Atna – Journal of Tourism Studies
2025, Vol. 20, No. 1, 137-160
ISSN 0975-3281/https://doi.org/10.12727/ajts.33.7

Mapping Research on Bicycle Tourism: A Bibliometric Analysis

Raveesh Sharma* and Ashish Nag*

Abstract

Purpose: In the field of travel and tourism, especially those related to adventure tourism, "Bicycle Tourism" is the fastest-growing area. "Bicycle tourism" is still in its infancy, and further investigation is required to properly comprehend it more methodically and scientifically.

Research Methodology: The researcher used the Scopus database and searched the keyword "Bicycle Tourism" to identify the research papers. In the search from the year 1982 to 20th April 2024, the researcher retrieved a total of 134 articles. The researcher limited the research to specific research areas of Social Science and Arts and Humanities, only 56 articles were left behind and lastly researcher excluded the press which was left with 55 articles for the study. To quantify and illustrate the body of research on "Bicycle Tourism," the researchers in this study used the bibliometric analysis approach, VOS-Viewer, and R-studio software.

Findings: The analysis revealed that the one article that received more than 150 Scopus citations was found by the author. According to Scopus, Hans, H., Meng, B., & Kim, W. (2017) have received total citations of 175 and 21.88 total citations per year (TCPY).

Keywords: Bibliometric Analysis, Performance Analysis, Science Mapping, R-Studio, VOS-Viewer, Bicycle Tourism

1. Introduction

Bicycle tourism is a specialised kind of travel that may help local communities and surrounding regions in several ways, including social, economic, and environmental benefits **(Faulks, Ritchie, & Fluker, 2007; Lumsdon, 1996, 2000; Ritchie,1998; Tourism Australia, 2014)**. Reducing environmental harm, enhancing social infrastructure development, and stimulating local

* Department of Tourism and Travel Management, Central University of Himachal Pradesh, Dharamshala, Himachal Pradesh, India - 176215; cuhp21rdtt06@hpcu.ac.in; anaag81@hpcu.ac.in

economic growth are all benefits of cycling tourism **(Pratte, 2006)**. Cycling may enhance health and quality of life **(Anon, 2010; Cohen, Boniface, et al., 2014; A. Lusk & Li, 2012)**. Bicycle tourism is a relatively new kind of travel primarily occurring in rural regions **Lane, B. (1994)**.

Table 1

Term	Definitions
'Bicycle tourism'	"Recreational cycling activities ranging from a day or part-day casual outing to a long-distance touring holiday. The fundamental ingredient is that the visitor perceives cycling as an integral part of an excursion or holiday, i.e. a positive way of enhancing leisure time" **(Lumsdon, 1996, p. 27).**
'Bicycle Tourists'	"A person of any nationality, who at some stage or other during his or her holiday uses the bicycle as a mode of transportation, and to whom cycling is an important part of this holiday. Short trips to the 'corner shop' are not included" **(Simonsen & Jorgenson, 1998, p. 20).**
'Bicycle Tourists'	"A person who is away from their home town or country for a period not less than 24 hours or one night, for a vacation or holiday, and for whom using a bicycle as a mode of transport during this time away is an integral part of their holiday or vacation. This vacation may be independently organised or part of a commercial tour and may include transport support services and any formal and/or informal accommodation" **(Ritchie, 1998, pp. 568–569).**
'Bicycle Tourism'	"Recreational visits, either overnight or day visits away from home, which involve leisure cycling as a fundamental and significant part of the visit" **(Sustrans, 1999, p. 1).**
'Bicycle Tourism'	"Trips involving a minimum distance of 40 kilometres from a person's home and an over-night stay (for overnight trips), or trips involving a minimum non-cycling round trip component of 50 kilometres and a minimum four-hour period away from home (for day trips) of which cycling, involving active participation or passive observation, for holiday, recreation, leisure and/or competition, is the main purpose for that trip. Participation in cycling may include attendance at events organised for commercial gain and/or charity (competitive and non-competitive), as well as independently organised cycling" **Blamey, R. (1997)**
'Recreational cyclist'	"A person involved in any recreational cycling activity or excursion, which is undertaken within a period not longer than 24 hours or one night from their home destination, and for whom cycling is seen as a positive way of using leisure time" **(Ritchie, 1998, p. 569)**

Regarding preserving energy, protecting the environment, and promoting social equality, walking and cycling are the best forms of transportation **(Tolley, 1990)**. Encouraging bike tourism may benefit the travel and tourism sector, lower energy and carbon footprints, and provide job possibilities. **Yuan, E. (2015).** This study aims to discover what is happening in the field and help future researchers by looking at all the works published between 1982 and April 20, 2024. It will use a bibliometric analysis based on citations to judge the previous study.

No research uses bibliometrics to assess articles on bicycle tourism in this area. The five research questions (RQs) that follow have been developed for this study:

RQ1 What is the citation pattern, most referenced publications, most cited countries, and most cited keywords in Bicycle Tourism from 1982 to 2024?

RQ2 Who are the main contributors, Contributors with the most significant production, and most relevant affiliations in Bicycle Tourism?

RQ3 Which are the top journals in the field of Bicycle Tourism?

RQ4 To analyse the co-citation of Authors, Journals, and References.

RQ5 To analyse the co-occurrence of all author's keywords.

2. Review of literature

2.1. Bicycle Tourism

Lamont (2009), after carefully examining these definitions, suggests that the term "cycling tourism" be used to describe "trips away from an individual's home region, of which active or passive participation in cycling is considered the main purpose for that trip" (p. 21). According to **(Lee et al., 2014)**, those who travel specifically to experience bicycling events (passive) and those who go to compete in cycling events (active) are now included in the concept of "bicycle." Cycle tourism encompasses several forms, such as self-arranged excursions, planned commercial bicycling tours, or participation in bike competitions, both actively and passively **(Lee et al., 2014)**. The following definition distinguishes five significant categories of cycling tourism. There are five types of cycling tourists: 1) independent, 2) recreational, 3) participative, 4) passive, and 5) competitive **(Lamont & Buultiens, 2011)**. Thus far, insufficient academic research has been done to define mountain biking tourism (MTB) **(Buning, Cole, & Lamont, 2019)**. According to **Moularde and Weaver (2018)**, mountain biking tourism refers to "trips lasting at least 24 hours away from a person's home environment, where active participation in mountain biking for recreational purposes is the primary motivation and determining factor in destination choice" (p. 3). Adventure tourism is an emerging niche of travel that offers thrilling commercial guided tours via outdoor activities that highlight the natural scenery of the destination **(World Tourism Organisation, 2014)**. **The Adventure Travel Trade Association (2013)** predicts a steady global increase in the adventure tourism industry, estimated at $263 billion. Cycling has been more and more popular over the past several decades. In 2021, the worldwide bike industry is estimated to be worth around USD 60 billion, and over the next eight years, bike sales are predicted to rise by 8.2% yearly **(Grand View Research, 2022)**. Compared to adventure and conventional sports like solo

climbing or base jumping, cycling usually carries less risk, but it frequently causes varying degrees of excruciating physical deterioration **(Scheer & Hoffman, 2020)**. Cycling tourism is a specialised kind of travel that may help local communities and surrounding regions in several ways, including social, economic, and environmental ones **('Faulks, Ritchie, & Fluker, 2007; Lumsdon, 1996, 2000; Ritchie, 1998; Tourism Australia, 2014)**. Some writers say cyclist tourists belong to a single, homogenous group. **Simonsen, P., & Jorgenson, B. (1996). Ritchie (1998, p. 569)**, who explains his studies on cycle tourism in New Zealand, observes that "Bicycle tourism should be defined as any activities, whether cycling or non-cycling, that are undertaken by those who are on vacation for longer than 24 hours or one night and for whom the bicycle is an integral part of this trip." Sports tourism is one of the fastest-growing categories **(Delpy, 1996)**. Strong motivation can enhance a person's cycling ability and **career (Bunting et al., 2015)**. **(Buning et al., 2015)** Challenges, the thrill of social possibilities, and contests are the main draw for mountain bike travellers **(Getz, D.; McConnell, 2011)**.

