



How to Make EU Tourism Sector Greener, more Efficient and Sustainable: A Bibliometric Analysis

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ABSTRACT

Even if creating jobs and fostering economic growth are two of the tourist industry's most important roles, preserving its sustainability is a big issue on a global scale. Our research aims to provide a bibliometric analysis of the relevant literature used in the VOSviewer software's examination of the sustainability of the industry. The goal is to evaluate the current status of research on environmental aspects of sustainable tourism development and to pinpoint the key areas, journals, articles, and authors from 1996 to 2021. A total of 337 relevant papers on subjects like the utilization of renewable energy sources, energy efficiency, energy indicators, and sustainability in the tourism industry were analysed in the Scopus database, based on their authors, publication year, geographic location, and number of citations. This study provides helpful information to promote theoretical and practical research in this area by adopting a systematic and visual review of all studies pertinent to the development of sustainable tourism.

Keywords: Tourism, Sustainable Development, Sustainable Value Added, Renewable Energy Sources, Energy Efficiency, Bibliometric Analysis

JEL Classifications: Q01, Z32, O13

1. INTRODUCTION

The terms "sustainability" and "sustainable development" are used in numerous definitions. The development that satisfies present needs without jeopardizing the ability of future generations to satisfy their own needs is the most well-known definition of sustainable development. This term suggests a connection between social equality, environmental protection, and economic progress (WCED, 1987).

Due to the importance of tourism to the global economy, the relationship between sustainability and tourism is particularly intriguing. Millions of jobs are directly generated by tourism around the world. In literature, one of the benefits of tourism is its capacity to provide jobs. In addition, tourism has the greatest ability to share wealth when compared to other industries (Berno and Bricker., 2001).

In 2021., tourism participates with 10.3% of the total market share and with 10.4% of the total number of employees. In OECD

countries, this share is 4.4% of the total market share and 6.5% of the total number of employees (WTTC, 2021). In the last decade, tourism has been one of the fastest-growing sectors and its effects on the national economy are significant (Peng et al., 2017). The tourism sector should be carefully planned, managed, monitored, and configured according to sustainability criteria (Butler, 1999), otherwise further development of tourist regions may be compromised due to the imbalance between stable economic growth and the final use of natural resources. Consequently, the concept of sustainable tourism is very important (Fletcher, 2011).

The World Tourism Organization states that tourism is sustainable when takes into account current and future economic, social, and environmental impacts that meet the needs of visitors, industries, and the environment (UNWTO, 2019). Many papers have been written in recent years about the relationship between tourism and sustainability, highlighting the importance and difficulty of improving sustainability in the sector, but also identifying tourism as a key tool for competitiveness (Buckley, 2012).

The tourism industry should be encouraged to embrace 'clean and green' tourism, which ultimately leads to a reduction of the negative impact of the sector's business on the environment. The tourism sector should adopt a TBL (Triple Bottom Line) approach to achieving sustainability in its business following sustainability principles (Dwyer et al., 2009).

Promoting methods that result in low-carbon country development and including the tourism industry in the implementation of preventative measures of environmental plans with a view to its preservation and permanent protection should receive special attention (Klarin, 2018). Current policies and initiatives are intended to improve the effectiveness and quality of company through the generation of added value. Analysis of the future sustainable growth of tourism is one of the main components in reaching such goals, since various studies point to growing energy consumption and, as a result, a substantial environmental impact (OECD, 2017).

The literature on the sustainability of tourist development in relation to environmental issues is briefly summarized here, along with a description of the data processing approach. A debate was started with conclusions once the research's findings were analyzed.

2. MAIN DRIVERS OF SUSTAINABLE TOURISM

Numerous research indicate that rising energy use will have a big negative influence on the environment (OECD, 2020). The effects of climate change on the tourism industry are extensive (Scott et al., 2015), and they are already having an impact on sectoral operations, planning, and investment (Nicholls, 2014). The entire tourist industry was urged to confront climate change, which is one of the major threats to sustainable development and the 21st-century Millennium Development Goals, in the Davos Declaration on Climate Change and Tourism (UNWTO, 2007).

