

A BIBLIOMETRIC ANALYSIS OF STUDIES ON CLIMATE CHANGE IN TOURISM USING VOSVIEWER

TURİZMDE İKLİM DEĞİŞİKLİĞİ ÜZERİNE YAPILAN ÇALIŞMALARIN VOSVIEWER İLE BİBLİYOMETRİK ANALİZİ

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ABSTRACT

This study aims to examine the academic literature on climate change in the field of tourism through a bibliometric analysis. Accordingly, a search was conducted in the Web of Science database on May 15, 2025, using the keywords “Climate Change, Tourism and Adaptation,” which yielded 44 academic publications published between 2021 and 2025. The data obtained were analyzed using VOSviewer software. The results of the analysis indicate that the number of publications on climate change in tourism has increased over the years, with 2024 emerging as the year with the highest number of publications. The vast majority of these studies are articles, all of which were published in English. It was observed that the most frequently used keyword was “climate change.” Most of the publications fall under the category of “Hospitality, Leisure, Sport and Tourism,” and institutions such as the University of Johannesburg and the University of Oulu stood out as leading contributors in this area. Furthermore, the journal Hospitality, Leisure, Sport and Tourism was identified as both the most prolific and the most cited publication outlet. In terms of authorship, “Yan, Hong-qiang” had the largest collaboration network, whereas “Saarinen, Jarkko” received the highest number of citations. At the country level, the United Kingdom and South Africa were found to be the most productive in terms of publication output, citation counts, and international collaboration regarding the relationship between climate change and tourism. These findings suggest that these countries have made significant contributions to the literature in this field.

ÖZET

Bu çalışma, turizm alanında iklim değişikliği konusundaki akademik literatürü bibliyometrik analiz yöntemiyle incelemeyi amaçlamaktadır. Bu doğrultuda, 15 Mayıs 2025 tarihinde Web of Science veri tabanında “Climate change, Tourism and Adaptation” anahtar kelimeleriyle gerçekleştirilen tarama sonucunda, 2021-2025 yılları arasında yayımlanmış 44 akademik yayına ulaşılmıştır. Elde edilen veriler VOSviewer yazılımı aracılığıyla analiz edilmiştir. Analiz sonuçlarına göre, turizmde iklim değişikliği konusundaki yayınların yıllar içerisinde artış gösterdiği ve 2024 yılının en fazla yayının yapıldığı dönem olduğu belirlenmiştir. Söz konusu çalışmaların büyük çoğunluğunu makaleler oluşturmakta olup, tamamının İngilizce dilinde yayımlandığı tespit edilmiştir. En sık kullanılan anahtar kelimenin “climate change” olduğu gözlemlenmiştir. İlgili yayınların çoğunlukla “Hospitality, Leisure, Sport and Tourism” alanında yer aldığı; “University of Johannesburg” ve “University of Oulu” üniversitelerinin bu alanda en fazla yayın yapan kurumlar arasında ön plana çıktığı belirlenmiştir. Aynı zamanda, “Hospitality, Leisure, Sport and Tourism” dergisi hem en fazla yayın yapan hem de en yüksek atıf alan yayın organı olmuştur. Yazarlara yönelik analizde, en fazla iş birliği ağına sahip yazarın “yan, Hong-qiang” olduğu, ancak en fazla atıf alan yazarın “Saarinen, Jarkko” olduğu saptanmıştır. Ülke düzeyinde ise İngiltere ve Güney Afrika’nın, iklim değişikliği ve turizm ilişkisine dair en çok yayın üreten, atıf alan ve uluslararası iş birliği geliştiren ülkeler olduğu, bu bağlamda literatüre önemli katkılarda bulundukları sonucuna ulaşılmıştır.

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1. Introduction

Climate change is regarded as one of the most significant environmental issues threatening ecological, economic, and social systems globally. The tourism sector, which is highly dependent on natural resources, is directly affected by climate change, with impacts spanning a wide range from the attractiveness of destinations to tourism demand (Steiger et al., 2020). Increasing environmental vulnerability and changing climatic conditions have transformed the tourism industry from a merely vulnerable sector into one that is obliged to adapt to climate change (Kaján & Saarinen, 2013). Accordingly, academic studies investigating the interaction between tourism and climate change have increased substantially in recent years (Dube, 2024; Peeters et al., 2024; Sharma et al., 2025; Zhou et al., 2024).

The existing literature encompasses diverse thematic areas within the framework of sustainable development, such as the preservation of cultural heritage (Nocca, 2017), the production and utilization of climate change knowledge (Loehr & Becken, 2021), and adaptation strategies of tourism stakeholders (Turton et al., 2010). However, these studies are often limited to disciplinary or case-based approaches, with comprehensive analyses that reveal general trends and collaboration networks rarely conducted. In this context, systematically examining the structural characteristics of the literature is crucial for mapping the current body of knowledge and guiding future research.

