

MAPPING GLOBAL ECOTOURISM RESEARCH: A BIBLIOMETRIC STUDY USING VOSVIEWER

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Abstract: Ecotourism has become a central theme in sustainable tourism discourse, emphasizing the balance between environmental conservation and socio-economic development. This study aims to offer a comprehensive bibliometric overview of global ecotourism research trends and identify emerging directions for future inquiry. By mapping the evolution of this multidisciplinary field, the study clarifies the role of ecotourism in sustainability, conservation, and community empowerment. A total of 2,228 publications from 1986 to 2024 were extracted from the Web of Science Core Collection. Bibliometric techniques such as performance analysis and science mapping were conducted using VOSviewer to analyze trends in authorship, keywords, co-citation, and institutional collaborations. The results demonstrate a steady growth in ecotourism scholarship, with significant contributions from China, the United States, and Australia. Key themes include sustainable tourism, conservation, GIS applications, and community-based ecotourism initiatives. Influential authors and journals were identified, revealing clustering patterns around sustainability management and policy frameworks. The findings also underscore the rising importance of interdisciplinary and international collaboration. While research remains concentrated in English-language sources, there is increasing engagement from developing regions. Temporal analysis shows an exponential rise in publications post-2010, reflecting growing academic and policy interest. The study also captures how digital tools and remote sensing technologies are shaping new research frontiers in ecotourism. Furthermore, collaboration networks indicate a shift toward South-South academic partnerships, especially in biodiversity-rich regions. This structured analysis provides valuable guidance for researchers, policymakers, and practitioners aiming to enhance the sustainability and inclusivity of ecotourism initiatives. The study contributes to the strategic development of ecotourism by highlighting conceptual gaps, research strengths, and the need for integrated, policy-relevant approaches. It also points out underexplored areas such as indigenous knowledge integration and long-term impact assessment. Ultimately, this research facilitates a better understanding of how ecotourism can support the global sustainability agenda.

Keywords: bibliometric analysis, ecotourism, sustainability, community based, conservation planning, eco-tourism research trends, sustainable tourism, VOSviewer

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INTRODUCTION

The global tourism industry shows ecotourism as its fastest developing segment to support sustainable development including environmental conservation and community engagement. Ecotourism defined as responsible travel to natural areas that conserves the environment and improves the well-being of local people (Lee & Jan, 2019).

It is increasingly recognized as a tool to balance the demands of tourism with the need to protect ecological and cultural heritage. Environmental sustainability awareness growth at a global level has boosted the acceptance of ecotourism as a practical approach to mitigate mass tourism effects while enhancing traveler connections with natural environments (Hasana et al., 2022). The rapid expansion of ecotourism research has been observed during recent years through rising scholarly works on its conceptual framework, implementation challenges, and socio-economic implications (Ocelli Pinheiro et al., 2021; Hasana et al., 2022). This growing body of literature reflects the multidisciplinary nature of ecotourism research spans diverse academic fields including environmental science, economics, sociology, and geography. Bibliometric analysis offers researchers a valuable synthesis capability for understanding this diverse body of research to identify key trends, influential publications, and emerging themes within the field (Donthu et al., 2021; İnci & Köse, 2023). The systematic analysis of ecotourism research within academic databases yields critical understanding about its evolution, current gaps, and future directions.

As a key element of sustainable tourism practices ecotourism conserves natural environments while promoting local cultural participation through tourism activities that minimize environmental degradation. Over the years, the academics and professionals have increasingly paid attention on studying ecotourism as it shows a promising tool for achieving sustainable development goals (Mondino & Beery, 2019). The research community has examined both the definitions and principles while establishing criteria that distinguish ecotourism from mass tourism (Selkani, 2020). Researchers started studying ecotourism academically during the late 1980s while sustainability movements gained momentum. Early academic exploration at first focused on defining ecotourism while distinguishing it from other modes of travel

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(Cobbinah, 2015). Subsequently, research into ecotourism progressed through studies of its economic, environmental, and socio-cultural impacts, leading to a more nuanced understanding of its benefits and challenges (Fennell, 2008). Recently, the scope of Ecotourism research has evolved witnessed the rise of interdisciplinary studies integrating ecological science, behavioral studies and management practices (Choi et al., 2021; Fu & Zhao, 2024).

Promoting environmental conservation is one of the fundamental principles of ecotourism (Krüger, 2005). A number of researches have been undertaken to study the effectiveness of ecotourism initiatives in protecting biodiversity and ecosystems. For instance, research conducted in national parks and wildlife sanctuaries, highlight the role of ecotourism in supporting conservation efforts and raising awareness about environmental issues (Wardle et al., 2018; Das & Chatterjee, 2022). Another focus of ecotourism studies is to investigate the engagement of local community in the ecotourism activities. Researchers have studied the economic advantages that ecotourism delivers to indigenous and rural communities through job creation, skill development, and cultural preservation (Kim et al., 2019; Anup et al., 2020). However, scholars have documented unequal benefit distribution and conflicts between stakeholders (Chen et al., 2021; Yeboah, 2024). Studies on ecotourists' motivations and preferences and satisfaction levels continues to evolve as an emerging area of research. Researches have explored the ecotourists' demographic and psychographic profiles, revealing their preference for maintaining authenticity, providing educational value, and preserving environmentally friendly experiences (Yang et al., 2023). Further, Sobhani et al., 2023 indicated that various visitors management strategies aim to reduce negative impacts while enhancing the overall experience.

