

Ecotourism and Sustainability: A Bibliometric Analysis Using R

By

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ABSTRACT

Sustainability development in ecotourism is a benchmark for this study which may change over time. This research aims to analyse the relationship between ecotourism and sustainability using a literature review and bibliometric analysis. The research conducted in this paper focused on intellectual structure, volume, knowledge development, the author and source impact. In this research, we will use Microsoft Excel, VOS Viewer Software, and R Studio to analyse databases and gather more information from Scopus. This study uses subjective measures to examine the connections between a resource, community, and tourism to evaluate the sustainability of ecotourism. We identify an increase in the volume of articles on ecotourism published in the last three years. Moreover, Ecotourism has recently grown at a rapid pace. The bibliometric study uses R to identify the subject's most influential journals, authors, and papers. This study also provides a key and crucial element of ecotourism and sustainability into a single concept.

Keywords: ecotourism, sustainability, bibliometric analysis

INTRODUCTION

Existing knowledge of ecotourism

Ecotourism is now defined as "responsible travel to natural areas that protect the environment, promotes the well-being of local citizens, and includes analysis and education" (Titisari, 2022). Ecotourism combines conservation, community, and environmentally friendly travel. This means that those who implement, participate in, and market ecotourism activities should adhere to ecotourism principles. Minimizing physical, social, behavioural, and psychological impacts, providing positive

experiences for both visitors and hosts, increasing environmental and cultural awareness, and providing direct financial benefits to conservation are all principles of ecotourism. Ecotourism has long been viewed as ensuring that tourism contributes to biodiversity and natural heritage conservation while economically assisting local communities with important ecosystems, landscapes, and species. The links between tourism and natural areas, on the other hand, date back to the establishment of national parks and the delicate balance between conservation and visitors that remains unresolved. Thus, ecotourism is arguably a new wrinkle in the long-standing problem of ensuring a sustainable relationship between tourism and nature. However, the term "ecotourism" has come to refer to a wide range of products, market segments, discommoded nature, branding, operators, and seemingly anything with an ecological component (Colin, 2020).

Limitations and gaps

Ecotourism occurs when tourists, visitors, and locals are ethically aware and generally concerned about the surroundings, nature, and civilizations of the areas they visit. It usually focuses on preventing things like polluting the environment, affecting flora and fauna's natural life, causing damage to the areas visited, and making locals' lives more challenging (Mahmoud Ramadan Al-Azab, 2019). Ecotourism's goal is thus to provide positive experiences for both tourists and hosts. However, there are numerous problems with ecotourism. This study investigates the issues and the connection between ecotourism and sustainability. As a result, we believe that reviewing previous research on the ecotourism field is a useful way to better understand the current state of ecotourism and its sustainability as a long-term solution to our global floral and fauna problems (Daminda Sumanapala & Isabelle D. Wolf, 2019). As a result, this study aims to analyse and evaluate prior findings on ecotourism and sustainability. Evaluating the current state and publishing trend, the most prominent contributors (authors, articles, and sources), and how the publication's theme in Ecotourism and Sustainability has evolved.

Research Questions

The research questions (RQ) listed below demonstrate the review activities and process using bibliometric, text-mining, and visualization tools (i.e., R studio).

Table 1: Research Questions (RQ)

No.	RQ	Analysis Procedure
1	What is the current state and trend of publication in Ecotourism and Sustainability	<ul style="list-style-type: none"> • Document Type • Source type • Total number of contributors • Number of publications by year/ country • Annual growth rate.
2	What are the most influential contributors to Ecotourism and Sustainability	<ul style="list-style-type: none"> • Most influential authors • Most relevant sources • Most influential countries • Most influential source title

3	What is the most influential article, authors and sources on Ecotourism and Sustainability	<ul style="list-style-type: none"> • Highly cited documents • Author Impact • Lotka's Law • Source Impact • Bradford's Law • Co-occurrence network
4	How the theme of the publication has evolved in Ecotourism and Sustainability	<ul style="list-style-type: none"> • Thematic evolution • Trend Topic • Word Dynamic • Word Cloud • Tree Map

This article moves on to a more in-depth discussion and analysis after briefly reviewing essential definitions for Ecotourism and Sustainability. The methodology section of the paper describes the methods used in this investigation, including the data searching process, data collection, extraction, and analysis. The research findings were explained in the section that followed. This paper's discussion and conclusions section highlights the study's findings, describing in detail the key findings and their implications and explaining the study's limitations and future directions.

LITERATURE REVIEW

Ecotourism and sustainability

Ecotourism has been discussed in academic circles since the late 1980s, It is a type of nature-based tourist industry that preserves the local society's well-being. In addition, it also protects the environment and provides tourists with an enjoyable natural landscape and satisfaction. Furthermore, ecotourism entails traveling responsibly to fragile, immaculate, and mainly secured zones. This occurs for various reasons, including helping to educate travellers, cultivating tolerance for various cultures, and supporting the financial and political autonomy of surrounding communities (Garana, 2008). With unrestrained extra emphasis on the natural ecosystem and the enhancement of environmental consciousness, ecotourism has become increasingly popular, and tourist industry demand is growing yearly (CREST, 2019). This rise, however, brings with it a slew of environmental, cultural, and economic crises for the growth of ecotourism. For instance, the development of foreign visitors can stifle natives' flexibility of cultural expression, making some feel threatened. Furthermore, most natives are viewed as side tourist guides, resulting in them feeling stereotyped and encouraging stigmas. In addition, interaction among visitors and locals may result in a general transition throughout lifestyle.

