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Call for Papers
Summer Issue 2025
Journal of Environmental Management and Tourism

Journal of Environmental Management and Tourism is an open access, peer-reviewed interdisciplinary research journal, aimed to publish articles and original research papers that contribute to the development of both experimental and theoretical nature in the field of Environmental Management and Tourism Sciences. The Journal publishes original research and seeks to cover a wide range of topics regarding environmental management and engineering, environmental management and health, environmental chemistry, environmental protection technologies (water, air, soil), pollution reduction at source and waste minimization, energy and environment, modelling, simulation and optimization for environmental protection; environmental biotechnology, environmental education and sustainable development, environmental strategies and policies.

Authors are encouraged to submit high quality, original works that discuss the latest developments in environmental management research and application with the certain scope to share experiences and research findings and to stimulate more ideas and useful insights regarding current best-practices and future directions in Environmental Management.

Also, this journal is committed to a broad range of topics regarding Tourism and Travel Management, leisure and recreation studies and the emerging field of event management. It contains both theoretical and applied research papers and encourages obtaining results through collaboration between researchers and those working in the tourism industry.

The journal takes an interdisciplinary approach and includes planning and policy aspects of international, national and regional tourism as well as specific management studies. Case studies are welcomed when the authors indicate the wider applications of their insights or techniques, emphasizing the global perspective of the problem they address.

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"Ecotourism" and "Sustainability": A Bibliometrics Analysis using Biblioshiny and VOS viewer

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Abstract: This study presents a bibliometric analysis of research on sustainability in ecotourism, highlighting global trends, key themes, and emerging areas. Using databases like Scopus 1993–2024 till the date 10th December. Publications were analyzed to identify influential authors, institutions, and journals. The findings reveal a growing interest in sustainable practices, and biodiversity conservation within ecotourism. This Study uses Bibliometrics analysis (Biblioshiny), and VOS viewer software to identify the main developments. To achieve this goal in the "Scopus" database "Ecotourism Sustainability" keyword searched. Overall, 2849 articles were discovered. After applying the filter to the English language only 2741 articles were left. Again, we use a filter to get access to articles only and are left with 2275 articles. Although we need the articles of the journals only and get 2261 articles. After that, we narrowed our research to 2 subject areas social science and business, management and accounting we got 1752 articles. out of these 12 articles are in press so after excluding these articles we finalize our research to 1740 articles. The findings highlight annual publication trends, most relevant journals, top Nations, Journals and co-citation, co-occurrence and thematic analysis. The findings show that the most relevant journal is

"Sustainability (Switzerland)", Australia is the leading country and "Sustainability" is the most cited keyword. The results show the growing interest of researchers in the emerging field of ecotourism and sustainability and more attention is needed to enhance theoretical and empirical exploration of a domain in future.

Keywords: ecotourism; sustainability; Biblioshiny; VOS viewer.

JEL Classification: Q01; Q56; Z32; I23.

Introduction

Travelling to relatively pristine or unpolluted places with the explicit intention of exploring, gratitude, and enjoying the natural landscape, its fauna and flora, and any related cultural expressions found there was the original definition of "ecotourism" (Lascurain, 1987). The "International Union for Conservation of Nature" (IUCN) first gives the idea of ecotourism in year 1983 (Indwar & Muthukumar, 2023). "Ecotourism is a type of travel that prioritises protecting the environment and paying special attention to the experience of a natural area" (Zhang *et al.* 2021). However, ecotourism is a conservation tool that aims to "Improve the quality of life in desert, wetland, marine, and forest ecosystems" while also slowing the decline of biodiversity (Samal & Dash, 2022). The development of eco-friendly infrastructure and practices, as well as the prudent use of natural resources, are encouraged by ecotourism. It promotes social well-being, environmental stewardship, economic growth, educational enrichment, sustainable development and cultural preservation. which benefits both human and natural communities (Fu & Zhao, 2024). From these efforts, ecotourism has developed and embraced various concepts of tourism in related to nature, sustainable tourism, adventure tourism, rural tourism, green tourism, responsible tourism and wilderness tourism (Nordin & Jamal, 2020). The term sustainability (German: Nachhaltigkeit) was first introduced in Europe (1713) in the book Sylviculture Oeconomica, written by German scientist and forester Hans Carl von Carlowitz (Heinberg & Lerch, 2010). A major theme in the last 20 years has been the concern for "sustainability," as it relates to development, societies, livelihoods, and a variety of other social, economic, and ecological activities (Sneddon, 2000). The term "sustainability" is being used more and more to describe particular socio-ecological processes, such as urbanisation, ecosystem management, and agricultural practices, as well as to clarify the notion in ways like contrasting "strong" and "weak" sustainability (Jamieson, 1998). Sustainability is very important factor to take into account when developing ecotourism. The management approach of fulfilling financial obligations without compromising an equivalent or better standard of living for future generations is known as sustainability (Vincent & Thompson, 2002). In the tourism business, eco-tourism is thought to be the sector with a rapid rate of growth. Eco-tourism is more than just a catchphrase promoting leisure and vacation that values the environment. Ecotourism's primary objective is to preserve the diversity of natural and cultural ecosystems that exist worldwide. In the regions where it works, it respects and preserves the native customs while offering visitors entertainment and lodging that is as less intrusive or damaging to the environment as feasible (Nag, 2018).

This research aimed to investigate the publications of the study of "ecotourism" and "Sustainability" within the Scopus database with bibliometric analysis. This way, the trends of Ecotourism and Sustainability studies can be derived and recommendations made for future studies. Based on that objective, Our study aims to answer the following research questions:

RQ1. Which countries are the most productive, and what are the yearly trends in publications, citations, and author profiles?

RQ2. Which are the top ten cited articles in the field of Ecotourism and Sustainability?

RQ3. What are the key themes and topic trends explored by the researcher in the specific field?

1. Review of Literature

1.1 Ecotourism and Sustainability

The society of Ecotourism defines term as "responsible travel to natural areas, which conserves the environment and sustains the well-being of the local people". Ecotourism has been one of the most extensively studied ideas in the larger tourism industry within the last 20 years (Weaver, 2008). Sustainability, as defined by the dictionary, is the ability of a certain action or activity to be sustained (Santillo, 2007). Sustainability is becoming more and more seen as a desirable objective of environmental management and development (Brown *et al.* 1987). Many studies have been done in the field of Ecotourism linked with sustainability. Dinç *et al.* (2023) analyse the developments, and patterns of ecotourism research during the past 20 years, emphasising partnerships, co-citations and new research areas. Hasana *et al.* (2022) By using bibliometric analysis the study conducts a quantitative study of ecotourism in protected areas. Research publications published between 2002 and 2020 were analysed using the well-known bibliometric program VOSviewer. Le and Nguyen (2023) this paper, by using