It has been widely discussed in the ecotourism research that how policy frameworks and governance mechanisms foster the development of ecotourism activities. Researchers emphasize government must collaborate with private sectors, and non-governmental organizations (NGOs) to initiate and implement effective ecotourism policies (Pasape et al., 2015). The case studies in different countries demonstrate successful approaches with their respective best practices and lessons learned. Bibliometric analysis has become a popular method to review academic literature within the field of tourism. The quantitative analysis of publication trends citation networks, and co-authorship patterns reveals a comprehensive understanding of knowledge structure and emerging research directions (Donthu et al., 2021).

Recent bibliometric research has helped scholars map and synthesize this growing body of knowledge. For instance, Hasana et al. (2022) conducted a bibliometric review on ecotourism in protected areas, highlighting dominant research themes and challenges in policy implementation. Dinç et al. (2023) revealed fragmented global trends and underexplored regional networks. Similarly, Singh et al. (2021) examined thematic evolution and collaboration patterns in the Journal of Ecotourism. However, many of these studies are predominantly descriptive, with limited engagement in identifying conceptual gaps or critically evaluating the efficacy of ecotourism as a sustainable tool.

Several 2024–2025 studies have advanced this discussion. Lin et al. (2025) analyzed 3,982 eco-tourism publications and emphasized the need for integration between management and conservation goals, while Singh et al. (2025) examined sustainability trends and emerging themes in ecotourism using Scopus data. Their findings confirmed the rising importance of sustainable practices but noted a lack of longitudinal impact studies.

Riaz et al. (2024) explored ecotourism's contribution to economic growth through a systematic review, identifying a need for clearer metrics and regional differentiation. Amadu et al. (2025) highlighted the growing role of GIS in ecotourism, advocating for more spatially grounded planning. Additionally, Aprianoro et al. (2024) introduced the concept of halal ecotourism and traced its rapid development through bibliometric mapping. Aji et al. (2024) provided a detailed analysis of mangrove ecotourism, demonstrating the prominence of themes such as biodiversity, conservation, and carbon sequestration in coastal environments. Their findings highlighted the dominance of Asia in publication output and called attention to the importance of socio-ecological systems in ecotourism planning. Similarly, Sutiksno et al. (2024) explored the growth of geoheritage-based ecotourism, identifying international collaborations and emerging interests in financial inclusion and geoscience integration. However, both studies noted limitations such as geographic bias and methodological homogeneity, emphasizing the need for broader, more comparative approaches. Esparza-Huamanchumo et al. (2024) conducted a comparative bibliometric review of ecotourism, sustainable tourism, and nature-based tourism, revealing fragmentation in the literature due to separate treatment of overlapping concepts. Their study advocated for integrated research models that unify these streams to improve theoretical clarity and policy relevance.

Furthermore, they observed increasing international collaboration and a shift towards interdisciplinary research involving social, environmental, and technological fields. Despite the expanding literature, critical limitations remain. First, most bibliometric reviews, including those by Khanra et al. (2021) and Ocelli Pinheiro et al. (2021), rely heavily on quantitative metrics (e.g., citation count, co-authorship) without deep qualitative engagement. Second, language bias and English-dominated sources exclude valuable regional knowledge, especially from non-Western contexts. Third, interdisciplinary convergence remains limited, particularly in integrating behavioral science, technological innovation, and indigenous knowledge into ecotourism frameworks.

Empirical studies further complicate the picture. While ecotourism has shown promise in promoting biodiversity conservation (Wardle et al., 2018; Das & Chatterjee, 2022), scholars like Chen et al. (2021) and Yeboah (2024) note conflicts between stakeholders and unequal benefit distribution. Studies such as Anup et al. (2020) and Kim et al. (2019) underscore ecotourism's economic potential for rural communities but also point to the lack of proper institutional support. Meanwhile, research into ecotourist behavior (Yang et al., 2023) continues to highlight demand for authenticity and environmental responsibility, emphasizing the need for better visitor management (Sobhani et al., 2023). Liu & Chamaratana (2025) examined ecotourism in border areas of the Greater Mekong Subregion, finding stark contrasts between top-down ecotourism developments (e.g., Xishuangbanna, China) and community-based models (Luang Namtha,

Laos). The study exposed challenges such as external investor dominance, marginalization of local communities, and weak cross-border cooperation. They called for stronger governance frameworks and regional planning mechanisms

As a result, recent literature has begun advocating more holistic and cross-cutting frameworks. Choi et al. (2021) applied resilience theory to propose sustainable development models for estuarine ecotourism, and Fu & Zhao (2024) used the Theory of Planned Behavior to explore pro-environmental tourist behavior. These approaches move beyond traditional impact studies to consider decision-making, value systems, and governance.

This study aims to provide a comprehensive overview of global ecotourism research trends and identify future research directions through bibliometric analysis. By clearly mapping the evolution of this multidisciplinary field, the study seeks to clarify the role of ecotourism in sustainable development, conservation, and community engagement. The review examines major scholarly work including authors and themes to present the view of how ecotourism research has evolved over time. This study reveals critical gaps in addition to opportunities for advancing theoretical and practical knowledge in this field. The findings of this study will provide guidance to researchers and policy makers and tourism practitioners to develop new approaches for sustainable tourism management and ecological conservation.