2.2. Tourism Bibliometric Analysis

Tourist literature most commonly applies bibliometric analysis to evaluate journals and their authors **(Michael Hall, 2011)**. Bibliometric analysis has shed light on many different areas of intellectual work, helping us learn more about research methods, intellectual frameworks, influential scholars, institutional dominance in a field, discipline-specific geographic areas, knowledge domains over time, specific research topics within disciplines, and finally, the level of progress made in a field over time **(Cheng et al., 2018; Della Corte et al., 2019; Johnson & Samakovlis, 2019; López-Bonilla & López-Bonilla, 2021; Mavric, Öğretmenoğlu, and Akova, 2021)**. The use of bibliometric techniques has illuminated a variety of topics, such as Wellness tourism **(Suban, 2022),** Halal tourism **(Suban et al., 2021)**, Food tourism **(Naruetharadhol & Gebsombut, 2020)**, Medical tourism **(Habibi et al., 2022)**, Wetland tourism **(Choudhary et al., 2024)**, Sustainable tourism **(Della Corte et al., 2019)**, and a review of state tourism policy **(Virani et al., 2019)** etc. including methodology, intellectual structure, high profile, renowned academics or institutions, etc. **(Cheng et al., 2018; Koseoglu et al., 2016; Mavric et al., 2021; Michael Hall, 2011; Sharma et al., 2021; Singh et al., 2022; Suban et al., 2021; Thompson & Friess, 2019; Virani et al., 2019)**.

3. Research methodology

3.1. Bibliometric Analysis

A quantitative analytical approach known as "bibliometrics" assesses a research paper's importance and usefulness in a particular field of study using techniques based on mathematics and statistics **(Santos-Rojo et al.,**

2023). For more forward-looking insights into research trends, bibliometric techniques employ summaries to categorise all research articles published in a specific field **(Suban et al., 2021)**. The two main bibliometric analysis fields that academics have identified are performance analysis and science mapping **(Cobo et al., 2011)**. Because there is more and more writing about tourism, bibliometric analysis helps gather data, judge how healthy research works, and give evidence-based advice by looking at past study papers **(Hall, 2011)**. The researcher employed the open-source R program to assist with data analysis via the Biblioshiny platform, which was created and designed by **Aria and Cuccurullo (2017)**. The researchers also used the VOS viewer for visual analysis. It is frequently used for data visualisation and network research. Additionally, it is an application for network visualisation **(Van & Waltman, 2017)**. The H index evaluates individual academics based on the quantity and prominence of their research articles. **(Egghe and Rousseau, 2006)**.

3.2. Identification of Keywords

Data for this study was obtained from the Scopus database since Scopus and Web of Science are the most widely used and reliable databases **(Garrigos-Simon et al., 2018)**. The first and most crucial stage in bibliometric analysis is identifying the keywords that will help you locate relevant research publications **(Su & Lee, 2010)**. To find the articles, the initial search was conducted using the following Boolean strings that comprised Bicycle Tourism in their title, abstract, or keywords: "Bicycle Tourism" OR "Cycle Tourism" in the Scopus database. These keywords are search terms in the title section to pinpoint publications that closely align with the research objectives. Keywords are utilised as search terms in the article's title section to identify publications that closely align with the research objectives. Scopus was selected as the database for this study based on its comprehensive coverage of research documents within the social sciences, arts, and humanities **(Hallinger & Chatpinyakoop, 2019)**. The researcher adhered to the PRISMA framework criteria, which the researchers set to accomplish this goal **(Moher et al., 2010)**.

3.3. Initial Search

Most publications published between 1982 to 20th April 2024 are taken into consideration. On 20th April 2024 (21:25 Hours), an IST researcher searched the Scopus database (www.scopus.com) using the abovementioned keywords. The most often used database for quantitative research is Scopus, which is also the largest, best-organized, and most structured database available **(Donthu et al., 2021; Moosa & Shareefa,2020; Suban, 2022; Suban**

et al.,2021). According to the search results, it contains 134 documents. After applying a filter, the article should be in English, and the researcher left with 124 documents. Again, limiting the research to journal articles, the researcher left with 91 articles. Afterwards, the researcher was limited to document-type articles and required 87 articles left. Afresh researchers limited our research to specific subject areas. The researcher chose social sciences and Arts and Humanities. Only 56 articles were left out, of which one was in the press. The researcher excluded that article and left with 55 articles for the study.

3.4. Inclusion and Exclusion

After narrowing down the search, we found 55 articles. Of 55, all are journal articles listed in the different subject areas; the first is Social Science, and the second is Arts & Humanities. This includes only research articles, book chapters, and no conference paper chosen for the study. The refining results were in 55 relevant articles published between 1982 and 20th April 2024.

4. Results and discussion

These papers were found using two different methodologies: science mapping and performance analysis. The study starts with a document citation format. The second category is the most frequently mentioned article in Cycle Tourism. The author's reference and the journal are co-cited within the context of cycling tourism.

4.1. Prisma Framework

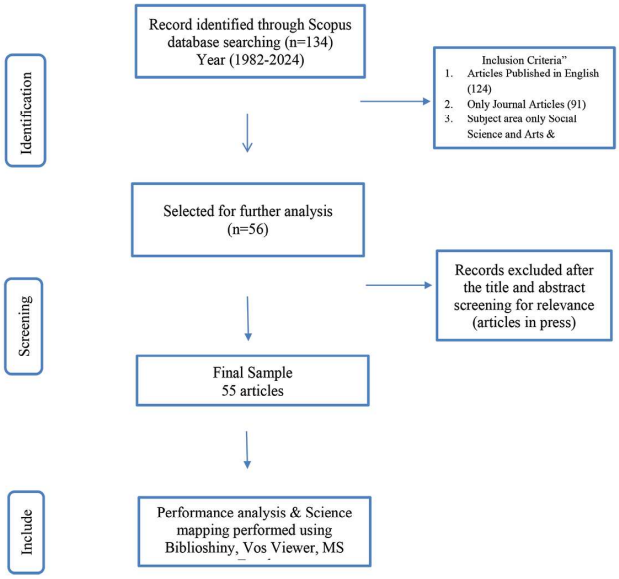


Figure 1: PRISMA framework was used to identify, screen, and select publications for the bibliometric review.

4.2. Performance Analysis

Research participants' contributions to a specific issue were examined using performance analysis **(Cobo et al., 2011; Donthu et al., 2021)**. Publication- and citation-related metrics are among the measures employed in performance analysis **(Dowth et al., 2021)**.

4.3. Descriptive Data Statistics

The researcher extracted Figure 2 using the RStudio software. After applying the appropriate filters, it provides a descriptive summary of the Scopus file the researcher obtained for the research investigation on April 20, 2024. The first work to include these keywords was published in 1982, according to the analysis period from 1982 to the 20th of April 2024. The Scopus collection has a total of 29 sources (journals) and 55 documents (articles). This study's yearly growth rate is 0. The percentage of international co-authors is 14.55.

Primary Information About the Data

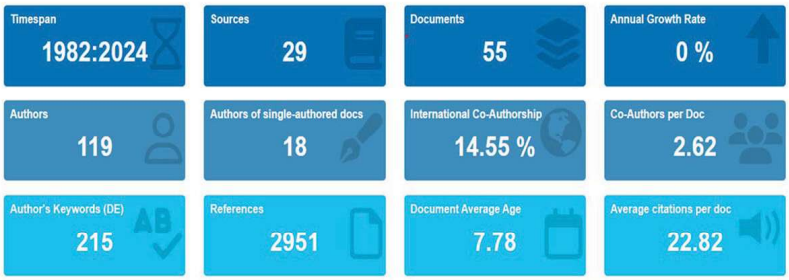


Figure 2: Main Information about Bicycle Tourism

4.4. Citation Analysis

Citation analysis lowers the possibility of personal bias by providing reproducibility, objectivity, and quantifiability. **(Worrall and Cohn, 2023).**

Table 2: The Citation structure in Bicycle Tourism, extracted using bibliophily

Number of citations	Number of articles	Percentage of articles
≥150	1	1.81
≥100	2	3.64
≥50	2	3.64
≥25	11	20
≥20	6	10.90
≥10	5	9.09
≥5	12	21.81
< 5	16	29.09
Total	**55**	**100**

The above table provides a study and examination of citation structure. We used the Scopus database to find relevant literature on bicycle tourism. Out of the 55 articles, one has over 150 citations, accounting for 1.81%. Two articles have received over 100 citations, making up 3.64%. The number of

articles with citations under 5 is at its highest (16), accounting for 29.09% of the article's percentage.

