

# Sostenibilidad y turismo de naturaleza

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## BIBLIOMETRIC REVIEW OF STUDIES ON SUSTAINABLE TOURISM AND CLIMATE CHANGE IN 2019<sup>1</sup>

### REVISIÓN BIBLIOMÉTRICA DE ESTUDIOS SOBRE TURISMO SOSTENIBLE Y CAMBIO CLIMÁTICO EN 2019

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## Abstract

This study aims to investigate academic publications on sustainable tourism and climate change in 2019. Due to global warming, the climate changes from day to day. Climate changes affect tourism and raise concerns about sustainability. This situation makes studies on sustainable tourism and climate change important. Quantitative research methods were used in the research. 227 publications were obtained after filtering the words “sustainable tourism” and “climate change” in the Web of Science database. These data were analyzed by VOSviewer. According to the results of the research, the first journal that stands out in terms of publication and citation in 2019 is Journal of Sustainable Tourism. Apart from this, Tourism Management and Annals of Tourism Research journals also came to the fore. The most broadcast countries are Australia, the USA and the UK.

**Key words:** Sustainability; sustainable tourism; climate change; publication; citation.

## Resumen

Este estudio tiene como objetivo investigar publicaciones académicas sobre turismo sostenible y cambio climático en 2019. Debido al calentamiento global, el clima cambia día a día; los cambios climáticos afectan al turismo y suscitan preocupaciones sobre la sostenibilidad, situación que hace que los estudios sobre turismo sostenible y cambio climático sean importantes. En la investigación se utilizaron métodos de investigación cuantitativos. Se obtuvieron 227 publicaciones después de filtrar las palabras “turismo sostenible” y “cambio climático” en la base de datos de Web of Science. Estos datos fueron analizados por VOSviewer. Según los resultados de la investigación, la

primera revista que se destaca en términos de publicación y citación en 2019 es el *Journal of Sustainable Tourism*. Aparte de esto, las revistas *Tourism Management* y *Annals of Tourism Research* también pasaron a primer plano. Los países más retransmitidos son Australia, Estados Unidos y Reino Unido.

**Palabras clave:** sostenibilidad; turismo sostenible; cambio climático; publicación; citación.

## Introduction

There is a very high interaction between climate change and tourism activities. Since the effects of climate change on tourism activities and destinations are closely related to tourist behavior, the direct effects of changing climate on tourism demand have four important effects, indirect effects of environmental change, tourism mobility and mitigation policies, and economic growth, consumer culture and social change related to social-political stability (Gössling *et al.*, 2012).

Scott *et al.* (2012) emphasize that climate, natural environment, income, personal security, travel costs and disposable wealth can be affected by climate change. Hall (2005) states that all of these factors are determining factors for travel motivation and destination preference for a tourist.

The interaction between climate change and tourism activities is bilateral. Cohen *et al.* (2011) states that short flights that benefit tourism may have impacts on climate change. Because planes release a lot of air pollutant gas into the air. The tensions between tourism consumption and the changing social norms for acceptable flight practice emphasize that this social group is not interested in what results these flights have left, although they often continue their own air travel. In this study, contrary to the effects of climate change on tourism, the effects of developments in tourism movements on climate change are encountered. In addition to the aircraft, high energy is required to carry out some activities in the hospitality operations. Since most of this energy is obtained from fossil fuels, it can be said that energy use in tourism causes greenhouse gas emissions (Scott *et al.*, 2010). Therefore, it is possible to see the effects of both the hospitality and travel industry on climate change.

There are studies examining the relationship between sustainable tourism and climate change from different perspectives in the literature. Gössling *et al.* (2012) review the current studies in the literature and present a framework that shows important current uncertainties and research needs in the studies.