MATERIALS AND METHODS

Bibliometric analysis

Bibliometric analysis is a quantitative analysis method used to describe, evaluate, and monitor published academic literature to trace the structure and trend of knowledge expansion (Lima & Bonetti, 2020; Greener, 2022; Sutiksno et al., 2024). Bibliometric data analysis can be utilized primarily for two purposes such as performance analysis and science mapping (Tyagi, 2024). Recently, a different type of research has applied bibliometric analysis to present novel views on research trends. Scholars are able to identify emerging research areas within their discipline and establish links between different academic institutions and organizations through this technique (Donthu et al., 2021). People interested in a subject area can use this technique to get an overview of literature basics and how it has changed over time (Greener, 2022).

This Bibliometric method made it easier to identify emerging research areas in the discipline and develop collaboration between academic institutions and organizations (Sutiksno et al., 2024). Researchers can utilize bibliometric analysis to quickly show the basics of the literature and how it has evolved through time (Liu et al., 2019). Bibliometric indicators can also be utilized to evaluate the quantity and quality of publications (Singh et al., 2020; Donthu et al., 2021).

Performance analysis and science mapping, two bibliometric techniques, were combined and employed as the analysis methods of this study. The performance analysis is related to evaluating the impacts of individual publications, countries, and affiliated institutions. Science mapping is a visual representation of a field to visualize its structure, subjects, and linkages with other disciplines (Chen et al., 2023). Several bibliometric indicators were applied in this study including authors, institution, country, and journals, co-citation, keyword co-occurrences, and bibliographic coupling.

Data source and processing

Scopus and Web of Science are considered as two of the world's most prestigious and influential databases for academic literature. The two databases have become vital tools for bibliometric analysis due to their combination of published documents with citation databases from all areas of science. However, a comparative analysis revealed that Scopus suffers from duplicate publications as major data quality issue (Singh et al., 2020). On the other hand, Web of Science Core Collection (WoS) has been recognized as an important database which significantly influence the bibliometric studies of various subject matters within science (Yan & Wang, 2023). WoS provides access to index journals, books, proceedings in social sciences, natural sciences, arts and humanities and so on (Zhu & Liu, 2020).

Thus, this study relied heavily on the primary data from Web of science database. The keywords "ecotourism" or "eco-tourism" were chosen as search parameters in the "search field". In the "All field" drop-down menu, "Title" was selected (Title refers to the title of a journal article, proceedings paper, book, or book chapter). While making research over the WoS database, we filtered "article and conference paper" as a document type from "document types" and "English" as a language from "language." Thus, the search equation was defined as (TITLE- (ecotourism) OR TITLE- (eco-tourism*)) AND (EXCLUDE (PUBYEAR, 2025)) AND (REFINE-(DOC-TYPE, "article", DOC-TYPE, "proceeding paper" and DOC-TYPE, "review article")) AND (REFINE (LANGUAGE, "English")).

However, the search criteria were not refined by time span. Consequently, data was collected from 1986 to 2024 in this study. By the end of December 2024, 2228 articles were used in bibliometric analysis. Information obtained from WoS database has been exported to tab-delimited (text) file and comma separated value (CSV) file for future investigations including detailed descriptions and cited references. The results of the study were crosschecked using an online tool on WoS website. VOSviewer (1.6.20) software was employed to visualize co-citation analysis, keyword analysis, co-occurrences analysis and bibliographic coupling. This study employed WoS as its only source of data. Therefore, there is little chance that mistakes could be made or some data be found duplicated (Rana, 2020).

RESULTS AND DISCUSSION

Results: Performance analysis

Annual performance of publications

The annual number of publications in a particular field of study is a strong indicator for assessing the progress of the field (Rana, 2020). The first publication on Ecotourism was recorded in the Web of Science core collection in 1986 which can be considered a pioneer work in the field of ecotourism. The articles related to ecotourism were not published

in the Web of Science Core Database between 1987 and 1989. Figure 1 shows a gradual increase in publications from 1986 until about 2005, after which a notable upward trend is observed. The number of publications increased sharply between 2010 and 2020 and reached the highest in 2022. The citation patterns also showed a similar trend, which also began rising significantly from 2005 onwards, reaching its highest point around 2022, since then indicating a decline.

The above trend indicates a growing research interest in the ecotourism-related subject over the past two decades, with a peak in 2022. The decline in both publications and citations observed from 2022 could indicate either a shift in research interest or a delay in citation accumulation for recent publications.

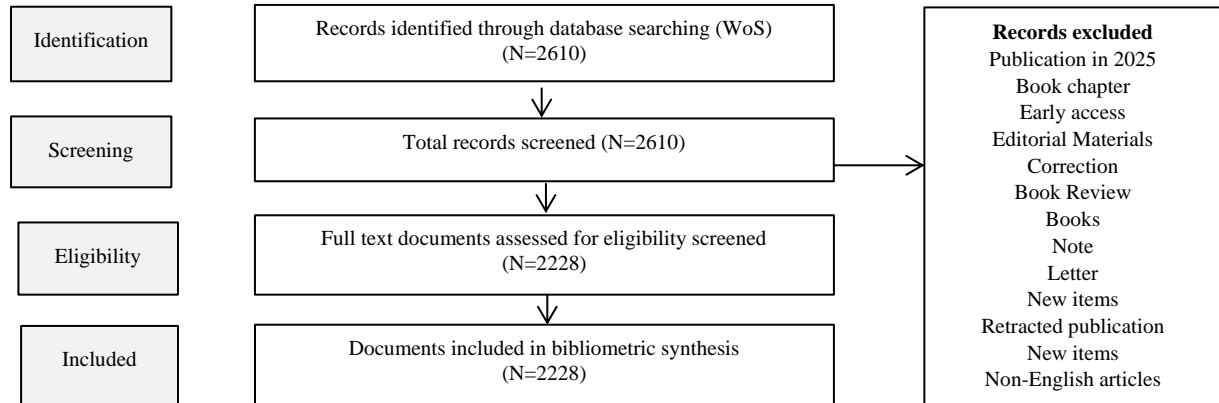


Figure 1. Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) flow diagram (Moher et al., 2009) for the systematic review of tourism research in Ecotourism

