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The Role of Management in Sustainable Tourism: A Bibliometric Analysis Approach

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Abstract: This study presents a bibliometric analysis of sustainable tourism management using the VOSviewer tool. It aims to fill the bibliometric gap in the growing body of research on sustainable tourism management and, consequently, contribute to recent scholarly interest in this subject. Therefore, its main objective is to present a qualitative and quantitative analysis of the research published on sustainable tourism management from 1996 to April 2023, which enables its scientific production. To this end, we used a total of 317 publications with 7475 cited references from Web of Science. In addition, we performed three bibliometric analyses (co-authorship, co-citation and co-occurrence of keywords). The results show the current trends in sustainable tourism management and also provide a theoretical basis regarding this subject, which is of growing importance in the tourism sector. Our study's conclusions suggest that the priorities of sustainable tourism management are shifting from competitiveness to sustainability, in accordance with new consumer demands and the 2030 Agenda. In conclusion, a broader framework of sustainable tourism management is required.

Keywords: bibliometric analysis; web of science; management; sustainable; tourism

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1. Introduction

At present, the tourism industry has become one of the most crucial developing sectors for the global economy. A major challenge the industry faces is competitiveness, as different actors seek to obtain an advantage over others [1,2].

Concern for the environment can be highlighted as a topic of interest for tourists because it is a significant issue for developed and developing countries across the world [3]. As a result, sustainable development has become a general trend in all economies [1]. Sustainability has received enormous attention from scholars and economists attempting to provide practical solutions to the current issues. The concept of sustainability can be defined from multiple perspectives: Eizaguirre et al. [4] have indicated that more than a hundred definitions exist among researchers and academic professionals. However, the most widely accepted definition is the one provided by the World Commission on Environment and Development, which views sustainable development as growth that meets the needs and aspirations of current populations without compromising those of future generations.

Recent years have seen a growing interest in scientific research on important concepts such as tourism and sustainability [5–7]. Both are closely related and are among the most widely discussed topics by academics and researchers across the world at present [3,5,6,8,9]. Indeed, sustainability plays a vital role in tourism contexts because it can be considered part of the general image of a destination [3]. For this reason, it is essential that tourist destinations take care of their environment and continuity in order to guarantee economic development [8].

Sustainable tourism has become a core form of tourism [10–12]. The way in which companies approach sustainability in the tourism field is essential to how destinations manage their tourism strategies, because sustainable tourism satisfies the needs of the present. Sustainable tourism takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities [1]. Achieving sustainable tourism is a continuous process that requires ongoing management by all parties involved. One of the main challenges in managing tourism businesses is balancing tourism with sustainable development [13].

Despite the importance of the management of sustainable tourism, as well as the growing interest in the subject among researchers [2], few authors have analyzed this issue from a management point of view [3,14]. Additionally, investigations using systematic reviews remain almost non-existent [3]. Therefore, the present study aims to achieve the following specific research objectives (O), which will be analyzed throughout the research:

O1. Analyze the key documents, countries, universities, and authors in sustainable tourism management.
O2. Identify collaborative relationships among these authors by analyzing co-authorship in the field of tourism management in sustainable tourism.
O3. Determine the primary documents that have contributed to the intellectual structure of sustainable tourism management over time through co-citation analysis.
O4. Evaluate thematic clusters and emerging trends for future studies in sustainable tourism management by analyzing the co-occurrence of keywords in the tourism field.

In the following sections, first, a review of the literature is carried out. Subsequently, the methodology is explained, referring to the bibliometric analysis and data sources. After that, the main results are discussed. Finally, the main conclusions of the study are presented.

2. Literature Review: Sustainable Tourism, Management and Bibliometric Analysis

2.1. Sustainable Tourism

Sustainable tourism is tourism that is capable of satisfying the demands of tourists and local communities, taking into account their present and future impacts, for instance by protecting resources without harming cultural integrity, biodiversity, ecological processes and subsystems [15,16]. Therefore, one of the biggest advantages of this type of tourism is that it is able to guarantee a positive experience, not only for the tourism industry but also for local communities. In summary, by helping to manage the impacts of tourism, sustainable tourism meets the needs of current and future visitors alike [1].

Sustainable tourism can improve the economy of a nation, boost business and encourage efforts to preserve the environment and social and cultural values in both the present and the future [17]. The concept of sustainable tourism has received special attention in recent years due to the development of the tourism industry more generally and the growing environmental concerns associated with this. For this reason, a large body of literature has emerged that uses bibliometric analysis for sustainable tourism [18–21]. In fact, according to Niñerola et al. [21], we can affirm that sustainable tourism is an issue that continues to grow.

2.2. Management and Sustainable Tourism

According to World Tourism Organization (UNWTO) [22], the current economy is characterized by considerable competitiveness in the vast majority of sectors, including the tourism industry. Therefore, organizations in this sector must try to achieve a competitive advantage. To this end, companies need to carry out good organizational management [23].

Public awareness about sustainability and management in the tourism field is gradually increasing [21,24]. Thus, sustainable tourism management relies on extensive collaboration between companies, local communities, governments and other stakeholders [3,25]. In this way, the implementation of appropriate practices and policies is crucial to achieving success in this type of tourism as well as preserving the environment and increasing competitiveness [25].

Consequently, the managers of tourism companies play an essential role in the management of sustainable tourism through adopting responsible practices and including sustainability principles in their day-to-day operations. Acting in such a way can help reduce tourism's environmental impacts and thereby promote the conservation of biodiversity. Therefore, sustainable tourism management is essential for the future of tourism. In addition, it can improve economic development, generate more employment and increase people's quality of life [26]. Thus, UNWTO [22] has highlighted the importance of responsible tourism management and how it can facilitate economic growth, job creation and social inclusion while preserving natural resources. By contrast, inadequate management risks causing a significant loss of cultural heritage due to cultural degradation [25]. In this way, various trends in sustainable tourism management are emerging, responding to the challenges of sustainable development and the global COVID-19 crisis [27]. However, despite the increasing significance of sustainable tourism management, there has been limited research attention given to bibliometric analysis and science-mapping in the literature [3].

3. Methodology

3.1. Bibliometric Analysis

Pritchard [28] has defined bibliometrics as the application of mathematical and statistical methods to books and other media. He is considered the academic who introduced the term 'bibliometrics' from the works of Hulme [29], and who recognized the importance of analyzing the bibliography of a specific research area through statistical analysis. The term has continued to evolve ever since: numerous software tools have been developed and the concept has been used in a multidisciplinary way with the aim of studying publication patterns [30,31]. Bibliometric analysis comprises two areas: on the one hand, it is based on performance analysis, which is related to scientific impact due to the number of citations that were achieved; on the other hand, it is grounded in scientific mapping, which allows for the theoretical, the intellectual or the social to be visualized by graphically representing the scientific structure [32–34]. The VOSviewer software (version 1.6.18) tool is useful for obtaining a visual representation of a certain field of knowledge through different methods, such as citation analysis, co-citation, co-authorship, co-occurrence of keywords and bibliographic coupling [35]. Bibliometric analysis has recently increased in popularity in different disciplines [36], including business management [37], consumer behaviour [38], marketing [39], medicine [40], physics [41], education [42], biology [43], tourism [44] and multidisciplinary analysis [45].

