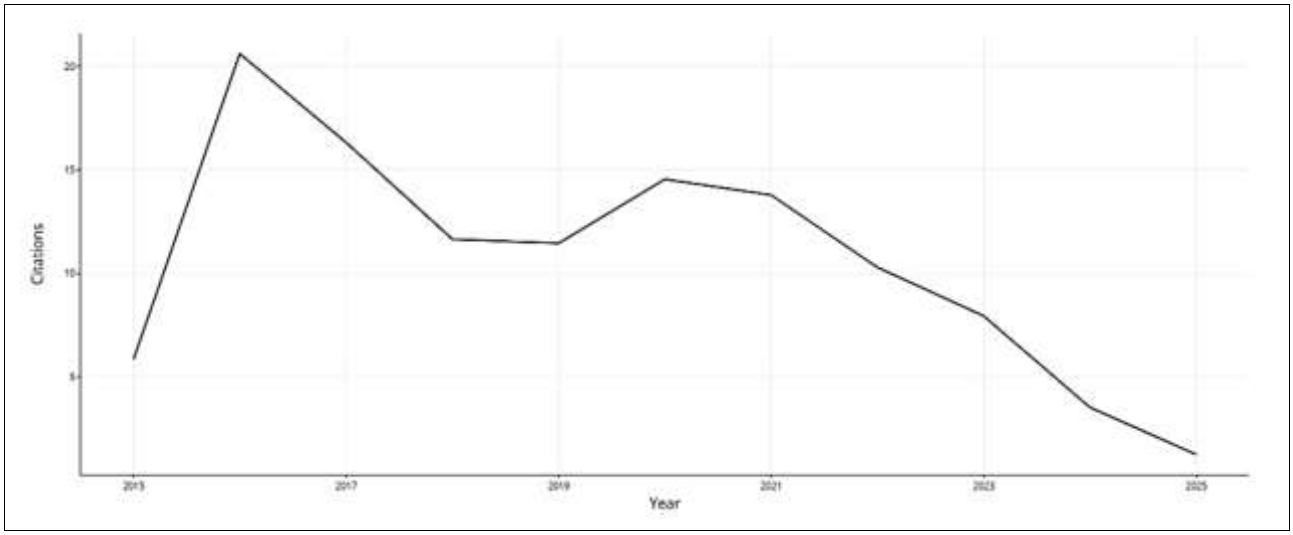


Fig 4: Periodic Trend

Journal Analysis

The author did article analysis to discover relevant and significant sources. Journal analysis is undertaken on all two grounds, namely (a) number of documents published (figure 05) and (b) H index (figure 6). H index is regarded a better indicator of quality of journals. It is determined as maximum value of "n" i.e., quantum of journals that have published n articles and have earned minimum "n" number of citations. Thus, individually the number of papers published as well as citations obtained cannot determine the important and significant sources. However, H index takes both into account for determining the influence and contribution made by a journal to a specific area of research. Journal of Cleaner Production and Technological Forecasting and Social Change are the journal with the highest h index as well as the biggest number of papers published on the subject. Followed by a cities and a journal of resources, conservation and recycling making mark in the list of both top 20 cited journals as well top 20 journal publishing on this subject. A closer review of journals offers insight into the fact that most of research activity is focused on the discipline's environment, management/Business.