Leading countries and institutions

The number of publications and citations each country holds in the Web of Science core collection reflects which country is the most productive country in the particular research field (Dzikowski, 2018). 129 countries and 2334 institutions involved in ecotourism-related studies between 1986 and 2024. Figure 2 shows the figure global distribution of ecotourism-related paper publications from 1986 to 2023. Out of 129 countries, 13 have published more than 50 papers between 1986 and 2024. Based on the number of the documents published, China (440 articles and 1935 citations) is the most productive country and ranked first in the field of ecotourism research (Figure 3).

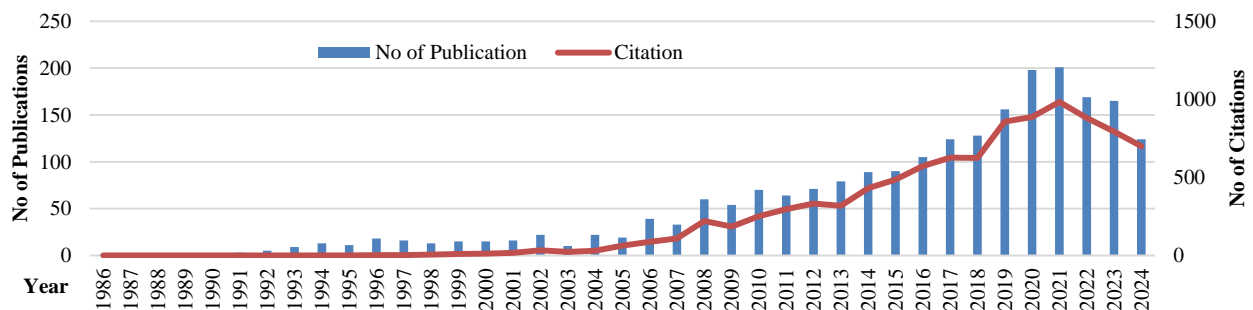


Figure 1. Distribution of publications and citations by years (1986-2024) (Source: Author, 2025)

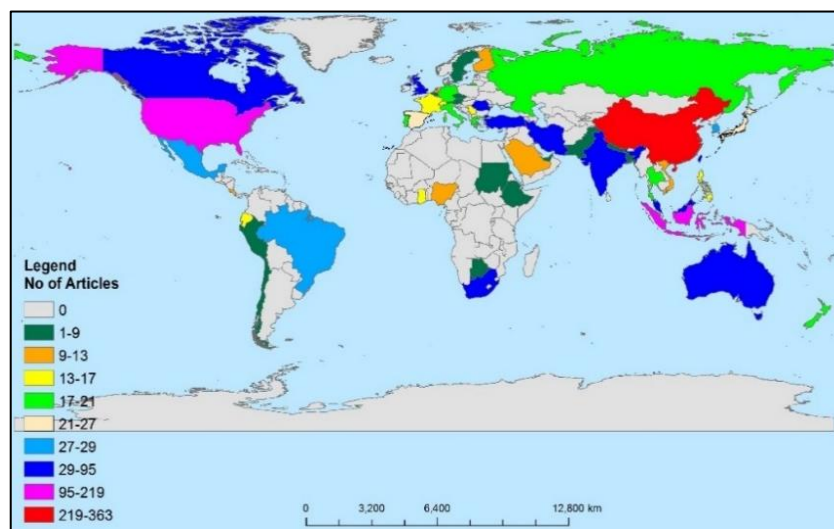


Figure 2. Worldwide distribution of ecotourism-related articles (Source: Author, 2025)

However, the United States is ranked first regarding the highest number of citations (6499 citations) (Table 1Table 1). A major portion of ecotourism research publications originates from China, Indonesia and Malaysia and India that demonstrates region's growing interest in ecotourism as a sustainable development approach.

The research publications from the USA and Canada showed higher levels of influence in ecotourism studies despite having fewer publications compared to China. Research from Iran and Taiwan and England produces substantial contributions to ecotourism knowledge, yet each entity exhibits varying levels of impact.

Griffith University is the most productive institute based on the number of publications (with 32 publications), followed by the Chinese Academy of Sciences (26 publications), the Islamic Azad University (24 publications), the University of Johannesburg (22 publications) and Bogor Agricultural University (20 publications). However, the rank differs remarkably in terms of influential institutions depending on the number of citations. For example, Griffith University is ranked first as the most influential institute having obtained the highest publication citations (773 citations), followed by the University of British Columbia (667 citations) and the Chinese Academy of Sciences (492 citations) (Table 2).