Many bibliometric studies that are either directly or indirectly related to sustainable tourism exist. Ruhanen et al. [19] were the first to carry out a bibliometric analysis in the field of tourism sustainability in the period 1988–2012. Subsequently, Niñerola et al. [21] analyzed studies related to sustainable tourism in the period 1987–2018, placing emphasis on interest in sustainability as a scientific discipline in the tourism field and its importance in the management of tourist destinations. Furthermore, Yoopetch and Nimsai [20] analyzed studies related to sustainable tourism in the period 1990–2018, demonstrating the growing interest in sustainability in the development of the tourism industry. Cavalcante et al. [18] provided a review of research on sustainable practices in tourism related to marketing in the period 1997–2020. The results showed that tourism sustainability is an area that can be taken advantage of by tourism managers due to tourists' growing environmental awareness. Nevertheless, to date, in the field of sustainable tourism management, few bibliometric studies analyzing this topic have been published. Although Pahrudin et al. [3] studied the role of marketing and management in sustainable tourism in the period 1992–2021, their bibliometric analysis only focused on content analysis, while overlooking alternative analyses such as co-authorship and co-citation. Therefore, we believe that it is necessary to carry out a specific bibliometric study showing the intellectual structure in this scientific field, with the aim of compiling the most important studies on the subject [37].

Based on other previous bibliometric studies [36,46–48], in this study, we use the Web of Science (WoS) database as a pillar to carry out our bibliometric analysis. This database is

advantageous because it includes studies in top-level journals published by, among others, Elsevier, Emerald, Springer, MDPI, Wiley and Taylor and Francis [36,49]. In addition, WoS contains more information for carrying out bibliometric analysis [50,51] than is true of other databases such as Google Scholar and Scopus [52]. With the help of bibliometrics, this study aims to fill a research gap in the field of sustainable tourism management. It seeks to combine co-authoring, co-citation and co-word analysis to reveal and visualize the big picture and evolution of this area of research. Through this technique, we hope to develop a map of the intellectual structure of the investigative network, which could benefit future work and research [47].

3.2. Data Collection

We analyzed studies specifically related to the management of sustainable tourism. In order to correctly establish the search parameters, we took into account those bibliometric studies related to sustainable tourism [2,3,18–21,53] and the keywords of articles with a high number of citations in this field [5,27,54–62], as in the work of [36,63]. Given that the objective of the study was to analyze sustainable tourism in the field of environmental management, the keywords in the row section were as follows: the first group combined the words 'sustainable touris*' OR 'sustainable destination*' and the second group combined the words 'tourism management' OR 'environmental management' OR 'crisis management'. In order to limit the number of documents, we limited the search parameters in terms of topic, that is, the words could only be found in the title, abstract or keywords [47]. We filtered the 504 resulting documents according to the following norms to guarantee that all the sample articles were congruent with the objectives of our study (Figure 1), following the indications in [63]. In this way, at first, only articles were included, excluding, e.g., proceeding papers, book chapters, review articles, editorial material, meeting abstracts and books during the period between 1996 and 14 April 2023. The data were obtained from the Web of Science Core Collection database, which is widely used in bibliometric analysis due to its high impact factor and is widely regarded as the most reputable index available. [47]. With more than 14,000 journals, it is considered the database with the highest quality [45]. This database can filter to ensure that only articles are searched, which are considered most relevant for the investigation [63]. Second, we carefully reviewed all the articles and eliminated those studies unrelated to the subject being analyzed. Finally, using Excel and Endnote, we looked for duplicate records and did not find any. Ultimately, through applying these filters, we obtained a sample of 317 articles (Figure 1).

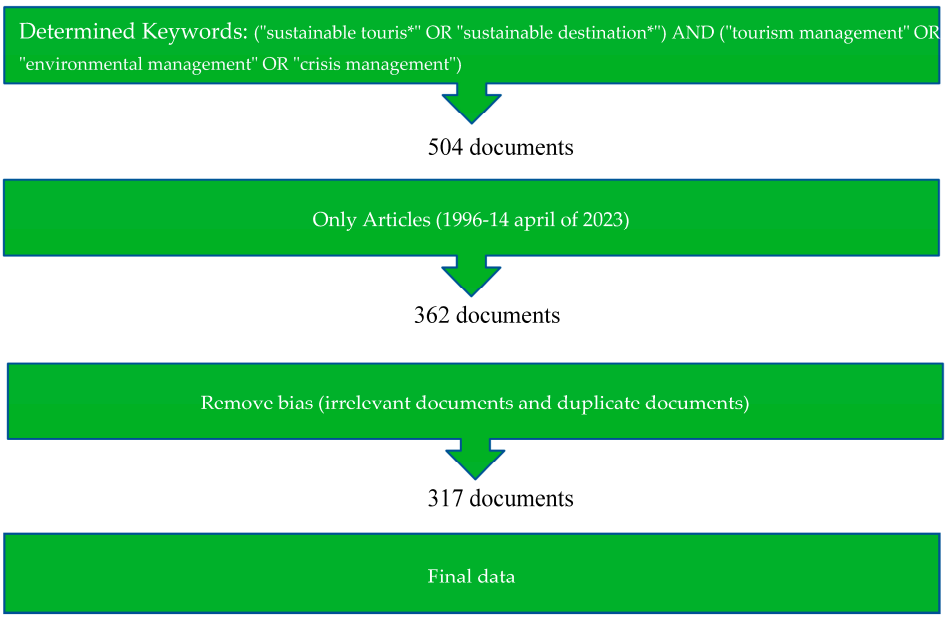

Figure 1. Data analysis process. Source: Own elaboration.

3.3. Data Analysis

We used the VOSviewer programme to obtain the visual networks from the analyzed documents. Specifically, VOSviewer helped us to create maps in relation to the analysis of co-authorship, co-citation and co-occurrence of the keywords [35,36]. We used the Thesaurus File tool with the objective of eliminating duplicate and similar elements in the software, following the recommendations of Van Eck and Waltman [35]. In order to achieve the most appropriate level to determine the relevant clusters in such an analysis, it is necessary to establish a cut-off point for each one [47]. In our analysis, it was necessary to establish a minimum number of documents per author in the case of co-authorship, a minimum number of citations in the case of co-citation, and a minimum number of occurrences in the case of the co-occurrence of keywords. Determining the appropriate level is very important because if it is too low, the visualization will be more complex and there will be irrelevant information, while if it is too high, important and reliable publications will be lost [37]. Following the recommendations of Fauzi [47], we carried out several tests in each analysis with the objective of reaching the most appropriate level to determine the relevant clusters in the analysis.

4. Results and Discussion

4.1. Descriptive Analysis

4.1.1. A General Overview of the Field

A total of 317 articles from 133 database journals were obtained from the search, as shown in Table 1. In Figure 2, we present the evolution of research published in WoS from 1996 to 2023. The first article to analyze sustainable tourism management was written by Der Borg et al. [64], focusing on the negative consequences of overtourism in seven World Heritage cities (Aix, Amsterdam, Bruges, Florence, Oxford, Salzburg and Venice) and the importance of management by the authorities with the aim of reducing negative externalities. Consequently, the field has continuously exoanded, seeing a production peak in 2022 (45 publications) as well as a maximum number of citations in 2020 (771). With the growing importance of demand in companies' management of sustainable tourism [65], due to a change in consumer perspectives [5] as well as the need to adapt to the new policies proposed by the Glasgow Declaration, which aims to reduce carbon emissions by half by 2030 and reach net-zero emissions before 2050 [66], it is expected that this scientific production will continue to increase in the coming years.