As a result of the industry's ongoing strong economic expansion, greenhouse gas emissions are continuing to rise (Gössling and Peeters, 2015; Lenzen et al., 2018; Scott et al., 2016). According to the World Travel and Tourism Council (WTTC, 2020), the next 20 years will be marked by the inclusion of climate change and related challenges in corporate strategy, facilitating the transition to a low-carbon economy on a global scale and boosting local resilience to climate change.

2.1. Energy Consumption

According to estimates, the tourism industry contributes to 5-8% of the world's total emissions of dangerous gases, which eventually destroys natural resources. Tourism is an important sector in terms of energy consumption and greenhouse gas emissions (Lenzen, et al., 2018). By implementing environmental levies, EU member states' environmental policies aim to achieve the environmental and sustainable development objectives. The use of economic instruments in environmental protection and conservation is crucial, as evidenced by the growing relevance of these tools in

EU environmental policy for reducing pollution and conserving natural resources. The main goal is to migrate to higher taxation by the end of 2030 by further implementing environmental taxes and correspondingly lowering labor taxes as one of the principal production inputs (SERI, 2015).

Companies from various industries can lessen their negative effects on the environment by improving resource efficiency, particularly by lowering greenhouse gas emissions and using more renewable energy sources (RES). In their analysis, Kratena and Sommer (2014) predict that the production process will shift from using primary resources (capital and labor) to inputs that are resource-oriented and more efficient. The implementation of environmental fees and environmentally conscious inputs can result in savings. Meyer et al. (2011) provide an example of how recycling, taxation, and advisory policies can work together to increase employment and value-added growth while also lowering production inputs (SERI, 2015).

2.2. Usage of Renewable Energy Sources (RES)

Energy efficiency must be promoted by technology for the growth of energy efficiency and penetration of RES through the use of specific economic instruments, keeping in mind the tenets of sustainable development (Menegaki et al., 2018). Utilizing RES in the tourism industry can lessen reliance on imported fuels, increase consumer environmental consciousness, and have a less detrimental effect on the environment. Such a strategy may ultimately lead to a decrease in the amount of energy required as well as new employment possibilities associated to the use of RES (Dziuba, 2016; Bohdanowicz et al., 2011). At the moment, renewable energy sources (RES) are the most appropriate kind of energy for the idea of a clean environment that doesn't pollute during the production of organic matter and lowers the price of energy requirements. Additionally, RES refers to a contemporary way of living and is intended to be used in tourism (Łapko, 2018).

According to Trstenjak et al. (2020), the shift to a low-carbon economy will bring about structural changes and the development of new services that can offset the costs of the economic transition, thereby accelerating the pace of economic growth and development that is sustainable from an economic, environmental, and social perspective. Policymakers should concentrate on addressing the three problems that were identified as the main barriers to a higher adoption rate for RES: a lack of awareness and knowledge about the available EU funds intended to achieve sustainable business models and products, alluring funding opportunities for sustainable projects, and ultimately complicated bureaucratic procedures. While meeting ethical and environmental investment objectives, investments in RES are also quite rewarding for the investor. By adding photovoltaic modules, the ship's engines use less fossil fuel and emit fewer greenhouse gases, which boosts investment returns (Yacht Rent, 2022).

3. LITERATURE REVIEW

Due to the importance of tourism to the global economy, the relationship between sustainability and tourism is particularly intriguing. There has been a lot of writing in recent years about

the connection between tourism and sustainability, underlining both the necessity and the challenge of enhancing sustainability in the industry while also identifying tourism as a crucial tool for competitiveness (Buckley, 2012).

With 492 papers published in the top four journals, nearly half of which occurred in the final 2 years of the analysis, Ruhanen et al. (2015) study does demonstrate the rise in the field of sustainable tourism research. Case studies, empirical investigations, and critical reviews made up the majority of the papers published on sustainable tourism. They demonstrate that, despite the theoretical and methodological approaches seeming to have developed through time, themes in research on sustainable tourism have stayed constant.

In their research from 1987 to 2018, Niñerola et al. (2019) looked at 4647 papers in the Scopus database that discussed sustainability concerns in tourism. The literature on sustainability challenges in the field of tourism is rapidly expanding, and sustainability is increasingly becoming a strategic approach for businesses and tourist destinations, according to an analysis of the top journals, authors, institutions, and keywords.