Table 1.Top ten leading countries in ecotourism-related research (Source: Author, 2025)

Country	Documents	Citations	Citation per Article
CHINA	440	1935	4.40
USA	286	6499	22.72
INDONESIA	185	174	0.94
AUSTRALIA	167	2311	13.84
MALAYSIA	102	475	4.66
INDIA	91	1149	12.63
CANADA	81	2017	24.90
ENGLAND	79	574	7.27
TAIWAN	75	226	3.01
IRAN	73	893	12.23

Table 2. Leading institutions based on the number of publications and citations (Source: Author, 2025)

Organization	Articles	Citations
GRIFFITH UNIVERSITY	32	773
CHINESE ACADEMY OF SCIENCES	26	492
ISLAMIC AZAD UNIVERSITY	24	214
UNIVERSITY OF JOHANNESBURG	22	334
BOGOR AGRICULTURAL UNIVERSITY	20	16
STATE UNIVERSITY SYSTEM OF FLORIDA	20	448
UNIVERSITY OF BRITISH COLUMBIA	19	667
BUCHAREST UNIVERSITY OF ECONOMIC STUDIES	18	80
GRIFFITH UNIVERSITY GOLD COAST CAMPUS	18	157

Most cited articles and leading authors

The number of citations obtained by a published article can be used to measure the relevance of the article in the respective field and considered as landmarks due to their pioneering contributions (Lima & Bonetti, 2020). Some of the articles that most frequently cited in studies are considered strong relevance reference material. However, it must be noted that, in general, older articles have higher chances of being referenced when compared to newer ones.

It should be remembered, however, that the most cited articles are not necessarily the most important ones (Mulet-Forteza et al., 2018). The indicates the top ten most cited articles in the field of ecotourism. "Ecotourism and the empowerment of local communities" is the most cited article (549 citations), published in Tourism Management Journal in 1999 (Scheyvens, 1999). This paper presents an empowerment framework to analyze how ecotourism influences the social, economic, psychological and political impacts of the local communities (Table 3).

Table 3. Top ten most cited articles between 1986 and 2023 (Source: Author, 2025)

Authors	Title	Publication Year	Total Citations
Scheyvens (1999)	Ecotourism and the empowerment of local communities	1999	628
Honey (2008)	Setting Standards: Certification Programmes for Ecotourism and Sustainable Tourism	2008	392
Weaver et al. (2007)	Twenty years on: The state of contemporary ecotourism research	2007	386
Chiu et al. (2014)	Environmentally responsible behavior in ecotourism: Antecedents and implications	2014	339
Powell & Ham (2008)	Can ecotourism interpretation really lead to pro-conservation knowledge, attitudes and behaviour? Evidence from the Galapagos islands	2008	307
Kruger (2005)	The role of ecotourism in conservation: panacea or Pandora's box?	2005	303
Stronza & Javier (2008)	Community views of ecotourism	2008	257
Jones (2005)	Community-based ecotourism - The significance of social capital	2005	254
Tsaur et al. (2006)	Evaluating ecotourism sustainability from the integrated perspective of resource, community, and tourism	2006	251
Mullner et al. (2004)	Exposure to ecotourism reduces survival and affects stress response in hoatzin chicks (Opisthocomus hoazin)	2004	236

Table 4 lists the top ten most productive authors in the field of ecotourism between 1986 and 2024. Carvache-Franco mauricio is the most productive author in ecotourism research, with 15 publications and 146 citations.

Table 4. The top ten most productive authors (Source: Author, 2025)

Author	Articles	Citations
Carvache-Franco, Mauricio	15	146
Carvache-Franco, Wilmer	13	93
Xu, Anxin	9	30
Zeppel, Heather	9	2
Butcher, Jim	8	57
Carvache-franco, Orly	8	45
Cater, Carl	8	140
Walter, Pierre	8	320
Avenzora, Ricky	7	5
Fennell, David	7	111

However, in terms of total citations, "Hunt Carter" is the most influential author in ecotourism research with five publications and 354 citations (Table 5).

Table 5. The top ten most influential authors (Source: Author, 2025)

Author	Articles	Citations
Hunt, Carter	5	354
Walter, Pierre	8	320
Buckley, Ralf	5	245
Chatterjee, Bani	6	236
Das, Madhumita	6	236
Carvache-Franco, Mauricio	15	146
Cater, Carl	8	140
Wolf, Isabelle	6	127
Fennell, David	7	111
Carvache-Franco, Wilmer	13	93

Leading journals

The top ten most popular journals are shown in Table 6. Between 1986 and 2023, 985 journals published articles on ecotourism in which "Sustainability" (95) was the most popular journal, followed by "Journal of Eco tourism" (54), "Journal of Sustainable Tourism" (47), and Journal of environmental protection and ecology (41) and "Tourism management" (34). Although "Sustainability" produced the most papers, "Tourism management" was the most cited journal with 3890 citations.