VOSviewer software to perform bibliometric analysis of ecotourism literature published in between 2002-2022. According to this study, data-driven decision-making, stakeholder involvement, and climate adaption in researchers worldwide are becoming interested in the planning and administration of ecotourism. This is ecotourism, as a tourism sector that stresses conservation of the environment, respect for culture, and sustainable development, which has rapidly gained prominence since its concept in the 1980s. The area has been well-researched and increasing attention is placed on the capability of this area to be useful in meeting SDGs. According to recent studies (Jones *et al.* 2023), it is found that ecotourism can successfully be implemented through balancing environmental, social, and economic factors for minimum ecological footprints while having the benefits accruing to the local communities. One such significant analysis was conducted by Smith and Lee (2022) on research trends. Patel (2024) did an impressive job summarizing ecotourism's current trends and impacts. Utilizing tools such as Biblioshiny and VOSviewer, these studies map the geographical distribution of the research, key authors, and the thematic clusters surrounding the concepts of sustainability and ecotourism. Findings from such studies indicate increased community-based ecotourism, where the local communities are empowered to take part in and benefit from tourism activities (Williams & Thompson, 2023). Gokkaya *et al.* (2017) & Shasha *et al.* (2020) have also studied ecotourism using bibliometric analysis. Liu and Li (2020) have analysed research trends throughout the domain of ecotourism, which has lately become an area of significant focus both for policymakers and researchers as a key step towards sustainable tourism. A bibliometric study was performed based on 2531 ecotourism-related papers published between 1990-2016 extracted from the SSCI, “Science Citation Index” (SCI), “Index to Scientific & Technical Proceedings” (ISTP), and “Arts & Humanities Citation Index” (A&HCI). Honey (2008) said, “Ecotourism and sustainability are intricately connected, with ecotourism often seen as a tool for achieving sustainable development by balancing environmental conservation, cultural preservation, and economic benefits for local communities”. More recently, a notable trend that has been emerging from bibliometric studies is the growing application of technology in ecotourism research. For instance, technologies such as GIS and remote sensing are being used to monitor environmental impacts, optimize sustainable practices, and enhance the visitor experience (Brown & Taylor, 2023). Another emerging theme is the role of ecotourism in climate change mitigation and adaptation, particularly in vulnerable ecosystems (Garcia *et al.* 2024). The ecotourism sector has recently begun to embrace a more inclusive, socially sustainable form of tourism with a focus on equity, inclusion, and capacity building in host communities (Rodrigues & Carter, 2024). It reflects the changing understanding of the concept of sustainability, from purely environmental concerns, to challenging researchers to think about how ecotourism can bring positive long-term changes to local cultures and economies. Recent bibliometric analyses (Chen *et al.* 2023) suggest that the country’s most active in the field of ecotourism research are typically those with great biodiversity and rich cultural heritage, like Brazil, Costa Rica, and Kenya. These regions remain at the forefront of scientific research and practical ecotourism activities.

Keyword Identification: To find relevant articles, the initial search was conducted using the Boolean string that included ecotourism sustainability in their “title”, “abstract”, or “keywords”: - “Ecotourism” and “Sustainability” in the Scopus database. These keywords can be used as a search item in the title section to find particular papers that meet the study's objectives.

2. Methodology

Bibliometric Analysis: According to (Cooper, 2015), Bibliometric methods calculate the impact or influence of a chosen research article on subsequent studies. Bibliometrics refers to "Component fields related to the study of the dynamics of disciplines as reflected in the production of their literature"(Hood & Wilson, 2001). The use of statistical and mathematical metrics to assess and contrast the advancements in science and methodology across all fields of study is known as bibliometrics. The bibliometric analysis includes an interaction analysis between the researchers and the subjects which they are willing to study in addition to the performance analysis of contributions on certain topics (Donthu *et al.* 2021). The quantitative evaluation of academic output is the typical use of bibliometrics, which is also beginning to be applied to practice-based research. The two primary processes in bibliometrics are science mapping and performance analysis (Noyons *et al.* 1999). Evaluation of groupings of scientific actors (nations, institutions, departments, and researchers) and the effects of their work are the goals of performance analysis (Noyons *et al.* 1999). Science mapping aims to illustrate scientific research's dynamic and structural elements (Borner *et al.* 2003). We use a VOSviewer tool that allows users to create and view bibliometric maps. For instance, VOSviewer can be used to create maps of authors or journals using co-citation information or to create maps of keywords using co-occurrence information. Maps created with any appropriate mapping approach can be shown in VOSviewer (Van Eck & Waltman, 2009). Additionally, we have used the R program, which is open-source software that facilitates data analysis for academics utilising

Biblioshiny systems i.e designed by (Aria & Cuccurullo, 2017). The data exported from scientific databases is combined using an R language algorithm to create a flow ft that can be uploaded to a web platform for information processing. Multiple analysis and the creation of visual maps are the reasons why this methodology performs better. Additionally, it provides a global perspective of scientific production that uses static graphics and prevents user participation (Pessin *et al.* 2022).

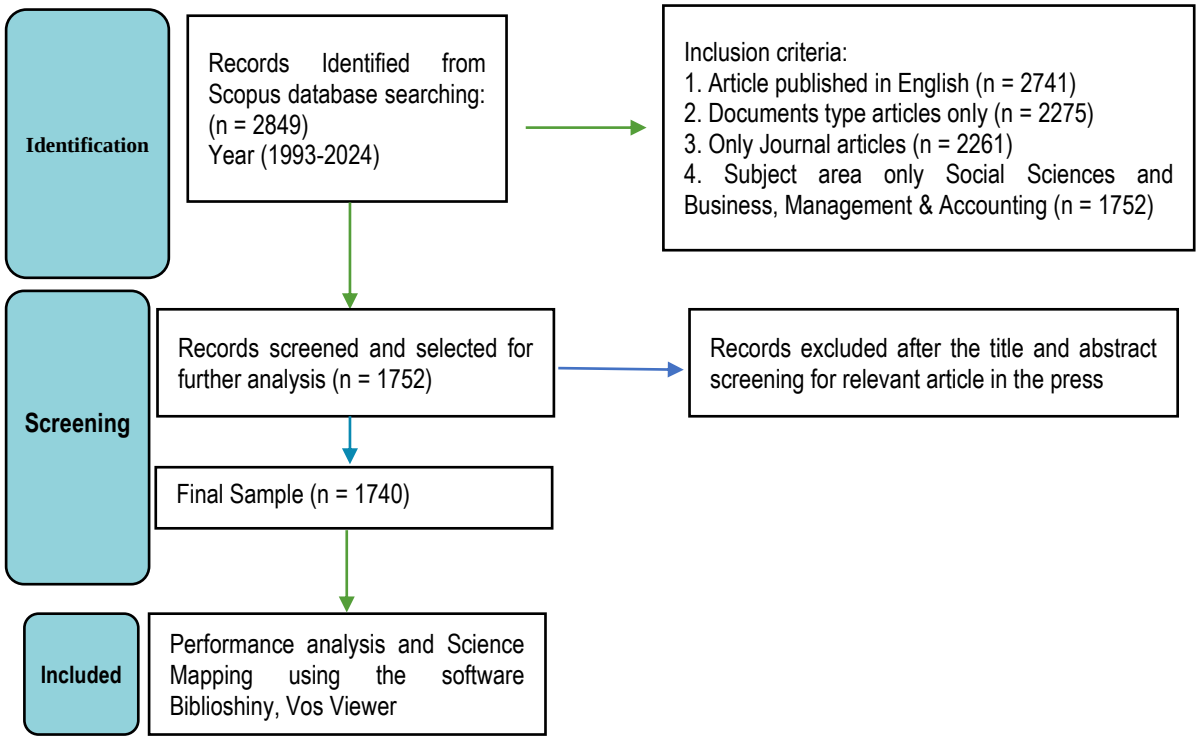
Initial research: As shown in figure 1, the search results contain 2849 articles. After applying the filter, limiting to our research articles in the English language is 2741. Again, we narrowed our research to document-type articles only in the English language is 2275. After finalizing this we have left with the journal articles which are in English language are 2261. After choosing the 2 subject areas only 1752 articles were left out of which 12 articles were in the press, we excluded these articles. The final articles we had left were from 1740.

Inclusion and Exclusion: After limiting our research, as displayed in figure 1, 1740 articles remain. These articles are lifted from different subject areas. For our study, we chose 2 subject areas: 1. Social Sciences and 2. Business, Management, and Accounting. This includes only research articles, no book chapters, and no conference papers. The 1740 articles were published between 1993 and 2024.

3. Results and Discussion

Systematic reviews should provide enough information about their procedures and findings to enable consumers to judge the reliability and relevance of the review's conclusions. To make it easier to report systematic reviews clearly and comprehensively, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement was created (Page *et al.* 2021).

Figure 1. Prisma framework



Source: Authors compiled from Scopus Database

3.1 Performance Analyses

Performance analysis examines how research participants contribute to a certain sector (Cobo *et al.* 2011). Since it is quite a common practice for reviews to explain the performance of different research elements, then most reviews, even in those theses that do not participate in scientific mapping, will present some form of performance analysis (e.g., authors, institutions, nations, and journals). Measures used in performance analysis include metrics linked to publications, metrics related to citations, and metrics related to both publications and citations (Donthu *et al.* 2021).

Table 1 was extracted using Biblioshiny software. Table 1 provides a descriptive summary of the Scopus file we obtained for our research investigation on December 10, 2024, after applying different filters. The first work to

include these keywords was published in 1993, according to the period of our analysis, which runs from 1993 to the end of 2024. Our Scopus collection has a total of 266 sources (Journals) and 1740 documents (articles). Our study's yearly growth rate is larger than 10, which indicates that keyword research is ongoing. The percentage of international co-authors is 28.79.