Climate change is a globally escalating issue that requires multidisciplinary approaches. Within this context, the tourism sector—being directly dependent on environmental conditions—stands out as one of the most affected fields. Given the significant role of human interactions and environmental factors in the tourism industry, assessing the current status of international studies on climate change is of great importance both for contributing to academic literature and for providing guidance to policymakers. This research, therefore, aims to present an overview of scientific publications addressing climate change in tourism and to systematically analyze these publications using bibliometric methods.

Based on studies published in the Web of Science database, this analysis seeks to reveal the direction, developmental process, and research trends of academic interest in climate change in tourism. Literature reviews demonstrate that this topic has been increasingly addressed by researchers and diversified through interdisciplinary approaches. Consequently, systematically evaluating the position of the topic in the literature using visual mapping techniques is important for understanding the current state and offering new insights for future studies.

This study not only summarizes the existing literature but also provides an original framework through analyses conducted with the VOSviewer software, distinguishing its methodological approach from similar works in the literature. The findings offer valuable insights across multiple dimensions, from the geographical distribution of academic productivity and author collaborations to the most cited works and prominent thematic areas. Additionally, the results enable the development of strategic recommendations for future research on climate change in tourism. Thus, this research contributes methodologically to the literature while establishing an evidence-based foundation for shaping sustainable tourism policies.

2. Conceptual Framework

The impacts of climate change on the tourism sector manifest in both positive and negative ways; however, negative outcomes such as economic losses and the unsustainability of tourism activities tend to predominate (Altun & Şahin, 2023). In particular, the deterioration of climatic comfort leads to the contraction or shift of traditional tourism seasons, resulting in changes in destination choices (Yalçın, 2022). These changes are not limited to rising temperatures but also include irregularities in precipitation patterns, sea-level rise, droughts, floods, and other extreme weather events. Climate is a key determinant of numerous environmental factors that directly contribute to tourism, including wildlife, biodiversity, coastal ecosystems, water resources, and forests (Turan & Çalkın, 2023). Therefore, changes in climate have direct effects on the spatial distribution of tourism, length of stay, and timing of travel.

Within the framework of global climate agreements, countries are developing action plans to mitigate the potential impacts of climate change on the tourism sector and are formulating sustainable tourism policies (Demiralp, 2022). These efforts are critically important for achieving climate change adaptation and ensuring the long-term sustainability of tourism. Especially in regions vulnerable to climate change, such as the Mediterranean Basin, threats faced by the tourism sector coexist with opportunities like emerging destinations and new types of tourism. Consequently, destinations must be reshaped through planning and policies aligned with climate change scenarios (Oğur, 2022).

One of the most significant contributors to climate change is carbon emissions resulting from transportation activities. In this context, promoting environmentally friendly transportation systems, reducing carbon footprints, and preventing resource wastage constitute key steps that the tourism sector can take in combating climate change (Şurğun et al., 2024). Climate change affects not only physical conditions but also tourists' experiences, perceptions of destinations, levels of trust, and image perceptions. Factors such as altered precipitation patterns, rising sea levels, and increased natural disasters threaten the sustainability of tourism activities and reduce the climate resilience of destinations (Ahmed & Helhel, 2022).

3. Method

The purpose of this study is to examine the literature addressing the topic of climate change within the field of tourism through bibliometric analysis. Bibliometric analyses are increasingly being utilized for the systematic evaluation of scientific publications and are recognized as an important tool across nearly all disciplines (Ellegaard & Wallin, 2015). The concept of bibliometrics was first defined by Alan Pritchard in 1969 as an approach proposed to replace the previously used term “statistical bibliography” (Diodato, 2012; Lawani, 1981). According to Pritchard, bibliometrics refers to the “application of mathematical and statistical methods to books, articles, proceedings, and other communication media.” In other words, bibliometrics is a preferred quantitative method for performing numerical analyses of scientific works published in printed or digital formats (Diodato, 2012, pp. 8–9).

Bibliometric analyses provide comprehensive information regarding the developmental process and dynamics of a research field by evaluating publications from various perspectives (Lawani, 1981). The earliest bibliometric study related to the topic was published in 1896 by Campbell under the title “Theory of the National and International Bibliography.” This work utilized mathematical and statistical tools to classify different categories and determine their distributions (Sengupta, 1992).

In the methodology section of the present study, the variables considered within the scope of the bibliometric analysis, data collection techniques, and analytical methods are described in detail. Thus, each stage has been meticulously examined, offering a comprehensive understanding of the research process.

3.1. Variables

In this study, international publications addressing the topic of climate change in the field of tourism were comprehensively evaluated. The study involves two main variables: tourism and climate change. However, the primary focus of the research is on studies related to climate change within the context of tourism; therefore, both variables were considered and examined from a holistic perspective. International documents concerning tourism and climate change included in the study were selected based on predefined criteria from publications released between 2001 and 2025. A bibliometric analysis was then conducted using these data. As a result of the analyses, the current status and trends of research conducted to date on tourism and climate change were revealed.