Previous study reveals that there is a significant relationship among tourism and sustainability. However, how much the topic involvement in commercial organizations should have in sustainable development efforts is still up for debate. At the same time, despite numerous discussions and studies on the ecotourism and sustainability, the fundamental issues remain unresolved. Ecotourism is facing several ongoing issues that need to be addressed. Furthermore, some previous studies believe that Ecotourism has a lot of potential to promote long-term sustainable development by reducing

environmental impacts during ecotourism adventures. Furthermore, Eco-tourists and travellers should choose organizations or programmes that educate and predominantly aim to improve the environment. As a result, at this time, it is appropriate to discuss the extent to which previous academics have studied this topic. Table 2 depicts some previous studies on ecotourism that require additional research to understand the relationship between ecotourism and sustainability fully.

Table 2: Summary of previous studies in ecotourism and sustainability

Author	Domain/Search Strategy/ Title	Data Source & Scope	TDE	Bibliometric Attributes Examined
(Titisari P.W., Elfis, Chahyana I., Janna N., Nurdila H., Widari R.S., 2022)	Management Strategies of Mangrove Biodiversity and the Role of Sustainable Ecotourism in Achieving Development Goals	Scopus	100	Type of publication Publications per year Highest citation Author, institution, country, Source and co-occurrence Keywords trends Bibliographic coupling
(Rahman A.A., Zainol N., Ramli A., Manzoor H., 2020)	Challenges in Creating Ecotourism in Rural Area: A Case of RK Eco Farm Business Venturing	Scopus	723	Type of publication Publications per year Frequency of paper Co-occurrence of keywords Citations documents Co-Citation relationships Bibliographic coupling
(Cardinali P., Varani N., Migliorini L., 2020)	Sustainable tourism attitude and preference in Italian adults: Value orientation and psychological need satisfaction	Scopus	240	Most Relevant Words Word Cloud Trend Topics Productive journals Authors productivity Keywords trends Publication trend
(Vantola R., Luoma E., Parviainen T., Lehikoinen A., 2021)	Sustainability manifesting as a multi-material and -sited network effect: How boat-sourced sewage management facilities serve as governance artifact advancing sustainability in nautical tourism	Scopus	58	Document Types Three Fields Plot Authors Impact Publication trend Highest citation Productive journals
(Khanra S., Dhir A., Kaur P., Mäntymäki M., 2021)	Bibliometric analysis and literature review of ecotourism: Toward sustainable development	Scopus	192	Bibliographic coupling Citation analysis Prestige analysis Coward analysis
(Hasana U., Swain S.K., George B., 2022)	A bibliometric analysis of ecotourism: A safeguard strategy in protected areas	Scopus	102	Productivity of journals and authors Number of publications Documents and author citation Co-occurrence analysis Co-authorship analysis Co-citation analysis Bibliographic coupling

TDE=Total documents examined

METHODOLOGY

Searching strategy

A search strategy is a list of search terms that are well-organised. For accurate and comprehensive results, the search strategy will incorporate keyword search principles (Piccarozzi et al., 2021; Salameh et al., 2020). This study used PRISMA (Preferred Reporting Items for Systematic Reviews) and bibliometric analyses (see Figure 1). This method thoroughly examines the knowledge gained over time (Visser et al., 2021). Bibliometric procedures, such as finding relevant articles in a database, are commonly used to filter and refine bibliographic data (such as Scopus). At this point, the data is displayed using the VOSviewer programme. Bibliometric analysis can identify and forecast future research topics (Paul & Criado, 2020). Scopus, an Elsevier database, contains over 50 million entries from over 5,000 publications (De Mauro et al., 2016). At the same time, our university purchased the Scopus database. The Scopus database was chosen as our primary data source for this reason.