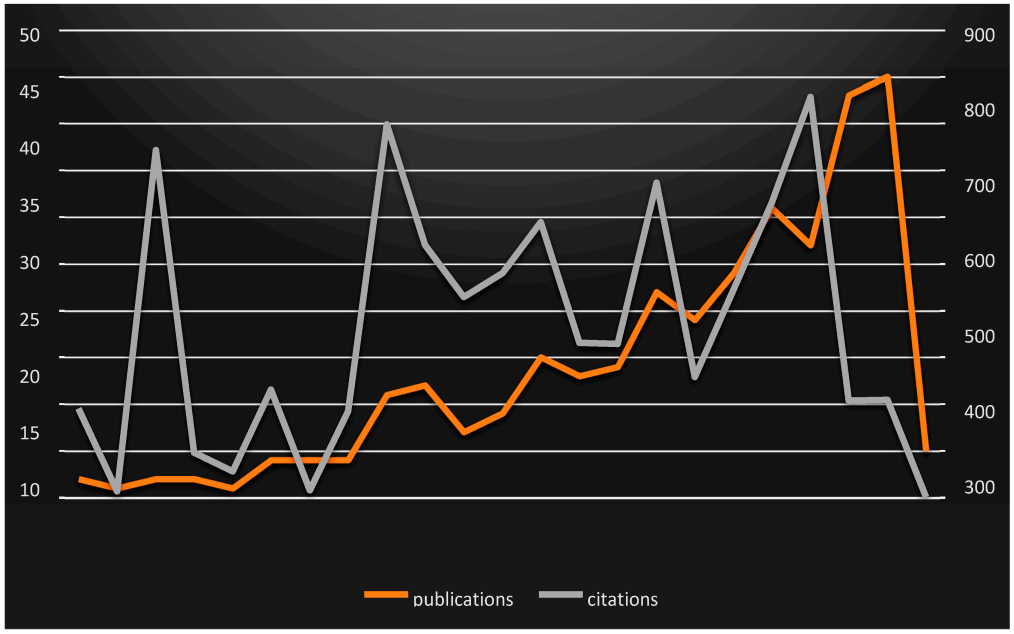

Figure 2. Number of publications and citations from 1996 to 2023. Source: Own elaboration.

Table 1. Summary of data.

Web of Science	Record Count
Articles	317
Citations (WOS)	7475
Journals	133
Authors	887
Institutions	479
Countries	78
Study time	1996–2023

Source: own elaboration.

According to Table 2, the 10 main sustainable tourism management research journals collectively published 133 papers (42% of the total sample). All of these journals published relevant research in the last two years of our analysis, evidencing growing interest in the subject. Of these 10, Sustainability and Journal of Sustainable Tourism published the most papers. It is noteworthy that all these journals have both a high Impact Factor and Scientific Journal Ranking (SJR). In addition, Table 2 also includes the number of issues per year of each journal.

Table 3 shows the most productive authors in the field under analysis. Australia stands out for its high number of citations and publications. We did not find any authors with particularly large numbers of publications, although in terms of number of citations we can highlight Hall, C. Michael, with 679, and Dredge, Dianne from the University of Lund (Sweden), with 335. Finally, the authors' h-index was generally high, with Hall, C. Michael from the University of Canterbury (New Zealand) again standing out, with 60, along with Becken, Susanne from the University of Griffith (Australia), with 38.

Table 4 presents the 10 articles with the most citations on WoS. It is noteworthy that a large proportion of the articles are recent and have large numbers of citations and citations per year, indicating the growing interest in the subject. Surprisingly, Hall, C.M. and Stoeckl, N are the only two authors present in the most-cited articles and among the ten most-cited authors. This is due to the fact that most of the authors present in the most-cited articles have only published one article. The most-cited article was written by Hall et al. [27], analyzing the impact of the COVID-19 pandemic on tourism. The authors recommend introducing sustainability policies with the aim of reorienting the current unsustainable trend in tourism, based on new forms of sustainable tourism borne in the pandemic. The second most-cited article was written by Mihalič, [55], concerning environmental competitiveness from a management perspective. The author analyzed environmental management in two fields: environmental impact, related to the introduction of tourist services committed to the environment, and environmental quality, related to the improvement of the environmental quality of the destination. The third most-cited article was written by Garrod and Fyall [67], analyzing the problems of sustainable tourism management in heritage sites in the United Kingdom. The authors recommend the introduction of conservation programmes and the financing of tourism management programmes.

Furthermore, Table 5 presents the most influential and productive institutions in the management of sustainable tourism. In terms of productivity, Griffith University stands out with 10 papers. However, even more noteworthy are the numbers of citations, including the University of Waterloo (869), the University of Canterbury (735) and Griffith University (404). Nevertheless, this indicator does not fully coincide with citations per article, which indicates the influence of the institution [68]; here, one can note the University of Waterloo (217.25 citations per article), the University of Canterbury (183.75) and the University of Waterloo (92.75). Finally, we highlight that all of them are recently published, which indicates the relevance of the current topic.

Table 2. Top ten journals by number of papers in the Web of Science data.

Journals	Papers	Cites	C/P	NI	SCOPE	First Paper	Last Paper	Impact Factor (2021)	SJR (2021)
Sustainability	42	510	12.14	24	Environmental Sciences, Environmental Studies, Green & Sustainable Science & Technology; Green & Sustainable Science & Technology	2015	2022	3.889	0.664
Journal of Sustainable Tourism	35	1940	55.43	12	Green & Sustainable Science & Technology; Hospitality, Leisure, Sport & Tourism	2009	2022	9.47	2.476
Tourism Management	14	1105	78.93	6	Environmental Studies; Hospitality, Leisure, Sport & Tourism; Management	1996	2019	12.879	3.3383
Journal of Cleaner Production	8	408	51.00	51	Engineering, Environmental; Environmental Sciences; Green & Sustainable Science & Technology	2008	2022	11.072	1.921
Tourism Management Perspectives	7	149	21.29	4	Hospitality, Leisure, Sport & Tourism; Management	2013	2021	7.608	1.761
Worldwide Hospitality and Tourism Themes	7	53	7.57	6	Hospitality, Leisure, Sport & Tourism	2010	2021	-	0.393
Current Issues in Tourism	6	154	25.67	24	Hospitality, Leisure, Sport & Tourism	2013	2022	7.578	1.838
Annals of Tourism Research	5	636	127.20	6	Hospitality, Leisure, Sport & Tourism; Sociology	1996	2018	12.853	3.145
Cuadernos de Turismo	5	14	2.80	2	Hospitality, Leisure, Sport & Tourism	2007	2022	-	0.148
International Journal of Contemporary Hospitality Management	4	234	58.50	12	Hospitality, Leisure, Sport & Tourism; Management	2016	2022	9.321	2.288
Total	133								

Note: C/P (average citation per paper); NI (number of issues per year); First Paper (year first published); Last Paper (year last published). Source: own elaboration.

Table 3. Top ten authors by number of papers in the Web of Science data.

Author/s	Papers	Cites	C/P	First Paper	Last Paper	University	h Index (WoS)
Dredge, Dianne	3	335	111.67	2010	2011	University of Lund (Sweden)	21
Whitford, Michelle	3	189	63.00	2011	2016	University of Griffith (Australia)	15
Ignacio Pulido-Fernández, Juan	3	80	26.67	2014	2015	University of Jaen (Spain)	21
Becken, Susanne	3	78	26.00	2016	2019	University of Griffith (Australia)	38
Ghaderi, Zahed	3	20	6.67	2013	2023	University of Kharazmi (Iran)	12
Pongsakornrungsilp, Siwarit	3	4	1.33	2021	2022	University of Walailak (Thailand)	4
Pérez Hernandez, Iverilys	3	2	0.67	2017	2020	University of Pinar del Rio (Cuba)	5
Ramirez Perez, Jorge Freddy	3	2	0.67	2013	2020	University of Pinar del Rio (Cuba)	1
Hall, C. Michael	2	679	339.50	2012	2020	University of Canterbury (New Zealand)	60
Stoeckl, Natalie	2	262	131.00	2012	2014	University of James Cook (Australia)	24

Note: C/P (average citation per paper); First Paper (year first published); Last Paper (year last published). Source: own elaboration.