3.2. Data Collection Method

To identify international research on climate change in the tourism sector, a comprehensive search was conducted on May 15, 2025, using the globally recognized Web of Science database. The Web of Science database was preferred due to its extensive coverage of publications in social sciences, particularly related to tourism (Jacso, 2005). Additionally, this database facilitates access to

internationally published studies as it includes prestigious indexes such as the Science Citation Index (SCI), Social Science Citation Index (SSCI), and Arts and Humanities Citation Index (A&HCI) (Goodman & Deis, 2005). Furthermore, important indexes such as the Conference Proceedings Citation Index-Science (CPCI-S), Conference Proceedings Citation Index-Social Science & Humanities (CPCI-SSH), Book Citation Index-Science (BKCI-S), Book Citation Index-Social Sciences & Humanities (BKCI-SSH), and Emerging Sources Citation Index (ESCI) are also part of this database.

To access international publications on the theme of tourism and climate change, the "topic" search option of the Web of Science database was utilized; this option covers titles, abstracts, and keywords. During the screening process, the keywords "Climate Change," "Tourism," and "Adaptation" were selected. Only the Web of Science database was preferred in this study because it provides access to peer-reviewed, high-impact academic publications in the field and offers comprehensive filtering and analysis options, making it a reliable resource for systematic reviews. Additionally, its structure allows for the tracking of interdisciplinary research, thereby providing a suitable platform for multidimensional subjects such as tourism and climate change.

No temporal restrictions were imposed, and an effort was made to access all relevant publications. However, since all retrieved publications were published between 2021 and 2025, the analyses were focused on this period. This choice aligns with the marked increase in academic interest regarding the impacts of climate change on the tourism sector in recent years. Therefore, focusing the dataset on the 2021–2025 period aims to reflect current trends and scholarly debates on the topic.

As a result of this search, a total of 44 scientific publications in the field of climate change in tourism were identified. These publications were analyzed in detail in tabular form according to criteria such as publication year, type, language, country and institution of publication, research areas, sources of publication, citation counts, and the distribution of publications and citations by year. In the bibliometric analysis, only records with complete bibliographic data indexed in Web of Science were used, while publications with incomplete metadata were excluded. However, given that the Web of Science database is continuously updated with new publications, it is anticipated that searches conducted at different times using the same keywords may yield varying results. This may lead to discrepancies in data obtained despite similar data collection methods (Liu et al., 2013).

3.3. Data Analysis

To conduct a bibliometric analysis of international publications on climate change in tourism and to visually present the results, the open-access and free software "VOSviewer" was selected. VOSviewer is defined as a "scientific mapping tool developed for the analysis and visualization of bibliometric networks" (Van Eck & Waltman, 2017, p. 1054). After downloading the data obtained from the Web of Science database, the dataset was imported into the software. Using these data, prominent authors, countries, and sources in the field of climate change in tourism were identified through analysis tabs such as "Co-authorship" (author collaboration), "Co-occurrence" (keyword co-occurrence), and "Citation." Thus, the most frequently used keywords, the researchers and countries with the most collaborations, and the authors, sources, and countries with the highest citation counts were determined. Consequently, scientific publications on climate change in tourism were presented in detail according to the defined parameters and analysis methods.

4. Findings

The results obtained from the bibliometric analysis of studies on climate change in tourism are presented through tables, figures, and charts. The distribution of studies conducted between 2001 and 2025 by year is detailed in Table 1. According to this compilation of 44 publications, the distribution of publications over time appears irregular. The year with the highest number of publications is 2024, with a total of six publications. This is followed by 2023 (five publications) and 2015 and 2016 (three publications each). Notably, a total of 17 publications have been produced in the last five years (2021–2025), indicating that the topic continues to attract current academic interest.

While relatively few publications were made in the early 2000s, there has been a noticeable upward trend in publication numbers after 2010. This suggests that the research topic has gained increased attention in the literature in recent years. Furthermore, the intensity of publications in 2024 and 2023 demonstrates a growing momentum in academic studies on the subject. Overall, the temporal distribution of publications reveals that the topic has particularly captured researchers' interest in recent years, resulting in an increase in studies contributing to the literature. This trend serves as a motivational factor for future research in the field.

Table 1. Distribution of Publications by Year

| Year | Number of Publications | Year | Number of Publications |
|------|------------------------|-------------------------------------|------------------------|
| 2025 | 1 | 2015 | 3 |
| 2024 | 6 | 2014 | 2 |
| 2023 | 5 | 2013 | 2 |
| 2022 | 3 | 2012 | 1 |
| 2021 | 2 | 2011 | 3 |
| 2020 | 3 | 2010 | 2 |
| 2019 | 2 | 2009 | 2 |
| 2018 | 1 | 2003 | 1 |
| 2017 | 1 | 2001 | 1 |
| 2016 | 3 | Total Number of Publications | 44 |

Source: Compiled by the author using the Web of Science database.

Table 2 presents the distribution of the examined studies according to publication types and languages. In the table, which analyzes a total of 44 publications, it is evident that articles clearly dominate by publication type ($n = 34$). This indicates that the majority of research on the topic is published in peer-reviewed academic journals, demonstrating that the subject is being systematically addressed within the scientific community.