According to Tokmak et al. (2018), there has been a rise in studies on sustainable tourism that favor qualitative research techniques. Additionally, it was shown that the number of experimental studies outnumbered the other studies in the papers that were analyzed. The majority of the studies in the field are conducted in Australia, the United States, and England, respectively.

Using a systematic strategy that combines bibliometric analysis and network analysis, Shasha et al. (2020) look into publications that were published between 2001 and 2018. They identify the innovative patterns, interdisciplinary partnerships, and research hotspots associated with ecotourism. The total number of pertinent publications has risen over time, according to the findings.

According to Garrigos-Simon et al. (2018), the literature on sustainability is exploding, mainly in the areas of income and employment. Journal of Sustainable Tourism, Sustainability, and Tourism Management, as well as organizations from the USA, Australia, Spain, and England, are the primary sources for these studies.

Many authors did investigate sustainability of tourism in their research using bibliometric analysis mainly using Web of Science (WoS) database (Cavalcante et al., 2021; Della Corte et al., 2020.; Pahrudin et al., 2022; Trip et al., 2021.; Herrera-Franco, 2021; Khanra et al., 2021.; León-Gómez, 2021; Jiménez-García, 2020; Tseng et al., 2021).

As smart tourism destinations are developed, policymakers and business professionals increasingly understand the significance of sustainability, which calls for precise instructions and rules. Sousa et al. (2022) conducted a bibliometric analysis of 59 papers between 1900 and 2020. using the Bibliometrix R-package and VOS Viewer software, taken from the Core Collection (CC) database of the Web of Science (WoS). They assembled a

bibliography linking, recognized the important authors, journals, papers, and most pertinent academic institutions. Their efforts to assess and further their expertise in this research field help to improve our comprehension of the ideas behind sustainable development. Simultaneously, they provide information on how sustainable and intelligent tourism will develop in the future.

Research on sustainable tourism development has grown significantly in recent years, and many academics have organized and integrated this research using a variety of analytical techniques. In order to undertake a visual and in-depth examination of the prior literature on this topic, the study by Ferreira and Robertson (2020) used bibliometric analysis, a quantitative method. This program can eliminate certain subjective influences on qualitative literature reviews because it uses a quantitative research strategy to look at citations and co-citation analysis of scientific literature. This work incorporates the most recent research in the field compared to earlier studies by combining a systematic and visual assessment of research on sustainable tourism from several analysis viewpoints of research trends, the co-occurrence of keywords, and the co-citation of references.

4. DATA DESCRIPTION AND METHODOLOGY

4.1. Data Description

It was suggested by Tranfield et al. (2003) to structure systematic reviews of the management literature into three stages: planning, conducting, and reporting (dissemination) of results. This methodology serves as the foundation for additional data analysis. A number of studies used bibliometric analysis to better comprehend the data collected and look for any potential hidden trends that might be crucial for future research (Fahimnia et al., 2015; Zhong et al., 2016). The field of bibliometrics combines and extensively intersects philology, information science, mathematics, and statistics in a particular subject (He et al., 2017).

The multidisciplinary database Scopus, which is owned by Elsevier and has approximately 69 million records, has been chosen as one of the most significant bibliographic databases (Elsevier, 2021). The Scopus database, which includes multidisciplinary and many sorts of scientific publications, is one of the most commonly utilized databases across several disciplines. In order to ensure that the body of literature included in the analysis is as extensive and high quality as feasible, this study chose the Scopus database as its source of empirical data. The WoS core collection database is typically used by writers for their study, however we choose to use the Scopus database instead.

4.2. Methodology

We used the bibliometric capabilities offered by the VOSviewer software to analyze authors, citations, geographic distribution, and keyword frequency in order to conduct a descriptive data analysis. A software program for creating and visualizing bibliometric networks is called VOSviewer. The examination of these networks might be based on citation, bibliographic coupling, co-citation, or co-authorship relationships, and these networks may comprise

journals, researchers, or individual publications. Additionally, VOSviewer can be used to create and display networks of relevant phrases that were taken from a corpus of scientific literature (Van Eck, Waltman, 2010; VOSViewer, 2022).