4.5. Most referenced publications on Bicycle Tourism

Table 3: Listed the top 10 most referenced publications by authors as per the Scopus database

Year	Author	Title	Source	TC	TCPY
2017	'Han, H., Meng., & Kim, W. (2017)'	"Emerging bicycle tourism and the theory of planned behaviour"	'Journal of Sustainable Tourism'	175	21.88
1998	'Brent W Ritchie,1988'	"Bicycle tourism in the South Island of New Zealand: planning and management issues."	'Tourism Management'	142	5.26
2000	'Les Lumsdon (2000)'	"Transport and Tourism: Cycle Tourism – A Model for Sustainable Development?"	'Journal of Sustainable Tourism'	118	4.72
2018	'Gazzola, P., Pavione, E., Grechi, D., & Ossola, P. (2018)'	"Cycle Tourism as a Driver for the Sustainable Development of Little-Known or Remote Territories: The Experience of the Apennine Regions of Northern Italy"	'Sustainability'	53	7.57
2016	'Meng, B., & Han, H. (2016)'	"Effect of environmental perceptions on bicycle travellers' Decision-making process: developing an extended model of goal-directed behaviour"	'Asia Pacific Journal of Tourism Research'	52	5.78
1999	'Ritchie, Brent W., and C. Michael Hall,1999'	"Bicycle Tourism and Regional Development: A New Zealand Case Study"	'Asia Pacific Journal of Tourism Research'	46	1.77
2014	'Lee, Cheng-Fei, and Hsun-I. Huang,2014'	"The Attractiveness of Taiwan as a Bicycle Tourism Destination: A Supply-Side Approach"	'Asia Pacific Journal of Tourism Research'	46	4.18
1995	'David Harrison,1995'	"Development of tourism in Swaziland"	'Annals of Tourism Research'	42	1.40
2018	'Pröbstl-Haider, U., Lund-Durlacher, D., Antonschmidt, H., & Hödl, C. (2018)'	"Mountain bike tourism in Austria and the Alpine region – towards a sustainable model for multi-stakeholder product development."	'Journal of Sustainable Tourism'	41	5.86

Year	Author	Title	Source	TC	TCPY
2004	'Les Lumsdon, Paul Downward, Andy Cope, 2004'	"Monitoring of cycle tourism on long-distance trails: The North Sea Cycle Route."	'Journal of Transport Geography'	40	1.90

Note: - TC means "Total Citations", and TCPY means "Total Citations Per Year" Figures and Data extracted using Biblioshiny

The above table displays the top 10 articles by authors that have received the most referenced publications, as per the Scopus database. **Han, H., Meng, B., & Kim, W. (2017)** have the most citations, with 175, and its average citation count is 21.88. The second paper by Brent W. Ritchie, 1988, has achieved 142 citations, and its average count is 5.26. The third article by Les Lumsdon (2000) has achieved 118 citations, and its average count is 4.72. Two articles each have more than 50 citations (Gazzola, P., Pavone, E., Grechi, D., & Ossola, P. (2018); Meng, B., & Han, H. (2016). The other five have citations between 40 and 46 by Ritchie, Brent W., and C. Michael Hall, 1999; Lee, Cheng-Fei, and Hsun-I. Huang, 2014; David Harrison, 1995; Pröbstl-Haider, U., Lund-Durlacher, D., Antonschmidt, H., & Hödl, C. (2018); Les Lumsdon, Paul Downward, Andy Cope, 2004. Because of the field's rapid progress, citations should soon increase. Many researchers have made significant contributions since the beginning of the field's study. Our bibliometric study identified several writers who wrote on bicycle tourism between 1982 and April 20, 2024.

4.6. Document by author

Table 4: Top 10 authors in the area of bicycle tourism with maximum publications

Rank	Authors	Total Publi-cations	Total Citations	h-Index	g-Index	Countries
1	FROST W	3	18	3	3	ITALY
2	TAYLOR P	3	18	3	3	GREECE
3	ATHANASOPOULOS K	2	35	2	2	AUSTRALIA
4	BAKOGIANNIS E	2	35	2	2	CHINA
5	CHRISTODO-ULOPOULOU G	2	35	2	2	UNITED KINGDOM
6	HAN H	2	227	2	2	AUSTRIA
7	KAROLEMEAS C	2	35	2	2	GREECE
8	KYRIAKIDIS C	2	35	2	2	KOREA
9	LAING J	2	15	2	2	POLAND
10	LAMONT M	2	31	2	2	SWEDEN

Note: - TP=Total Publication, TC Total Citation, h-Index, g-Index

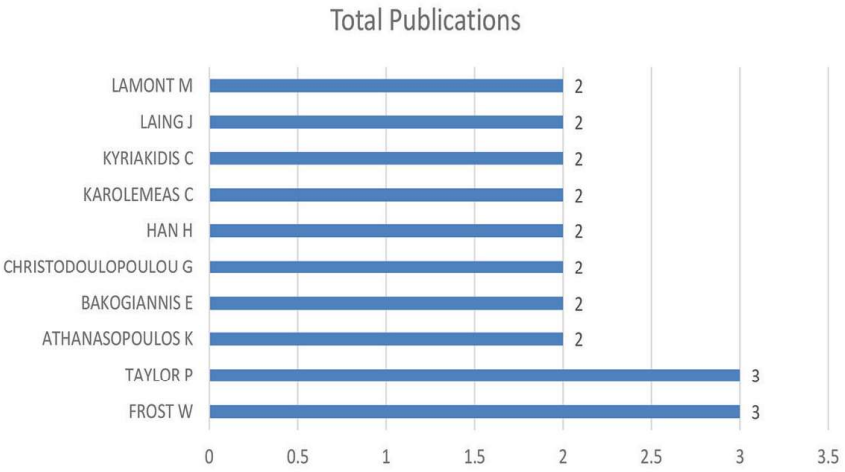


Figure 3: Authors with the most significant production

Finding the top 10 writers with the most citations was done using a Scopus-based ranking list, which produced the most pertinent authors in **Table 4 and Figure 3**. They displayed the top 10 writers with the most publications in bicycle tourism. This table includes authors with more than three publications and their total citations, g-index, h-index, and country of origin. These top 10 authors have written 22 articles, a total of 484 citations. With a maximum of 227 citations, HAN H has fewer publications than other authors. FROST W and TAYLOR P both have an h-index of 3, followed by ATHANASOPOULOS K, BAKOGIANNIS E, CHRISTODOULOPOULOU G, HAN H, KAROLEMEAS C, KYRIAKIDIS C, LAING J, and LAMONT M; the rest all have an h-index of 2. FROST W is from Italy, and TAYLOR P's country of origin is Greece, both of which have a maximum number of publications (3). HAN H from AUSTRIA has a maximum number of citations but has fewer publications.

4.7. Publication by Year

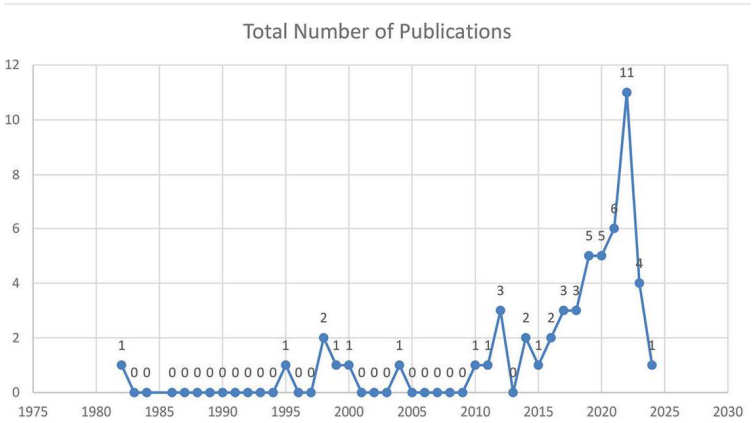


Figure 4: The publication trend, with figures by year extracted from Biblioshiny.