Moreover, there are five publications each categorized as book chapters and review articles, highlighting the importance of theoretical frameworks and literature reviews in contributing to the field. Other publication types such as proceeding papers ($n = 4$), early access ($n = 2$), and editorial materials ($n = 1$) are represented to a more limited extent. This diversity suggests that the topic is addressed across various academic platforms and evaluated through an interdisciplinary approach.

Regarding publication language, all publications were found to be in English ($n = 44$). This indicates that the research is conducted at an international level and that the findings gain visibility within the global academic community.

Table 2. Distribution of Publication Types and Languages

| Publication Type | Number of Publications | Publication Language | Number of Publications |
|--------------------|------------------------|----------------------|------------------------|
| Article | 34 | English | 44 |
| Book Chapters | 5 | | |
| Review Article | 5 | | |
| Proceeding Paper | 4 | | |
| Early Access | 2 | | |
| Editorial Material | 1 | | |

Source: Compiled by the author using the Web of Science database.

Table 3 presents the countries and institutions contributing most to the examined literature. In terms of the number of publications, the United Kingdom ($n = 6$) and South Africa ($n = 6$) rank first, followed by Canada ($n = 5$), Italy ($n = 5$), and Spain ($n = 5$), representing both European and Anglophone countries. This distribution reveals that the topic attracts considerable academic interest both within Europe and in English-speaking developed countries. Additionally, countries from different continents such as Australia, Finland, China, Switzerland, and Botswana have also made significant contributions to the literature. This indicates that the research topic is widely studied on a global scale and approached within diverse socio-cultural contexts.

At the institutional level, the University of Johannesburg (n = 4) and the University of Oulu (n = 4) have the highest number of publications. These are followed by Griffith University (n = 3), University of Waterloo (n = 3), and several other universities. A noteworthy point is that different campuses within the same university (e.g., Griffith University and Griffith University Gold Coast Campus) have contributed separately. This suggests that various research units within these universities focus on the topic and that interdisciplinary collaboration may be present. Particularly, the association of the University of Johannesburg with Botswana emphasizes the prevalence of regional cooperation and the academic prominence of the Southern African region in this field.

Overall, the geographical and institutional diversity of publications indicates that the research topic is not confined to a specific region or country but is addressed by numerous institutions and scholars globally. This diversity supports the notion that the research area holds universal interest and is evaluated within multicultural contexts.

Table 3. Countries and Institutions with the Highest Number of Publications

| Country | Number of Publications | Institutions | Number of Publications |
|----------------|------------------------|---------------------------------------|------------------------|
| England | 6 | University of Johannesburg | 4 |
| South Africa | 6 | University of Oulu | 4 |
| Canada | 5 | Griffith University | 3 |
| Italy | 5 | University of Waterloo | 3 |
| Spain | 5 | Bournemouth University | 2 |
| Australia | 4 | Griffith University Gold Coast Campus | 2 |
| Finland | 4 | University of Barcelona | 2 |
| People R China | 4 | University of Naples Federico II | 2 |
| Switzerland | 4 | University of South Africa | 2 |
| Botswana | 3 | University of Johannesburg | 4 |

Source: Compiled by the author using the Web of Science database.

Table 4 displays the academic disciplines and publication sources of the analyzed articles. Regarding publication disciplines, the field of Hospitality, Leisure, Sport and Tourism stands out as the dominant contributor with 21 publications. This finding indicates that the research topic is predominantly concentrated in studies related to tourism, hospitality, and recreation. Following this, Environmental Sciences (n = 12) and Green Sustainable Science and Technology (n = 11) also make significant contributions. This demonstrates that the environmental and climate-related dimensions of the research topic are prominent, highlighting its interdisciplinary nature.

Other fields contributing to a lesser extent include Environmental Studies (n = 7), Physical Geography (n = 4), Development Studies (n = 3), and Economics (n = 3), which serve as bridges between social sciences and natural sciences. This multidisciplinary distribution shows that the topic is evaluated not only from a tourism perspective but also within environmental, economic, and regional development contexts.

In terms of publication sources, journals focusing on Hospitality, Leisure, Sport & Tourism represent the largest group, with 32 publications. The specialization of these sources suggests that the majority of research is published directly in journals related to the field, targeting a focused academic audience. Publications in other disciplines (e.g., Marine Biology, Neuroscanning, Zoology & Animal Ecology, etc.) are quite limited, each represented by only 1 or 2 publications. This indicates that while the tourism-based topic is occasionally addressed in specific contexts within other disciplines, the primary concentration remains within field-specific journals.

Overall, it can be concluded that most publications focus on tourism and environment-related fields, with connections to contemporary themes such as sustainable development and climate change. This underscores that the study is conducted with an interdisciplinary approach and contributes to current scientific debates, particularly within the context of sustainable tourism.