In his study, Buckley (2012) states that social and environmental impacts, responses and indicators are the five main topics of focus for the tourism sector, population, peace, prosperity, pollution and protection worldwide. It also states that expanding protected areas, climate change and improving environmental accounting techniques are priority issues in future research on tourism. Studies on the interaction between Sustainable Tourism and climate change are constantly being studied. These studies examined the interaction between the two concepts in many ways (Amusan & Olutola, 2017; Dodds & Kelman,

2008; Scott *et al.*, 2011; Weaver, 2011; Ijeomah & Aiyelaja, 2009; Mycoo, 2014; Lambert *et al.*, 2010; Bonzanigo *et al.*, 2016; Scott, 2011; Crabbe, 2010).

In this study, it is aimed to reveal the intellectual structure of academic researches examining the relationship between climate change and sustainable tourism in 2019. Increasing global tendencies inevitably bring along some common global problems. Climate change, which is one of the most important of these problems, affects production and consumption processes in different ways, especially in the tourism industry. This study reveals both how often the subject is covered in a year and how it is evaluated with a citation network. The results of this research also reveal the level of care about of climate change, one of the common global problems of humanity, by tourism researchers and tourism scientific journals.

## Literature review

Since climate change is accepted as a precondition for sustainable development, it is frequently used in sustainable tourism research. Sustainable tourism studies on climate change often show an image that focuses on destination-scale issues, emphasizing the need to properly account for the environmental and social impacts of tourism travel, and reveal a lack of sustainable tourism conceptualizations in the past (Scott, 2011; Siddiqui & Imran, 2019). Sustainable tourism has been dominated by the climate change issue in recent years. The strong relationship between these two concepts and the increase in climate change in recent years involve some risks related to the sustainability of tourism (Weaver, 2011; Sifolo & Henama, 2017; Steiger *et al.*, 2019). According to the A Climate Change Vulnerability Index for Tourism (CVIT), which consists of 27 indicators, climate change is an increasing obstacle to the contributions of tourism to the Sustainable Development Goals (Scott *et al.*, 2019a). This strong bond between sustainable tourism and climate change has also paved the way for the increase of academic research on the subject in recent years.

It can be said that studies in the literature concentrate on certain specific subjects. In this sense, studies on the formation of sectoral awareness of the vulnerability of tourism to climate change are becoming widespread (Gössling & Scott, 2018; Dube & Nhamo, 2020). In addition, although it threatens sustainability, one of the most important factors in combating climate change is political and political attitudes. There are studies that highlight different management gaps arising from the lack of scientific knowledge in the process of creating policies on the subject (Bache *et al.*, 2015; Dube & Nhamo, 2019). Although it differs from different perspectives on climate change, especially despite all its threats, studies on the determination of political dilemmas regarding the issue are also included in the literature (Ciplet & Roberts, 2017).

There are studies that address different approaches to the effects of climate change on tourism activities in various geopolitical regions, countries and cities, rather than the general effects of climate change on tourism for the whole world (Rutty *et al.*, 2017; Becken *et al.*, 2020). In addition, studies are also conducted to analyze the effects of changes in climate-related factors such as temperature and precipitation on tourism demand (Gómez Martín, 2005; Amelung & Nicholls, 2007). According to the findings obtained from these studies, climate change affects the tourism industry negatively. Especially in destinations with tourism types such as winter tourism, mass tourism (sea, sand, sun), island tourism,

there are problems regarding demand. The continuation of climate changes, which are a result of global warming, shows that more obvious problems related to tourism may arise in the future (Belle & Bramwell, 2005; Yang & Wan, 2010; Neuvonen *et al.*, 2015; Seekamp *et al.*, 2019). It is frequently found in studies in which these studies are criticized in the literature. It is stated that the analysis and simulations for the effects of changes in climate-related factors on the tourism industry are lacking. Gössling *et al.* (2012) state that these scenarios are more complex than they appear. It is also criticized that the analysis and simulations made with variables such as temperature and precipitation are not based on a theoretical basis (Hernandez & Ryan, 2011). In addition, the failure to examine the economic, political-legal and social-cultural factors, which have great importance in researching the effects of climate change in these analyzes and simulations, causes unsuccessful results (Shaw & Loomis, 2008; Ford *et al.*, 2012).