The above figure shows the status of publications on bicycle tourism research between 1982 and 20th April 2024. "Bicycle Tourism in the South Island of New Zealand: Planning and Management Issues" by Brent W. Ritchie (1998) and "Monitoring Tourism on the UK's First Long-Distance Cycle Route" by Cope, M.; Doxford, David; Hill, Tony (1998). The year 1998 saw the publication of these two research papers. From 1983 to 1994, there were no publications. There is only one publication in 1995. There were no publications in the years 1996 and 1997. The year 1998 saw only two publications. There was only one publication in 1999 and 2000. In 2001, 2002, and 2003, there are no publications. The year 2004 saw only one publication. The period from 2005 to 2009 saw no publications. The years 2010 and 2011 saw one publication each. In 2012, the number of publications increased to three. There was no publication in the year 2013. The year 2014 saw two publications, followed by one in 2015. The year 2016 saw the release of two publications. In the years 2017 and 2018, three publications were released. In 2019 and 2020, there were five publications. There were six publications in 2021. There will be eleven publications in 2022. In the year 2023, there are four publications. In the present year, up until April 2024, there is only one publication.

4.8. Document by country/territory

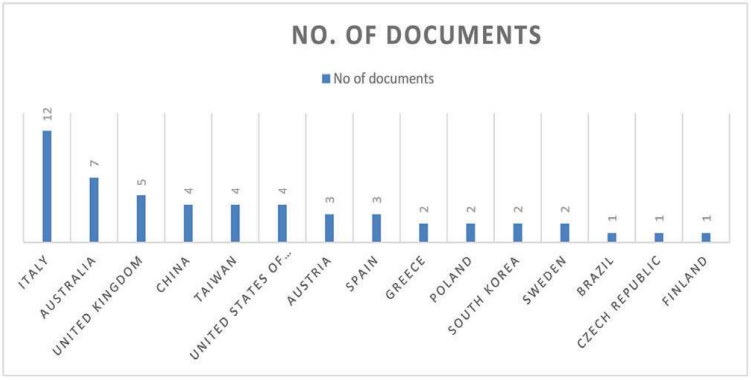


Figure 5

The above figure shows the most progressive countries that are studying bicycle tourism. In this figure, Italy is leading with 12 documents, followed by Australia with seven documents and the United Kingdom, China, and Taiwan with four documents each. Further, Austria, Spain, Greece, Poland, South Korea, and Sweden have two documents each, and countries like Brazil, the Czech Republic, and Finland have only one document each.

4.9. Most Cited Countries

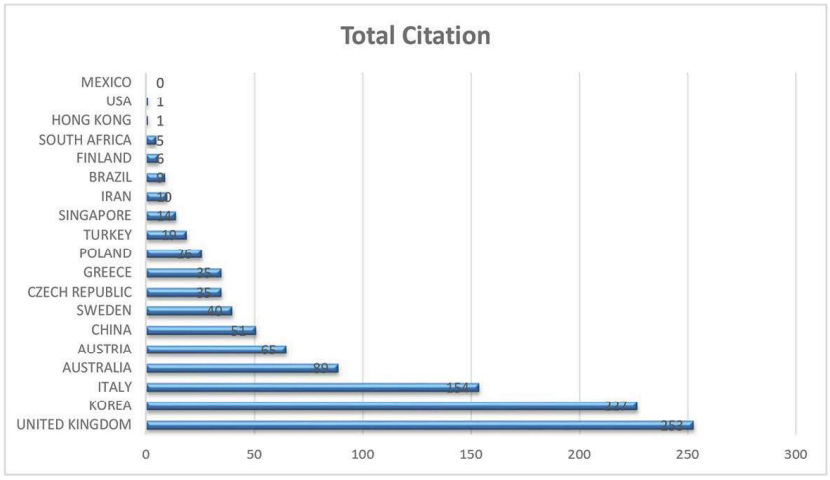


Figure 6

The total number of citations for every nation and the contributions made by the various states to the world community are shown in **Figure 6**. Considering each country's total citations, this research only included the top 19 nations regarding bicycle tourism productivity. In 253 citations, the United Kingdom, one of the world's top nations, took first place. Italy came in second with 154 citations, followed by South Korea with 227 citations. Australia has received 89 citations and took fourth place. Austria received 65 citations, and the country China received a total of 51 citations. The rest of the countries, Sweden, Czech Republic, Greece, Poland, Turkey, Singapore, Iran, Brazil, Finland, South Africa, Hong Kong, the USA, and Mexico, received less than 50 citations. This data demonstrates that the United Kingdom, South Korea, and Italy are heavily involved in bicycle tourism.

4.10. Author's most relevant affiliations

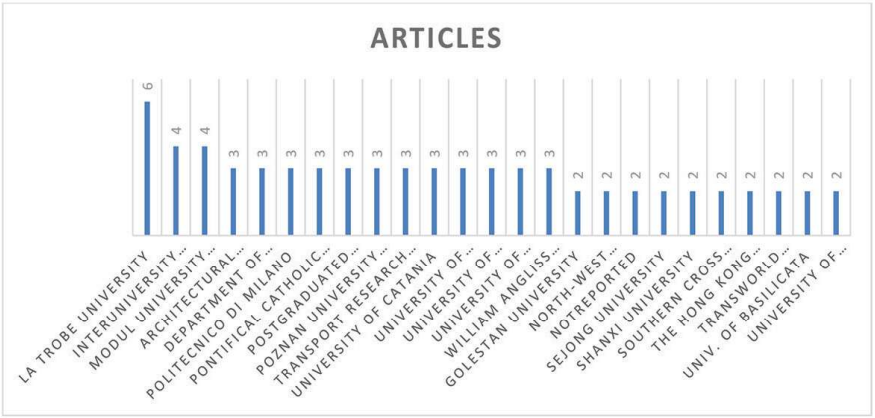


Figure 7: Publication Trend University-wise

The above shows the research contribution of different universities and colleges in the field of bicycle tourism around the globe. One hundred nine authors from 61 universities and colleges have published 108 documents. Figure 7 displays the contribution of the top 25 institutes in cycle tourism. Out of 25 institutes, the researcher has mentioned the top 10 institutes from the 25 institutes, as mentioned in the table and the figure. The La Trobe University in the United Kingdom leads the field in bicycle tourism with six articles, closely followed by the Interuniversity Centre for Economic and Mobility Research and Module University Vienna with four articles each. The other universities, namely Architectural Engineering and Mathematics (dictum), the University of Brescia, the Department of Architecture and Urban Studies, Politecnico di Milano, Pontifical Catholic University of Paraná (puppy), Postgraduate College, Poznan University of Physical Education, and the Transport Research Centre, all have three articles in the domain of bicycle tourism.