Table 1. Descriptive Data Statistics

Timespan	1993-2024
"Sources (Journals, Books, etc)"	266
"Documents(articles)"	1740
"Annual Growth Rate %"	18.34
"Document Average Age"	6.23
"Average citations per doc"	33.38
"International co-authorships %"	28.79

Source: Extracted from RStudio using Scopus database

3.2 Citation Analyses

With the Scopus database, Table 2 shows the top 10 most referenced publications by authors. (Sims, 2009) has the most citations with 880, and its average citation count is 55.00. All the Top 10 publications had more than 300 citations in the second-place paper (Hassan, 2000), with 589 citations and an average citation rate of 23.56. (Juvan & Dolnicar, 2014)

It is in the third position with 503 total citations with 45.73 per year. Additionally, the final seven articles each have more than 300 total citations (Gössling & Peeters, 2015, Nicholas *et al.* 2009, Han, 2021, Reynolds & Braithwaite, 2001, Ballantyne *et al.* 2010, Lee & Jan, 2018, Jamal & Stronza, 2009). Given the field's explosive expansion, we predict that citations will soon rise. Since the study's inception, many scholars have made significant advances in Ecotourism research. In our database, we located 4555 writers who contributed to works between 1993 and 2024. To locate the authors' table with the most relevant information, we created a ranking list of the top 10 authors with the most citations. According to Table 2, the paper with the maximum number of citations is "Food, place, and Authenticity: Local Food and the Sustainable Tourism Experience" (Sims, 2009).

Table 2. Top 10 most referenced publications by authors

Year	Author	Title	Source	Total Citation	Citation per year
2009	Sims, R (Sims, 2009)	"Food, Place and Authenticity: local food and the Sustainable tourism experience"	"Journal of Sustainable Tourism"	880	55.00
2000	Hassan, S.S (Hassan, 2000)	"Determinants of Market Competitiveness in an Environmentally Sustainable Tourism Industry"	"Journal of Travel Research"	589	23.56
2014	Juvan, E., Dolnicar, S. (Juvan & Dolnicar, 2014)	"The Attitude–Behaviour gap in Sustainable Tourism"	"Annals of Tourism Research"	503	45.73
2015	Gössling, S., Peeters, P. (Gössling & Peeters, 2015)	"Assessing Tourism's Global Environmental Impact 1900–2050"	"Journal of Sustainable Tourism"	412	41.20
2009	Nicholas, L. N., Thapa, B., Ko, Y. J (Nicholas *et al.* 2009)	"Residents' Perspectives of a World heritage site: The Pitons Management Area, St. Lucia"	"Annals of Tourism Research"	401	25.06
2021	Han, Heesup. (Han, 2021)	"Consumer Behaviour and Environmental Sustainability in Tourism and Hospitality: a review of theories, concepts, and latest research"	"Journal of Sustainable Tourism"	395	98.75
2001	Reynolds, C, Paul.,	"Towards a conceptual	"Tourism Management"	380	15.83

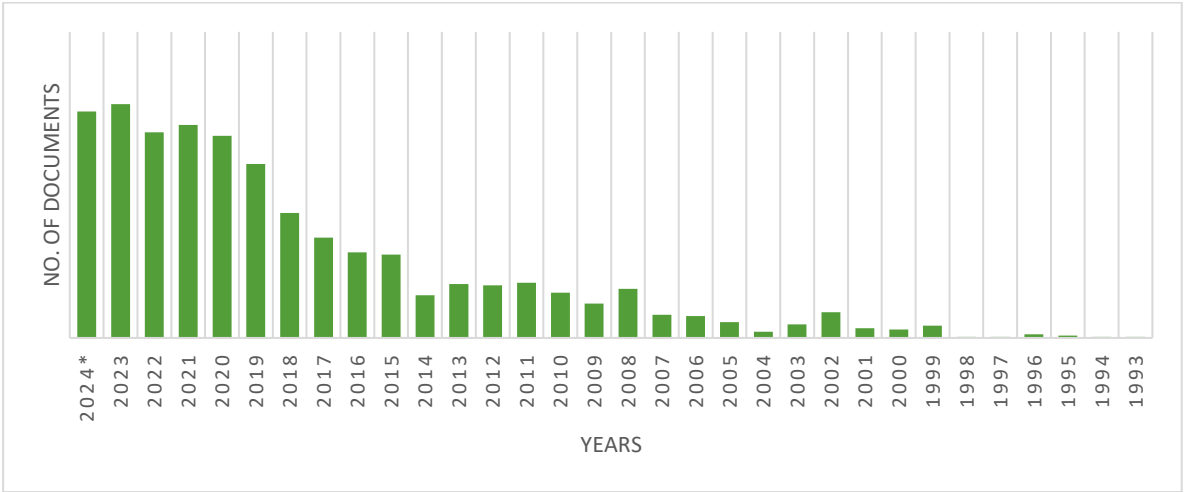
Year	Author	Title	Source	Total Citation	Citation per year
	Braithwaite, Dick. (Reynolds & Braithwaite, 2001)	framework for Wildlife Tourism"			
2010	Ballantyne, Roy., Packer, Jan., Falk, John. (Ballantyne *et al.* 2010)	"Visitors' learning for Environmental Sustainability: Testing short- and long-term impacts of Wildlife Tourism experiences using structural equation modelling"	"Tourism Management"	376	26.86
2018	Lee, Hung, Tsung., Jan, Hauh, Fen. (Lee & Jan, 2018)	"Can Community-Based Tourism contribute to Sustainable development? Evidence from residents' Perceptions of the Sustainability"	"Tourism Management"	352	58.67
2009	Jamal, T., Stronza, Amanda. (Jamal & Stronza, 2009)	"Collaboration theory and Tourism practice in protected areas: Stakeholders, Structuring and Sustainability"	"Journal of Sustainable Tourism"	350	21.88

Source: Data extracted from Scopus database

3.3 Number of documents published

Figure 2 shows the status of Ecotourism and Sustainability research publications between 1993 and December 10, 2024. The first paper on this topic was the unrecognized threat to tourism. Can tourism survive 'sustainability'? (McKercher, 1993) study, which examined ecologically sustainable development in the tourism field. After completing the analysis pattern, we have concluded the number of documents published throughout the years. In 1993 and 1994, there was only 1 publication in these years. Approximately 20-21 papers averagely published between 2000 to 2010. From 2014 to 2024, the research on ecotourism and sustainability has increased. In 2014 35 documents were published. And, in 2015 the number of documents published was 68. In 2016 the number increased to 70. In 2017 the number increased to 82, In 2018 the published documents were 102. In 2019 the numbers were 142, In 2020 (165), 2021 (174), 2022 (168) and last year the numbers are in most published 191. Current year till December 185 documents have been published.

Figure 2: Show the publication trend. Figures were extracted using Biblioshiny.



Source: Data extracted from Scopus database

3.4 Most Relevant Affiliations. Top 10 University

Table 3. Publication trend university-wise

Affiliation	Articles
GRIFFITH UNIVERSITY	52
UNIVERSITY OF SURREY	42
THE UNIVERSITY OF QUEENSLAND	31
JAMES COOK UNIVERSITY	27
KYUNG HEE UNIVERSITY	27
UNIVERSITY OF NOVI SAD	27
UNIVERSITY OF OTAGO	27
UNIVERSITY OF QUEENSLAND	27
MURDOCH UNIVERSITY	24
UNIVERSITY OF WATERLOO	24

Source: Data extracted from Scopus database

Table 3 shows the most relevant affiliations, the top 10 associated with which have the most published documents. Griffith University (Australia) has the greatest number of articles published in the field studied. After that, the University of Surrey (United Kingdom) has 42, and the University of Queensland (Australia) has 31.