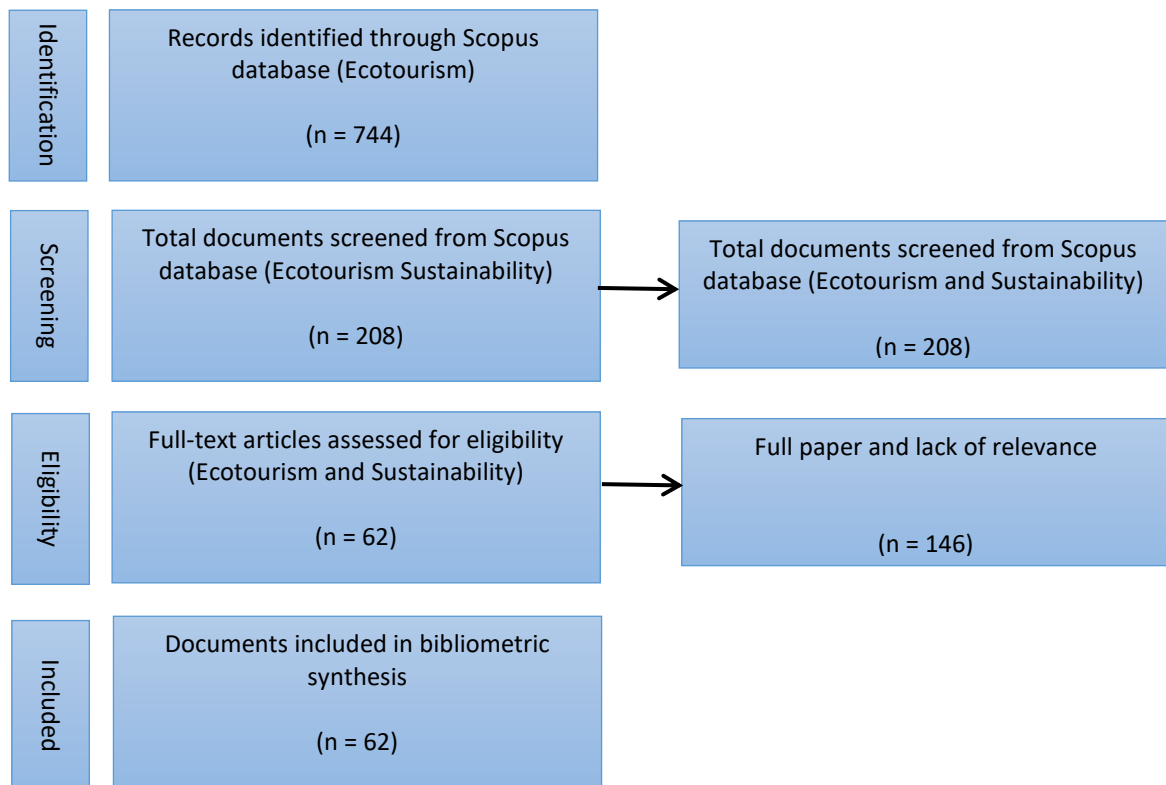


Figure 1: The PRISMA diagram that we used to find, screen, and select articles in our bibliometric review

Inclusion and exclusion criteria

At the beginning of the search, all search results are examined for titles and abstracts following previously established criteria (refer to Table 3). They then examined and summarized all publications that had passed the initial selection procedure. Every piece

of research is based on its volume of publication; most prominent journals and authors; research themes that were frequently discussed. As there was so much literature on ecotourism and sustainability, we constructed a final database of 62 papers from 2020 to 2022. These are journal articles that give writers the option to publish their work in an open-access format.

Table 3: Search criteria

Scopus Category	Searching criteria.	No of article
Topic 1	“Ecotourism”	744
Topic 2	“Ecotourism AND Sustainability”	208
Research years	2020–2022	62
Document Type	All types of publication	62
Language	English	62
Author name	All	62

Extraction techniques

62 journal articles were exported in a format that was compatible with applications, as shown in Table 3. To increase study accuracy, a thorough analysis of the downloaded database was conducted. The extraction process begins by looking for the keywords "Ecotourism" and "Ecotourism AND Sustainability," respectively. We utilized VOSviewer and Excel (.csv) for this study. Bibliometric academic researchers can view bibliometric maps graphically with the free VOSviewer software. The most helpful article title, author, keyword, and citation information, including all references, can be found in the final Scopus database. Analysis of bibliometric data is beneficial because it can identify and foresee potential areas of future research (Paul & Criado, 2020).

Choice of synthesis method (Analysis)

Descriptive analysis was part of the preliminary investigation process. We created a series of graphs in Excel to chart the evolution of publications on ecotourism and sustainability principles over time. Meanwhile, the bibliometric analysis technique was used in the following step. This technique employs citations to identify the most influential papers and researchers on a given topic. Other indicators of academic prominence include the H-index, total citations, and citations per publication. Depending on the results, co-citation analysis may concentrate on the journal, author, keyword co-citations, and so on. We were able to create "network maps" based on article linkages by viewing our sample database with VOSviewer and R studio.

RESULTS

Document profiles

The articles that were found spanned the years 2020 to 2022. Only after 2020 did publications start to become more organised, and they also started to increase gradually and consistently in number. Based on the total of 62 documents (Table 4) considered, there is 43.92% annual growth and the average citation per document is 13.45, while

the total number of references involved is 4576. Furthermore, most of the work in this area is published as articles (95.16 per cent), followed by reviews (4.84 per cent).

Table 4: Document profiles

Description	Results
Main Information About Data	
Time span	2020:2022
Sources (Journals, Books, etc)	62
Documents	62
Annual Growth Rate %	43.92 %
Document Average Age	1.76
Average citations per doc	13.45
References	4576
Document Contents	
Keywords Plus (ID)	191
Author's Keywords (DE)	287
Authors	
Authors	215
Authors of single-authored docs	9
Authors Collaboration	
Single-authored docs	9
Co-Authors per Doc	3.6
International co-authorships %	35.48 %
Document Types	
Article	59 (95.16%)
Review	3 (4.84%)

RQ1: What is the current state and trend of publication in Ecotourism and Sustainability

As seen in Figure 2, there have been more papers published over time that relate to the ideas of ecotourism and sustainability. According to the volume of papers produced, earlier research has paid a significant amount of attention to the topic and scope of the study on ecotourism and sustainability. According to preliminary data from the Scopus database, despite the relatively few publications on the issue at the time, the topic of ecotourism started to get increasing attention in the early 1990s. The trend has been rising since 2002.

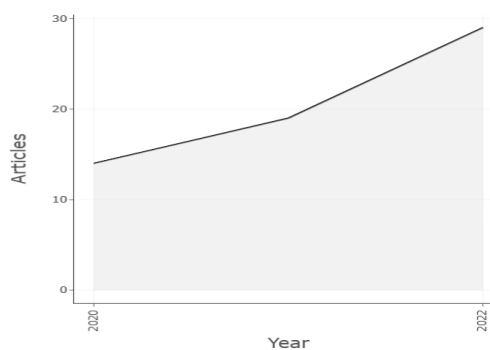


Figure 2: Annual Scientific Production (Total published articles from 2000-2022)

According to the data presented in Figure 2, 33 out of 62 publications were successfully published between 2020 and 2021. These many articles demonstrate how popular this subject is in discussions in the media. Researchers have been introduced to numerous studies by the ecotourism sector and academics who understand the importance of ecotourism from a wider perspective. Furthermore, from 2021 to 2022, the number of articles keeps rising.