4.11. Leading Journals in the area of Bicycle Tourism

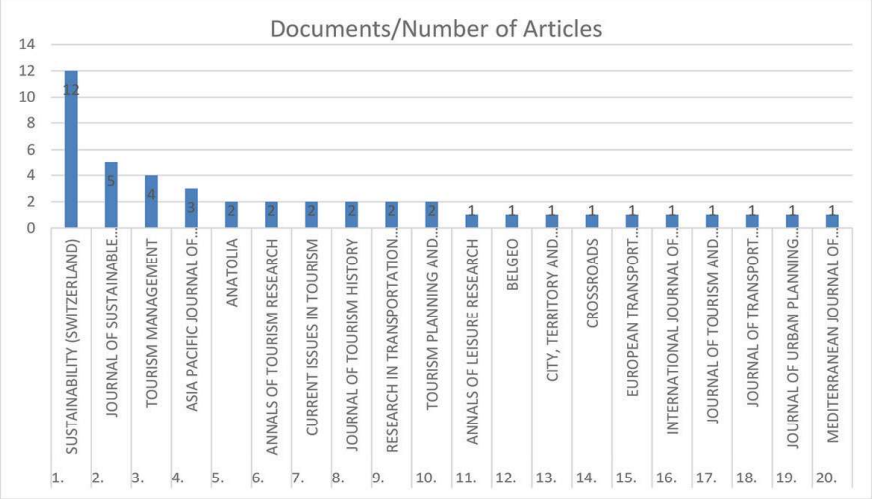
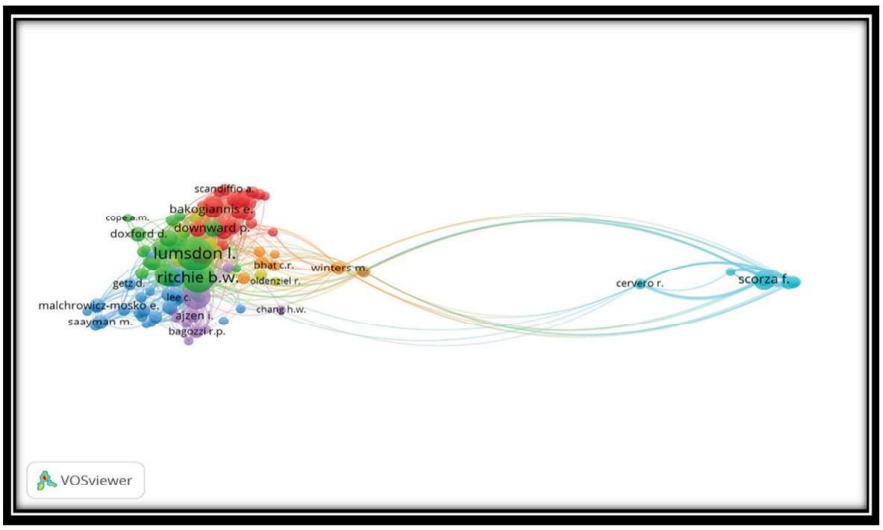


Figure 8: Articles Journal-wise

The above shows the list of journals and the entire quantity of papers on bicycle tourism. The analysis includes the top 20 journals. "Journal of Sustainability (Switzerland)" has 12 documents, while among the top 20 journals, the Journal of Sustainability Tourism has five documents, and the Tourism Management Journal has three. One journal, Anatolia, has produced three documents. There are six journals: Annals of Tourism Research, Current Issues in Tourism, Journal of Tourism History, Research in Transportation Business and Management, and Tourism Planning and Development, which has two documents. The other ten journals—Belgeo, City, Territory, Architecture, Crossroads, European Transport Research Review, International Journal of Tourism Cities, Journal of Tourism and

Development, Journal of Transport Geography, Journal of Urban Planning and Development, and Mediterranean Journal of Social Sciences—have only 1 document.



9: Authors Co-Citations Network on Bicycle Tourism

Sources: VOS Viewer

5.1. Author co-citation analysis

For this citation research, we conducted a primary contributor analysis. The above figure reveals five clusters. The top 10 co-cited authors are Lumsdom L. (61 citations and 1349 total link strength), Ritchie B.W. (49 citations and 1142 total link strength), Hans H. (38 citations and 1091 total link strength), Scorza F. (21 citations and 842 total link strength), Murgante B. (14 citations and 646 link strength), Bakogiannis E. (17 citations and 564 link strength), Faulks P. (19 citations and 524 total link strength), Hillier B. (10 citations and 510 total link strength), Kyriakidis C. (15 citations and 99 total link strength), and Siti M. (15 citations and 499 link strength).

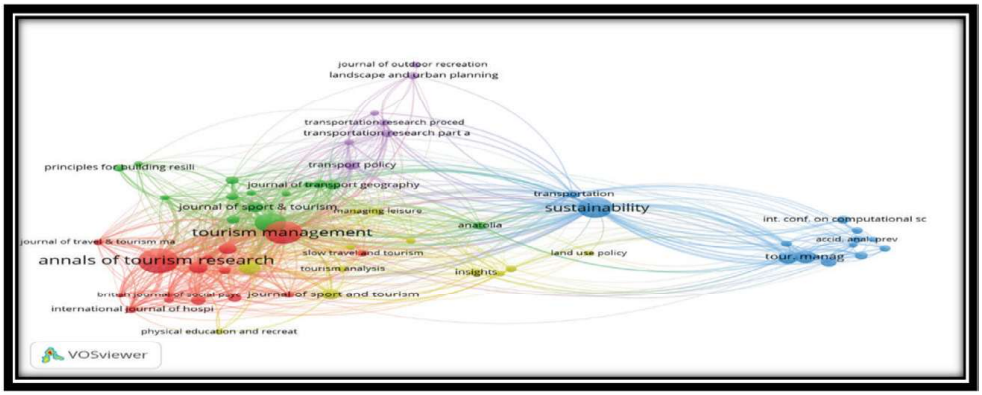


Figure 10: Journals co-citation

Sources: VOS Viewer

5.2. Co-citation sources Analysis of Journals

After studying the author's co-citation analysis, the above figure represents the co-citation sources in the bicycle tourism journals; the researcher finds 64 items in 5 clusters. Cluster 1 contains 15 items, Cluster 2 contains 14 items, cluster 3 contains 13 items, Cluster 4 contains 12 items, and the last cluster contains five items. The counting method is complete counting, with the minimum number of citations of 5 of the 1556 sources and 61 meeting the threshold.

Top ten co-citation sources are Tourism Management (77 citations and 1801 total length strength), Annals of Tourism Research (86 Citations and 1608 total length strength), Journal of Sustainable Tourism (55 Citations and 1065 total length strength), Sustainability (64 citations and 963 total length strength), Journal of Travel Research (26 citations and 674 total length strength), Current issues in tourism (20 citations and 517 total length strength),j.sustain.tour (22 citations and 422 total length strength), Tourism Geographies (17 citations and 384 total length strength), Tour. Manna (23 citations and 380 total length strength), and Journal of Sport and Tourism (16 citations and 369 total length strength).

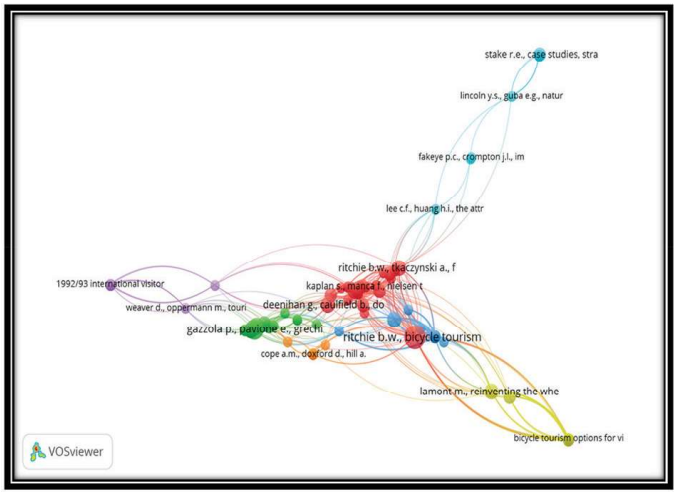


Figure 11: References Co-Citation figure extracted from VOS viewer

Source: VOS Viewer

5.3. Co-citation of References

The reference co-citation is shown in the above figure. It shows the relationship between publications and research subjects in bicycle tourism. Of 2891 cited references, 129 meet the threshold of having at least three citations using the complete counting approach. We applied the complete counting method to all types of analysis and cited references within the unit of analysis. The researcher created a total link strength of 1354 with a minimum cluster size

of 7. We recorded 124 items, 7 clusters, 925 links, and a total link strength of 1354. Cluster 1 (Red Colour) has 29 items. (Ritchie, 1998) has 66 links, 96 total link strengths, and a total of nine citations. Cluster 2 (the green colour) has 28 items. Cluster 2 (green) contains 24 links, 37 link strengths, and seven citations. Cluster 3 (Blue Colour) has 18 items. (Downward & Lumsdon, 2001) has 33 links, 49 total link strengths, and a total number of citations 4. The Cluster (4 (Yellow Colour)) has 16 items. (Lamont, 2009) has 35 links, 51 total link strengths, and a total number of citations 4. Cluster 5 (Violet Colour) has 14 items. Item number 14 (Weaver & Oppermann, 2000) has 22 links; the total link strength is 22, and the total number of citations is 2. In the same cluster, number 5, item number 5 (Hoyt & Lumsdon, 1993) has 21 links, the total link strength is 21, and the total number of citations is 2. The remaining items in cluster 5 (Violet Colour) have 13 links, the total link strength is 24, and the total number of citations is 2. Cluster 6 (the Sky Blue colour) has 12 items. (Stake, 2003) has eight links; 15 is the total link strength, and the total number of citations is 3. The last cluster, which is cluster number 7, has seven items. (Cushing, 1997) has 17 links; 19 is the total number of link strengths, and the total number of citations is 2.