Table 4. Most Published Disciplines and Sources

| Research Areas | Number of Publications | Publication Sources | Number of Publications |
|--------------------------------------|------------------------|---------------------------------------|------------------------|
| Hospitality Leisure Sport Tourism | 21 | Hospitality, Leisure, Sport & Tourism | 32 |
| Environmental Sciences | 12 | Marine Biology | 2 |
| Green Sustainable Science Technology | 11 | Neuroscanning | 1 |
| Environmental Studies | 7 | Zoology & Animal Ecology | 1 |
| Geography Physical | 4 | Design & Manufacturing | 1 |
| Development Studies | 3 | Sustainability Science | 1 |
| Economics | 3 | Anthropology | 1 |
| Regional Urban Planning | 3 | Climate Change | 1 |
| Architecture | 2 | Management | 1 |
| Business | 2 | Social Psychology | 1 |
| Education Educational Research | 2 | Water Resources | 1 |

Source: Compiled by the author using the Web of Science database.

Table 5 presents the publications with the highest scientific impact within the related field. Citation count is considered a fundamental indicator of a publication's visibility and contribution within the academic community. In this context, the study titled "African climate change: 1900-2100" by Hulme et al. (2001), published in *Climate Research*, ranks first with 764 citations. The second position is held by the work of Nocca (2017), titled "The role of cultural heritage in sustainable development: Multidimensional indicators as decision-making tool", published in *Sustainability*, which has received 233 citations. The third place is occupied by Kaján et al. (2013) with their study "Tourism, climate change and adaptation: A review", published in *Current Issues in Tourism*, cited 212 times.

The top 10 cited publications generally focus on the following themes: climate change and adaptation policies, sustainability and cultural heritage, environmental impacts of tourism, marine tourism and coastal ecosystems, energy consumption, and carbon emissions. In this respect, it is observed that the highly cited works predominantly revolve around climate change, sustainable tourism policies, and environmental planning.

Moreover, most journals in which these studies were published are high-impact Q1 journals specializing in sustainability, environmental science, and tourism, emphasizing the scholarly quality of the research.

Finally, the total citation count of 1571 for studies on climate change in tourism indicates that this subfield is rapidly growing and gaining significant scientific attention. This finding suggests that research on climate change in tourism is increasingly attracting interest and will continue to be a key focus for future investigations.

Table 5. Most Cited Publications

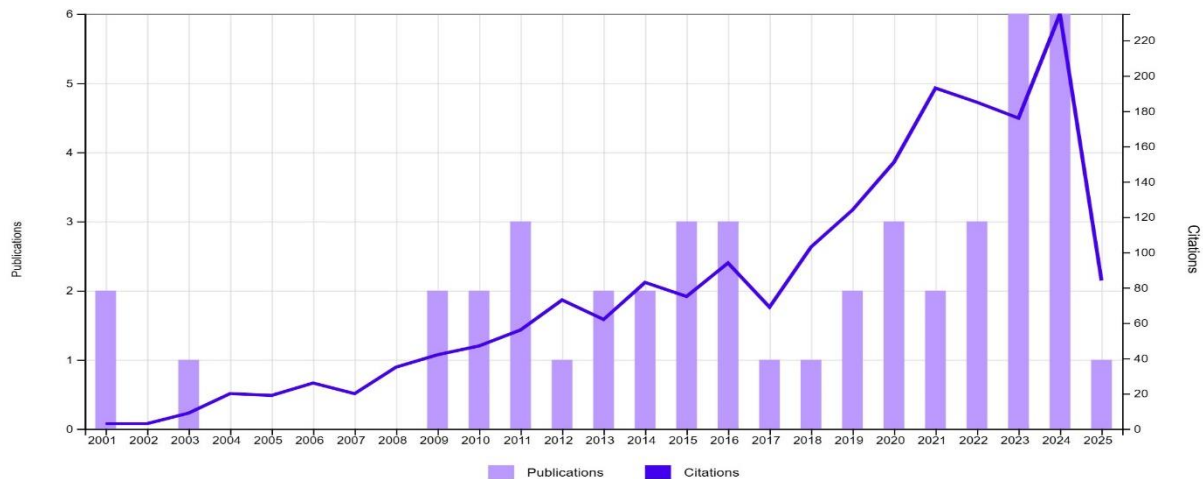
| | Title of Publication | Author | Source | Year of Publication | Number of Citations |
|---|---|--|---------------------------|---------------------|---------------------|
| 1 | African climate change: 1900-2100 | Hulme, M; Doherty, R; (...); Lister, D | Cimate Research | 2001 | 764 |
| 2 | The Role of Cultural Heritage in Sustainable Development: Multidimensional Indicators as Decision-Making Tool | Nocca, F | Sustainability | 2017 | 233 |
| 3 | Tourism, climate change and adaptation: a review | Kaján, E and Saarinen, J | Current Issues in Tourism | 2013 | 212 |
| 4 | The impact of climate change on demand of ski tourism - a simulation study based on stated preferences | Steiger, R; Posch, E; (...); Walde, J | Ecological Economics | 2020 | 53 |

| | | | | | |
|--|---|---|--|------|-------------|
| 5 | The Tourism Climate Change Knowledge System | Loehr, J and Becken, S | Annals of Tourism Research | 2021 | 52 |
| 6 | Developing an approach for tourism climate change assessment: evidence from four contrasting Australian case studies | Turton, S; Dickson, T; (...); Wilson, R | Journal of Sustainable Tourism | 2010 | 51 |
| 7 | Comparative coastal and marine tourism, climate change, and the blue economy in African Large Marine Ecosystems | Karani, P and Failler, P | Environmental Development | 2020 | 48 |
| 8 | Sustainable tourism, climate change and sea level rise adaptation policies in Barbados | Mycoo, M | Natural Resources Forum | 2014 | 44 |
| 9 | National tourism policy for climate change | Becken, S and Clapcott, R | Journal of Policy Research in Tourism Leisure and Events | 2011 | 39 |
| 10 | Global tourism, climate change and energy sustainability: assessing carbon reduction mitigating measures from the aviation industry | Leal, W; Ng, AW; (...); Rampasso, I | Sustainability Science | 2023 | 30 |
| Total Number of Citations for Studies on Tourism and Climate Change | | | | | 1571 |