Because a boarder search did not yield the desired results, we narrowed our search to just the titles. Basic keywords were only used in the titles of publications linked to sustainable tourist development and energy efficiency. Sustainable tourist development, energy efficiency, energy indicators, renewable energy sources, added value, photovoltaic modules, and nautical tourism, as one of the major tourism subsectors, were the keywords employed in the research. 337 scientific papers, published between 1996 and 2021, were found to meet the search criteria. The terms with the greatest number of repetitions and overall connection strength are “sustainable development,” “sustainable tourism,” and “energy efficiency” (Table 1).

5. DISCUSSION AND CONCLUSIONS

Through the interpretation of the visual knowledge and co-occurrence of keywords in sustainable tourism research, hotspots and frontiers of this research field can be determined.

5.1. Keywords

Figure 1 represents the largest keyword co-occurrence sub-network and its cluster map related to the topic. Sustainable development, tourism, sustainability, tourism development and energy efficiency were most used keywords with more than 40 occurrences each (first five places). On the 6.th place we have keyword “ecotourism” very closely related to our research and in accordance with the research of Niñerola et al. (2019). We do see that “energy efficiency” is very popular topic in this research field related to the sustainable tourism development. “Environmental impact” and “environmental protection” occured 29 times while “renewable energy” and “renewable energy resources” occurred 19 times (Table 1).

5.2. Number of Published Papers Per Year

The number of papers published throughout the observed time, where the progressive development in the number of published

papers since 1996 is obvious, must also be analyzed. Prior to 1996, when the number of them was relatively low, there were very few articles published. With a total of 47 scientific papers, the majority of the papers were released in 2020. One of the greatest factors contributing to the increase of publications in this topic is the global COVID-19 pandemic (Figure 2). According to Ruhanen et al. (2015) and Niñerola et al. (2019), we see that the overall number of publications on sustainable tourism is increasing at an exponential rate.

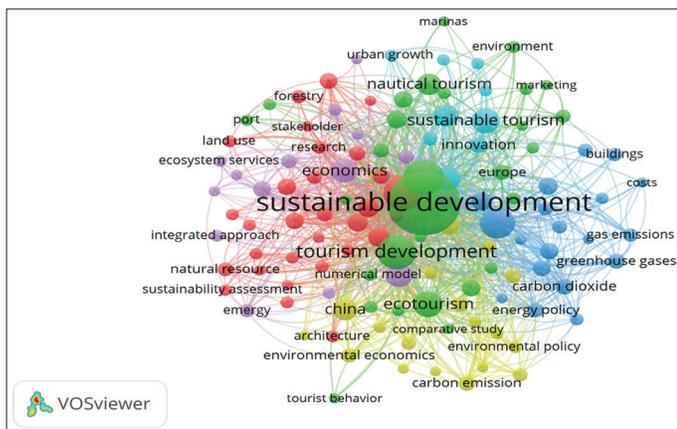
5.3. Papers Published by Type

222 scientific articles (59.5%) were published, followed by 85 conference publications (22.8%), 36 book chapters (9.7%), and 12 reviews (3.2%), in addition to the analysis of the quantity of

Table 1: Keywords

Keyword	Occurrences	Total link strength
Sustainable development	211	1174
Tourism	66	386
Sustainability	65	393
Tourism development	57	389
Energy efficiency	44	281
Ecotourism	34	226
Sustainable tourism	32	134
Economics	29	221
Environmental impact	29	222
Environmental protection	29	249
Planning	28	180
CHINA	24	168
Climate change	24	158
Nautical tourism	22	83
Agriculture	19	168
Decision making	19	158
Renewable energy	18	141
Renewable energy resources	18	128
Ecology	17	140
Economic development	17	122
Hotels	17	109
Investments	17	143
Energy conservation	16	146
Environmental management	16	132
Renewable energy source	16	124
Croatia	15	89
Alternative energy	14	120
Carbon dioxide	14	134
Economic and social effects	14	106
Energy utilization	14	128
Innovation	14	81
Regional planning	14	102
Tourism management	14	92
Biodiversity	13	96
Carbon emission	13	103
Energy policy	13	135
renewable resource	13	118
Ecosystems	12	103
Europe	12	88
Natural resources	12	76
Economic analysis	11	87
Environmental economics	11	97
Greenhouse gases	11	91
Renewable energies	11	97
Rural areas	11	87
Tourism industry	11	73
Solar energy	10	48

Figure 1: Keywords



Source: Author’s calculation

Source: Author’s calculation

papers published by year. Other categories of works are minor (Figure 3).