It is included in studies that state that the analysis and evaluations made on the effects of climate change on the tourism industry in the literature should be handled with a holistic approach. Factors such as quality of life indicators, agricultural capacity, urban and rural population, longevity, threatened biological species, dependency on natural capital, all affected by the first change have a relation with the tourism industry. It is beneficial to evaluate climate change and sustainable tourism relations considering a holistic relationship of all these elements (Dogru *et al.*, 2019). The fact that these factors are under threat naturally creates problems regarding the sustainability of tourism activities.

The negative interaction between climate change and sustainable tourism inevitably requires the efforts of the destinations to eliminate these negativities by following certain policies and strategies. Naturally, scientific research has been done towards these efforts. All stakeholders need to work in harmony to manage threats related to climate-related factors and reduce their impacts on tourism, due to rising temperatures, uneven rainfall, sea level rise, severe storms and increased salinity rate. Having a strategy that will determine the basic responsibilities for the tourism industry to adapt to climate change can significantly affect the success of the destinations (Scott *et al.*, 2019b; Huynh & Piracha, 2019)

## Method

In this study, a bibliometric analysis of international publications in the field of sustainable tourism was conducted in 2019. Studies on sustainable tourism and climate change have gained weight with the 2nd millennium and these studies have increased year by year. Hundreds of studies are carried out on the subject every year. It is important for this study to take a general picture of the studies of the last year and to compile the works that are sources of common references to these publications. In the study, quantitative research methods were used and academic studies on sustainable tourism related to climate change are examined using the bibliometric analysis technique. It is possible to obtain the data required for bibliometric analysis from many databases, especially Web of Science (WOS), Google Scholar and SCOPUS. In this study, WOS database was preferred. The reasons such as the WOS database being a highly reputable database and impact factor among the international databases, the data obtained from the WOS database provide the data format required by the package programs, the possibility to make a wider classification, and the library membership at an international level play an active role in this choice.

In the study, 227 publications were obtained after filtering the words “sustainable tourism” and “climate change” in the Web of Science database. Studies in which both words have common occurrences were evaluated. These 227 publications were used in the analyzes and the evaluations were limited to this number. The final filtering process was made on 27.01.2020 and the broadcasts published after this date were not taken into consideration.

In the study, answers to the following questions were sought.

- How is the general outlook of publications on sustainable tourism and climate change?
  - Which are the top publishing countries, institutions (universities) and authors?
  - Which journals are the most published?
  - Which keywords were used the most?
  - What are the most cited publishing?
- What are the most common citations of these studies?
- What are the methods used by the most commonly cited studies?

In the study, published in the Web of Science database, academic studies on sustainable tourism and climate change were analyzed using the bibliometric analysis technique. The authors, country, institution, journal, keyword and bibliography information of the publications obtained according to the search criteria were downloaded in “Plain Text” format. These data were analyzed by VOSviewer (van Eck & Waltman, 2010) to respond to the questions developed in the research using the package program. After the distribution of the publications according to the database, year, country, institution and journal information, the keywords were subjected to the co-word analysis and the bibliographic information to the co-citation analysis. A visual map of the words and cited publications obtained through these analyzes are obtained through the VOSviewer package program.

## Findings

All findings obtained are not included in this text. Only the 10 most important information for each category are included in the tables. In addition, extra information, which is considered to be important for some categories other than 10 information, is also discussed in the text. The findings were reported as subtitles, taking into account the purpose of the study.

### Distribution of publications by countries

Table 1 shows the distribution of publications by country and the number of citations received by these publications in WOS. Due to the restriction requested for the summary, only 5 countries are included. The ranking in table 1 was created taking into account the number of publications. In the light of the findings, Australia was the country with the most publications in sustainable tourism and climate change in 2019 with 35 publications. The

number of citations in this country is 968. The other four countries in terms of published numbers are England, USA, Spain and New Zealand. Another remarkable detail to table 1 is that New Zealand, which ranked 5th with 24 publications, is in the first secret with 1378 references.