Source: Compiled by the author using the Web of Science database.

Figure 1 illustrates the distribution of publication and citation counts related to climate change in tourism between 2001 and 2025. According to the data obtained from the Web of Science database, the first publication in this field was made in 2001, while the first citation occurred in 2009. Examination of the graph reveals that both the number of publications and citations peaked in 2024. Indeed, recent statistical data indicate a growing academic interest in this field, with a marked upward trend in both publications and citation counts.

Figure 1: Graph Showing the Distribution of Publications and Citations by Year

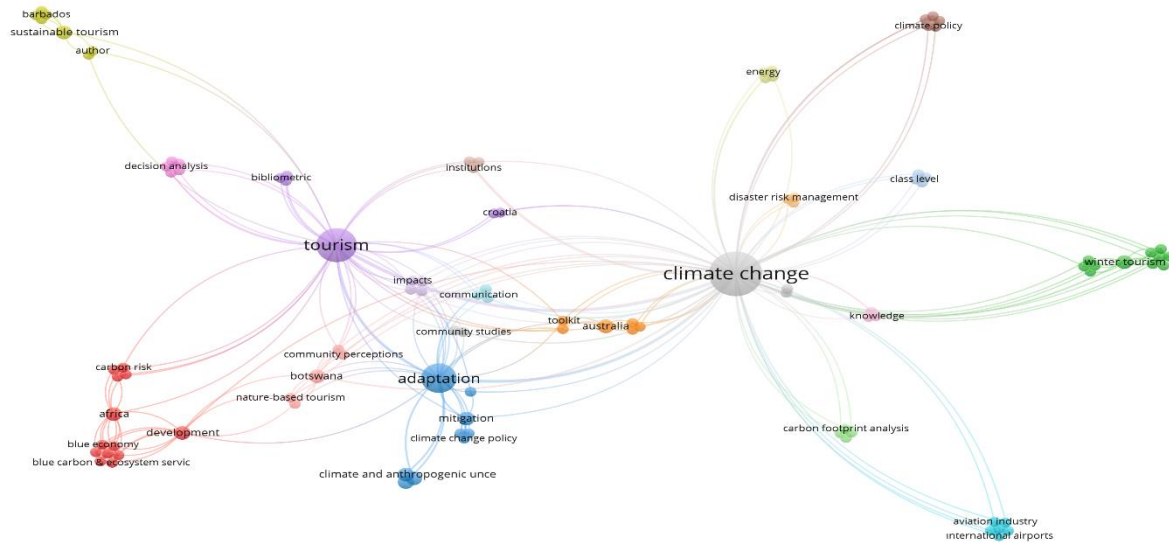


Source: Retrieved from the Web of Science database by the author.

Figure 2 presents the network map of keywords used in studies on climate change in tourism. A total of 151 distinct keywords were identified in the examined literature, of which 69 keywords that appeared at least twice were included in the analysis. According to the findings, the term "climate change" was determined to be the most frequently used keyword in this research area. Furthermore, the relevant keywords were grouped into six different clusters based on thematic similarities. These clusters are visualized on the map with circles of varying colors and sizes. Overall, it was observed

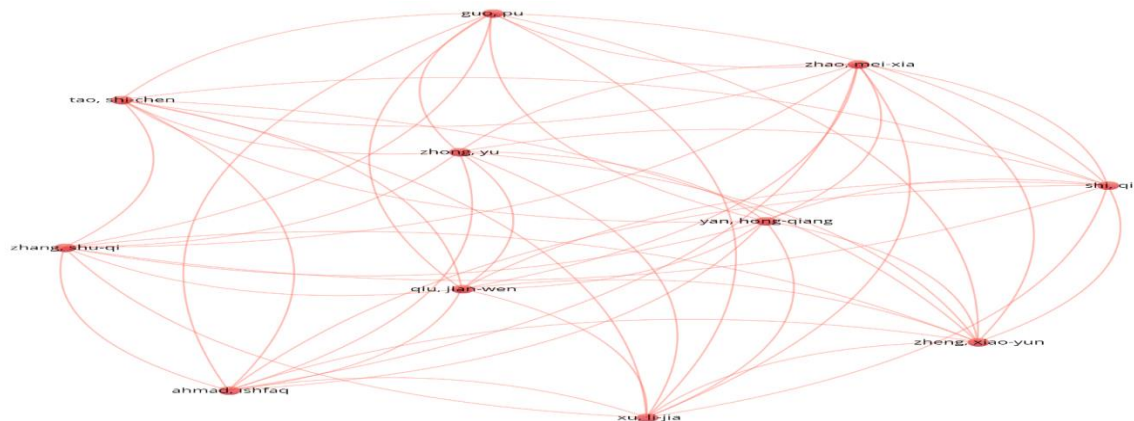
that the keywords "tourism," "adaptation," and "development" were frequently used and exhibited strong relationships with other concepts.