Table 4. Top ten papers by cites in the Web of Science data.

Title	Author/s	Journal	Cites	Year	C/Y	Links	Type of Study
Pandemics, transformations and tourism: be careful what you wish for	Hall, CM; Scott, D; Gössling, S	Tourism Geographies	472	2020	159.33	8	Qualitative
Environmental management of a tourist destination-A factor of tourism competitiveness	Mihalic, T	Tourism Management	365	2000	28.08	13	Quantitative
Managing heritage tourism	Garrod, B; Fyall, A	Annals of Tourism Research	304	2000	13.22	4	Quantitative
Residents' attitudes to tourism: a longitudinal study of 140 articles from 1984 to 2010	Nunkoo, R; Smith, SLJ; Ramkissoon, H	Journal of Sustainable Tourism	266	2013	26.7	1	Qualitative
Environmental practices and firm performance: an empirical analysis in the Spanish hotel industry	Molina-Azorin, JF; Claver-Cortes, E; Pereira-Moliner, J; Tari, JJ	Journal of Cleaner Production	249	2009	17.78	11	Quantitative
Local tourism governance: a comparison of three network approaches	Beaumont, N; Dredge, D	Journal of Sustainable Tourism	237	2010	18.23	5	Quantitative
A systematic review of research on innovation in hospitality and tourism	Omerzel, DG	International Journal of Contemporary Hospitality Management	212	2016	26.5	5	Qualitative
The resilience of formal and informal tourism enterprises to disasters: reef tourism in Phuket, Thailand	Biggs, D; Hall, CM; Stoeckl, N	Journal of Sustainable Tourism	207	2012	18.82	3	Quantitative
Tourism in European heritage cities	van der Borg, J; Costa, P; Gotti, G	Annals of Tourism Research	162	1996	6	2	Quantitative
Predicting residents' pro-environmental behaviors at tourist sites:. The role of awareness of disaster's consequences, values, and place attachment	Zhang, YL; Zhang, HL; Zhang, J; Cheng, SW	Journal of Environmental Psychology	123	2014	13.67	5	Quantitative

Note: C/Y (average citation per year). Source: own elaboration.

Table 5. Top ten institutions by papers in the Web of Science data.

University	Country	Papers	Cites	C/P	First Paper	Last Paper	Scimago Ranking
University of Griffith	Australia	10	404	40.4	2005	2019	6
University of Queensland	Australia	5	319	63.8	2001	2019	37
University of Jaen	Spain	5	84	16.8	2007	2022	793
University of Islamic Azad	Iran	5	19	3.8	2013	2022	931
University of Cadiz	Spain	5	17	3.4	2012	2019	780
University of Waterloo	Canada	4	869	217.25	2001	2020	131
University of Canterbury	New Zealand	4	735	183.75	2009	2020	281
University of Southern Cross	Australia	4	371	92.75	2009	2021	1188
University of Johannesburg	South Africa	4	301	75.25	2013	2022	22
University of Otago	New Zealand	4	156	39	2012	2020	201

Note: C/P (average citation per paper); First Paper (year first published); Last Paper (year last published). Source: own elaboration.

4.1.2. Co-Authorship Analysis

Co-authorship analysis shows the collaboration networks that exist between authors, organizations or countries promoting the development of knowledge in a given scientific field [69,70]. It was introduced in 1966 by De Solla and Beaver [71] in the field of psychology. In scientific fields seeing increased methodological and theoretical complexity, this type of analysis is useful for understanding how different authors, organizations or countries collaborate with each other [31,69]. Following the recommendations of Koseoglu et al. [72], in our analysis we used the co-authorship of the authors, because whereas authors remain stable over time, their affiliations with countries or universities may change. We established a cut-off point of 20 citations per author, which gave rise to 14 authors distributed in three collaboration networks. Our analysis of scientific production networks allowed us to identify three clear collaboration networks: two of them of an international nature and all of them are international and inter-institutional in nature (Figure 3). In Figure 4, we observe the trend of co-authorship during the analyzed period. We observe how the blue network is the oldest, starting in 2010, followed by the green network, with the red network being the one with the most recent publications, reaching 2020. The number of publications is homogeneous throughout the analyzed period. The red network is made up of Scott, Noel from the University of the Sunshine Coast (Australia); Le, Dung of VinUni University (Vietnam) and Connolly, Rod, Becken, Susanne and Warren, Christopher from Griffith University (Australia). This network is the most current, is international and inter-institutional in nature, and began production in 2017, ending in 2019. The green network is made up of McLennan, CharLee J. from Griffith University (Australia); Ritchie, Brent W and Ruhanen, Lisa M. of the University of Queensland (Australia), Moyle, Brent from Southern Cross University (Australia) and Carr, Ana from the University of Otago (New Zealand). This network is international and inter-institutional in nature and began production in 2014, ending in 2016. The blue network is made up of Dredge, Dianne and Beaumont, Narelle from the University of Queensland (Australia) and Whitford, Michelle and Ford, Emma-Jane from Southern Cross University (Australia). This network is inter-institutional in nature, is the oldest (being in force between 2010 and 2011) and is made up of the two most productive authors in terms of number of citations (Table 3).

There are collaboration changes over time in the scientific network. For example, in the red network, we can see how Warren, Christopher and Becken, Susanne began to collaborate in 2017, and then Le, Dung, Scott, Noel, Becken, Susanne and Connolly, Rod M. began to collaborate in 2019. In the green network, McLennan, Char-lee J., Ritchie, Brent W., Ruhanen, Lisa M. and Moyle, Brent D. began to collaborate in 2014, while Carr, Anna and Ruhanen, Lisa collaborated later, in 2016. Finally, in the blue network, Beaumont, Narelle and Dredge, Dianne began to collaborate in 2010, while Dredge, Dianne, Ford, Emma-Jane and Whitford, Michelle began collaborating in 2011.