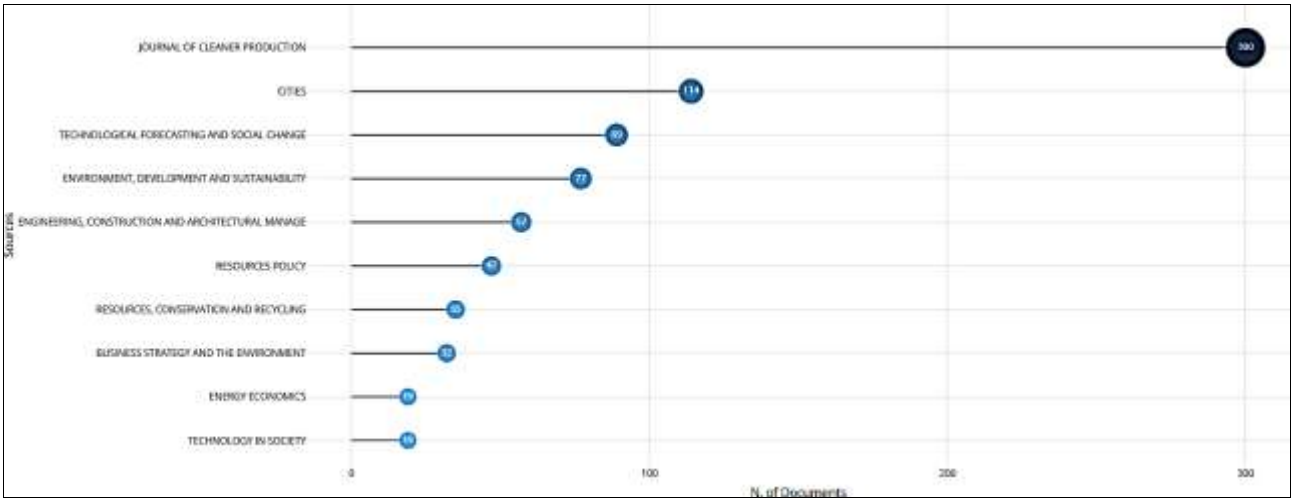


Fig 5: Most Relevant Sources

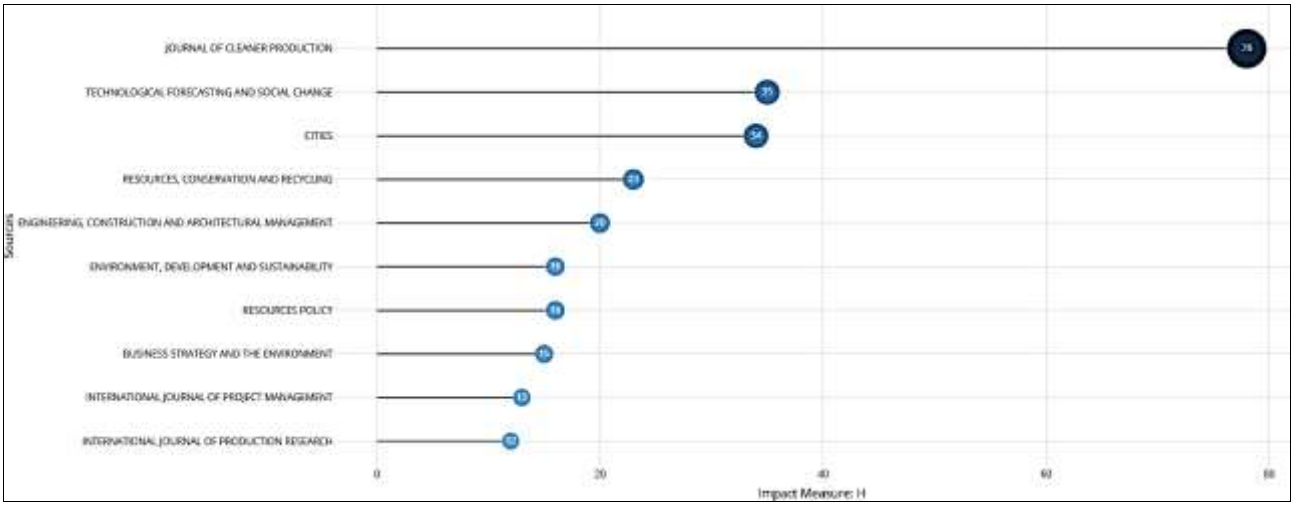


Fig 6: Local sources impacted by H index

Source Dynamics Based on LOESS (locally estimated scatterplot smoothening), Top five journals' dynamics in terms of number of articles are illustrated in figure 7. All the top five journals observe growing tendencies, notably after the year 2019. In recent years, i.e., after 2020, a growing tendency notices in all 5 publications.

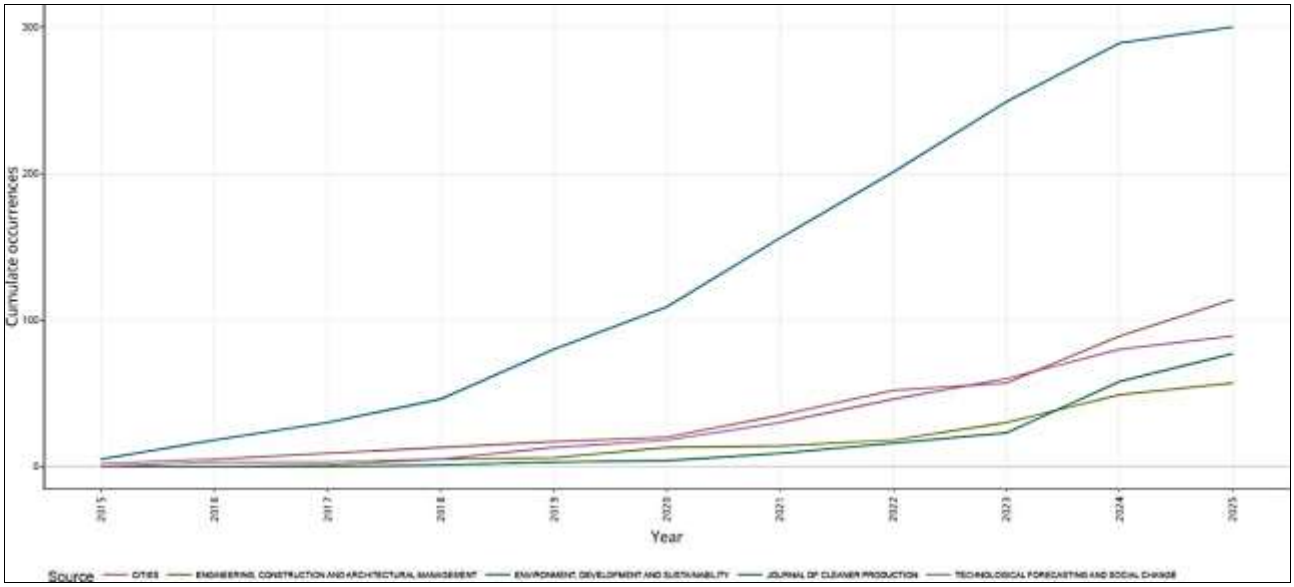


Fig 7: Source Growth

Authors

Author analysis is undertaken in the study in order to determine the most prominent and significant writers in the area of research which gives a vital guidance to future research scope. Analysis is done on the three parameters i.e., number of articles generated (figure (8a)), number of Citation (figure (8b)) and H index (figure 9). Wang Y, followed by Zhang Y and Wang J. are the top 3 writers producing the largest number of research articles on the subject Green Infrastructure. On the basis of H index top 3 important and important writers are Wang Y,Zhang Y and Wang J.