5.4. Papers Published by Individual Author

There have been numerous authors who have contributed to the growth of the field of sustainable tourism research. 15 authors who published at least three publications on the sustainability of tourist development between 1996 and 2021 were found in our database. We looked at the number of published documents, the number of citations, and the overall link strength to find the authors who were the most pertinent. Analyzing the number of articles published by individual authors, our findings reveal that Kovačić, M. (12) and Zhang, J. (6) have the most papers published in the field of nautical tourism, respectively, while Becken, S. (225) had the most citations (Table 2, Figure 4).

5.5. Papers Published by Publication Country

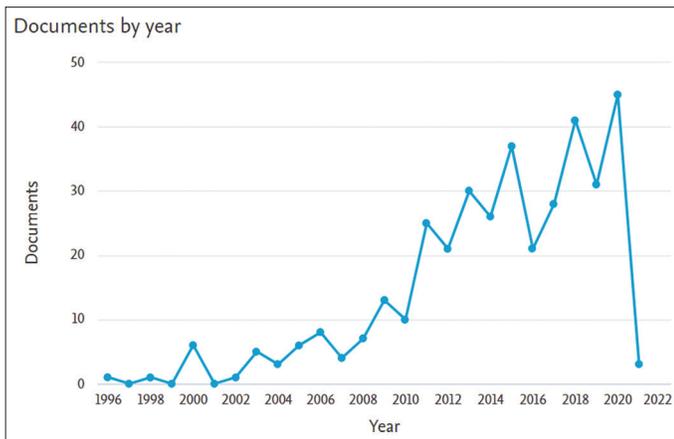
Further analysis of papers by country of publication shows that China and Croatia are leading countries in the number of published papers, followed by Italy and Spain. Quite interesting fact is that the USA leads in number of citations. Using the author's countries of affiliation, it was shown that there is a global interest in sustainable tourism because 13 countries have published at least 100 publications on the topic, 6 have written more than 300

papers, and 3 have published more than 600 papers. The fact that authors from different countries are interested in it implies that it is a worldwide issue. The reviews by Ruhanen et al. (2015) and Zhong et al. (2016) found that the results were remarkably comparable (Table 3 and Figure 5).

5.6. Countries by Number of Citations

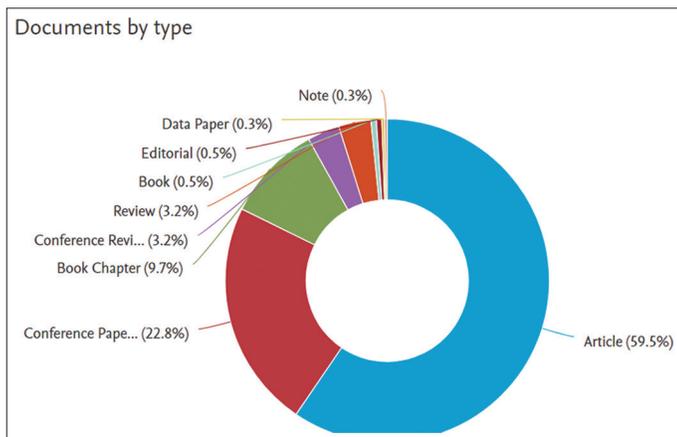
Since citations make it easy to quickly identify significant works in the area, they are the way most often used to gauge an author, journal, or paper's importance (Zupic and Cater, 2014). This enables us to compare citations across countries. The United States, with 876 citations, Italy, with 681 citations, and The Netherlands, with 625 citations, are the top three countries in terms of citations. Since the field has been expanding quickly, we anticipate that citations may rise soon (Figure 5).