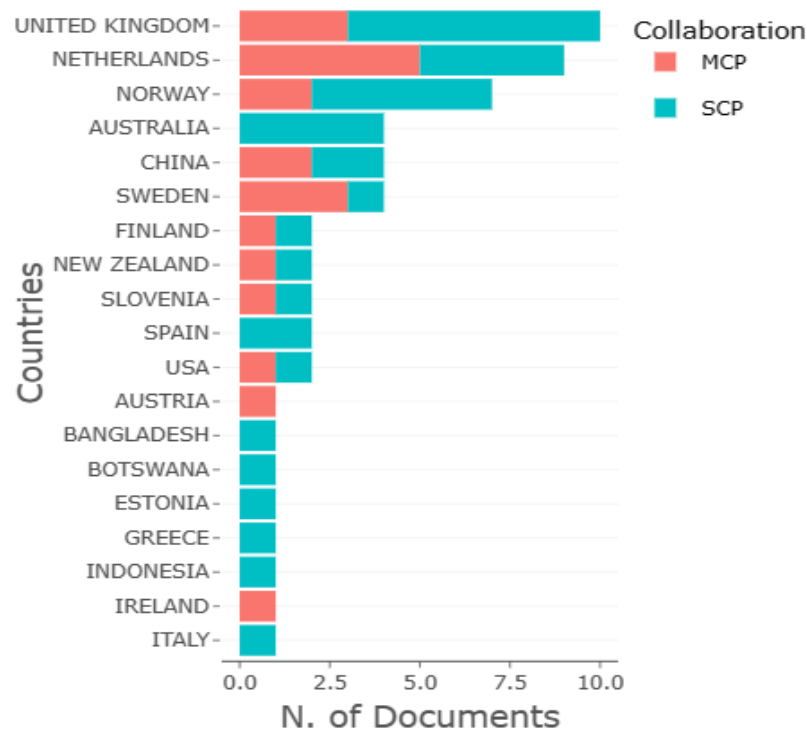


Figure 3: Top 10 highest publications by country

Following Figures 2 and 3, we can see that the top ten countries and categories of papers relating to ecotourism and sustainability are highlighted. Whereas United Kingdom (with 10 articles), Netherlands (with 9 articles), and Norway (with 7 articles) are the top three countries that publish the most articles in this field. Even though most publications are in the form of articles (95.16%) and review papers (4.84%). Overall, Ecotourism and sustainability is a topic that is actively discussed in United Kingdom, while conferences are popular places for discussing and exchanging ideas.

RQ2: What are the most influential contributors to Ecotourism and Sustainability

The study focuses on the most influential countries and institutions, the most influential source titles, the most prominent authors, the writers' production over time, and the second research topic, which is about ecotourism and sustainability. Table 5 showed that the most significant authors and publications were present in the sample database. There are often five authors who have a lot of influence: Ioannides D (2020), Mika JP (2021, 2022), Higgins-desbiolles F (2021, 2022), Dolnicar S (2020, 2022), and Fredman P. (2021). The author with the most citations overall is Ioannides D, with 264,

followed by Mika JP, with 34. Aall C 2022, a new author, also contributes to the publication of ecotourism and sustainability at the same time. The four articles with the most citations are shown in Table 3. With a total of 237 citations, the article with the highest number of citations is the covid-19 problem as an opportunity for abandoning the unsustainable global tourist course. Next, with a total of 27 citations, is "Making do" in rural tourism: the resourcing behaviour of tourism micro-firms. 20 years of Nordic nature-based tourist research: a review and future research agenda, and indigenous tourism and the sustainable development goals, with a total of 21 and 16 citations, respectively.

Table 5: The most influential authors

Author's Name	Title	Journal	TC	AF	TCpY	PY
Aall C	Serious gaming to stimulate participatory urban tourism planning	Journal of sustainable tourism	6	0.13	3.000	2022
Adiyia B	Post-apartheid local sustainable development through tourism: an analysis of policy perceptions among 'responsible' tourism stakeholders around pilanesberg national park, south Africa	Journal of sustainable tourism	12	0.25	3.000	2020
Dolnicar S	Habit drives sustainable tourist behaviour	Annals of tourism research	9	0.67	4.500	2022
Dolnicar S	Carbon labels on restaurant menus: do people pay attention to them?	Journal of sustainable tourism	15	0.67	3.750	2020
Fredman P	The wildlife watching experiences cape: the case of musk ox safaris at dovrefjell-sunndalsfjella national park, Norway	Scandinavian journal of hospitality and tourism	7	1.00	2.333	2021
Fredman P	20 years of Nordic nature-based tourism research: a review and future research agenda	Scandinavian journal of hospitality and tourism	16	1.00	5.333	2021
Higgins-desbiolles F	The ongoingness of imperialism: the problem of tourism dependency and the promise of radical equality	Annals of tourism research	3	1.17	1.500	2022
Higgins-desbiolles F	Indigenous tourism and the sustainable development goals	Annals of tourism research	22	1.17	7.333	2021
Ioannides D	"Making do" in rural tourism: the resourcing behaviour of tourism micro-firms	Journal of sustainable tourism	27	1.00	6.750	2020
Ioannides D	The covid-19 crisis as an opportunity for escaping the unsustainable global tourism path	Tourism geographies	237	1.00	59.250	2020
Koens K	Identifying stakeholder perspectives and worldviews on sustainable urban tourism	Current issues in tourism	15	0.33	5.000	2021