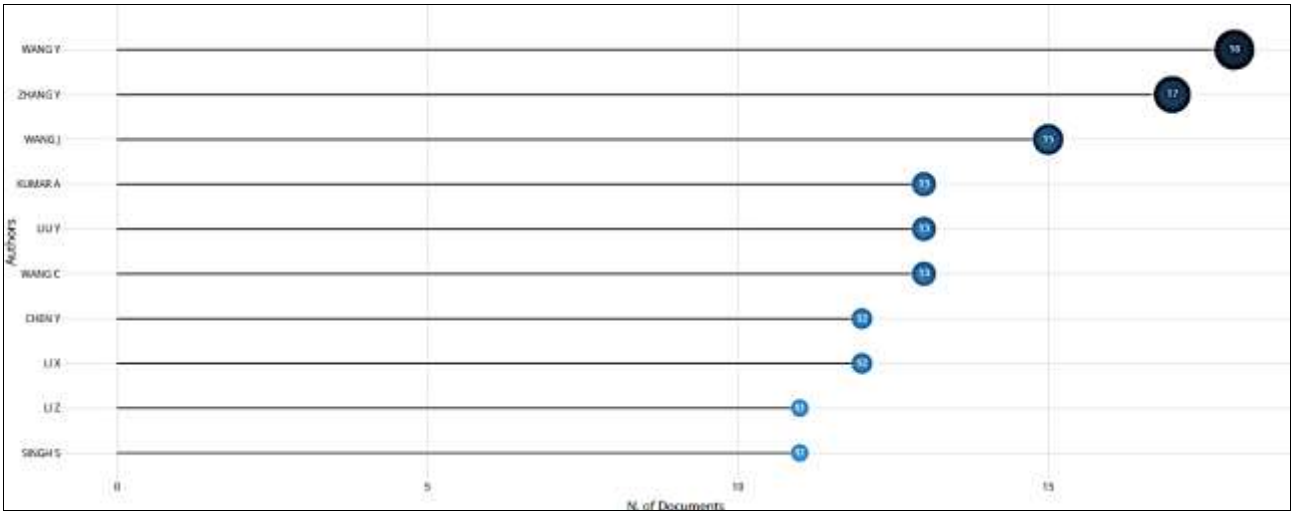


Fig 8 (a): Most Relevant Authors

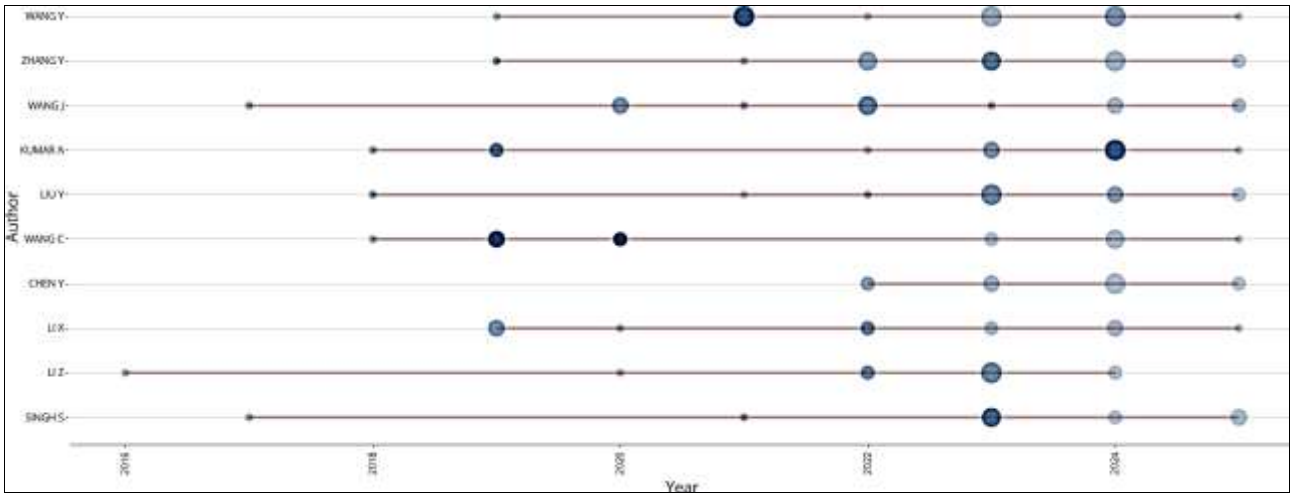


Fig 8 (b): Authors production over time

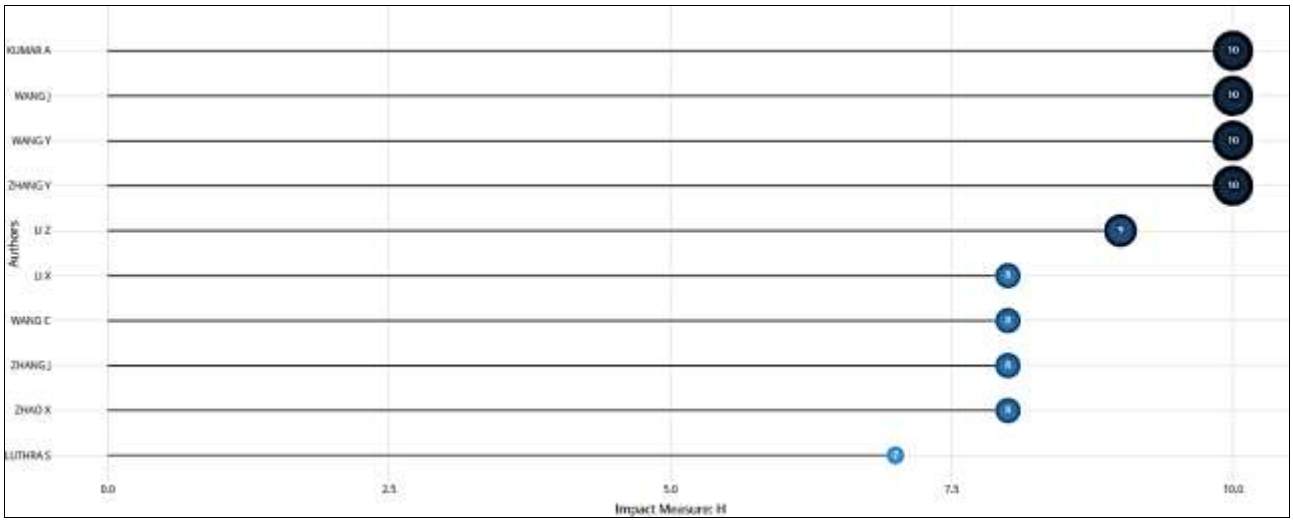


Fig 9: Authors' local impact by H index

Country-wise analysis

The analysis of various nations producing research in the subject of Green Infrastructure was done in order to determine the countries with research concentration. On the basis of both production (table 3) as well citation (table 4) China, India and UK, China, India and Italy are the top nations according to table 3 and table 4 accordingly. This demonstrates that the largest contribution in the area of Green Infrastructure is provided by industrialized nations. Although emerging nations like Indonesia and Malaysia are able secure place on top 20 countries on the basis of output but they lack their name in citation. This implies that emerging nations are creating research papers on this issue, but quality of the articles has to be raised.

Fig 10: Countries' Scientific Production

Table 3: Top 20 Countries by Research Article Frequency in the Field of Study

Country	Freq
China	332
India	129
Uk	105
Usa	83
Australia	82
Italy	72
Brazil	42
Spain	40
Germany	33
Malaysia	33
Netherlands	30
Canada	27
Hong Kong	26
Turkey	25
Portugal	23
Iran	21
France	20
Finland	19
Sweden	18
Austria	17