Figure 2. Keyword Network



The network map illustrating collaboration among authors was generated using the VOSviewer software. In the analysis, the criteria required authors to have contributed to at least one publication and received at least one citation. Based on this threshold, 118 authors out of a total of 146 were included in the evaluation. According to the resulting data, the network map showing the authors with the highest collaboration levels is presented in Figure 3. Examination of the map reveals that authors collaborating on climate change in tourism are grouped within a single cluster. Within this framework, researchers named “Zhong, Yu,” “Qiu, Jian-Wen,” and “Yan, Hong-Qiang” were identified as having the strongest connections and most frequent collaborations in this field. Evaluating the overall network structure, it is noteworthy that “Yan, Hong-Qiang,” marked by a red circle, stands out as the author with the highest level of collaboration.

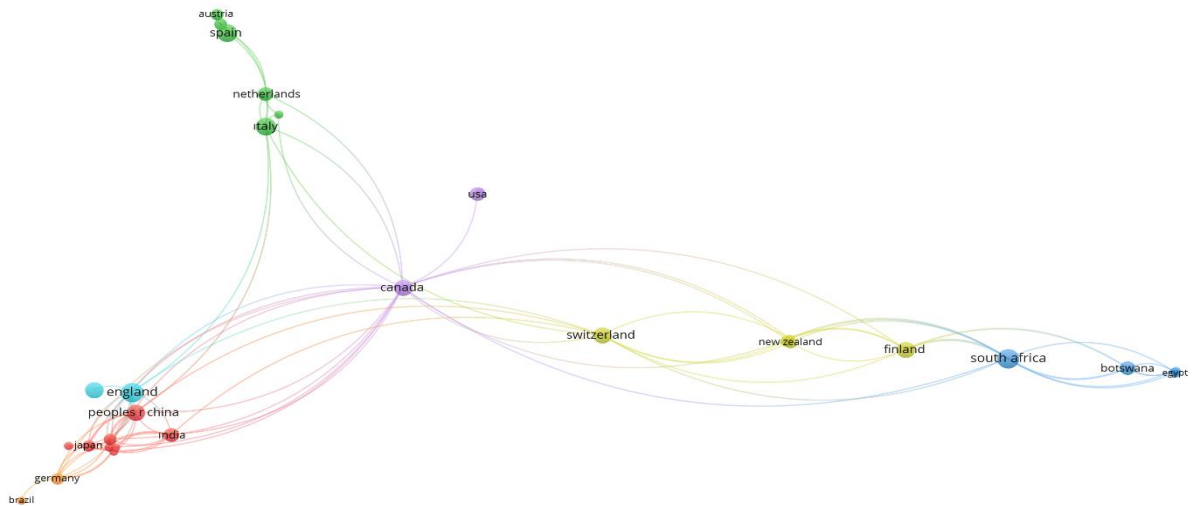
Figure 3. Network Map of Authors with the Most Collaborations



The network map illustrating international collaboration among countries was generated using the VOSviewer software. The analysis criteria required countries to have at least one publication and one citation. Under this threshold, all 38 countries included in the analysis were evaluated. Based on the obtained data, the network map displaying the countries with the highest levels of collaboration is presented in Figure 4. Examination of the map reveals that the countries collaborating on climate change in tourism are grouped into five distinct clusters. The first cluster includes Brazil, Germany, Japan, India, China, and England; the second cluster consists of Italy, the Netherlands, Spain, and Austria; the third cluster includes Canada and the USA; the fourth cluster comprises Switzerland, New

Zealand, and Finland; and the fifth cluster contains South Africa, Botswana, and Egypt. These countries have the strongest connections and the highest levels of collaboration in the field. When the overall network structure is considered, it is notable that Canada and Switzerland, represented by large nodes, stand out in terms of international collaborations.

Figure 4. Network Map of Countries with the Most Collaborations



The network map of the most cited authors was created using the VOSviewer software. In the analysis process, the criterion of having at least one publication and one citation was applied to authors, resulting in the inclusion of all 146 authors meeting these conditions. Based on the findings, the network map illustrating the most cited authors is presented in Figure 5. According to the analysis results, the most cited authors in studies on climate change in tourism are grouped into four distinct clusters. Within this context, “Saarinen, Jarkko,” who has received a total of 284 citations from three publications and is represented by the largest red node on the network map, stands out as the most highly cited researcher in the field.