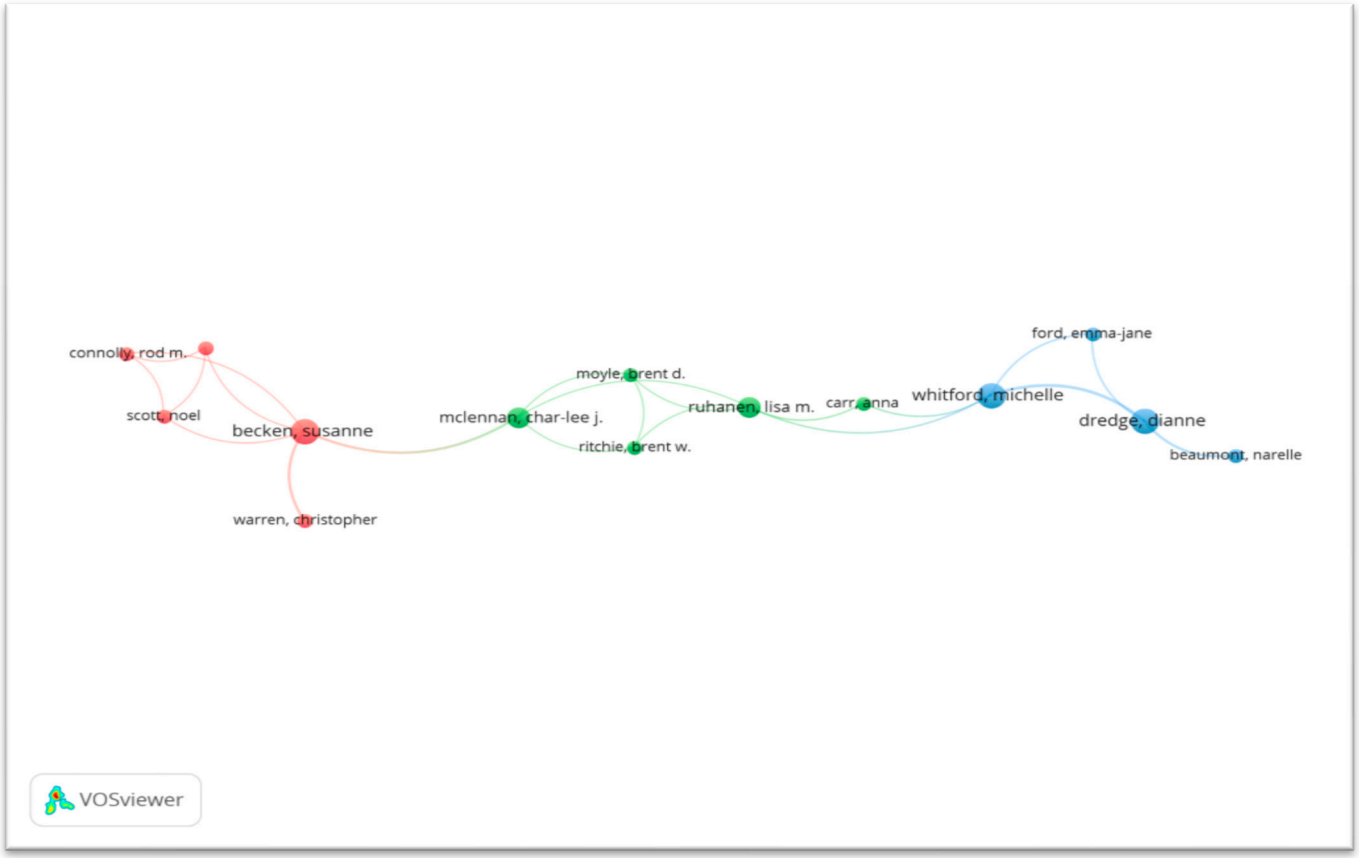

Figure 3. Co-autorship (authors) networks in the Web of Science data. Source: Own elaboration.

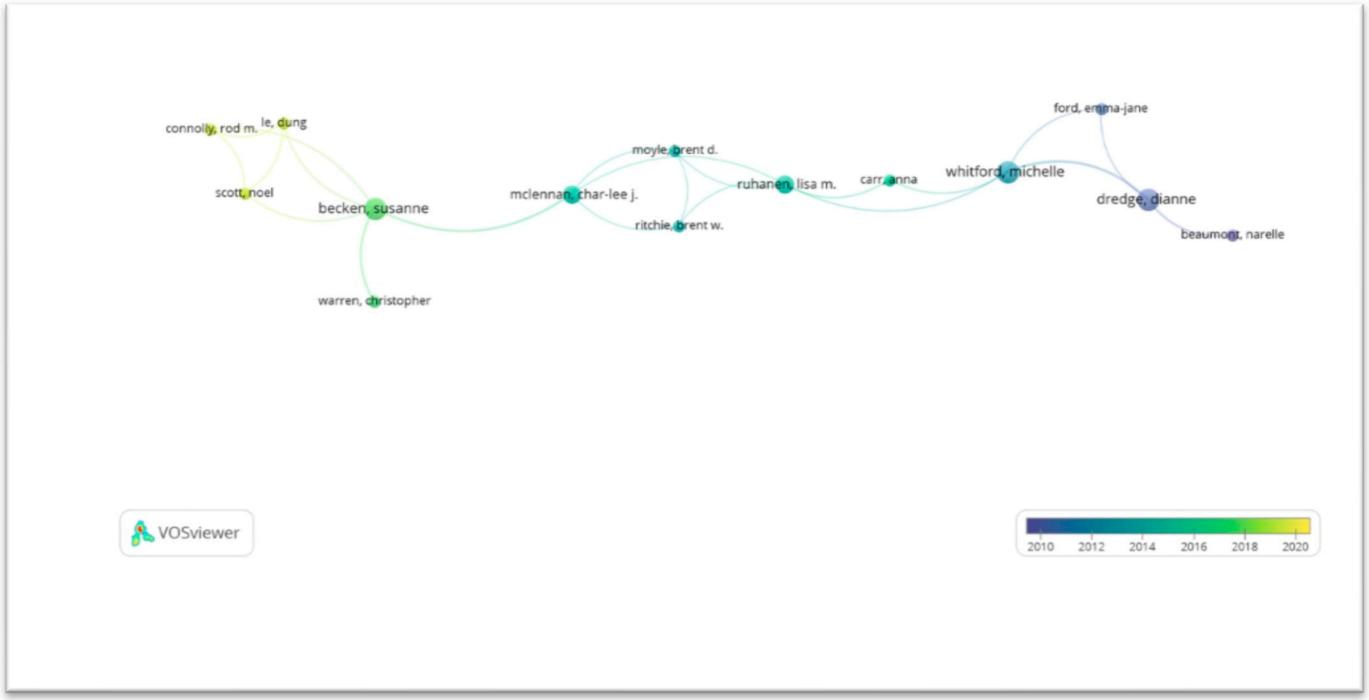

Figure 4. Co-autorship trends (authors) networks in the Web of Science data. Source: Own elaboration.

4.1.3. Co-Citation Analysis

Co-citation analysis is a scientific mapping technique that shows whether the cited publications, authors or journals have been cited jointly by the publications in the database sample [73]. The more times they have been jointly cited, the stronger the scientific map link [37,74]. This type of analysis was introduced by Small [74] in the field of physics. It is useful for revealing the intellectual structure of a given research field [75], changes in the literature over time [37] and the underlying themes [76], which can help researchers to highlight disciplinary contributions in an interdisciplinary field [70]. Following the recommendations of Fauzi [47], we apply the co-citation of documents because it is the most appropriate analysis with the aim of mapping the intellectual structure of a given field. Having applied a cut-off point of nine citations per document, we analyzed 35 cited references in our co-citation analysis. Table 6 shows the 10 documents with the highest numbers of co-citations.

Our co-citation analysis produced four main groups (Figure 5). Based on the theme of the most representative publications, we obtained the label of each group based on inductive and qualitative interpretations. To do this, we reviewed the keywords of the publications as well as their main findings and the methodological aspects, following Fauzi's [47] recommendations.