Table 1. Distribution of Publications by Countries

	<i>Country</i>	<i>Publications</i>	<i>Citations</i>
1	Australia	35	968
2	England	31	638
3	USA	25	364
4	Spain	25	287
5	New Zealand	24	1378
6	Sweden	20	1148
7	Canada	20	988
8	Netherlands	15	520
9	Finland	14	474
10	South Africa	12	409

Although the publication numbers of Sweden and Canada are lower than the countries in the top ranking, their citation numbers are quite high. It can be said that countries such as France (6 publications, 461 citation), Italy (5 publications, 526 citation), Germany (10 publications, 658 citation) and Norway (11 publications, 517 citation), which are not included in the table, come to the fore in the scientific studies conducted on the related to topic.

### Distribution of publications by universities

In table 2, the universities and their country statistics are given to the number of citations in the WOS database that published the most in the field of sustainable tourism related to climate change in 2019.

Table 2. Distribution of publications by universities

	<i>University</i>	<i>Country</i>	<i>Publications</i>	<i>Citations</i>
1	University Canterbury	New Zealand	15	1096
2	University Waterloo	Canada	14	878
3	Linnaeus University	Sweden	13	729
4	University of Oulu	Finland	13	471
5	Griffith University	Australia	12	730
6	University of Johannesburg	South Africa	10	387
7	University of Queensland	Australia	9	118

	<i>University</i>	<i>Country</i>	<i>Publications</i>	<i>Citations</i>
8	Lund University	Sweden	8	650
9	Western Norway Research Institute	Norway	8	369
10	Breda University of Applied Sciences	Netherlands	7	146

In table 2, it is seen that the university that broadcasts the most is University of Canterbury, New Zealand. While there are 15 publications in this university, there are 1096 number of citations. The other four universities are University Waterloo (Canada), Linnaeus University (Sweden), University of Oulu (Finland) and Griffith University (Australia), respectively. Although the number of publications of Lund University in Sweden, and Western Norway Research Institute in Norway are low, the number of citations is high. Although not included in table 2, the citations of the University of Exeter (5 publications, 247 citation) and Lincoln University (3 publications, 229 citation) are high.

### **Distribution of publications by journals**

One of the most important issues from the preparation stage of an academic publication is from which source. The choice of the broadcasting platform suitable for the purpose of the broadcast ensures that it reaches the right audience, and therefore more effective.

Table 3 shows the most published sources and their citation numbers in 2019. The ranking is based on the most publication and all are journals. In terms of both the number of publications and the number of citations, the Journal of Sustainable Tourism has come to the fore with a significant difference.

Table 3. Distribution of publications and citations by journals

	<i>Source</i>	<i>Type</i>	<i>Publications</i>	<i>Citations</i>
1.	Journal of Sustainable Tourism	Journal	62	1941
2.	Sustainability	Journal	15	70
3.	Tourism Management	Journal	9	413
4.	Annals of Tourism Research	Journal	7	699
5.	Worldwide Hospitality and Tourism Themes	Journal	7	10
6.	Journal of Cleaner Production	Journal	5	108
7.	Tourism Geographies	Journal	5	114
8.	Scandinavian Journal of Hospitality and Tourism	Journal	4	68
9.	Tourism Review	Journal	4	8
10.	Asia Pacific Journal of Tourism Research	Journal	3	24

Other journals include Sustainability, Tourism Management, Annals of Tourism Research and Worldwide Hospitality and Tourism Themes. Annals of Tourism Research and Tourism

Management journals are ranked 2nd and 3rd in terms of citation counts, even if the number of publications is not. Apart from these, magazines such as *Tourism Geographies*, *Scandinavian Journal of Hospitality and Tourism*, *Tourism Review* and *Asia Pacific Journal of Tourism Research* have focused on sustainable tourism studies related to climate change, although not much in 2019. In addition, although they are not included in Table 3, *Wiley Interdisciplinary Reviews-Climate Change* (2 publications, 177 citation), *Ecological Economics* (1 publication, 205 citation) and *Global Environmental Change-human and policy dimensions* (1 publication, 388 citation) journals have high citation rates.