Figure 2: Number of published papers per year



Source: Author's calculation

Figure 3: Number of papers published by type



Source: Author's calculation

Table 2: Authors by number of published papers

Author	Documents	Citations	Total link strength
Kovačić M.	12	64	8
Zhang J.	6	62	3
Favro S.	5	19	6
Li X.	5	13	2
Gržetić Z.	4	27	5
Zhang Y.	4	33	4
Agus C.	3	14	0
Becken S.	3	225	0
Gračan D.	3	8	1
Li Z.	3	6	1
Liu J.	3	10	2
Romão J.	3	56	0
Vidučić V.	3	6	0
Wang Y.	3	3	0
Zaman K.	3	49	0

Source: Author's calculation

Table 3: Number of papers by publication country

Country	Documents	Citations	Total link strength
China	51	200	12
Croatia	37	113	2
Italy	32	681	18
Spain	23	114	16
Greece	18	196	7
United States	18	876	16
United Kingdom	17	445	12
Portugal	16	165	15
Romania	16	13	3
Germany	14	142	12
Netherlands	13	625	18
Indonesia	11	45	6
France	10	388	15
Australia	9	94	1
India	8	51	1
Taiwan	8	152	0
Malaysia	7	61	7
New Zealand	7	372	2
Poland	7	20	1
Thailand	7	3	1
Austria	6	21	2
Brazil	6	10	3
Pakistan	6	56	9
Iran	5	2	1
Japan	5	46	4

Source: Author's calculation

5.7. Papers Published by Subject Area of Research

The analysis of the published papers according to the subject area shows that the papers from The Science of the Environment (23.2%) and Social Sciences (16.6%) dominate, followed by Engineering (11.8%), Energy (10.6%) and Management (9.2%), while the share of other areas is significantly lower (Figure 6).

5.8. Papers Published by Publishing Source

The 20 most relevant journals in terms of citations and numbers of published papers are shown in Table 4. According to the publishing source, International Multidisciplinary Scientific Geoconference Surveying Geology and Mining Ecology Management (SGEM), Acta Ecologica Sinica and Sustainability are leading sources in terms of number of published papers (over 10) (Figure 7). According to the CiteScore the most successful publisher is Elsevier from Netherlands. Results obtained are opposite to results of Mota et al. 2018, since they found Tourism Management, Annals of Tourism Research and Journal of Sustainable Tourism on the first three places.

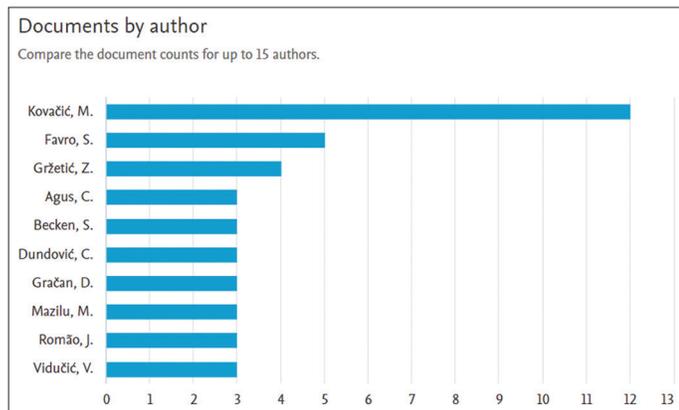
Monitoring the evolution of each source, allows us to see that recently the Sustainability journal is taking the lead in terms of published papers but in terms of citations this novelty has not allowed it to reach a remarkable number which is in accordance with (Garrigos-Simon et al., 2018).

Top Conference Series Earth And Environmental Science, Journal Of Cleaner Production. Advanced Materials Research, Journal Of Sustainable Tourism and Renewable Energy are journals publishing a pretty stable number of articles, related to sustainability, with a great impact when observing their citations. This shows us the quality of the journal and its impact.

Journal Of Cleaner Production, Renewable Energy and Ecological Economics are top three most successful journals in field of sustainable tourism development when comparing number of published documents, CiteScore, SJR, Percentiles and Rankings.