- Cluster 1 (red colour): The use of measurement indicators in the economic sphere is of great importance because its main objective is to observe the situation we are in and establish plans for the future [77]. In the management of sustainable tourism, the use of indicators is particularly relevant, because it allows for one to quantify whether a destination is sustainable [78] and, consequently, to introduce plans to reduce tourism's environmental impact [79]. This cluster comprises studies analyzing the impact of sustainable tourism through the introduction of a series of indicators, with the aim of establishing recommendations for the management and introduction of sustainability policies in destinations. For example, Choi and Sirakaya [80] developed an index to quantify sustainable tourism at the local level through 125 indicators (32 political, 28 social, 25 ecological, 24 economic, 13 cultural and 3 technological). Furthermore, Miller [81] developed an indicator with the objective of quantifying the sustainability of hotels.
- Cluster 2 (green colour): The United Nations' 2030 Agenda for Sustainable Development has established a series of recommendations to achieve sustainable development (United Nations Development Programme (UNDP), 2023) [82], which are collected by UNWTO with the aim of creating environmentally responsible tourist destinations (UNWTO, 2017, 2023) [22,66]. To this end, it is necessary to introduce sustainable tourism programmes that act in accordance with the prerogatives of the planet and that include all the actors involved [5]. The importance of planning in tourism has already been underlined by Jamal and Getz [83], showing the interdependencies among multiple stakeholders in tourist destinations. Various studies have highlighted the need to introduce programmes to sustainably manage tourist destinations. For example, Hall [5] criticized the current lack of commitment to sustainable tourism management planning and has recommended the introduction of serious policies to act in accordance with the 2030 Agenda.
- Cluster 3 (blue colour): Environmental management in the tourism field includes measures to avoid the harmful impacts of tourism activity while saving economic resources [84]. This cluster is focused on the analysis of the energy transition of hotels in order to achieve sustainability through capital investment and employee training [85]. For example, Molina-Azorín et al. [86] have revealed a positive relationship between the introduction of environmental measures in hotels and improvements in their economic performance. Erdogan and Baris [87] have recommended the introduction of sustainable practices in the Turkish hotel industry, which lacked sustainability programmes at the time. Best and Thapa [84] reached the same conclusions in relation to the Caribbean hotel industry.

- Cluster 4 (yellow colour): Tourism has negative consequences for the environment, including the depletion of natural resources (water and energy), the spread of diseases, environmental contamination, the extinction of species and soil degradation [88,89]. This cluster is focused on analyzing the negative impacts of tourism on the environment with the aim of providing recommendations regarding the management of tourist destinations so that they can act in accordance with sustainability objectives. For example, Gössling [88] has analyzed five aspects of the alterations in the environment due to tourist activity: changes in land use, use of energy, extinction of wild species, spread of diseases and loss of local entity of tourist destinations. Hunter [90] has analyzed different policies in the management of tourist destinations so that they can act in a sustainable manner, and has underlined the problems that occur where there is no joint action by the different actors involved.

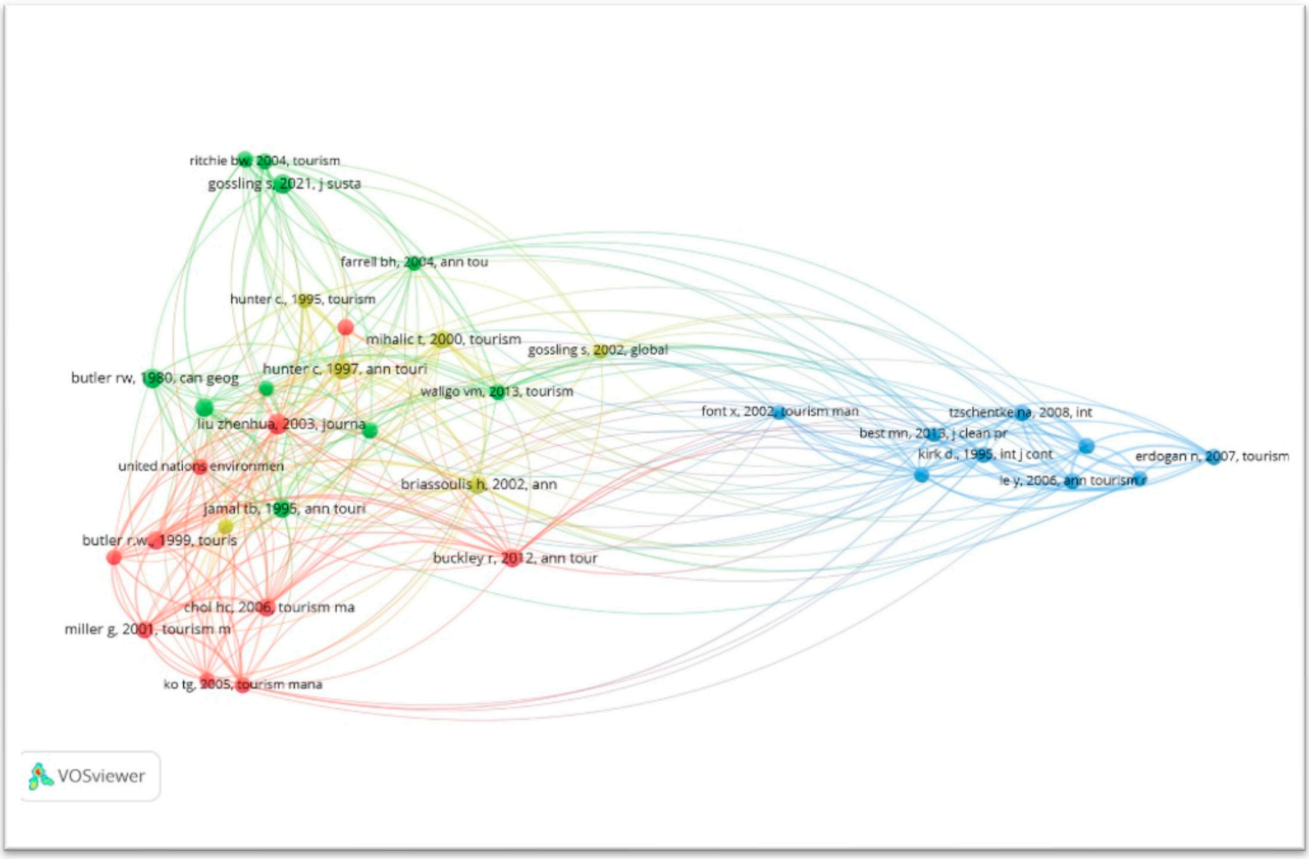

Figure 5. Co-citation (documents) networks in the Web of Science data. Source: Own elaboration.

Table 6. Top ten documents in the co-citacion analysis in the Web of Science data.

Article	Citation	Total Link Strength
[91]	17	302
[90]	16	321
[92]	15	258
[93]	15	156
[94]	14	309
[80]	14	303
[83]	14	273
[93]	13	243
[94]	13	243
[55]	13	201

Source: own elaboration.

Table 7 presents the summary of the co-citation analysis based on the representative groups and publications.

Table 7. Co-citation clusters in the Web of Science data.

Cluster n° and Colour	Cluster Label	N° of Articles	Most Representative Publications
1 (red)	Assessment of tourism sustainability	10	[80,81,91,93,95–97]
2 (green)	Protection programs in the tourism sustainability	10	[5,83,92,94,98–100]
3 (blue)	Transition to sustainable tourism	9	[84,86,87,101–103]
4 (yellow)	Current issues in the sustainability in tourism	6	[54,88–90]

Source: own elaboration.

4.2. Content Analysis

Co-word analysis is used for carrying out a content analysis of sample publications based on keywords. It was introduced by Callon et al. [104] in the field of sociology. Unlike the other analyses provided by VOSviewer, which are oriented to the study of bibliographies, such as citation, co-citation, co-authorship and bibliographic coupling, co-word analysis is focused on the content of publications [31]. Its main function is to explore the interaction of keywords with the aim of suggesting the most prominent and influential themes currently under study [105] as well as future research trends [46]. WoS provides two types of keywords: 'Author Keywords', which are the keywords provided by the authors, and 'Keywords Plus', which are the keywords indexed by WoS, produced automatically from the titles of the cited references of the documents analyzed [106]. Following Zhang et al. [107] recommendations, in our analysis we only used 'Author Keywords', because 'Keywords Plus' are less complete in representing the content of an article. Of the 959 keywords, only 28 met the threshold of appearing at least six times. Table 8 summarizes the top 15 keywords, their number of occurrences and total link strength.