Table 4. Most cited journals

	<i>Source</i>	<i>Type</i>	<i>Citations</i>
1	Journal of Sustainable Tourism	Journal	1453
2	Tourism Management	Journal	750
3	Annals of Tourism Research	Journal	563
4	Global Environmental Change	Journal	182
5	Current Issues in Tourism	Journal	154
6	Ecological Economics	Journal	154
7	Journal of Transport Geography	Journal	139
8	Tourism Geographies	Journal	122
9	Energy Policy	Journal	112
10	Journal of Travel Research	Journal	106

The most cited the publication of the articles examined in table 4 are listed. The most cited source was “Journal of Sustainable Tourism” with 1453. Following are the journals “Tourism Management (750)”, “Annals of Tourism Research (563)”, “Global Environmental Change (182)” and “Current Issues in Tourism (154)”. In addition, it is listed in Table 4 in journals that received over 100 citations in 2019.

### Most Published Authors and Most Cited Publications

In table 5, the most published authors and citation numbers in the WOS database are given. The ranking was made according to the number of publications and the authors with high number of citations were given priority in equal number of publications.

Table 5. Most published and cited authors

	<i>Author</i>	<i>Publication</i>	<i>Citation</i>
1	Gössling, Stefan	15	1441
2	Hall, C. Michael	13	1029
3	Scott, Daniel	10	811
4	Coles, Tim	4	234



	<i>Author</i>	<i>Publication</i>	<i>Citation</i>
5	Higham, James	4	59
6	Arana, Jorge E.	4	56
7	Leon, Carmelo J.	4	56
8	Buckley, Ralf	3	359
9	Becken, Susanne	3	237
10	Ceron, Jean-Paul	2	457

Michael Hall and Stefan Gössling were the top publishers in 2019 with 13 publications. Later, D. Scott, T. Coles and J. Higham were the other top publishers, respectively. The ranking in table 5 is made according to the number of publications. For this reason, one of the most interesting findings here is the researchers with a high number of citations despite the low number of publications. Jean-Paul Ceron's two publications received 457 citations during 2019. Similarly, 3 publications of Ralf Buckley received 359 citations.

Table 6 shows the studies that publications on sustainable tourism and climate change are cited most in 2019. The most striking detail in these studies is that 6 of these 10 publications were published in the Journal of Sustainable Tourism. The fact that this journal is one of the most prestigious media for sustainable tourism may have influenced such a result.

Table 6. Most cited authors and journals in publications

	<i>Author</i>	<i>Article</i>	<i>Journal</i>	<i>Citations</i>
1	Scott (2011)	Why Sustainable Tourism Must Address Climate Change	Journal of Sustainable Tourism	45
2	Weaver (2011)	Can Sustainable Tourism Survive Climate Change?	Journal of Sustainable Tourism	40
3	Scott, Peeters & Gössling (2008)	Can Tourism Deliver Its "Aspirational" Greenhouse Gas Emission Reduction Targets?	Journal of Sustainable Tourism	36
4	Gössling (2002)	Global Environmental Consequences of Tourism	Global Environmental Change	33
5	Becken (2007)	Tourists' Perception of International Air travel's Impact on The Global Climate and Potential Climate Change Policies	Journal of Sustainable Tourism	31
6	McKercher, Priedeaux, Cheung & Law, (2010).	Achieving Voluntary Reductions in The Carbon Footprint of Tourism and Climate Change	Journal of Sustainable Tourism	28
7	Hares, Dickinson & Wilkes (2010)	Climate Change and The Air Travel Decisions of UK Tourists	Journal of Transport Geography	27
8	Scott & Becken (2010)	Adapting to Climate Change and Climate Policy: Progress, Problems and Potentials	Journal of Sustainable Tourism	25

	Author	Article	Journal	Citations
9	Barr, Shaw, Coles & Prillwitz (2010).	'A Holiday Is a Holiday': Practicing Sustainability, Home and Away	Journal of Transport Geography	25
10	Buckley (2012)	Sustainable Tourism: Research and Reality	Annals of Tourism Research	25