In order to reduce the damaging effects of the tourism industry's operations on the environment, the sector should be urged to adopt "clean and green" tourism. Analysis of tourism's future sustainable development is one of the essential components in accomplishing these objectives because several studies indicate that it will increase energy consumption and have a substantial environmental impact. Policymakers should concentrate on tackling the problems that have been identified as the main barriers to a higher rate of RES adoption. The largest barrier is a lack of understanding and information about the available EU funds, a lack of appealing funding prospects for sustainable projects, and ultimately difficult bureaucratic processes.

Figure 4: Authors by number of papers published

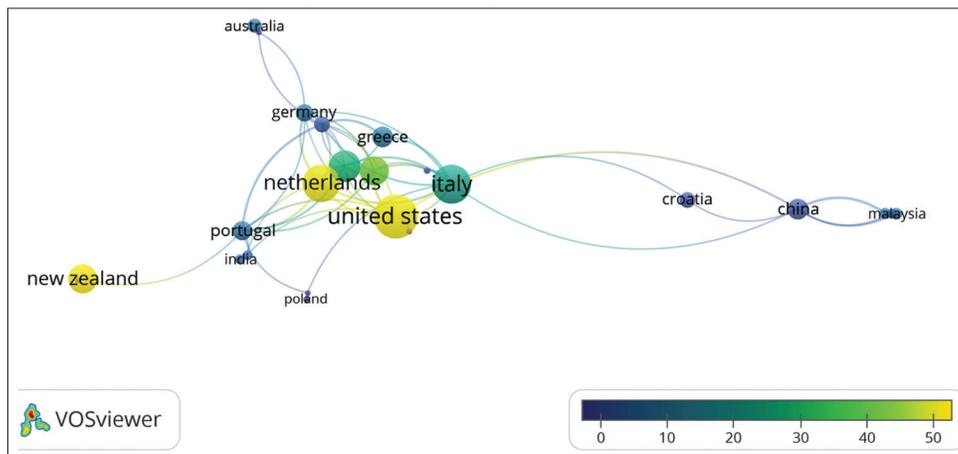


Source: Author's calculation

Future study proposals should concentrate on other facets of sustainable tourism, as this article has highlighted the importance of sustainability's environmental (energy) component. The application of more thorough bibliographic data analysis using additional bibliographic databases, such as Web of Science, as well as examining the effects of the global COVID-19 epidemic on trends in the number of published works, are suggested as areas for further study. The COVID-19 pandemics have an impact on many areas of economics and business theory and practice, and there is undoubtedly room for improvement and advancement in this field of study.

The scientific contribution of this paper is in identifying the most pertinent journals in the field of environmental and social sciences that are indexed in Scopus database and in providing a brief