Table 4: Citation Metrics of Leading Countries: Total and Average Citations per Article

Country	Total Citations	Average Article Citations
China	10352	31.20
Uk	9198	87.60
Italy	6737	93.60
Australia	6370	77.70
Usa	3892	46.90
India	2908	22.50
Brazil	1899	45.20
Canada	1626	60.20
Finland	1407	74.10
Korea	1350	79.40
China	10352	31.20
Uk	9198	87.60
Italy	6737	93.60
Australia	6370	77.70
Usa	3892	46.90
Malaysia	1329	40.30
Portugal	1253	54.50
Hong Kong	1196	46.00
Netherlands	1089	36.30
Spain	1068	26.70
Malaysia	1329	40.30

Documents citation

Analysis of papers assists in the selection of references that are pertinent to the area. The most highly cited articles internationally are displayed in the figure 11 below. All the papers included in the figure have received more than 500 citations, showing their great impact on the field of research. The largest number of citations was garnered by a paper from Ghisellini P. (2016) titled "J CLEAN PROD," which has received 4104 votes of citation worldwide. This was followed by Murray A. (2017), with a paper in "J BUS ETHICS," that has 2062 citations. Further highly cited publications were from Kang H.S. (2016), with 1113 citations in "INT J PRECIS ENG MANUF GREEN TECHNOL" and from Allam Z. (2019) and De Jesus A. (2018), with equal citations of 792 each. These papers comprise germinal literature covering issues of sustainability, ethics, smart cities, and ecological economics.