3.4 Document by Country

In Table 4 shows the various countries' contributions to the global publication. The number of publications per nation, only the top 15 most productive countries in terms of Ecotourism and sustainability were taken into account in this analysis. Only publications authored in English (2741), as per the Scopus database, were looked at for the study. With 219 publications published in this field and a total of 8579 citations, the United States, one of the world's top industrialised nations, took first place. Australia came in second with 215 papers and 9529 citations, followed by the United Kingdom with 153 articles and 7484 citations. This data demonstrates that the US, UK, and Australia are heavily involved in culture heritage tourism research, as the rest of the countries maintained their positions in the top 15 out of 113 countries. This data demonstrates how actively engaged in research on Ecotourism and sustainability are the US, UK, and Australia.

Table 4. Publication by countries.

Ranking	Countries	Documents	Citations
1	United States of America	219	8579
2	Australia	215	9529
3	United Kingdom	153	7484
4	Spain	133	3374
5	China	131	3154
6	Italy	116	2809
7	Indonesia	111	751
8	Canada	87	3918
9	South Africa	81	2379
10	Malaysia	77	1943
11	India	57	1219
12	Portugal	57	1337
13	New Zealand	55	2671
14	Turkey	50	1421
15	Taiwan	49	1896

Source: Data extracted from Scopus database

3.5 Most Relevant Journal Sources

We have the top 10 journals relevant to “ecotourism” and “sustainability” as shown in Table 5. The leading journal with the top articles published is “SUSTAINABILITY (SWITZERLAND), which has 434 articles. The number second position is the “JOURNAL OF SUSTAINABLE TOURISM” with 333 articles published. The “JOURNAL OF ECOTOURISM” has 64 articles that have been published. “GEOJOURNAL OF TOURISM AND GEOSITES” has 54 articles published. “CURRENT ISSUES IN TOURISM” has 53 number of articles published. The remaining 5 i.e. “TOURISM MANAGEMENT”, “ENVIRONMENT, DEVELOPMENT AND SUSTAINABILITY”, “TOURISM GEOGRAPHIES”, “ASIA PACIFIC JOURNAL OF TOURISM RESEARCH”, “INTERNATIONAL JOURNAL OF SUSTAINABLE DEVELOPMENT” have less than 50 articles published but more than 28.

Table 5. Top 10 Journals

Sources	Articles
SUSTAINABILITY (SWITZERLAND)	434
JOURNAL OF SUSTAINABLE TOURISM	333
JOURNAL OF ECOTOURISM	64
GEOJOURNAL OF TOURISM AND GEOSITES	54
CURRENT ISSUES IN TOURISM	53
TOURISM MANAGEMENT	45
ENVIRONMENT, DEVELOPMENT AND SUSTAINABILITY	35
TOURISM GEOGRAPHIES	32
ASIA PACIFIC JOURNAL OF TOURISM RESEARCH	29
INTERNATIONAL JOURNAL OF SUSTAINABLE DEVELOPMENT AND PLANNING	29

Source: Extracted from RStudio using Scopus database

3.6 Most Cited Countries. Top 10 Countries

The research impact of different nations is shown in Table 6 as Total Citations (TC) and Average Article Citations (AAC). Total Citations, which show the overall impact of each nation's research output, show the total number of times research articles from that nation have been cited. Australia, for instance, has the largest research footprint, with 7,229 citations. Conversely, average article citations show the calibre and applicability of the articles by calculating the average number of citations per article. Although its TC is smaller than that of larger nations like the USA or China, New Zealand has the highest AAC of 58.70, indicating that its articles have a significant impact on an individual basis. This information sheds light on the volume and calibre of research contributions made in these countries.

Table. 6 Top 10 Cited Countries

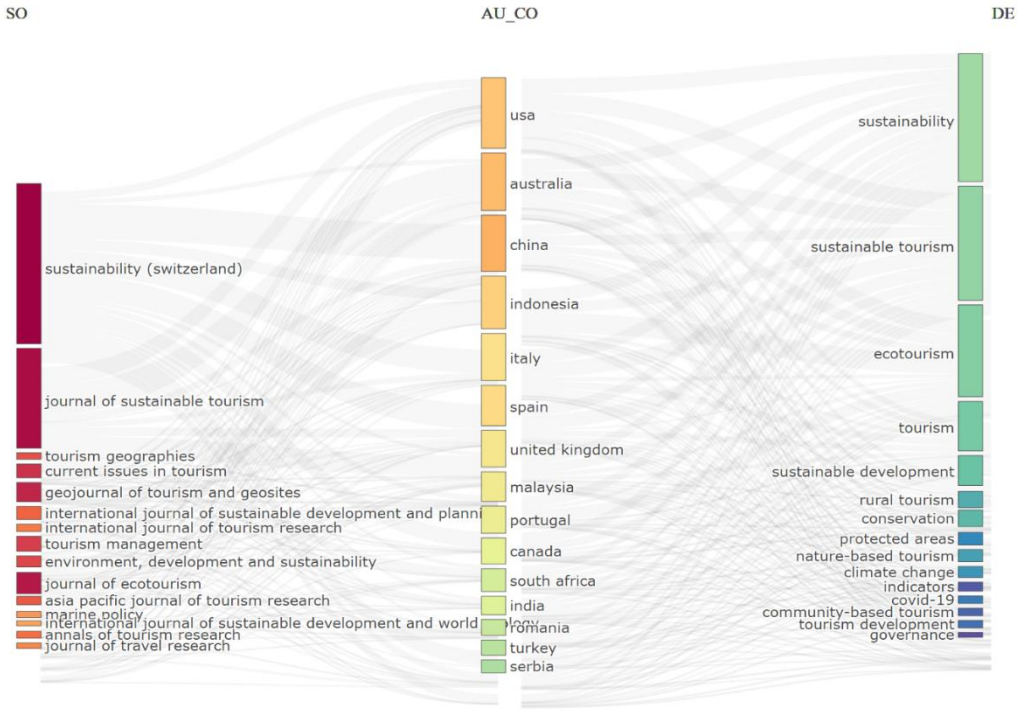
Country	TC	AAC
AUSTRALIA	7229	52.40
UNITED KINGDOM	5931	67.40
USA	4570	36.30
CHINA	3484	26.80
CANADA	2863	55.10
SPAIN	2504	28.80
ITALY	2325	26.40
NEW ZEALAND	1585	58.70
MALAYSIA	1499	34.90
SWEDEN	1045	52.20

TC: Total Citation**, AAC:** Average Article Citations
Source: Data extracted from Scopus database

3.7 Three Field Plot

Three-field plots, or Sankey diagrams, show the interconnections of different attributes of the research database. Sankey diagrams describe the weighted features and help visualize the different systems and their conversations (Guleria & Chakma, 2022). The sum of influx weights at each node equals the sum of the weighted value of, outgoing faxes. In this study, a three-field plot is obtained via the Biblioshiny R-programming package, rectangular diagrams present the essential elements with different colours. Number of communications between multiple components in three-field plots. It directly depends upon the height of the rectangle. By analysing the relationship between these three units it can be observed that the major area of interest in this field is Sustainability, Sustainable Tourism and Ecotourism. The plot can reveal the dispersion of scientific articles within a particular discipline categorizing areas of focus and interdisciplinary exploration along with the identification of the most productive countries and journals within a specific field as showcased in the figure. The figure shows that the Sustainability(journal) is at the top of the most-performing journal list accompanied by the Journal of Sustainable Tourism and Tourism geographies, with the top three countries U.S.A, Australia and China. The most relevant and frequently occurring keywords are Sustainability, Sustainable Tourism and Ecotourism.