	development using a q-sort methodology						
Koens K	Serious gaming to stimulate participatory urban tourism planning	Journal of sustainable tourism	6	0.33	3.000	2022	
Mayer I	Identifying stakeholder perspectives and worldviews on sustainable urban tourism development using a q-sort methodology	Current issues in tourism	15	0.33	5.000	2021	
Mayer I	Serious gaming to stimulate participatory urban tourism planning	Journal of sustainable tourism	6	0.33	3.000	2022	
Melissen F	Identifying stakeholder perspectives and worldviews on sustainable urban tourism development using a q-sort methodology	Current issues in tourism	15	0.33	5.000	2021	
Melissen F	Serious gaming to stimulate participatory urban tourism planning	Journal of sustainable tourism	6	0.33	3.000	2022	
Mika JP	Indigenous tourism and the sustainable development goals	Annals of tourism research	22	0.67	7.333	2021	
Mika JP	Te awa tupua: peace, justice, and sustainability through indigenous tourism	Journal of sustainable tourism	12	0.67	6.000	2022	

Notes: TC=total citations; AF=articles fractionalized; PY=publication year; TCpY=total citation per year



Figure 4: The most relevant sources

The most prestigious academic journals are peer-reviewed, which means that each contribution is evaluated before publication by academics with expertise in the same field as the author and editor. They should make that the researcher used the proper methods, that the work contributes to the field, and that new material is presented in the

context of what is already known. The 10 most pertinent sources for information on ecotourism and sustainability are shown in Figure 4. The Journal of Sustainable Tourism is the most prominent publication in this discipline, followed by Scandinavian Journal of Hospitality and Tourism, Annals of Tourism Research, Journal of Ecotourism, Tourism Management, Journal of Travel Research, Current Issues in Tourism, Pertanika Journal of Social Sciences and Humanity. Next, Tourism Geographies and Tourism Planning and Development. Peer review is a crucial part of this journal's publishing process, which ensures its accuracy and value to the sectors in which it is published.

RQ3: What are the most influential articles and sources on Ecotourism and Sustainability Highly Cited Documents/ Papers

This renowned rating honours the top scientists in the world whose Web of Science citation records are rated in the top 1% of their respective fields. Being listed among the works that have been most frequently mentioned is a sign of a distinguished and successful academic career. Additionally, the number of times a researcher's works are cited significantly raises the exposure and potential reputation of their affiliations with larger universities (Martnez et al., 2015). However, several outside factors that don't appear to be directly related to the "quality" of the article's content affect the total number of citations an article receives (Fahimifar et al., 2022). Table 6 lists the 10 articles and papers on ecotourism and sustainability that have been cited the most.

Table 6: Most cited documents/papers

Paper	Total Citations	% Cited	TC per Year	% TCpY	Normalized TC	% NTC
Ioannides D, 2020, tour geogr	237	42.32	59.25	37.84	6.72	23.50
Mihalic T, 2020, ann tour res	61	10.89	15.25	9.74	1.73	6.05
Khanra S, 2021, tour manage perspect	49	8.75	16.33	10.43	4.17	14.59
Xu F, 2020, j sustainable tour	46	8.21	11.50	7.34	1.30	4.55
Wu J, 2021, j travel res	44	7.86	14.67	9.37	3.75	13.12
Gössling S, 2022, j sustainable tour	28	5	14.00	8.94	6.94	24.27
Breiby Ma, 2020, scand j hosp tour	27	4.82	6.75	4.31	0.77	2.69
Yachin Jm, 2020, j sustainable tour	27	4.82	6.75	4.31	0.77	2.69
Scheyvens R, 2021, ann tour res	22	3.93	7.33	4.68	1.87	6.54
Hambro Dybsand Hn, 2020, tour manage	19	3.92	4.75	3.03	0.54	1.89

Notes: PY=publication year; TC=total citations

Author impact

Based on the h-Index, authors whose papers have been published can also be ordered based on the ensuing impact (Hirsch, 2005). The most used index is the H-index (an author has an h-index of h if they have at least h works that have been referenced h times). The G-Index is comprised of the G articles with the most citations (Egghe, 2006). Meanwhile, M-Index is calculated by dividing the H-index by the number of years a

scientist has been active. Based on Table 7 shows that the authors with the highest h-Index and G-index obtained by Dolnicar S, Fredman P, Higgins-desbiolles F, Ioannides D, Koens K, Mayer I, Melissen F and Mika JP with the achievement of a total 2 h-index that describer significant impact. Then followed by 2 authors Aall C, and Adiyia B with an h-Index and g-index value of 1 with a fairly good impact. Besides, the most active authors are Fredman P, Higgins-desbiolles F, Koens K, Mayer I, Melissen F, and Mika JP with a value of m-Index of 0.667. Finally, the most significant contributor with the highest citation (i.e., TC) is Ioannides D with a total of 264 (55.93%) citations, followed by four authors Mika JP, Higgins-desbiolles F, Dolnicar S, and Fredman P with a total citation of 34 (7.20%). All this information was produced around the year 2020 to 2022.