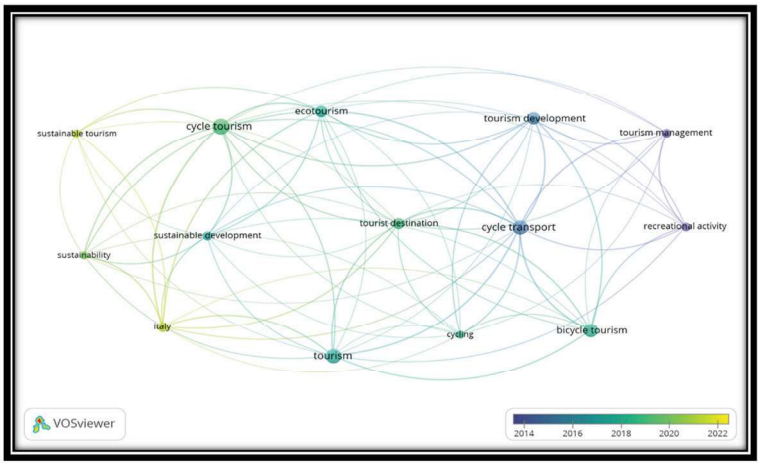


Figure 12: Keywords Co-Occurrence figure extracted using VOS viewer

Source: VOS Viewer

5.4. All keywords Co-occurrence analysis

The above figure presents the co-authorship map of all the keywords. In co-occurrence analysis, the minimum number of occurrences of a keyword is 5 of the 444, and 14 meet the threshold. The selection process involves a total of 14 keywords. The keywords named Cycle Transport (14 occurrences and 46 total link strength), Cycle Tourism (19 occurrences and 38 total link strength), Eco-Tourism (10 Occurrence and 33 total link strength), Italy (8

occurrences and 31 link strength), Tourist Destination (9 Occurrence and 31 total link strength), Tourism (16 occurrences and 30 total link strength), Bicycle Tourism(14 occurrences and 28 total link strength), Tourism Development (12 occurrences and 27 total link strength), Sustainable Development (7 occurrences and 22 total link strength), Sustainability (5 occurrence and 20 total link strength), Cycling (5 occurrence and 18 total link strength), Recreational Activity(6 occurrence and 16 total link strength), Tourism Management (6 occurrences and 15 total link strength) and Sustainable Tourism (5 occurrences and 11 total link strength). It has 2 clusters and 14 items/keywords.

Cluster 1 (Red) includes seven keywords: bicycle tourism, cycle transport, cycling, recreational activity, tourism development, tourism management, and tourist destination.

Cluster 2 (Green) includes seven keywords: cycle tourism, eco-tourism, Italy, sustainability, sustainable development, sustainable tourism, and tourism.

5.5. Three Fields Plot

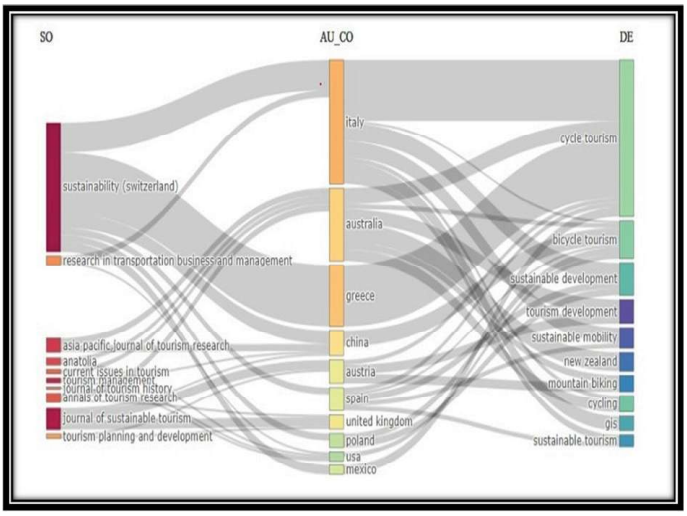


Figure 13
Source: VOS viewer

Note: The left-hand side is the sources, countries are in the middle, and keywords are on the right-hand side.

In the three-field plot, the relationship between (Sources), (countries), and (keywords) is shown in **Fig no. 13,** extracted using VOS viewer.

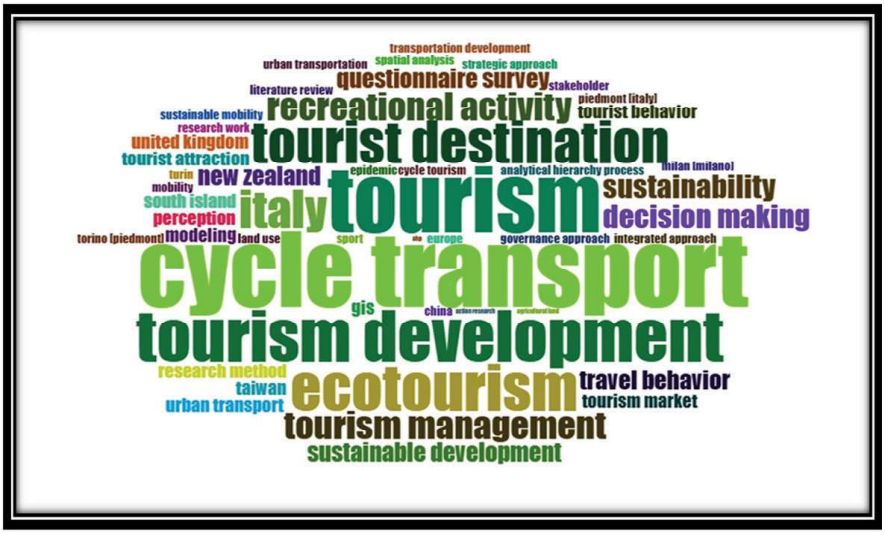
According to **Guleria and Chakma (2022)**, the three-field layout is also known as a Sankey diagram. This researcher shows the correlation among the sources, countries, and keywords in bicycle tourism. Research in Transport Business and Management, Current Issues in Tourism, Annals

of Tourism Research, Anatolia, Asia Pacific Journal of Tourism Research, Journal of Sustainable Tourism, Tourism Planning and Development, Tourism Management, and Journal of Tourism History are the 10 most important sources in the field of Cycle Tourism.

Top 10 Countries in Bicycle Tourism are Italy, Australia, Greece, China, Austria, Spain, Poland, the United Kingdom, Mexico, and the United States of America.

The top 10 search terms for bicycle tourism are "cycle tourism," "sustainable development," "tourism development," "sustainable mobility," "New Zealand," "cycling," "mountain biking," "GIS," and "sustainable tourism."