Figure 3. Three field plots, Relationship between Sources(left), Countries (Middle), and Keywords (Right) for Ecotourism and Sustainability

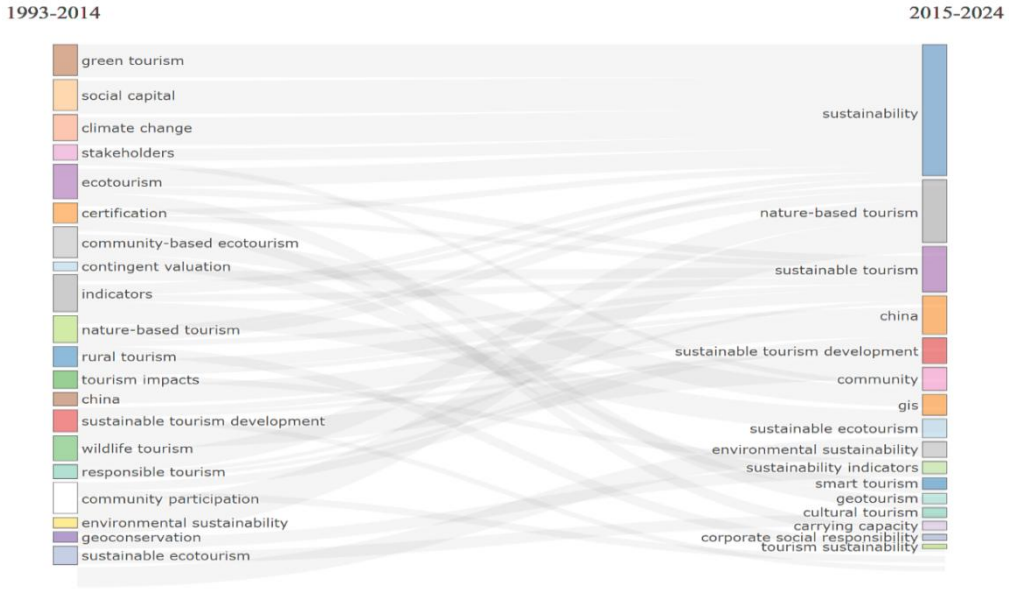


Source: Extracted from RStudio using Scopus database

4. Thematic Evolution of Ecotourism and Sustainability

We have observed a sharp rise in publication between 2015-2024. The study looked at 1st phase 1993-2014 and 2nd 2015-2024 as shown in Figure 4. The algorithm used for these progressions is a walk trap and some criteria set for it, such as minimum cluster frequency of 5 number of words and number of labels for each cluster is 3 and the parameters for a number of words is 100. The thematic map separates the subjects into four quadrants according to their centrality and density value along two axes, taking into account the number of publications, citations, and the extent of overlap with other topics. Centrality measures a theme's importance concerning other themes on the map, whereas density measures the expansion of the internal connections inside a cluster that a theme is used to signify. The cluster label chosen by the Biblioshiny program reflects the most widely used phrases. Cluster centrality and density determine the cluster's location, while the cluster's size indicates the frequency of usage of the phrases it contains (Cobo *et al.* 2011). The interface generated the first theme evolution map based on the Sankey diagram. Sankey diagrams have long been used to illustrate the flow of material or energy across various network operations. They provide a flow numerical data example. Their evolution and interrelation (Riehmann *et al.* 2005).

Figure 4. Thematic Evolution

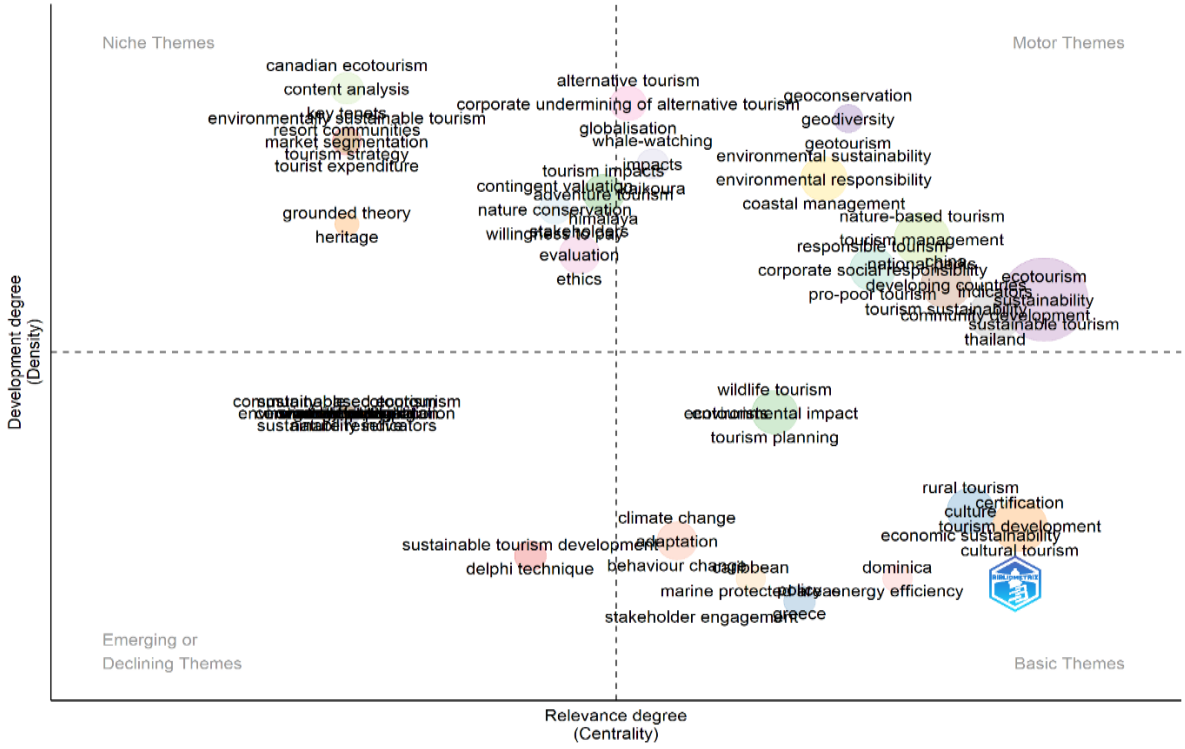


Source: Extracted from RStudio using Scopus database

4.1 Thematic Map between 1993-2014. Map Generated by Biblioshiny

As shown in Figure 4. Between 1993 and 2014, the main focus of Sustainability research was on developing topics and underlying concepts. Important subjects that focused on environmental preservation and community engagement were green tourism, ecotourism, and community-based ecotourism. A desire to comprehend the social and cooperative aspects of sustainable tourism is reflected in terms like social capital, climate change, and stakeholders. Additional focal areas that were aimed at assessing and encouraging responsible tourism practices included certification, contingent valuation, and indicators. All things considered, this era established the foundation for the study of Sustainability, emphasising fundamental ideas, environmental issues, and the part played by communities and stakeholders in the growth of the industry.

Figure 5. Thematic Evolution 1993-2014



Source: Extracted from RStudio using Scopus database

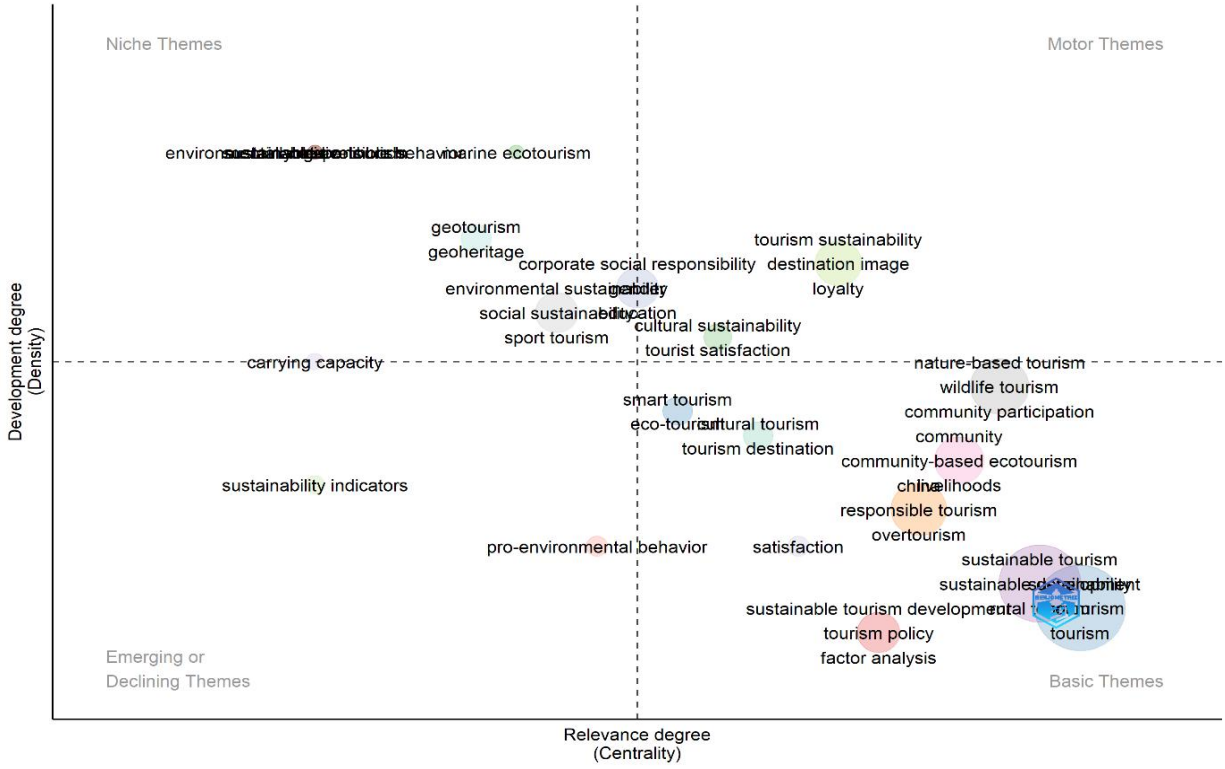
The bottom left quadrant (emerging theme) represents a theme that is not fully developed and has low density and centrality. These subjects are of less importance and present opportunities for future research. The bottom right quadrant (fundamental theme) indicates that fundamental, transversal, and underlying themes have relevance probability with minimal network development. In the future, greater attention must be paid to topics. The upper left quadrant (niche themes) represents well-developed, highly specialised, dense, and peripheral themes. The upper right quadrant (motor themes) indicates highly developed, dense, and central themes. It is highly pertinent and helps to advance the research (Bagdi *et al.* 2023).