Table 6. The ten leading Journals with publications and citations on ecotourism (Source: Author, 2025)

Source	Articles	Citations
Sustainability	95	879
Journal of ecotourism	59	604
Journal of sustainable tourism	47	2299
Journal of environmental protection and ecology	41	102
Tourism management	34	3890
Environment development and sustainability	31	273
International handbook on ecotourism	30	120
Annals of tourism research	28	1933
Fresenius environmental bulletin	24	50
Ekoloji	22	63

Analysis of the intellectual structure

Author keyword co-occurrence analysis

An analysis of keyword co-occurrences enables tracing new study domains and research themes in a specific subject as keywords indicate the article's actual content (Singh et al., 2020). The co-occurrence analysis of author keywords examines the frequency of co-occurring keywords. Co-occurrence author keywords quantifying the frequency of articles in which two keywords appear together. The Table 7 below shows top ten author's keywords used in eco-tourism research from 1986 through 2024. The results show that "ecotourism" is the dominant research theme, followed by "sustainable development", "sustainability", and "eco-tourism". "Ecotourism" dominates the research landscape, suggesting a strong academic focus on environmental and sustainable tourism. The emergence of "GIS" indicates the increasing use of geospatial technologies in tourism studies.

Table 6. Top ten keywords, co-occurrence frequency, and total link strength (Source: Author, 2025)

Keyword	Occurrences	Total link strength
Ecotourism	937	1323
Sustainable development	154	276
Sustainability	105	215
Eco-tourism	99	85
Tourism	92	161
Conservation	91	193
Sustainable tourism	72	146
Protected areas	69	146
Community-based ecotourism	44	77
GIS	43	93

The Figure 4 below shows clusters of co-author keyword networks, containing 73 frequently appearing author keywords (out of 4635) which have appeared at least 10 times. There are 9 clusters with 594 links in the entire network with total strength 1703. VOSviewer is an effective tool for visualization of such connections between authors' key words. The map of this visualization features circles that are called nodes representing specific keywords. The size corresponds to frequency of occurrence i.e., bigger size means higher frequency. The thickness of a line represents how strong two circles are connected. Words that are closer together and have similar colors represent that they are more alike compared to those that are apart and have different colors (Greener, 2022). The co-occurrence network visualization highlights the connections among keywords, forming multiple clusters. Central Cluster (Ecotourism and Sustainability) represents the core themes in tourism research focusing on environmental protection and sustainable practices. Tourism Development Cluster examines economic, social, and environmental implications of ecotourism. Community and Policy Cluster highlights the role of technology and community engagement in tourism management. The clustering of keywords reflects distinct subfields, such as conservation, tourism policy, and community engagement.

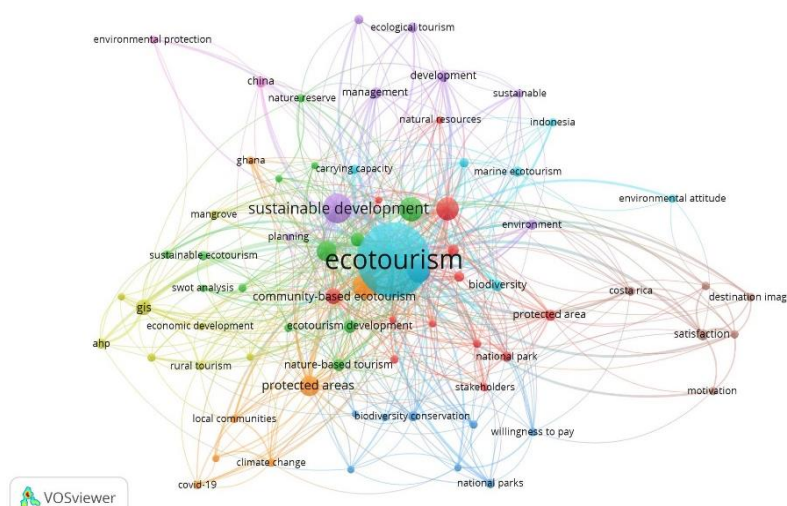


Figure 4. Co-occurrence author keywords network (Source: Author, 2025)

Co-Citation analysis of cited-authors

Co-citation is known as "how often two earlier articles are referenced in a subsequent article" (Greener, 2022). It measures how many times in the third article two articles are cited (Singh et al., 2020).

Table 7. Co-citation analysis of "Cited Authors" (Source: Author, 2025)

Author	Occurrences	Total link strength
Weaver, DB	470	9683
Buckley, R	394	8260
Fennell, DA	375	7373
Scheyvens, R	273	5361
Honey, M	233	4277
Ceballos-lascurain, H	210	3549
Lindberg, K	207	4345
Stronza, A	203	4569
Lee, TH	187	3674
Hall, CM	176	3387

Co-citation analysis provides a platform for understanding the process of spatial growth, and it can, therefore, be an effective tool for graphically depicting the intellectual structure of a subject. In addition, co-citation analysis offers insight into the knowledge domain (Singh et al., 2020). Table 8 presents the top ten most frequently co-cited authors in the field of

tourism research. The findings indicate that Weaver, DB and Buckley, R are the most prominent scholars in this domain. Other highly co-cited authors include Fennell, DA, Scheyvens, R, and Honey, M. The co-citation network visualization (Figure 5.) identifies four distinct clusters, each representing a thematic area in tourism research. Green Cluster (Ecotourism and Sustainable Tourism) focuses on sustainable tourism development, conservation strategies, and the role of tourism in environmental sustainability. Yellow Cluster (Tourism Development and Conservation) is centered on eco tourism's economic and environmental impacts, particularly in protected areas and eco-sensitive regions. Red Cluster (Broader Tourism Research and Policy) includes a diverse set of scholars who examine various aspects of tourism management, community-based tourism, and global tourism trends. Blue Cluster (Tourism Policy and Regional Development) focuses on tourism governance, policy-making, and its implications for regional and economic development.