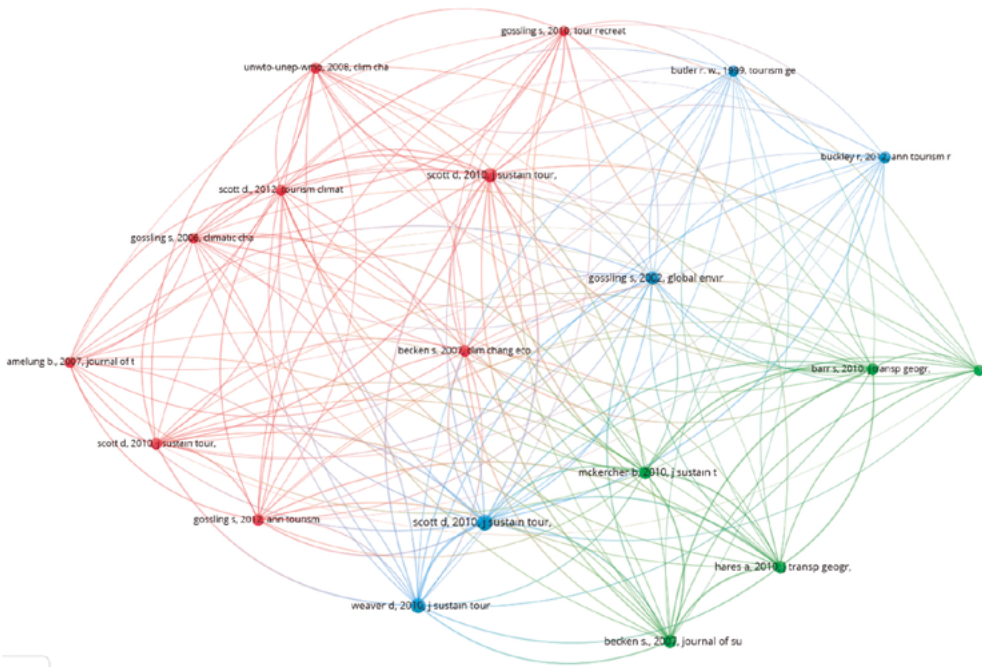
The other top 3 journals are Global Environmental Change Journal of Transport Geography and Annals of Tourism Research. Scott (2011) was the most cited author with 45 citations. Another important finding related to the subject is that the 10 most cited publications were written in 2011 and before.

### Common citation map of publications

In figure 1, there is a common citation map of the publications examined on the subject in 2019. The map given here also contains the relationships of the publications cited together. Publications given in the same colors are more interrelated. In addition, the thickness of the colored dot next to the publications indicates that more citations are made.

By examining the keywords in the 227 articles examined, the image in figure 2 was obtained. The words in the image consist of keywords that repeat at least 5 times. Different colors and color tones are available for clear use. In the figure, 42 keywords are repeated at least 5 times. "Sustainable Tourism" and "Climate Change" are the most emphasized words.

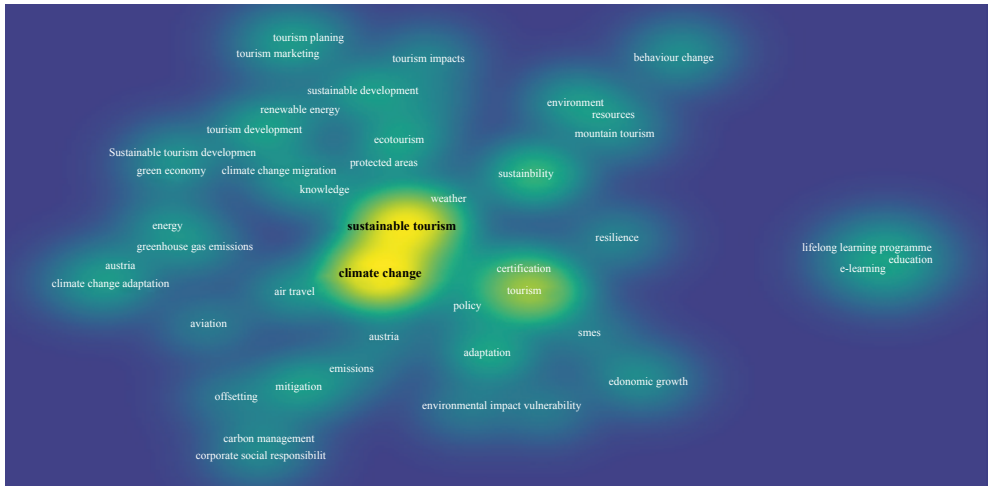
Figure 1. Common citation map of publications



## Common word (co-word) analysis of the keywords of publications

However, certification, tourism and sustainability developments are the most frequently emphasized key words.