Figure 5. Network Map of the Most Cited Authors



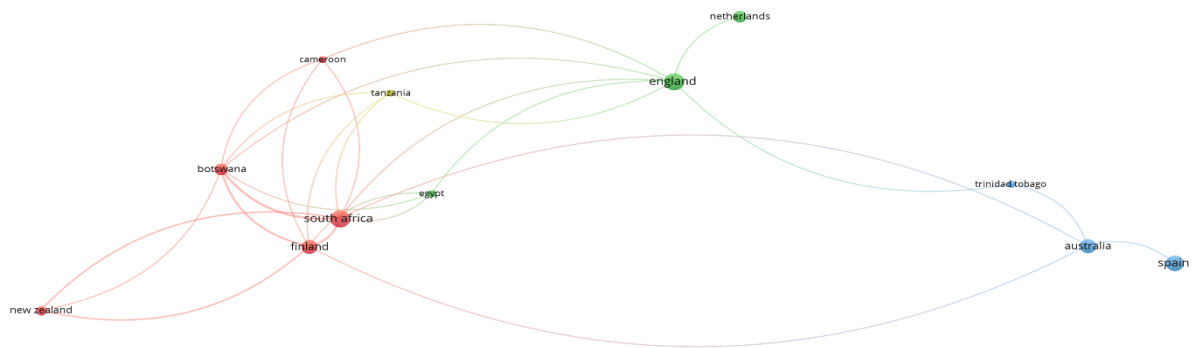
The network map of the most cited sources was created using the VOSviewer software. Within the analysis, the criteria of having at least one publication and one citation were applied to sources, resulting in 37 out of 44 qualifying sources being included in the evaluation. Based on the obtained data, the network map of the most cited sources is presented in Figure 6. Examination of the map reveals that the most cited sources in studies on climate change in tourism are grouped into three main clusters. In this context, the journal *Current Issues in Tourism*, represented by the green cluster, stands out as the most cited publication outlet in the field.

Figure 6. Network Map of the Most Cited Sources



The network map of the most cited countries was created using the VOSviewer software. In the analysis, the criteria required countries to have at least one publication and one citation; all 38 countries meeting this threshold were included in the evaluation. Based on the obtained results, the network map illustrating the most cited countries is visualized in Figure 7. Examination of the map shows that the countries with the highest citation counts in studies on climate change in tourism are grouped into three distinct clusters. The analysis further revealed that South Africa is the country with the highest number of citations in this field.

Figure 7. Network Map of the Most Cited Countries



5. Conclusion, Discussion, and Recommendations

This study conducted a bibliometric analysis of international publications on climate change within the field of tourism, comprehensively revealing the current state, trends, and key actors in the research area. The review spanning the period from 2001 to 2025 showed a marked increase in the number of publications related to tourism and climate change, particularly in recent years, reflecting the topic's growing and contemporary academic interest. The fact that all publications are in English and produced by various countries and institutions on a global scale underscores the universal importance and interdisciplinary nature of the field. The reason for selecting the period between 2021 and 2025 is to examine emerging new trends in climate and tourism research in the post-COVID-19 era.

The analyses demonstrated that studies on climate change in tourism are predominantly concentrated within the discipline of Hospitality, Leisure, Sport, and Tourism, while other fields such as environmental sciences, sustainability, and economic development also make significant contributions to the literature. Furthermore, the collaboration network revealed that the United Kingdom, South Africa, Canada, and several European countries stand out as leading academic centers, alongside developing countries like South Africa and Botswana, which also actively contribute to the research. The prominence of the United Kingdom and South Africa indicates strong academic collaborations within these countries. Accordingly, it is recommended that developing countries establish research partnerships with institutions in these nations. This indicates that the research area holds significance across diverse socioeconomic and environmental contexts in both developed and developing countries.

In this context, the increasing academic output in the literature provides an essential knowledge base for better understanding and managing the impacts of climate change in the tourism sector. However, the current data suggest that the field is still represented by a relatively limited number of publications, highlighting the need for more in-depth and comprehensive research. Accordingly, the following recommendations are presented.

- Studies on the impacts of climate change in tourism should be increased, particularly within diverse regional contexts and cultural settings. This approach would enable the development of not only universal policies but also localized and region-specific strategies.
- Research examining the relationship between tourism and climate change should encourage greater integration of disciplines such as environmental sciences, sociology, economics, and political science. This interdisciplinary approach ensures a more holistic understanding of the field.
- Examples of international collaboration identified in analyses should be further expanded in the future, with a particular emphasis on promoting projects that support the research capacities of developing countries.
- To enhance the accuracy and comprehensiveness of bibliometric analyses, databases beyond Web of Science should be utilized, thereby enabling access to a wider and more diverse range of publications.
- The findings of academic studies should be effectively shared with stakeholders in the tourism sector; policymakers, tourism enterprises, and local administrations should utilize scientific evidence to develop strategies for combating and adapting to climate change.

In conclusion, the topic of climate change in tourism is rapidly growing as a current and significant research area in the literature; however, it still requires more in-depth and comprehensive studies. This study aims to reveal the current state of the literature, shed light on future research directions, and contribute to shaping sectoral policies based on scientific foundations.

Ethics Statement: Since the study does not require a survey or interview on any institution, organization or person, it is not included in the studies requiring an ethics committee.

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