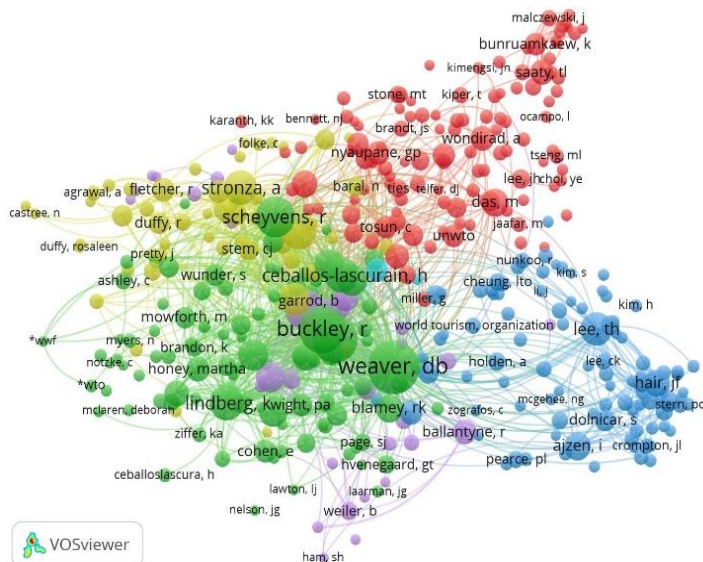


Figure 5. Co-citation analysis of "Cited Authors"
(Source: Author, 2025)

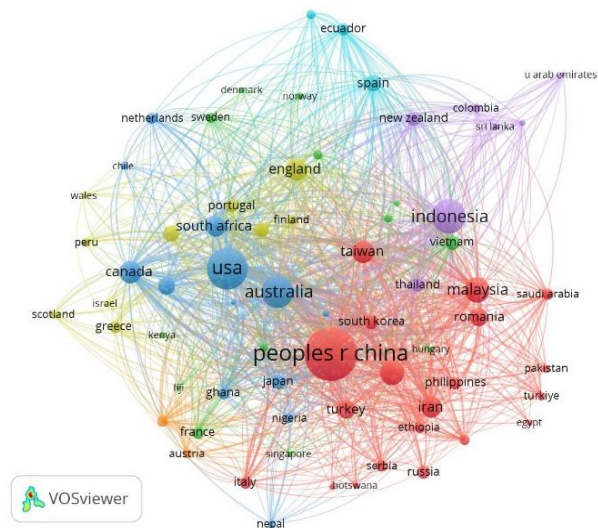


Figure 6. Bibliographic coupling between countries
(Source: Author, 2025)

Bibliographic coupling

Bibliographic coupling occurs when the two documents have cited the third document (Singh et al., 2020; Sing et al., 2025). The bibliographic coupling analysis, with "country" as the unit of analysis, is carried out to provide a graphic analysis of the extent to which the authors of the main country cite the same documents. People's Republic of China has the largest node, indicating that it has the highest volume of research output and the most shared references with other countries. USA and Australia are also highly connected, reflecting their significant contributions and strong bibliographic coupling with multiple countries. Indonesia, Malaysia, and England have medium to large nodes, showing strong involvement in tourism and environmental research. Red Cluster represents strong regional collaboration among East and Southeast Asian countries, often in topics related to tourism, environmental sustainability, and economic development. Blue Cluster highlights research collaborations between Western nations with a focus on sustainable development and conservation. Green Cluster indicates strong European cooperation in academic research. Purple Cluster suggests a smaller but distinct network likely focusing on region-specific tourism or environmental concerns (Figure 6).

The strong connectivity of China suggests that it plays a central role in global research, collaborating with both developing and developed countries. The clustering shows that countries within geographic proximity tend to collaborate more frequently, sharing similar research themes. The interconnections indicate that tourism, sustainability, and environmental issues are global research topics with contributions from diverse regions.

DISCUSSION

The bibliometric analysis of ecotourism shows that researchers from developed and developing countries have made significant contributions to the field. The scientific production in ecotourism began in the twentieth century. From this date, there has been an increase in scientific interest in ecotourism-related research, resulting in an exponential expansion over the years. The analysis shows that research on ecotourism has emerged and is progressing concurrently across several academic disciplines. The findings show that, despite many fluctuations between 1986 and 2007, the annual number of publications has increased since 2008 (Figure 1). The United Nations recognized ecotourism and declared 2002 the "International Year of Ecotourism," which may have encouraged researchers to conduct ecotourism-related research, contributing to the rapid increase in publications. The distribution of citation counts obtained by articles related to ecotourism published between 1986 and 2024 showed an increasing tendency. Until 2003, the number of citations collected per year was less than 100. However, this figure has progressively climbed. Citations have been increasing since 2004, and this trend is projected to continue in the following years (Figure 1). A number of publications influenced the progress of ecotourism research during this time period. Scholars expanded on previous research areas in response to emerging ecotourism challenges. They established international collaborations for ecotourism-related research and switched their

emphasis from identifying the concept of ecotourism to ecotourism and sustainable management, with a particular emphasis on community participation and sustainability. In recent years, many researchers used newly established research methodologies such as GIS, and remote sensing to identify the potential sustainable locations for ecotourism development.