Table 8. Top 15 keywords in the Web of Science data.

Rank	Keywords	Occurrences	Total Link Strength
1	sustainable tourism	115	519
2	tourism management	52	225
3	tourism	35	152
4	sustainability	35	141
5	environmental management	29	128
6	sustainable development	24	99
7	COVID-19	19	94
8	ecotourism	16	75
9	protected area	15	65
10	sustainable management	14	62
12	crisis management	13	60
11	tourism development	11	52
13	community	10	50
14	stakeholder	10	41
15	conservation	8	44

Source: own elaboration.

Starting with the five clusters provided by VOSviewer, we classified and labelled each cluster based on the posts that each keyword represents. On the network map, it can be seen that the clusters are closely related and provide a network of interconnected clusters (Figure 6 and Table 9). In addition, Figure 7 presents the temporal evolution of the use of keywords in order to show the trend and future lines of research. Based on these two maps, we present the clusters, depending on the content and their temporal evolution.

- Cluster 1 (red colour): Ecotourism is defined as nature-based tourism whose main motivation for tourists is the observation and appreciation of nature or the traditional

cultures predominant in natural spaces [108]. This topic has great relevance in Asia because a large portion of the researchers come from this region. It has current relevance because it protects the environment [109], avoids the negative effects of mass tourism [110] and respects the traditions and way of life of the local population [111]. Numerous studies have analyzed ecotourism from the perspective of management. For example, Rahimian et al. [112] have assessed the factors that have a negative impact on ecotourism in Iran due to the COVID-19 pandemic, concluding that correct management can contribute to the recovery of tourist destinations. Pornprasit and Rurkkhum [113] have investigated the management of ecotourism in tourist destinations in Thailand, recommending new policies in destination management with the aim of allowing for greater participation of the local population.

- Cluster 2 (green colour): Crises cause unwanted situations in the economy, politics and society, with long-term negative consequences [114]. In business contexts, crisis management involves making decisions in situations of uncertainty and often when key information is incomplete or unknown [115]. As Figure 7 shows, this cluster has the most current relevance due to the COVID-19 pandemic, a crisis that compelled tourist destinations to adapt to travel restrictions, for example, by focusing activity on local tourism or sustainable destinations [27]. In this regard, Ertac and Cankan [116] have analyzed the increase in demand for sustainable tourism in North Cyprus, while Gomez [117] has drawn similar conclusions concerning Arizona and Milan. It is noteworthy that, due to the impact of COVID-19 on tourism, a large portion of Chinese researchers have investigated the management of the pandemic in tourism management. However, due to the global relevance of this fact, European researchers also highlight this issue.
- Cluster 3 (blue colour): Sustainable development is defined as 'development that meets the needs of the present without compromising the ability of future generations to meet their needs' [118] (World Commission on Environment and Development, WCED, 1987). In order to achieve sustainable tourist destinations, it is necessary to introduce policies that are in accordance with the principles of sustainable development [119]. This topic has great relevance in America, especially among South American researchers. Various studies have analyzed a range of policies introduced by tourist destinations with the aim of achieving sustainable development. For example, Klaučo [120] have analyzed sustainable development in rural regions of Slovakia, Smerecnik and Andersen [121] in North American hotels, Figueroa and Rotarou [122] on Easter Island, and Abdou et al. [123] in Egypt.
- Cluster 4 (yellow colour): Wild tourism is a type of tourism limited to observation and non-consumptive encounters with the wildlife of a protected area [124]. Unplanned tourism development in protected areas can lead to environmental degradation [125] and threaten ecological integrity [126]. Different studies have analyzed the negative impact of overtourism in national parks, where management is more focused on commercial tourism development than on environmental preservation [127]. Example studies include Prakash et al. [126] in Sri Lanka, McNicol and Rettie [127] in Canada, Badola [128] in the Himalayas and Arsić et al. [129] in Serbia.
- Cluster 5 (purple colour): Hotels are the central element of tourist accommodation in tourist destinations [130], paying special attention to planning and management regarding sustainability [131]. This is due to the consumption of two natural resources: water and energy [132]. Therefore, the managers of tourist destinations are increasingly introducing eco-friendly strategies [133], with two main objectives: on the one hand, to save energy [134]; on the other hand, to improve tourist satisfaction [135]. A large portion of the researchers who analyze sustainable tourism are Spanish researchers. Different studies have analyzed hotel management from a sustainability point of view, including Wickramasinghe [132] in Sri Lanka, Stylos et al. [136] in the Dominican Republic, and Salehi et al. [137] in Iran.

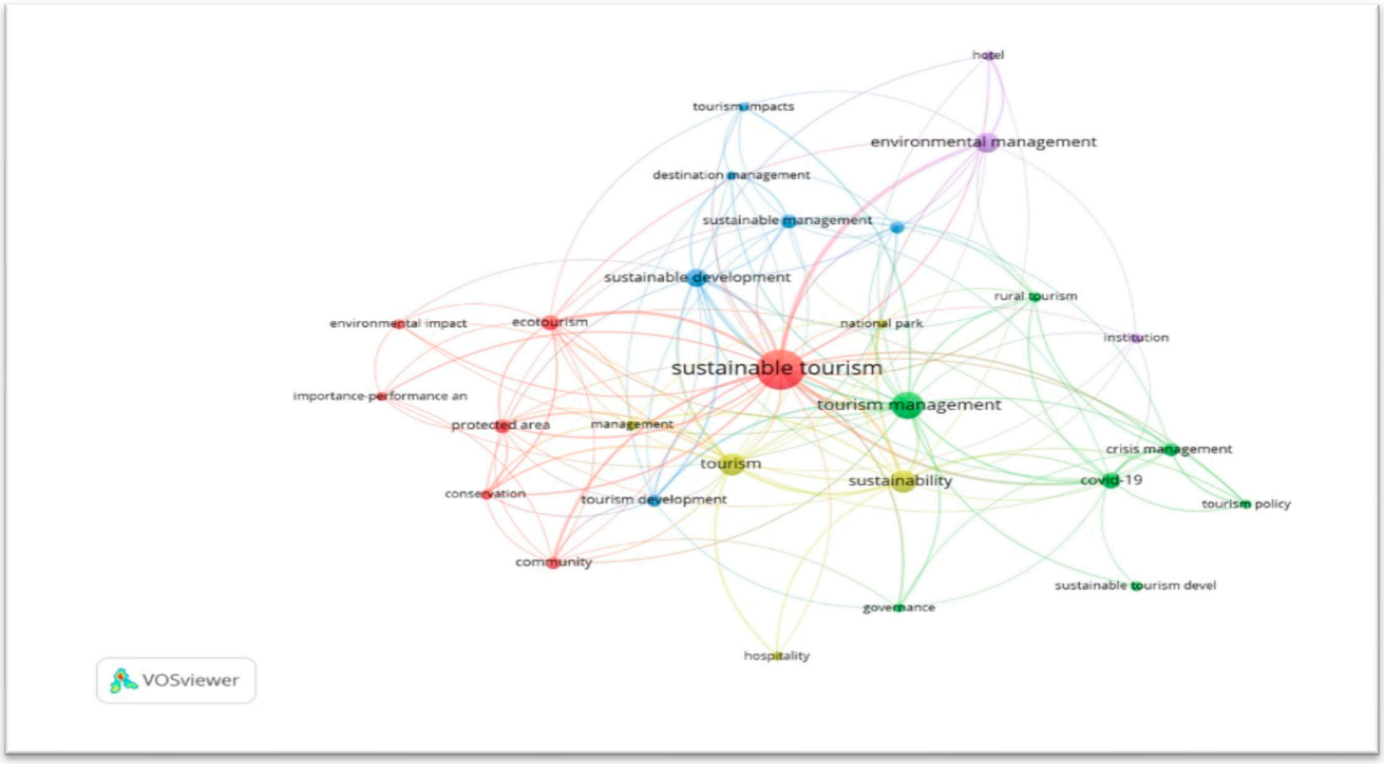

Figure 6. Co-occurrence ('Author Keywords') networks in the Web of Science data. Source: Own elaboration.