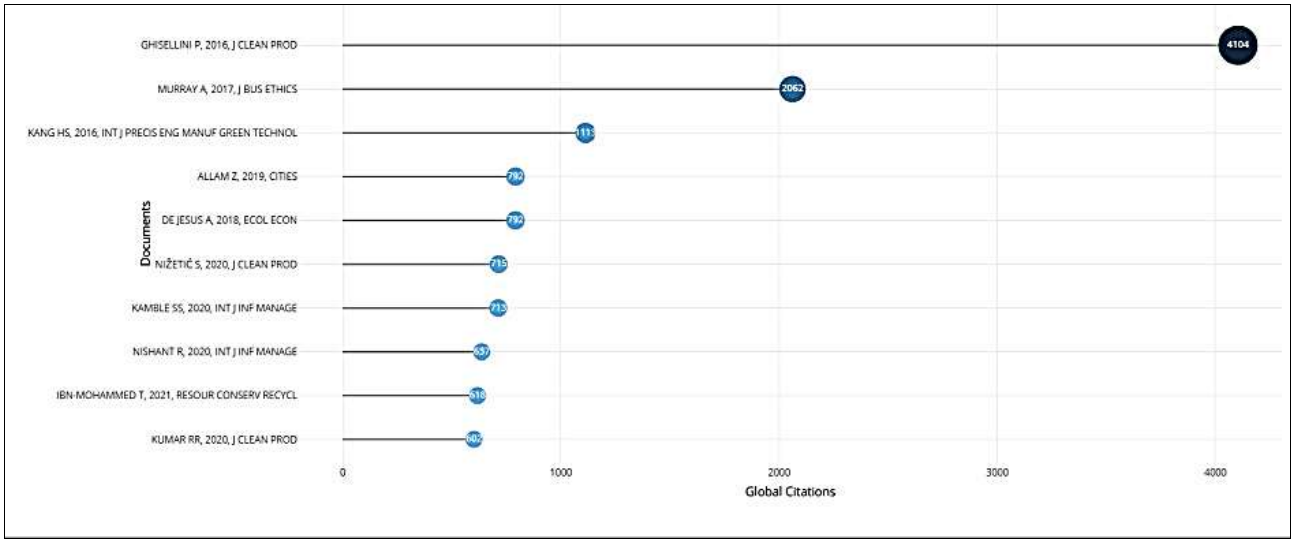


Fig 11: Most Global Cited Documents

Keyword

The keyword refers to the fundamental unit of the given topic of study. Keyword analysis assists the author to acquire insights into the knowledge structure and trend of that specific topic. Figure 12 visually illustrates the top 10 terms utilized. Green Infrastructure followed by sustainable development, sustainability, Decision Making and Climate Change are the primary keywords utilized in research publications. These keywords may be used as a proxy in literature for relevance on the subject of Green Finance. Figure 12 is visual depiction of the important term in the form of word cloud. The frequency of the term is shown by the size of the keyword. Various factors like Sustainable Development, sustainability, Smart City, Urban Planning, Innovation, decision making, Project Management, Construction Industry etc may be identified on which work has previously been done making the area of Green Infrastructure inter-disciplinary.

Fig 12: Word Cloud

Trend topics

Research trend on the topic Green Infrastructure is depicted in figure 13. Review of the last five years of research on the suggestion of Green Infrastructure to be an inter disciplinary field of research. After 2015, the study fields started to grow steadily. Until that time, practically all research were done on reverse logistics, knowledge exchange, etc., and institutional theory. Large-scale sectors including industrial management, energy, environment, and education have come into existence as the study scope continues to grow. A focus from 2019 forward is on sustainable consumption, business sustainability, and environmental management. Recent years (2021-2025) are clearly bent towards decision-making, innovation, climate change, sustainability, and environmental economics - showing an attitude shift towards applied and policy-oriented research. With the introduction of new concepts like green development, machine learning, and sustainable development objectives, interested parties have begun integrating the digital with developmental problems. Interestingly, in recent trends, empirical study has gained priority over conceptual and theoretical studies - an indicator of increased relevance to data-backed and practical methods in GI related research.

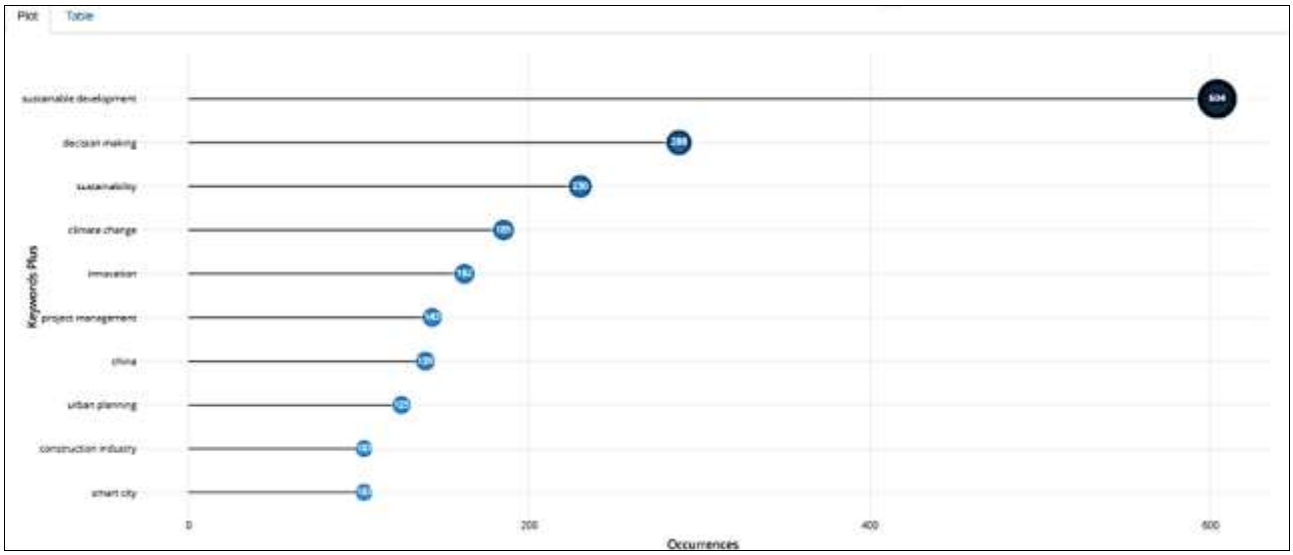


Fig 13: Trend Topics

Data visualisation

Data visualisation of current literature is developed with the purpose of objectively map the existing knowledge base of the subject Green Infrastructure. Data visualisation is useful in order to examine the theme research progression of a subject. It allows researchers to construct networks and study clusters inside. Networks may be established based on numerous ways including author, document, and keywords. In this research mapping of literature using network analysis is undertaken on three knowledge structures namely (a) conceptual structure (b) intellectual structure and (c) social structure.