This study indicates that several institutions and countries are interested in ecotourism research. The analysis shows that China, the United States, Indonesia, Australia, Malaysia and Taiwan are the most important countries in the field. Many developing countries, such as China, Malaysia, Taiwan, Turkey, Romania, India, Brazil, Mexico and so on, have begun appearing on the list of the top twenty most influential countries. Other developing countries are also expected to increase their representation in the ecotourism research arena. The analysis further displayed that the most influential institutions (top three) are from Australia, China, and Iran respectively. Most of the leading authors are from Latin America and China.

However, the principal author of the most cited publications is affiliated with institutions in New Zealand (Scheyvens, 1999). Most studies focused on ecotourism issues in developing countries, but the authors were predominantly from developed countries, with a few exceptions, such as China, Malaysia, and Indonesia. However, the publication trend on ecotourism from Africa and Asia has increased. In order to better understand the emerging domains in ecotourism, a keyword co-occurrence analysis was carried out. Author keywords analysis has revealed that the predominant themes were "ecotourism" and "sustainable" (Figure 7), which was confirmed by an analysis of the most frequently cited papers (Scheyvens, 1999; Honey, 2008). The findings show that the studies in this field were first focused on ecotourism concepts.

This has evolved, and the emphasis has recently shifted towards ecotourism management (including sustainable ecotourism). Moreover, the complex relationship of ecotourism with the environment and society shows that managing one will naturally affect the other. As a result, it is important to investigate how ecotourism management fits into the practical implementation and how optimal management practice can be achieved. Accordingly, sustainable management of ecotourism will continue to be the key theme in the future. Furthermore, an analysis of various journals reveals that research on ecotourism has progressed concurrently across multiple academic disciplines and is expanding. The bibliographic coupling analysis showed that there is literature with similar research goals and themes. The most important thing to study was how ecotourism affects tourists, local communities, and conservation. There were also a lot of articles that focused on the conceptual aspects and framework formation of ecotourism, and many articles elaborated on the theoretical underpinnings.

As the importance of preserving natural ecosystems grows, it is anticipated that more future research studies will concentrate on eco-tourism mechanisms, regulations, and legislation. Such studies may facilitate mitigating the negative effects of tourism on ecosystems. It is more important to confirm the participation of location communities in order to ensure stable and equitable development. It emphasizes the importance of future ecotourism research focusing on providing empirical evidence on the outcomes of various policies developed at local and international levels. In the future, the geographical information system, in conjunction with remote sensing, will be used in ecotourism research to enable online monitoring of ecotourism activities. In the future, a common platform should be established to conduct comparative studies, allowing scholars and ecotourism practitioners from various countries to communicate their methods and share their experiences.

CONCLUSION

This research paper provides a comprehensive bibliometric analysis of ecotourism research. It reveals key scholarly contributions, thematic trends, and future directions for research. The findings indicate that ecotourism has emerged as a multidisciplinary field, involving environmental conservation, sustainable development, and community engagement. Further, the analysis indicated an extensive growth of ecotourism-related research over the past decades, with a marked increase in publications and citations, in journals such as *Sustainability*, *Journal of Ecotourism*, and *Journal of Sustainable Tourism*. Existing research demonstrates that institutions from China and Australia and the United States constitute the primary contributors to this field while China shows the greatest productivity in article production. Naturally occurring clustering patterns between co-cited authors demonstrate that research on ecotourism revolves predominantly around themes about sustainable tourism management and conservation and policy frameworks.

This research identifies Weaver Buckley and Fennell as influential authors who have contributed significant work to ecotourism discourse by using co-citation analysis. The research utilizes co-citation analysis to understand how Weaver, Buckley and Fennell have established themselves as major contributors to the field of ecotourism studies.

Research in ecotourism centers on three central themes because co-cited authors cluster into these fields of sustainable tourism management, conservation, and policy frameworks. Further, bibliographic coupling analysis underscores the strong international collaboration among countries, with China, the USA, and Australia forming significant research hubs. The keyword co-occurrence analysis further reveals that dominant research themes include ecotourism, sustainable development, conservation, protected areas, GIS, and community-based ecotourism.

These findings indicate a sustained focus on balancing tourism growth with environmental sustainability and social responsibility. This paper constitutes a comprehensive literature review on ecotourism. These results are significant for readers doing research work in ecotourism related-fields and it also offers ideas to scholars seeking viable areas for their studies or ways of approach that can accelerate knowledge progression amidst fresh subfields like this one.

Limitations

This study has a few limitations. The data was sourced from the WoS core database alone hence it does not capture all available data; it is most recognized but this is only part of the available total data. This raises the need for future research using different databases such as Scopus, Science Direct, Google scholar amongst others which will confirm what has been found herein. However, since quality articles written in languages other than English were not considered in this bibliometric analysis due to the language restriction of the present study. The contribution made by non-English speaking

countries might go unnoticed. In addition, only scientific papers have been used in this research, leaving behind other materials like books or book chapters. Then all document types available in the WoS database should be viewed through bibliometric analysis within this realm. Any good paper that has failed to use the required keywords in the title of the article has not been included in this analysis. These papers' contents have not been subjected to bibliometric analysis and therefore require deeper scrutiny within this sub-field using this methodology. We collected the data within a specific timeframe so that the numbers of citations and publications may slightly vary in future. Different mapping techniques can be used to create a complete domain map of ecotourism research. In spite of these limitations, the findings offer an encompassing bibliometric overview concerning the major research trends involved in ecotourism studies over the last thirty-six years.

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