Figure 2. Common word (co-word) analysis of the keywords of publications



In addition, eco-tourism, green economy, emission, energy, green gas emission, renewable energy and air are the words that appear in Figure 2 in environmentally important concepts. Moreover, sustainable development, planning, marketing, economic growth, and policies that can contribute to the development of tourism are reflected in the results of the analysis.

## Discussion and conclusion

Studies with bibliometric analysis of studies on sustainable tourism or the effects of climate change on sustainable tourism are hardly encountered in the literature. However, there are only a few academic studies that make bibliometric analysis of publications on climate change (Jankó *et al.*, 2017) and general tourism (Fu & Dai, 2010; Yu, 2017). According to the 227 studies examined, the most publications on sustainability and climate change were made in Australia, England, USA, Spain, New Zealand. It is noteworthy that 227 publications have been published in the WOS database on this subject for in one year. However, this result is directly proportional to the fact that climate change is on the agenda. As a matter of fact, in the study where Haunschild *et al.* (2016) conducted a bibliometric analysis of publications on climate change and it was emphasized that studies on climate change have gradually increased after 2000. This assessment has also been identified in different scientific studies (Stanhill, 2001; Grieneisen & Zhang, 2011; Bornmann & Mutz, 2015). The citation numbers of these countries are also high. The common features of these countries are that their economic and social development is at a good level. Communities such as climate change and sustainability pay more attention to global and awareness-raising issues. Likewise, the universities with the highest level of broadcasting are from these countries or those with similar level of development.

## Implications

Journal of Sustainable Tourism has come to the fore as the most important platform in the categories of the most publications, the most cited in the database and the most cited sources of 227 studies. This is also an indication that the journal has acted in accordance with its publication policies. Tourism Management, Annals of Tourism research, Global Environmental Change, Current Issues in Tourism, Worldwide Hospitality and Tourism Themes and Sustainability have come to the fore in different categories. In this study, the Journal of Sustainable Tourism was identified as the most cited journal, Hall, Gössling and Scott are the three most cited researchers.

The relationship between tourism and environmental events makes the concepts of sustainable tourism and climate change interrelated. The interaction between these two concepts brings with it a research process that gradually searches for the 2000s. Concepts such as eco-tourism, emission, energy, green gas emission, renewable energy, air, sustainable development, planning, marketing, economic growth and policy are frequently covered in studies on, which are indirect or directly related to sustainable tourism and climate change

Even academic studies conducted only in 2019 provide an important reference to reveal the relationships between sustainable tourism and climate change phenomena's. Because researchers conduct academic research in order to find solutions according to the urgency of problems related to a subject. The COVID-19 pandemic, which started at the end of 2019 and affected the whole world in 2020, provides important foresights to learn from global problems such as sustainable tourism and climate change (Prideaux, *et al.*, 2020). The withdrawal of people from nature for a while due to the pandemic has allowed nature to renew itself. In this sense, the restructuring of the tourism phenomenon by considering factors such as carrying capacity, over-tourism and sustainability can be a source of reducing the problems in the field (Şengel, 2021).

## Limitations and future studies

This study reveals the intellectual structure of sustainable tourism related to climate change publications in 2019, which is a very important issue for the tourism industry. The major important limitation of the study is that this study, in which an important issue is investigated, only analyzes the publications in 2019. However, the study was limited to one year in terms of determining that researchers and scientific journals in the field of tourism attach importance to the interaction between sustainable tourism and climate change. For this reason, bibliometric analysis of the publications in longer time intervals can be done in order to reveal the development of the subject over time in future studies.

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