Conceptual structure

In this study conceptual structure network is formulated using co-word analysis (figure 14) and Co- occurrence analysis (figure 15) of keywords. Co- occurrence network graphically depicts the relationship or in other words how frequent variables appear together. Conceptual structure is the only method which uses the content of the research document to visually present the relationship between the topics. Thematic map plot is produced in order to visualize the key themes in the field of Green Infrastructure based on co-word analysis on the unit keyword. Thematic map is a two-dimensional plot with density on X axis and centrality or importance on Y axis. Each bubble on the map represents the theme with specific density and centrality. As evidenced through the use of Figure 14, three main themes have been identified:

(i) economic and social effects, (ii) decision making and project management, and (iii) sustainability, climate change, and innovation. Keywords like Green Infrastructure and sustainability do not constitute separate clusters. Their interrelation and integration throughout various research areas within this field are very high. The economic and social effects theme occupies the upper-right quadrant: of high relevance and moderate development, which means this theme acts as a motor with major impetus in Green Infrastructure research. Decision making and project management theory-based themes in the upper-left quadrant indicate that they are well-developed with internal coherence yet less central to the overall field. Situated in the lower-central portion of the map, sustainability, climate change, and innovation are basic themes-highly relevant yet underdeveloped-demanding further research and operationalization.

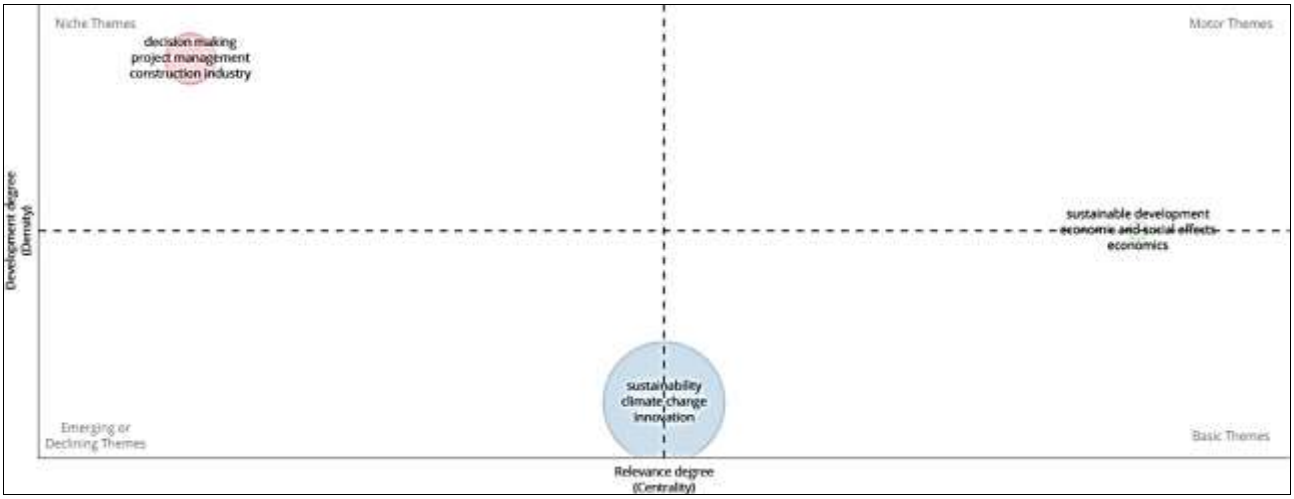


Fig 14: Thematic Map

Multiple corresponding analysis (MCA) is used by the software biblioshiny in order to form conceptual structure network on unit keyword. Figure 14 shows the three major clusters; each cluster being colored differently. The size of the node indicates the frequency of keyword occurrence, whereas the small space between the nodes shows high conceptual relatedness. Themes in the blue cluster are identified to have sustainability, climate change, and innovation as keywords that hold foundational positions. The red cluster on the niche quadrant contains keywords: decision-making, project management, and construction industry. The cluster on the right side represents themes of sustainable development, economic and social impacts, and economics, as these themes are considered well-developed and of great relevance to Green Infrastructure.