Figure 5: Countries by number of citations



Source: Author's calculation

Table 4: Papers by publishing source

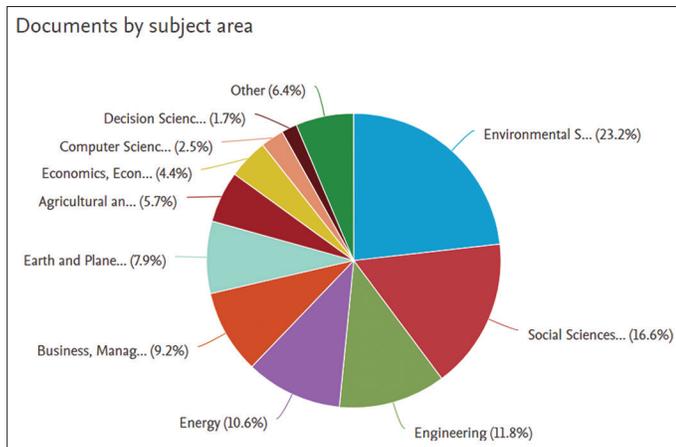
Source	Publisher	Documents	Country	Cite Score 2019	SJR 2019	Category	Percentile	Rank
International Multidisciplinary Scientific Geoconference	SGEM	14	Bulgaria	0.4	0.232	Geology	17 th	157/189
Surveying Geology And Mining Ecology Management	Ecological Society of China	12	China/ Netherlands	1.1	0.229	Ecology	30 th	259/370
Acta Ecologica Sinica	Multidisciplinary Digital Publishing Institute (MDPI)	10	Switzerland	3.2	0.581	Renewable energy, Sustainability and the Environment	56 th	132/679
Sustainability	IOP Publishing LTD	9	United Kingdom	0.4	0.175	General Environmental Science	16 th	176/210
Iop Conference Series Earth And Environmental Science	Elsevier	9	Netherlands	10.9	1.886	General Environmental Science	98 th	4/210
Journal Of Cleaner Production	Trans Tech Publication	6	Germany	/	0.121	Engineering	/	/
Advanced Materials Research	Taylor&Francis	6	United Kingdom	6.4	1.333	General Environmental Science	98 th	4/210
Journal Of Sustainable Tourism	Elsevier	6	Netherlands	11.2	2.052	Renewable energy, Sustainability and the Environment	90 th	17/179
Renewable Energy	WITPress	5	Germany	0.3	0.142	General Environmental Science	15 th	179/210
Wit Transactions On Ecology And The Environment	Elsevier	4	Netherlands	7.6	1.331	Ecology, Evolution	94 th	37/629
Ecological Indicators	Elsevier	4	Netherlands	2.7	0.545	General Energy	64 th	23/63
Energy Procedia	Springer Nature	4	Germany	4.9	0.788	Pollution	78 th	26/120
Environmental Science And Pollution Research	Int. Society for Horticultural Science	3	Belgium	0.4	0.184	Horticulture	11 th	75/84
Acta Horticulturae	Elsevier	3	Netherlands	6.9	1.719	Economics and Econometrics	93 th	44/637
Ecological Economics	Int. Information and Engeneering Technology Association	3	United Kingdom	1.4	0.219	Geography, Planning and Development	53 th	316/679
International Journal Of Sustainable Development And Planning	Taylor&Francis	3	United Kingdom	4.0	0.584	Geography, Planning and Development	87 th	84/679
International Journal Of Sustainable Development And World Ecology	The General Jonas Zemaitis Military Academy of Lithuania	3	Lithuania	3.9	0.375	Safety Research	86 th	11/79
Journal Of Security And Sustainability Issues	SRAC - Societatea Romana Pentru Asigurarea Calitatii	3	Romania	1.2	0.280	Management Information Systems	40 th	62/104
Quality Access To Success	Elsevier	3	Netherlands	8.6	1.661	Environmental Engeneering	92 th	10/132
Science Of The Total Environment	Wiley-Blackwell	3	United Kingdom	4.9	0.997	Development	92 th	19/239
Sustainable Development								

Source: Author's calculation

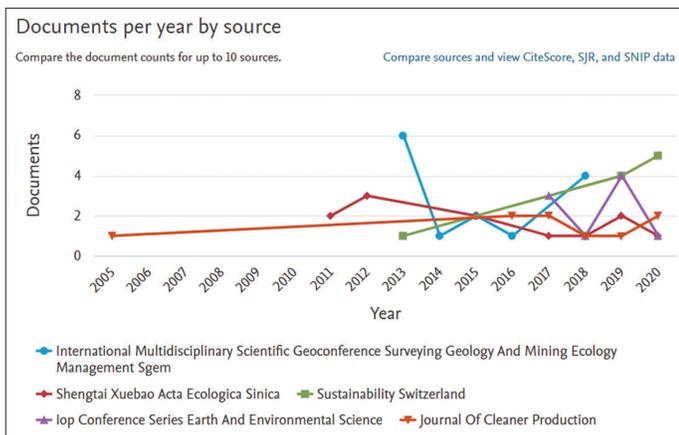
overview of papers by publishing source in a table that could serve as a good starting and guiding point for new researchers in this area.

The possible generalization of this study's findings and the range of its conclusions have been significantly reduced by a number of

restrictions. First of all, because it only uses the Scopus database, results from other databases must also be taken into account. Second, while it would be worthwhile to examine all facets of the tourism industry's sustainability, we here just concentrated on the environmental aspects.

Figure 6: Papers by subject area of research

Source: Author's calculation

Figure 7: Papers by publishing source

Source: Author's calculation

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