5.6. Word Cloud



5.7. Tree Map

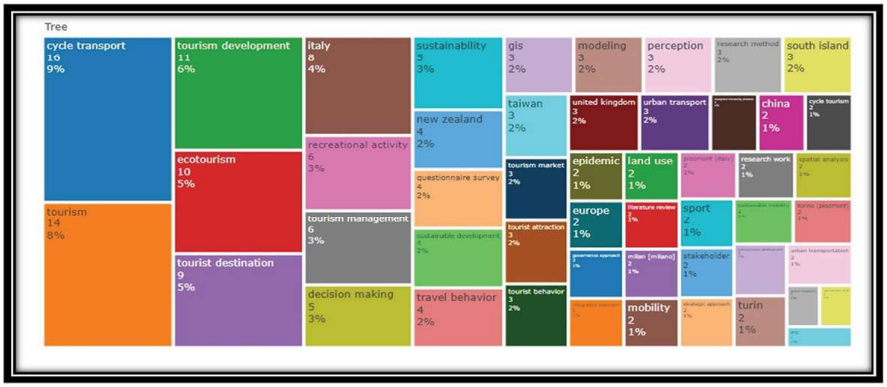


Figure 14: Tree Map contains the most cited keywords

Sources: VOS Viewer

The researcher has analysed the most common authors' keywords globally in bicycle tourism (Figure No. 14). The researcher used the Biblioshiny tool to examine the important keywords used in bicycle tourism. In this particular field, the researcher gets 265 items. The top 10 most frequently used words in bicycle tourism are shown in table number 8 as Cycle Transport (16), Tourism (14), Tourism Development (11), Eco-Tourism (10), Tourist Destination (9), Italy (8), Recreational Activity (6), Tourism Management (6), Decision Making (5), and Sustainability (5).

6. Conclusion

The present study aims to acquire a more profound comprehension of the existing status of research on bicycle tourism. The research was done using documents released between 1982 and April 20, 2024, which helps give a general picture of the trends and applicability of the field. To the best of the researcher's knowledge, no bibliometric evaluations have been conducted on cycle tourism research thus far. Consequently, this work is a significant addition to the area. Researchers have found the most valuable scholarly papers by thoroughly scanning the Scopus database. This study specifically included articles published between 1982 and April 20, 2024. "Bicycle tourism in the South Island of New Zealand: planning and management issues" (1998) by Brent W. Ritchie, and "Monitoring Tourism on the UK's First Long-Distance Cycle Route" by Cope, M.; Doxford, David; Hill, Tony (1998). The year 1998 saw the publication of these two research papers. In 2019 and 2020, researchers again start paying attention to bicycle tourism. The years 2019 and 2020 witnessed five documents, 2021 witnessed six documents, and the maximum number of publications shown in 2022 witnessed eleven. In 2023, the graph moved downward with only four publications. There is only one publication until April 20, 2024. Italy is the country that produces the most documents on the study of bicycle tourism, with twelve publications produced in total. Australia and the United Kingdom come in second and third, respectively, to Italy in this regard. "Emerging Bicycle Tourism and the Theory of Planned Behaviour" by Han, H., Meng, B., & Kim, W. in 2017 is the most cited document, with 175 citations and 21.88 citations per year. Researchers from La Trobe University published nine documents, followed by the Interuniversity Centre for Economic and Mobility Research and Modul University Vienna, with four documents each. Han H from Austria is the most cited author in the domain, with 227 citations. The journal Sustainability Switzerland witnessed 12 documents. Italy has eleven documents in the corresponding author's country, and in the document by country, Italy has twelve documents. The most cited country is the United Kingdom, with 253 citations, followed by Korea and Italy, with 227 and 154 citations. To further enhance the field of bicycle tourism, experts feel that this study effort will help illuminate the road for future scholars.

7. Theoretical Implications

From an academician's point of view, the completed bibliometric analysis helps in offering some responses to important queries that scholars have to consider while studying bicycle tourism. Researchers can gain insight from this study by recognising and comprehending emerging patterns in this subject, the terminology used, the publications that primarily address these enquiries, and field reference studies. This is the first research on bicycle tourism, using bibliometrics to close the knowledge gap by identifying the most cited authors, the most cited countries, the authors' most relevant affiliations, leading journals, highly performing academic institutions, and the most pertinent documents in the field. It does this by utilising various bibliometric analysis techniques, including the author co-citation network, journal co-citation, reference co-citation, and co-occurrence analysis of all keywords; the three-field plot; the word cloud; and the tree map for the most cited keywords. Therefore, the current findings should serve as the foundation for future studies on bicycle tourism by tourism experts and scholars.

The theoretical implications of this study also underscore the growing importance of bicycle tourism as a form of adventure travel. Comprehensive, systematic, and scientific inquiry is crucial to understanding the dynamics of bicycle tourism's growth, as it is still in its early stages. Using bibliometric analysis tools such as VOS Viewer and RStudio, scholars can thoroughly understand the discipline's evolution and current trends. Citation analyses by **Hans et al. (2017)** and other foundational studies demonstrate an increasing focus on bicycle tourism among scholars. As this study has shown, additional targeted research on its socio-economic effects and long-term viability is required. Based on the results, there is a need for more research and practice in the field of tourist management and policy around bicycle tourism.

7.1. Practical Implications

This study's findings on bicycle tourism have important implications for anyone working in the travel and tourist industry, especially in the adventure tourism subsector. Understanding the trends and patterns of bicycle tourism through bibliometric analysis can help tourism operators, policymakers, and destination managers design personalised services and infrastructure, especially as the industry continues to grow. Bicycle tourism is attracting academic interest, and the findings suggest that the industry needs to be more profitable and environmentally friendly. These goals include improvements to bike lanes and safety features, increased interest in bicycle tourism as a marketing tool for various locations, etc. This kind of study has the potential to bring academics and tourism organisations together to understand better the effects of bike tourism on local economies and communities. Researchers

can use this knowledge to establish bike tourism as a distinct niche within adventure travel.

8. Limitations And Future Scope

Even with all of this paper's significant contributions, there are still some important constraints to be aware of, such as data retrieval via a single database rather than several sources. Although the researcher recognises that Scopus has many papers covering the whole topic, he thinks including various databases will provide additional coverage. Furthermore, the restriction of this study to English-language publications may have undervalued research in other languages. More keywords must be included to investigate the domain of bicycle tourism thoroughly. The current study used R Studio, Scopus, and VOS Viewer for the analysis. It is notable, nonetheless, that in addition to VOS Viewer, R Studio, and Scopus, other analytical tools like Gephi, Cite Space II, and Bibexcel may be used in future studies. Researchers can apply more sophisticated bibliometric analysis approaches, such as clustering, bibliographic coupling, and co-word analysis, for improved results. The results of this study could help future researchers pinpoint areas of inquiry that will probably become more popular in the years to come when examining bicycle tourism. Consequently, experts and academics who wish to go deeper into the field of research can use this bibliometric analysis as a starting point.

References

Adventure Travel Trade Association. (2013). *Adventure tourism market study: A report of the Adventure Travel Trade Association*. https://cdn.adventuretravel.biz/docs/research/adventure-tourism-market-study-2013-web.pdf

Anon (2010). Wider health and wellbeing impacts of transport planning, New Zealand: Environment Canterbury Regional Council.

Aria, M., & Cuccurullo, C. (2017). bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, *11*(4), 959-975.

Blamey, R. K. (1997). Ecotourism: The search for an operational definition. *Journal of sustainable tourism*, *5*(2), 109-130.

Buning, R. J., & Gibson, H. (2015). The evolution of active-sport-event travel careers. *Journal of Sport Management*, *29*(5), 555-569.

Buning, R. J., Cole, Z., & Lamont, M. (2019). A case study of the US mountain bike tourism market. *Journal of Vacation Marketing*, *25*(4), 515-527.

Cheng, M., Edwards, D., Darcy, S., & Redfern, K. (2018). A tri-method approach to a review of adventure tourism literature: Bibliometric analysis, content analysis, and a quantitative systematic literature review. Journal of hospitality & tourism research, 42(6), 997-1020.