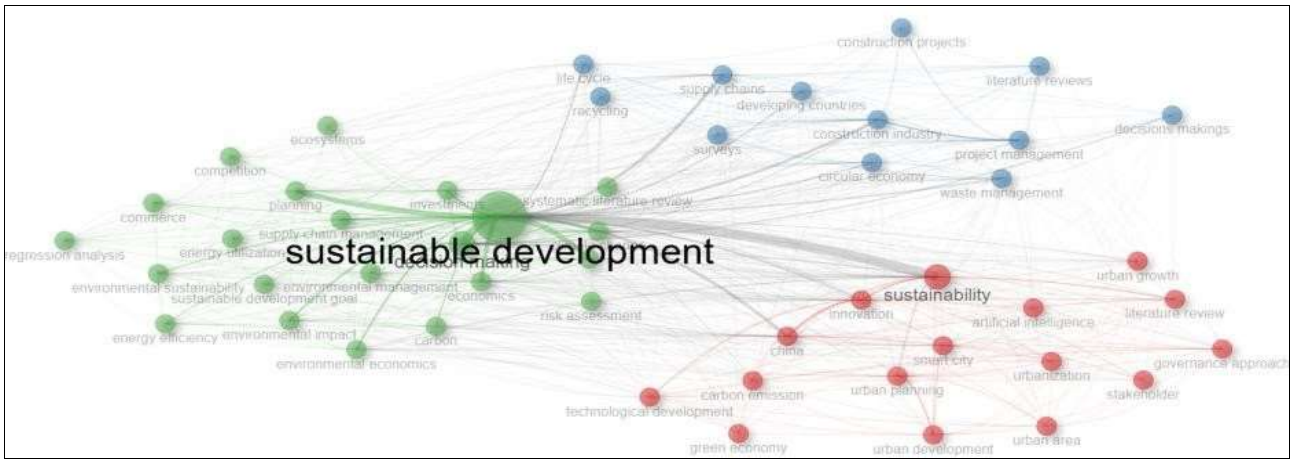


Fig 15: Conceptual Structure Network

Intellectual structure

In order to investigate prominent writers and their influence in terms of their collaborative network co- citation analysis is undertaken on the unit author. This analysis helps the researcher to comprehend various related studies on a single issue. Intellectual structure thus constructed delivers insights with reference to co-operation or cooperation among diverse writers. Co- citation refers to the frequency or the number of times two writers are referenced jointly. Co- citation analysis delivers insights into the many sorts of studies undertaken on a certain research issue. If two writers are quoted together multiple times then suggests their study is comparable. The above analysis of co-citation networks shows the thematic clusters that have been emerging in the Green Infrastructure domain. Five clusters are identified in the network: red, orange, blue, purple, and green, each standing in for different research domains. Red clusters recognize these reported studies who handled sustainability

frameworks and conceptual underpinnings. The orange cluster has in its core, whose heavily cited work is a key reference in the literature on urbanization and smart city strategies related to Green Infrastructure. The blue cluster, with authors such as is moving toward circular economy and innovation for sustainable practices. By contrast, the purple cluster embraces behavioral and marketing theorists such as focusing on public perception, decision-making, and behavioral models taken into account while adopting sustainable infrastructure. The green cluster, by comparison, again seems to include but probably from the perspective of a related but different area. Combining this co-citation analysis with a systematic review draws attention to the fact that Green Infrastructure research is spread among diverse-but-linked domains through sustainability theory, urban systems, circular economy, behavioral insights, and an empirical framework

Fig 16: Collaborative Network Co-Citation Analysis

Social structure

In order to understand the existing collaboration among authors from different countries, co- citation analysis on the unit countries is conducted. Interpreting the network matrix will allow one to visualize a co-citation network for unit authors in Green Infrastructure. The network reveals four big clusters with colours-green, blue, purple, and red-as the major focal areas in research. The green cluster signifies renowned authors such as Wang Y and Liu Y, who have oriented their works more towards planning and environment of Green Infrastructure. The blue cluster comprises authors such as Wang C and Zhang W, focusing on the technical and engineering applications in this area. The purple cluster comprises authors such as Zhang Y and Li Z, focusing on sustainability assessment and performance evaluation of Green Infrastructure systems. The red cluster, meanwhile, with Kumar A and Singh S, speaks primarily to issues of policy, resilience, and supply chain in Green Infrastructure. Besides this, the orange soluble cluster of authors like Chan DWM and Edwards DJ hints at some niche yet influential work in construction and urban development. The following figure shows the geographical collaboration network growing from 30 countries' research outputs focusing on Green Infrastructure studies. The international collaboration patterns are robust, and China emerges as the main contributor, followed by strong collaborations with the USA, Australia, and the UK. This map offers a vision of global participation within a much broader dimension as opposed to clusters that we saw before, mainly across Asia, Europe, and North America. China is at the center with solid collaborative ties with the USA, India, and Australia, reaffirming its eminent position in Green Infrastructure research worldwide. Highlighting an important feature is the USA as another big hub actively collaborating with many countries across continents. The map again validated the world as distributed in Green Infrastructure research, with multi-regional collaborative efforts taking the highest note.