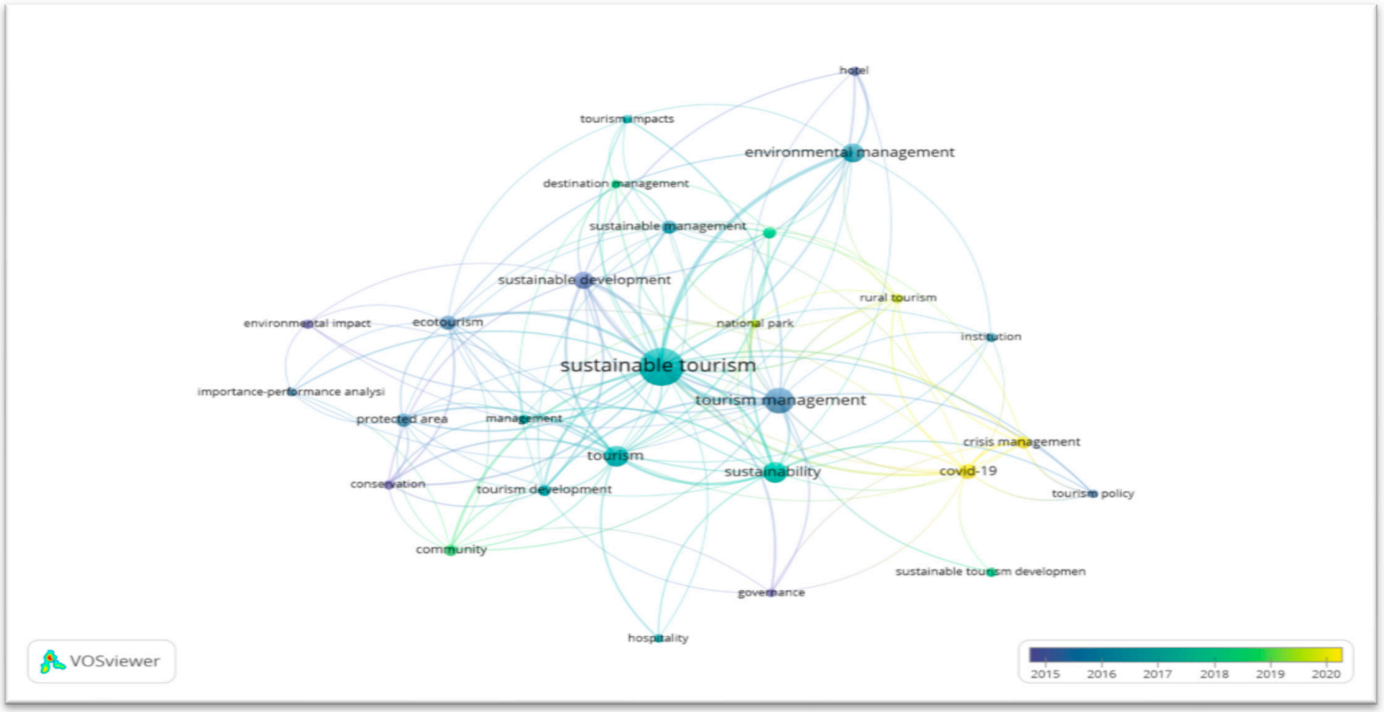

Figure 7. Time evolution in co-occurrence ('Author Keywords') networks in the Web of Science data. Source: Own elaboration.

Table 9. Co-word clusters in the Web of Science data.

Cluster n° and Colour	Cluster Label	N° of Keywords	Most Representative Keywords
1 (red)	Ecotourism in the sustainability of tourism	7	Community, conservation, environmental impact, protected area, sustainable tourism, ecotourism
2 (green)	Managing the crisis in the tourism	7	COVID-19, crisis management, tourism management, tourism policy, sustainable tourism development
3 (blue)	Development of sustainable tourism policies	6	Destination management, sustainable development, sustainable management, tourism development
4 (yellow)	National parks and sustainability in tourism	5	Hospitality, management, national park, sustainability, tourism
5 (purple)	Managing sustainable hotels	3	Hotel, institution

Source: own elaboration.

Table 9 summarizes the co-occurrence of keywords through cluster labels and representative keywords.

5. Conclusions

Interest in the concept of sustainable tourism management has been growing exponentially due to the increasing demand for this type of tourism. In accordance with the recommendations presented by the UN 2030 Agenda for Sustainable Development, UNWTO recommends that tourist destinations change the perspective of management towards sustainable tourism, with the aim of acting in accordance with the prerogatives of the planet. In addition, in the past decade, tourists' environmental awareness and demand for more sustainable tourist destinations have increased, recognizing that the environment is a global concern. Accordingly, scientific research regarding this subject has grown gradually since 2011, registering peaks in production in 2022 and citations in 2020.

Such emerging and growing interest in sustainable tourism management prompted us to carry out this study, with the aim of providing a complete analysis of relevant academic research on the role of sustainable tourism management through bibliometrics. The results of previous studies made it possible to carry out an inventory of the scientific production of sustainable tourism management on WoS between 1996 and April 2023.

Our bibliometric analysis addressed a total of 317 articles from 133 high-impact scientific journals. First, we found that the most-cited articles focus on either the tourism industry's management of the COVID-19 pandemic in tourism through the implementation of sustainability policies, environmental competitiveness through management or the management of sustainable tourism in heritage sites. Second, regarding the collaborative relationships between authors, we highlighted the international and inter-institutional nature of this field of study, proving the global relevance of the topic. Third, concerning the co-citation analysis, we affirmed the existence of four related clusters: the evaluation of sustainable tourism, protection programmes in sustainable tourism, transition programmes towards sustainable tourism and problems related to sustainable tourism. Fourth, and finally, our content analysis revealed the existence of five clusters related to ecotourism, crisis management, the development of sustainability policies, national parks and sustainable hotels.

In terms of our bibliometric study's theoretical applications, for businesses, the competitiveness challenges they face are closely linked to achieving sustainable development goals that reduce negative impacts on the environment, promoting the conservation of natural resources and encouraging innovation in environmentally responsible services. As the environmental awareness of tourists increases, we can find new businesses that offer a greater commitment to the environment, such as hotels, wild tourism and ecotourism.

Regarding the limitations of our research, we should note the problem of using WoS as the only database, as it is biased in favour of English-language publications. In addition, the exclusive use of VOSviewer as an analysis tool precludes recognition of those thematic

areas receiving greater consideration by researchers within a specific knowledge area, something that can be achieved through the use of other bibliometric analysis programmes.

In terms of our bibliometric study's practical applications, in addition to providing theoretical elements for future research on sustainable tourism management, we have shown that sustainable tourism is an intangible marketing variable that can be used by tourist destinations to increase their competitiveness. Finally, in relation to future lines of research, it would be interesting to carry out new bibliometric analyses using other databases (e.g., Scopus or Google Scholar) to compare the obtained results and explore emerging concepts and new research trends related to sustainable tourism management.

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