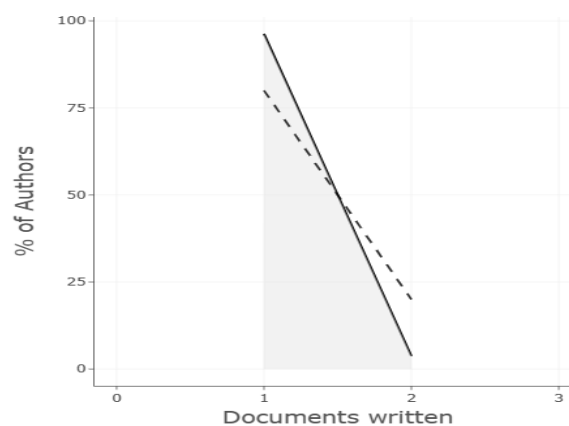
Table 7: The 10 most impactful author

Author (s)	h_index	g_index	m_index	TC	% TC	NP	PY_start
Dolnicar S	2	2	0.500	24	5.08	2	2020
Fredman P	2	2	0.667	23	4.87	3	2021
Higgins-desbiolles F	2	2	0.667	25	5.30	2	2021
Ioannides D	2	2	0.500	264	55.93	3	2020
Koens K	2	2	0.667	21	4.45	2	2021
Mayer I	2	2	0.667	21	4.45	2	2021
Melissen F	2	2	0.667	21	4.45	2	2021
Mika JP	2	2	0.667	34	7.20	2	2021
Aall C	1	1	0.500	6	1.27	1	2022
Adiyia B	1	1	0.250	12	2.54	1	2020

Notes: PY=publication year; TC=total citations; NP=number of publications; h=h-index; m=m index; and g=g-index.

Documents written	N. of Authors	Proportion of Authors
1	207	0.963
2	8	0.037

Figure 5: Lotka's Law



Lotka's Law

The well-known "inverse square law of scientific creation" is Lotka's Law. It contends that the ratio of authors who publish a certain number of papers to those who only publish one article stays constant (Friedman, 2015). In other words, it describes how often authors publish in a particular topic (Maz-Machado et al., 2017). Since then, numerous researchers from various fields have examined author production and publications using Lotka's Law (Friedman, 2015). The observed and fitted Lotka's distributions are shown in Figure 5. There have been 1 and 2 papers published. The relationship between the number of contributing authors and the number of published papers is clearly shown in Figure 5 above.

Source impact

The h-index, g-index, m index, and total citation of each journal that publishes a paper about ecotourism and sustainability are also taken into consideration in this study. The Journal of Sustainable Tourism tops the rankings in Table 8's data, with a h Index of 8, g Index of 14, m Index of 2.000, and 228 total citations. As a result, the study of ecotourism and sustainability is most impacted by the Journal of Sustainable Tourism. In contrast, Tourism Management, Annals of Tourism Research, Journal of Travel Research, and Scandinavian Journal of Hospitality and Tourism hold the second, third, fourth, and fifth spots, respectively, with h Index values of 4 and 3. Their total number of citations varied from 39 to 95. Concerning journals with h-Index 1, there are 5 journals with a total number of citations ranging from 1 to 19, which shows the journal has a minimal impact.

Table 8: The 10 most impactful sources

Source	h_index	g_index	m_index	TC	% TC	NP	PY_start
Journal of sustainable tourism	8	14	2.000	228	43.68	23	2020
Tourism management	4	4	1.000	39	7.47	4	2020
Annals of tourism research	3	5	0.750	95	18.20	5	2020
Journal of travel research	3	3	1.000	62	11.88	3	2021
Scandinavian journal of hospitality and tourism	3	6	0.750	56	10.73	6	2020
Current issues in tourism	2	2	0.667	19	3.64	2	2021
Academic journal of interdisciplinary studies	1	1	0.333	3	0.57	1	2021
International journal of tourism research	1	1	0.500	1	0.19	1	2022
Journal of destination marketing and management	1	1	0.250	13	2.49	1	2020
Journal of ecotourism	1	2	0.333	6	1.15	4	2021

Bradford's Law

If the core and middle zone numbers are known, Bradford's formula should be able to anticipate the total number of journals carrying articles on a subject because it predicts

that the number of journals in the second and third zones will be n and n^2 times higher than the first zone (Fairthorne, 2005; Garfield, 1980). It should be able to calculate how much essential information is missing from an incomplete search once the whole number of articles is known. It would be helpful for such research if Bradford's law accurately anticipated the number (and, if feasible, quality) of the literature given the time-consuming and significant work required to find sources on a topic for a systematic review (Friedman, 2015).



Figure 6: Bradford's Law

The classification of journals into core, intermediate, and wide groups is shown in the graphic above and is based on the Bradford law. The important journal groups are highlighted in colour and annotated. This group of periodicals comprises those that produced the most ecotourism research within a particular period. Figure 6 lists the 10 sources that are the most pertinent to the discussion of ecotourism and sustainability. Journal of sustainable tourism (23 papers) is the most prominent publication in this discipline, followed by the Scandinavian journal of hospitality and tourism (6 papers) and annals of tourism research (5 papers). This journal is very significant since its publishing procedure involves peer review, which serves to assure its accuracy and contribution to its respective fields.

Co-occurrence network

A co-occurrence network, sometimes called a semantic network, is a way to analyse text that visualizes probable links between individuals, organizations, ideas, and biological creatures like bacteria, and other things (Segev, 2021). Text mining-compliant electronically stored text makes co-occurrence network construction and visualization possible. The simplest definition of co-occurrence analysis is the counting of matched data inside a collection unit (Cohen et al., 2005; van Eck & Waltman, 2021). Figure 7 displays the high-frequency keywords having a tight co-occurrence connection in the subject of ecotourism and sustainability. Based on Figure 7, five major clusters have been generated. "ecotourism", "tourism development", and "tourist destination" constitute Cluster 1. Cluster 2 consists of the keywords "tourism management", "tourist behaviour", and "stakeholder". There are two networks in Cluster 3 and two networks in cluster 4, including "perception", "south Africa", "tourism", "policy

prospect". Furthermore, In the lower-left quadrant are long-used themes with low centrality (i.e., emerging, or declining themes). "Knowledge and Tourist behaviour" is the distinct subject in this quadrant. Finally, the bottom right quadrant has a simple motif with strong centrality but low density. These themes are vital to include in the study since they are generic issues that are often utilized, such as the theme of "sustainability, ecotourism and tourism development".