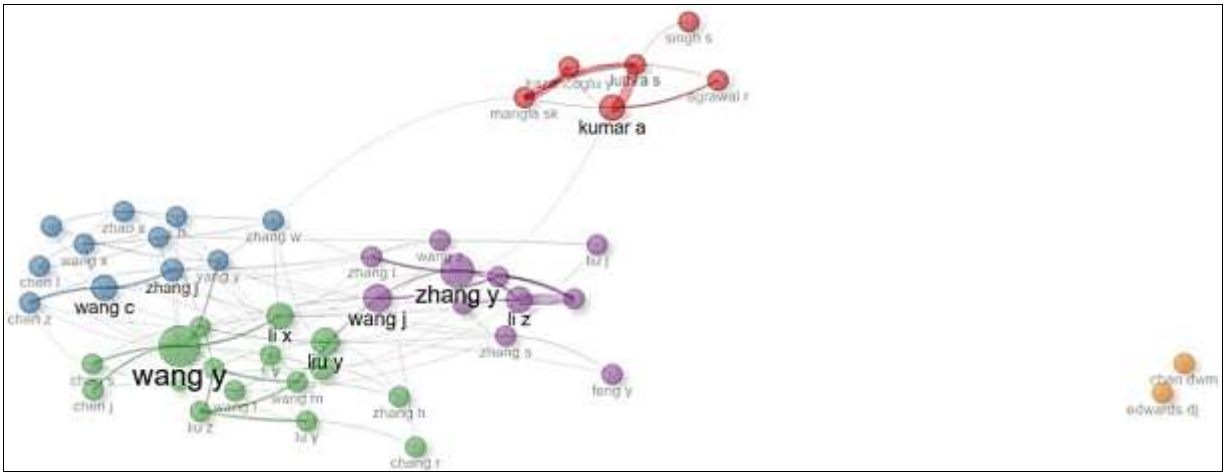


Fig 17: Collaboration Network

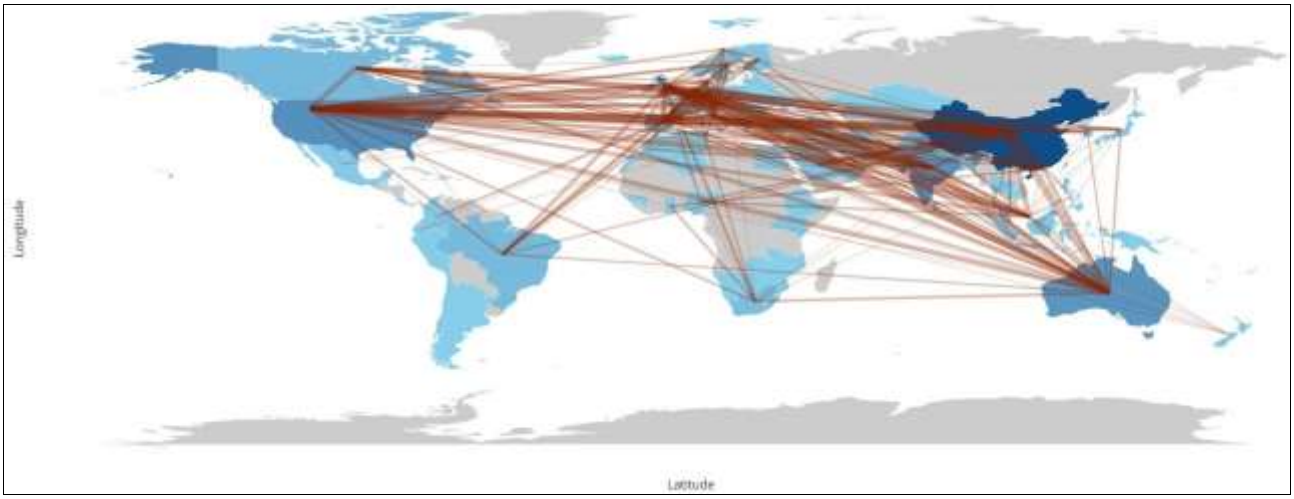


Fig 18: Country Collaboration Map

Conclusion

Bibliometric assessment of "Exploring Trends in Green Infrastructure Planning" is carried out by considering the most renowned and the biggest database applied worldwide-Scopus. The database is considered from the year 2015 to 2025. By performing the keyword search with AND operator and OR operator the database searching is done. A total of 1,667 documents are collected by the end of the search. The various parameters are studied for analysis of this database. It is noted that English language constitutes most of the papers 1.667 followed by Italian. The conclusion of keyword search suggests that greatest articles are with the term "sustainable development." Maximum papers are released in the year 2024 followed by the year 2025. The topic category Business, Management and Accounting includes roughly 29.7% of the publications. As far as the sort of document is concerned, articles of journal are the essential tenants followed by the review papers. The study of nations revealed, China as the largest number of publications during the time followed by UK. Documents with varied writers are also analyzed and the maximum authors average Publications account for 5 to 6. The biggest number of papers are from The University of Johannesburg and China is the main financial sponsor in this area. The descriptive and network analysis is also done by employing biblioshiny program. The many study types such as Periodic Trend, three field plots, authorship analysis co-occurrence analysis and citation analysis are done utilizing the same database. All these varied network analyses give a lot of information on the changes stated earlier. It can also be emphasized that the core work in Exploring Trends in Green Infrastructure Planning is done in 2024 and 2025. In the following years, tremendous and widespread growth is predicted in this region.

Recommendation for future study

Much work in the subject has been done not only by affluent countries like the USA but also by rising ones like India. Developing nations lack cooperation with authors of other countries, which highlights the gap and recommends future researchers pick for collaboration to have a powerful and vital effect. Further the themes on which research may be done soon include urban planning and climate change Lastly, of the moderators and mediator's variable just a few have been examined till date by very few researchers thus clearly providing chances for future investigation. Lastly, an empirical analysis may possibly be done in the future.

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