Choudhary, V., Nag, A., Kumar, A., & Kumar, V. (2024). Wetland Tourism: A Bibliometric Analysis (1985-2022). Journal of Tourismology, 10(2), 135-147. https://doi.org/10.26650/jot.2024.10.2.1444196

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

Cohen, J. M., Boniface, S., & Watkins, S. (2014). Health implications of transport planning, development, and operations. Journal of Transport & Health, 1(1), 63-72.

Della Corte, V., Del Gaudio, G., Sepe, F., & Sciarelli, F. (2019). Sustainable tourism in the open innovation realm: A bibliometric analysis. Sustainability, 11(21), 6114.

Delpy, L. (1996). *Sports tourism: An overview*.

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, *133*, 285-296.

Dowth, J., Smith, R., & Taylor, L. (2021). Metrics in performance analysis: An overview of publication and citation-based indicators. *Journal of Research Metrics and Analysis*, *15*(3), 123–135.

Egghe, L., & Rousseau, R. (2006). An informetric model for the Hirsch-index. Scientometrics, 69(1), 121-129.

Faulks, P., Ritchie, B. W., & Fluker, M. (2007). Cycle tourism in Australia: an investigation into its size and scope. Gold Coast: Sustainable Tourism CRC.

Garrigos-Simon, F. J., Narangajavana-Kaosiri, Y., & Lengua-Lengua, I. (2018). Tourism and sustainability: A bibliometric and visualization analysis. *Sustainability*, *10*(6), 1976.

Getz, D., & McConnell, A. (2011). Serious sports tourism and event travel careers. Journal of Sport Management, 25(4), 326-338.

Grand View Research. (2022). *Bicycle market size, share & trends analysis report by type, by application, by region, and segment forecasts, 2022–2030*. https://www.grandviewresearch.com/industry-analysis/bicycle-market

Habibi, A., Mousavi, M., Jamali, S. M., & Ale Ebrahim, N. (2022). A bibliometric study of medical tourism. Anatolia, 33(3), 415–425. https://doi.org/10.1080/13032917.2021.1954042

Hall, C. M. (2011). Publish and perish? Bibliometric analysis, journal ranking, and the assessment of research quality in tourism. Tourism Management, 32(1), 16-27.

Hallinger, P., & Chatpinyakoop, C. (2019). A bibliometric review of research on higher education for sustainable development, 1998–2018. *Sustainability*, *11*(8), 2401. https://doi.org/10.3390/su11082401

Hans, M., Roberts, K., & Lee, T. (2017). Exploring the rise of bicycle tourism: A citation analysis of scholarly trends. *Journal of Tourism Studies*, *25*(4), 312–328.

Johnson, A. G., & Samakovlis, I. (2019). A bibliometric analysis of knowledge development in smart tourism research. Journal of Hospitality and Tourism Technology, 10(4), 600-623.

Koseoglu, M. A., Rahimi, R., Okumus, F., & Liu, J. (2016). Bibliometric studies in tourism. Annals of tourism research, 61, 180-198.

Lamont, M. (2009). Reinventing the wheel: A definitional discussion of bicycle tourism. *Journal of Sport & Tourism*, *14*(1), 5-23.

Lamont, M., & Buultjens, J. (2011). Putting the brakes on: Impediments to the development of independent cycle tourism in Australia. Current Issues in Tourism, 14(1), 57-78.

Lane, B. (1994). What is rural tourism? Journal of sustainable tourism, 2(1-2), 7-21.

Lee, C. F., Chen, P. T., & Huang, H. I. (2014). Attributes of destination attractiveness in Taiwanese bicycle tourism: The perspective of active experienced bicycle tourists. *International journal of hospitality & tourism administration*, *15*(3), 275-297.

López-Bonilla, J. M., & López-Bonilla, L. M. (2021). Leading disciplines in tourism and hospitality research: A bibliometric analysis in Spain. Current issues in tourism, 24(13), 1880-1896.

Lumsdon, L. (1996). Cycle tourism in Brita. Insights (March), pp. 27–32. English Tourist Board.

Lumsdon, L. (2000). Transport and tourism: cycle tourism–a model for sustainable development. Journal of sustainable tourism, 8(5), 361-377.

Lusk, A., & Li, Y. (2012). Bicycling, health and weather-related disasters: Potential data to better predict risk.

Mavric, B., Öğretmenoğlu, M., & Akova, O. (2021). Bibliometric analysis of slow tourism. Advances in Hospitality and Tourism Research (AHTR), 9(1), 157-178.

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & Prisma Group. (2010). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. International journal of surgery, 8(5), 336-341.

Moosa, S., & Shareefa, M. (2020). A bibliometric analysis of research trends in quantitative studies. *Journal of Educational Research and Development*, *10*(2), 45–56.

Moularde, J., & Weaver, A. (2018). Serious about leisure, serious about destinations: mountain bikers and destination attractiveness. In Sport Tourism and Sustainable Destinations (pp. 123-141). Routledge.

Naruetharadhol, P., &Gebsombut, N. (2020). A bibliometric analysis of food tourism studies in South east Asia. Cogent Business and Management, 7(1). https://doi.org/10.1080/23311975.2020.1733829

Nees, J., Van Eck, L., & Waltman. (2017). VOS viewer Manual. https://www.vosviewer.com/documentation/Manual_VOSviewer_1.6.6.pdf

Pratte, J. (2006). Bicycle tourism: on the trail to economic development. Prairie perspectives: geographical essays, 9(1), 62-84.

Ritchie, B. W. (1998). Bicycle tourism in the South Island of New Zealand: Planning and management issues. Tourism Management, 19(6), 567-582.

Santos-Rojo, C., Llopis-Amorós, M., & García-García, J. M. (2023). Overtourism and sustainability: A bibliometric study (2018–2021). Technological Forecasting and Social Change, 188, 122285.

Scheer, V., & Hoffman, M. D. (2020). Ultramarathon and ultra-endurance sports. Sports-related Fractures, Dislocations and Trauma: Advanced On-and Off-field Management, 965-970.

Sharma, P., Singh, R., Tamang, M., Singh, A. K., & Singh, A. K. (2021). Journal of teaching in travel &tourism: a bibliometric analysis. Journal of Teaching in Travel & Tourism, 21(2), 155-176.

Simonsen, P., & Jorgenson, B. (1996). Cycling tourism: environmental and economical sustainability. Unpublished Report, Bornholm Research Centre, Denmark.

Simonsen, P., & Jorgenson, B. (1998). Cycle tourism: an economic and environmentally sustainable form of tourism. Unit of Tourism Research, Research Centre of Bornholm.

Singh, R., Sibi, P. S., & Sharma, P. (2022). Journal of ecotourism: a bibliometric analysis. Journal of Ecotourism, 21(1), 37-53.

Su, H. N., & Lee, P. C. (2010). Mapping knowledge structure by keyword co-occurrence: A first look at journal papers in Technology Foresight. scientometrics, 85(1), 65-79.

Suban, S. A. (2022). Bibliometric analysis on wellness tourism– citation and co-citation analysis. International Hospitality Review. https://doi.org/10.1108/ihr-11-2021-0072

Suban, S. A., Madhan, K., & Shagirbasha, S. (2021). A bibliometric analysis of Halal and Islamic tourism. International Hospitality Review. https://doi.org/10.1108/ihr-05-2021-0038

Thompson, B. S., & Friess, D. A. (2019). Stakeholder preferences for payments for ecosystem services (PES) versus other environmental management approaches for mangrove forests. Journal of Environmental Management, 233, 636-648.

Tourism, A. (2008). Global Report on Adventure Tourism.

Virani, A., Wellstead, A., & Howlett, M. P. (2019). Where is the Policy? A Bibliometric Review of the State of Policy Research on Medical Tourism. SSRN Electronic Journal, 2. https://doi.org/10.2139/ssrn.3445235

World Tourism Organisation. (2014). *Adventure tourism: A global perspective*. https://www.unwto.org/global/adventure-tourism

Worrall, J. L., & Cohn, E. G. (2023). Citation data and analysis: limitations and shortcomings. Journal of Contemporary Criminal Justice, 39(3), 327-340.

Yuan, E. (2015). Building Taiwan as a Major Biking Destination.