Figure 5 displays the thematic map for period 1, from 1993 to 2014, the start of this domain. The terms "wildlife tourism," "rural tourism," and "climate change" are placed in this quadrant which are the main keywords, respectively, and are located in the lower-right quadrant of the map to represent a fundamental theme that is considered to be significant and has not yet been developed for the research field due to its high centrality and low density. The themes that appear in the upper-right quadrant are believed to be key motor themes that have been thoroughly explored and have a high degree of centralization and density. Geoconservation is the focus of the first cluster in this quadrant. Between the basic theme and the motor theme, a large cluster is formed that includes the keywords "Ecotourism, Sustainability, Sustainable tourism, Tourism, sustainable development, conservation", and "nature-based tourism," indicating that more research has been done on the larger cluster of Ecotourism and, Sustainability. Last but not least, the issues in the top-left quadrant are highly specialised, have low centrality, and are thought to be of modest importance in this discipline. They also have a high density of research. The keywords in this quadrant are categorised into three clusters: "Canadian ecotourism" in the first cluster. In the second cluster and "Resort Communities, Tourism Strategy" and "Grounded Theory and Heritage" in the third cluster. The themes that appear in the lower-left quadrant are waning or emerging themes with low centrality and density, which are considered to be underdeveloped with minor importance in single clusters. One cluster is formed near emerging/declining themes and the basic theme, which consists of 2 clusters "community-based ecotourism" and "Sustainable tourism development"

4.2 Thematic Map between 2015-2024. Map Generated by Biblioshiny

The study of sustainable tourism underwent a substantial expansion and diversification between 2015 and 2024 as displayed in Figure 4. A greater focus on combining the environmental, social, and economic facets of tourism is reflected in key themes including sustainability, sustainable tourism development, and nature-based tourism.

Figure 6. Thematic Evolution 2015-2024



Source: Extracted from RStudio using Scopus database

A growing dependence on technology and data for sustainable planning and monitoring is indicated by emerging subjects such as GIS (Geographic Information Systems), smart tourism, and sustainability indicators. The growing significance of community and business involvement in accomplishing sustainable tourism goals is highlighted by themes including community participation, corporate social responsibility, and environmental sustainability. All things considered, the emphasis has moved to more sophisticated, multidisciplinary, and application-driven methods of tackling the difficulties associated with sustainable tourism in the contemporary day.

The thematic map for period 2 (2015-2024) is shown in Figure 6. During this time, motor themes that appear in the upper-right quadrants have a high centrality and density, making them interesting study topics. Figure 6 demonstrates how fundamental motifs from period 1 exist in the second period's motor theme, which has two clusters, the first cluster is made up of "tourism sustainability, destination image and loyalty" and the second cluster is "cultural sustainability and tourist satisfaction". The niche-related terms in the upper left quadrant. There are four clusters in this quadrant, with the first cluster consisting of the keywords "environment responsible behaviour", the second one has the keywords "marine ecotourism", the third cluster has "Geotourism and Geoheritage", the fourth one has the keywords "environment sustainability, social sustainability, sports tourism and ecotourism sustainability". Sustainability indicators and pro-environmental behaviour, located in the bottom left quadrant and have low relevance and development, are thus viewed as developing or fading issues. Finally, nine clusters of novel keywords in fundamental topics are revealed. Sustainability, ecotourism, tourism, conservation, climate change and protected areas are the keywords in the first cluster. Sustainability is the term in the second cluster. In the second cluster, "sustainable tourism, sustainable development, rural tourism, culture heritage, tourism management, indigenous tourism," in the third, "nature-based tourism, wildlife tourism, community participation, local community, community empowerment, community involvement" in the fourth cluster. In the fifth cluster "community, livelihood, agritourism, national park, swot participation" are the keywords. "China, responsible tourism, overtourism, urban tourism, destination management, local food" are keywords. "Sustainable tourism development, tourism policy and factor analysis" are the keywords in the sixth cluster. "Smart tourism and ecotourism" are in the seventh cluster. "Cultural tourism and tourism destination" are in the eighth cluster, and in the last cluster the keyword is "satisfaction".

4.3 Science Mapping

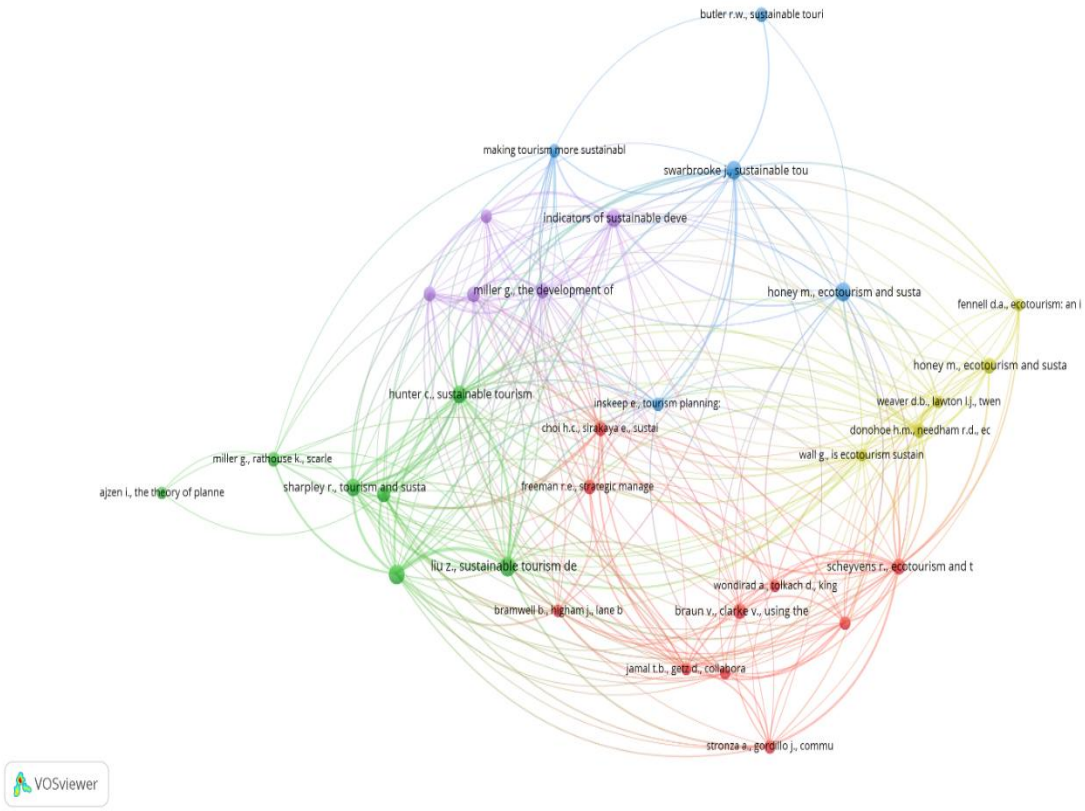
At the outset of the study, when several bibliometric data are presented to support scientific writing, the application of science mapping and bibliometric methodologies has been cemented as standard procedures. Since science mapping and bibliometrics procedures are made up of methodical processes based on various software, they are used to create a scientific drawing of the themes addressed with sophisticated talks. This method requires management. It is important to note that not all tools offer free access (Aria & Cuccurullo, 2017). As the name implies, science mapping aims to provide a summary of the "state-of-the-art" scientific understanding in each field of study. Stated differently, it encompasses the examination of numerical indications and interactions found within the scientific data corpus (Donthu *et al.* 2021). When paired with network analysis, it is crucial for demonstrating the intellectual and bibliometric structure of the topic of research (Moosa & Shareefa, 2020).