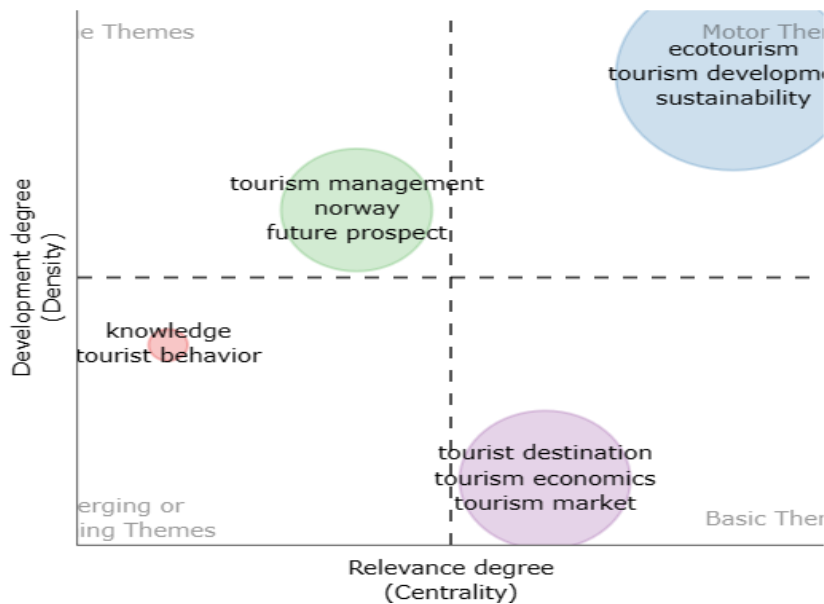


Figure 8: The thematic evolution

Trend topic

This study also looks at trends in the field; the graphic below gives an overview of how the word has changed over time and by year. To distinguish between themes that have been used for a long time and those that have only lately (Bolaos, 2022; Yardibi et al., 2021) The word is used more frequently and more lately further to the right as it rises in the list. Figure 9 and Table 9 show that the topic's development started to significantly increase in 2021. As indicated in the data's description below, the topic has been utilized since 2020, particularly in ecotourism studies' (F=46), tourism development and tourist destination (F=15), Sustainability (F=12), Tourist behaviour (F=6), and Research work (F=5). With the highest frequency compared to other themes in years q1, q2, and q3, the topics that are frequently discussed from 2020 to 2022 include "Ecotourism," "Tourism development," and "Tourist destination". This information also explains why the three subjects are currently popular in the ecotourism and sustainability industries.

Table 9: The trend topic year

Trend Topic	Frequency (F)	%	year_q1	year_med	year_q3
Tourism development	15	26.4	2020	2021	2022
Tourist destination	15	9.3	2020	2021	2022
Sustainability	12	8.5	2021	2021	2022
Ecotourism	46	7.8	2020	2022	2022
Tourist behaviour	6	6.2	2021	2022	2022
Research work	5	5.4	2021	2022	2022

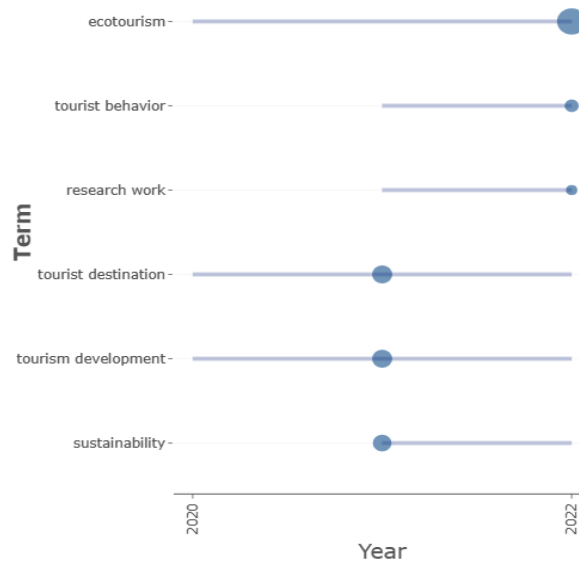


Figure 9: The trend topic

Word dynamic

The word dynamic illustrates how words change over time, as seen by the datasets. A cumulative count of the leading keywords along with the author's keywords, title, or abstract can also be used to select the presentation. Both methods are based on the total number of occurrences per year. Figure 10 shows the rise of the top keywords in the field of ecotourism and sustainability research from 2020 to 2022 based on the total number of occurrences per year. According to the figures in Figures 10 and 11, a number of important keywords started to show a noticeable increase in 2021 and have since continued to do so. From 2021 to 2022, "Word Dynamic" data analysis clearly demonstrates a rise in the use of dynamic keywords such as "ecotourism," "tourism development," and "sustainability". These findings align with the findings of other analyses, including "Trend Topic" and "Word Cloud" analyses. This result also explains why the phrases were selected as trending and significant over time.