4.4 Reference Co-Citation Figure Extracted from Vos-Viewer

This research starts by looking at the sources cited together in the figure. The study clusters illustrate the connections between several publications, Ecotourism and Sustainability research topics.

In figure 7, Out of 95840 cited references, it satisfies only 32 threshold references. Minimum number of citations of cited references are 20. With a minimum cluster size of 5, 5 clusters are made using Vos viewer. In cluster 1st there is a cluster of 10 items, in cluster 2nd there is a cluster of 7 items, in cluster 3rd there is a cluster of 5 items, in cluster 4th there is a cluster of 5 items, in cluster 5th there is a cluster of 5 items. Cluster 1st is in red, cluster 2nd is in green colour, cluster 3rd is in blue, cluster 4th is in yellow, and cluster 5th is in purple. The total linkages are 281, and total link strength is 617. The results are depicted in the figure (Liu, 2003) which is green in colour and has the most cited reference with 46 the total link strength is 79 and the links are 21. (Hunter, 1997) which is green in colour second in number with cited references 36, and has 24 links with a total link strength is 73. (Buckley, 2012) is in third in number green in colour has cited references are 43, 24 links and total link strength is 71. The fourth number is (Sharpley, 2000) has cited references are 35, has 25 links and a total link strength is 61. (Scheyvens, 1999) which is red in colour ranked fifth and has cited references are 28, 23 links and a total link strength is 60.

Figure 7. Reference co-citation Figure Extracted from Vos-Viewer



Source: Extracted from Vos-Viewer

4.5 Journal Co-Citation Figure Extracted from Vos-Viewer

After examining the co-citation references, the study focuses on the journal co-citations link in figure 8. We observed the threshold of 283 categories in 4 clusters out of 34521 sources and the minimum number of citations is 30. Cluster 1(Red) 83 items, Cluster 2 (Green) 58 items, Cluster 3 (Blue) 49 items and Cluster 4 (yellow) 10 items are four cluster colours and number of items in it. The counting method is full counting. From a total link strength of 620122, links are 11479 in 4 clusters and the total items are 200.

Figure 8. Journal co-citation Figure Extracted from Vos-Viewer

Source: Extracted from Vos-Viewer

The top 5 journals in this field of study are the Journal of Sustainable Tourism with total link strength of 120125 with 150 links and the most number of citations 4097 is of cluster 1, Tourism Management is in number 2 and has

98600 total link strength with 172 links and 3184 citations in this journal is of cluster 1, annals of tourism research (a journal) it has 2728 citations and 80796 total link strength with 151 links is of cluster 1, sustainability journal has 61892 total link strength with 199 links and 2386 number of citations is of cluster 2 and tour. manag is in 5th position with 44648 total ink strength with 104 links and 1370 citations of cluster 2.

4.6 Most Cited Keywords

Using the Biblioshiny tool, we were able to identify the most popular author keywords used worldwide in Ecotourism and Sustainability studies, as shown in the Table 7. We obtained the 50 most often referenced terms in this field. The table displays the ten most common keywords related to research. The preceding observation indicates that more work is being done in the areas of Sustainability, Sustainable tourism, and Ecotourism is the rank among the top 10 terms in this category due to the fact that the majority of its writers are also employed in these disciplines.

Table 7. Most cited keywords

Terms	Frequency
Sustainability	421
sustainable tourism	383
Ecotourism	285
Tourism	164
sustainable development	97
Conservation	49
rural tourism	43
nature-based tourism	41
climate change	39
protected areas	32

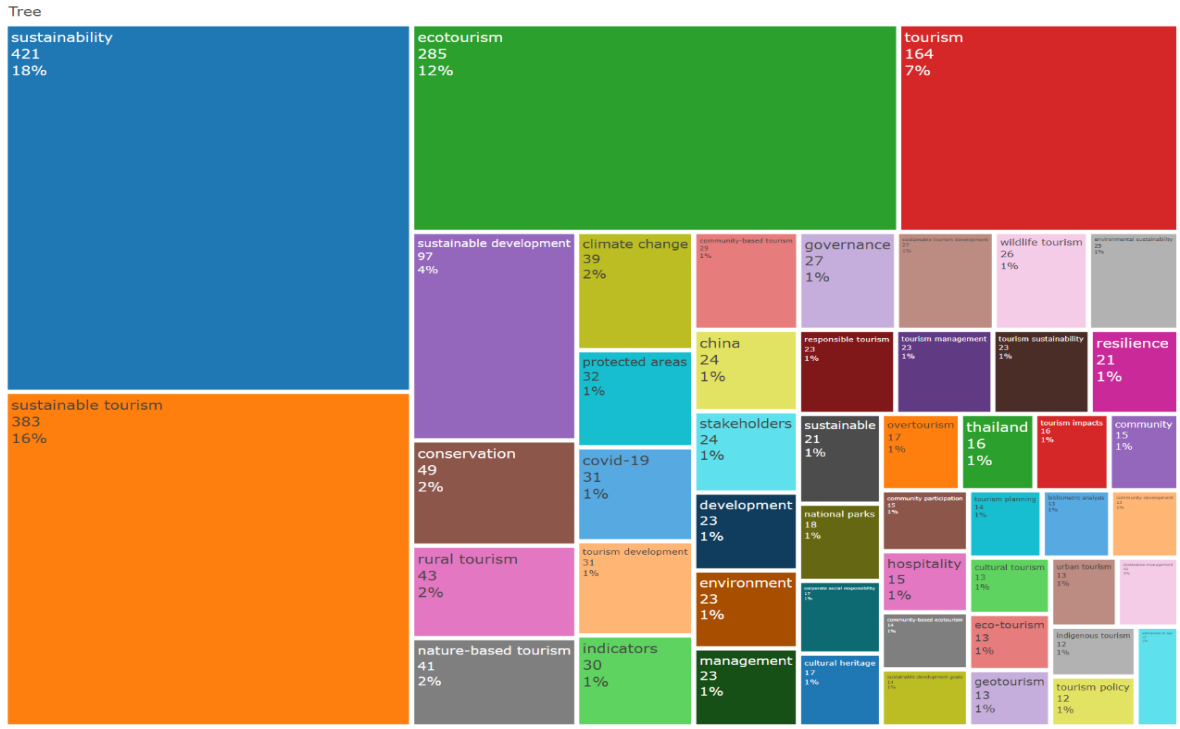
Source: Extracted from Biblioshiny

Most cited keywords figure obtained by using Biblioshiny software.

4.7 Treemap of Most Cited Keywords

Word Tree Map shows words that frequently occur in boxes that resemble map regions; the more words that appear, the larger the square area (Assalafiyah *et al.* 2020).

Figure 9. Tree map extracted using Biblioshiny



Source: Tree map extracted using Biblioshiny

Treemap showed in the Figure 9, the frequency with which the words are used in the above database of 1740 articles that we have taken. After applying a filter from Biblioshiny software by choosing the Field – Authors keywords and Number of words are 50 through this extraction the top three Keywords with are highest number occurrences are “Sustainability,” “Sustainable Tourism,” and “Ecotourism.”

Conclusion

The current study enhances our understanding of the current status of sustainability and ecotourism research. It covered the entire era of publishing in this field and allowed for a comprehensive examination over 31 years, from 1993 to December 2024. Much study is required to capitalise on this growing demand and provide the greatest services to tourists. We require a scientific understanding of cultural heritage tourism to provide tourists with flawless service. As a result, this study provides a comprehensive bibliometric analysis of sustainability and ecotourism, assesses the various issues examined, and identifies important theoretical and practical ramifications for both the travel industry and the academic community.

Finding publications from 1993 to the present by using the Scopus database is the study's primary contribution. However, after 2008, when the topic caught the interest of academics, the output of scholarly articles on it has become much more relevant. The number of publications increased from 40 in 2008 to 68 in 2015. We discovered a definite upward trend in the quantity of papers starting in 2015.

The development of major research topics in sustainable tourism from 1993–2014 to 2015–2024 is depicted in this Sankey diagram. Themes including "green tourism," "ecotourism," and "community-based ecotourism" were prevalent during the previous time frame (1993–2014). In addition to new topics like "environmental sustainability," "GIS," and "corporate social responsibility," there has been a discernible movement over time towards more expansive and integrated ideas like "sustainability," "sustainable tourism," and "sustainable tourism development." A growing focus on global sustainability issues, technological integration, and holistic approaches to tourist development is reflected in the diagram, which shows how core concepts from the earlier era affected more recent, complex conversations.

More researchers turned their attention to ecotourism and sustainability in 2008. In all, 1740 papers met the requirements for our 2024 study, including those published in English, that only journal articles were considered, and that focused on the social sciences as well as business, management, and accounting. Ecotourism and Sustainability research have not gotten the same amount of attention globally. Even though papers on the subject have been written in other countries, the Australia leads the field with 7229 citations and 52.4 average article citations, followed by the US, UK, China, and Canada. We discovered three papers having over 500 Scopus citations out of a total of 1988 citations from the leading publications. There were 4580 writers who produced publications regarding Sustainability and ecotourism study (1993-2024). According to Scopus, the papers (Sims, 2009) had an average citation rate of 55.56% each year.

Importance of the Study

The bibliometric analysis of "Ecotourism" and "Sustainability" with the help of tools such as Biblioshiny and VOSviewer is critical to understanding the academic and practical discourse around these interrelated concepts. This study identifies the trends in research, influential authors, and significant publications, providing a comprehensive overview of the field's evolution. It points out the geographic and thematic distribution of research, revealing gaps and opportunities for future studies. Through this study, stakeholder prioritisation is facilitated by the sustainable practices and policy development supported through collaborative examination of collaborations, co-citations, and keyword dynamics. Finally, it serves as a vital resource for academics, policymakers, and practitioners working towards promoting ecotourism as a sustainable development tool.

Limitations and Future Research

There are a number of restrictions on bibliometric analysis in the context of sustainability and ecotourism. First of all, it is frequently limited by the scope and accessibility of indexed databases, which may result in the exclusion of pertinent research published in regional or non-English publications. It is also difficult to document new themes and changing definitions of sustainability because ecotourism research is dynamic and multidisciplinary. A mixed-methods strategy that combines bibliometrics and content analysis to better understand theme patterns and knowledge gaps could be used in future studies to overcome these constraints. The comprehensiveness of analysis could also be improved by expanding databases to include non-traditional publication sources and a variety of geographic regions. Furthermore, cutting-edge methods like network dynamics and machine learning

may reveal a more profound understanding of the changing connections between sustainability and ecotourism. The present study exclusively employed VOS viewer and Biblioshiny software. However, it is noteworthy that other analytical tools, including Gephi, Cite Space II, and Bibexcel can be used in future research.

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Nihal, Central University of Himachal Pradesh

Credit Authorship Contribution Statement

Amrik Singh contributed significantly to this research through Conceptualization, Methodology, Investigation, Formal Analysis, Supervision, and Writing – Review & Editing. Their expertise and guidance played a crucial role in shaping the study's direction, ensuring methodological rigour, and refining the final manuscript.
Nihal Kapoor: Communicator, Idea Generator, Conceptualization, Investigation with co-author, Methodology, and Help in Writing – Original Draft, Data Curation.
Abhishek Kumar: Validation, Visualization and Project Administration and helps in finding the software packages and installation of the needed software.
Rajan Sharma: Help in finding keywords and help in Drawing a PRISMA diagram (Inclusion and Exclusion criteria).
Manoj Kumar: Helps in Investigation and Vos-viewer interpretation of the data analysis stage.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Declaration of Use of Generative AI and AI-Assisted Technologies

The authors declare that they have not used generative AI and AI-assisted technologies during the preparation of this work.

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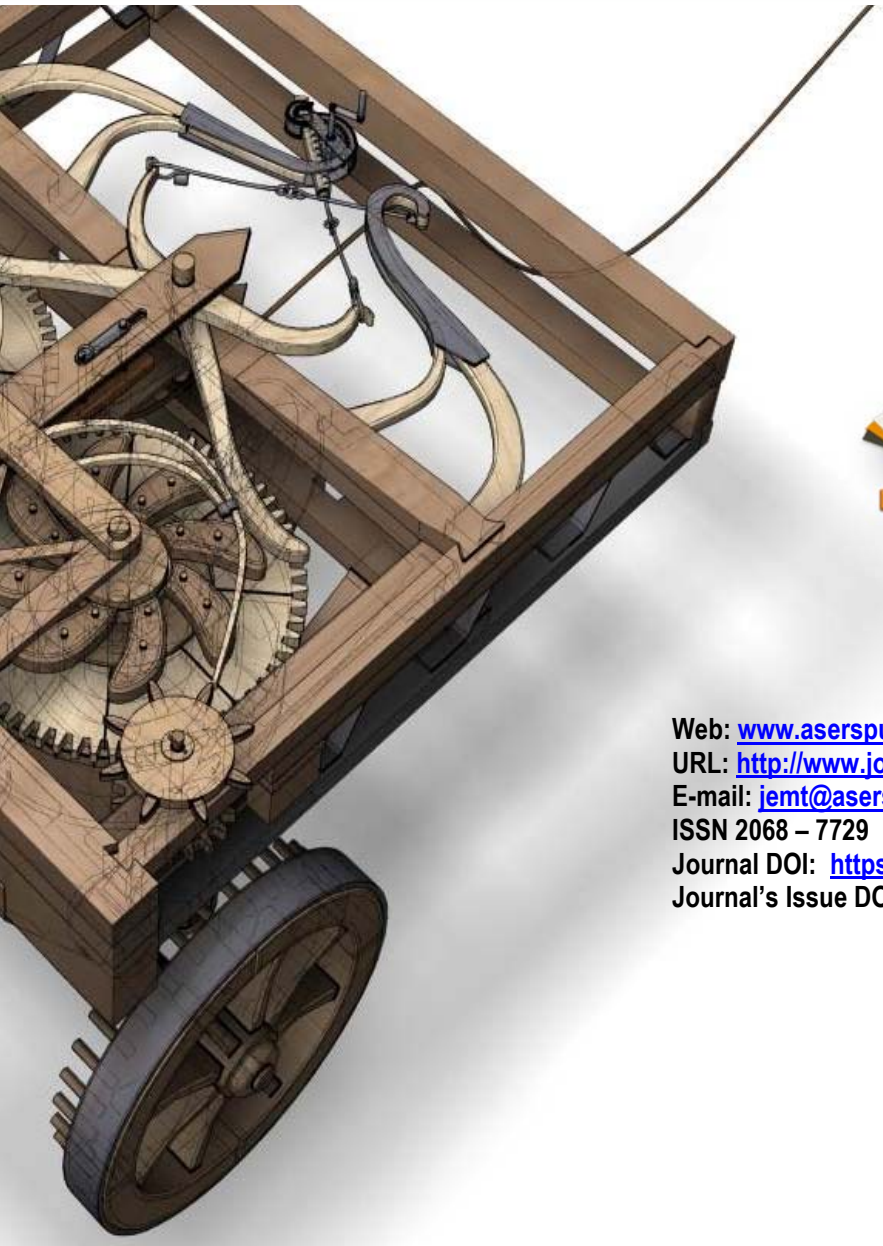

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