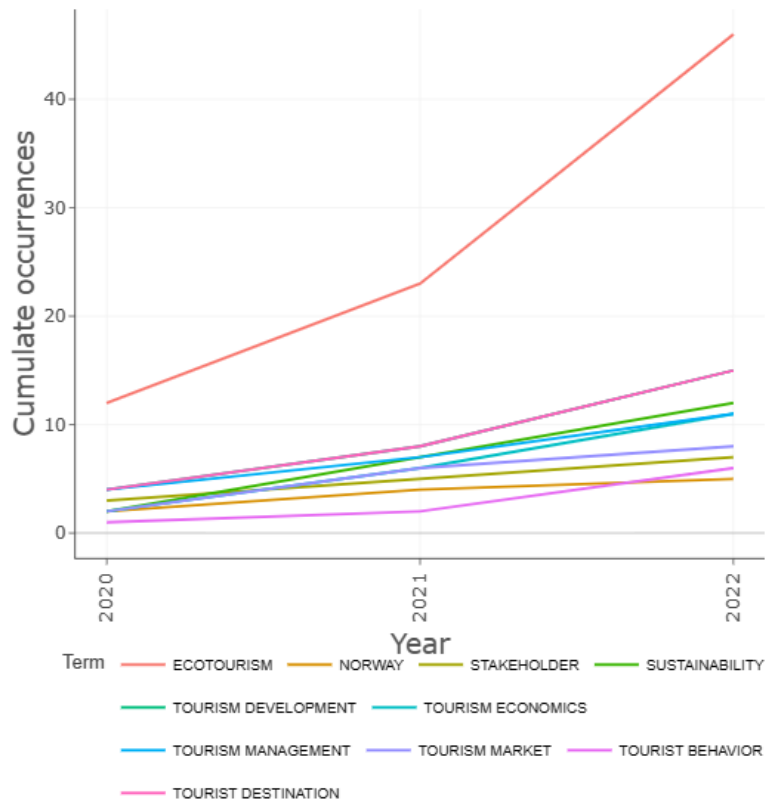


Figure 10: The Word Dynamic (2020-2022)



Figure 11: The word cloud

Tree map

The nodes of a tree diagram are displayed as layered rectangles in tree maps, which are a graphical representation of hierarchical data (Lockhart, 2015). They are made up of several stacked, proportionately sized rectangles. In a data tree, a large rectangle denotes a branch, and smaller rectangles display the size of each node within that branch. Figure 12 displays several tree maps of the top 50 words based on the author's keywords, keyword plus, title (bigrams), and abstract (trigrams), in that order. Based on the tree map data, "Ecotourism" has the highest percentage of 20% followed by "tourism development and tourist destination (7%)" and "Sustainability, tourism economy, and tourism management" at 5%. While other keywords only contribute a low percentage which is between 1% to 4% only. This result deviates greatly from the results of the "word cloud" research, which indicate that "tourism development" is the most often used term when referring to ecotourism and sustainability.



Figure 12: The tree map

CONCLUSION

The current paper provides a thorough analysis of previous ecotourism studies. Because it offers a framework for performing environment and economics properly, ecotourism academy is essential to today's sustainability problems. The study sheds light on some issues that don't appear to have received enough attention in the literature. The most widely used keywords in this area, according to several findings, are ecotourism and tourism development. Ecotourism is currently receiving recognition on a global scale as a growing industry. This will draw people interested in ethics, comparative studies, business, environmental development, and climate change. This conclusion is derived from the results of a series of methods that make up a bibliometric study methodology.

Overall, ecotourism and sustainability are prominent topics in United Kingdom. Seven notable authors are Ioannides D (2020), Fredman P (2021), Higgins-desbiolles F (2021), Higgins-desbiolles F (2020), Mayer I (2021), Melissen F (2021), and Mika JP (2021). Ioannides D has the highest citations which is 264 and Mika JP has 34. The Journal of Sustainable Tourism is the top journal in this study, followed by Tourism Management, Annals of Tourism Research, Journal of Travel Research, and Scandinavian Journal of Hospitality and Tourism. The Co-occurrence network has five main clusters. Cluster 1 includes “ecotourism”, “tourism development”, and “tourist destination”. Cluster 2 covers “tourism management”, “tourist behaviour”, and “stakeholder”. Cluster 3 and cluster 4, including “perception”, “south Africa”, “tourism”, “policy implementation”. Meanwhile, there are three networks in cluster 5, which are “Norway”, “social media”, and “wildlife management”. Several analyses were performed to analyse the theme evolution using thematic evolution, trend topic, word dynamic, word cloud, and tree map. The discovery of four crucial thematic areas related to ecotourism, knowledge, tourism management, and tourist destination was a notable conclusion of the current study. From 2016 to 2022, discussions about sustainability and ecotourism will be ongoing. This study explains why these topics are popular in ecotourism and sustainability. This varies from the “word cloud” analysis, which shows “tourism development” appears more when addressing ecotourism and sustainability.

In a conclusion, ecotourism needs environmental and social development to survive into the future. The researcher was able to discover potential study areas for follow-up research with the help of the data collected from this study and the ability of Bibliometrics analysis to anticipate future investigations. Consequently, the rigorous approach offers a wide range of study options. The analysis reveals significant gaps in the literature. Future studies should consider the "Ecotourism Development," as other researchers may use the study's findings to investigate the literature's stated best practiced for ecotourism. Future research may also include documents from a bigger database to alleviate this intrinsic constraint. Emerging and specialized journals, for instance, like the Journal of Sustainable Tourism and Tourism Management, where current views on ecotourism and sustainability are presented. The influence of ecotourism and sustainability in general should also be examined in future research, along with other knowledge streams including the economic, environmental, and sociological perspectives. As a result, including papers from these journals may enhance the research by adding knowledge about recent developments in ecotourism and sustainability research. However, the current study may serve as a guide for future academics looking to develop their ecotourism studies.

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