

THE EVOLUTION OF ECOTOURISM ON GEOHERITAGE IN SCIENTIFIC RESEARCH: A BIBLIOMETRIC ANALYSIS

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Abstract: Abstract: The objective of this study is to examine the evolution of Ecotourism on Geoheritage through bibliometric analysis. Total of 53 papers pertaining exclusively to the domain of Ecotourism on Geoheritage, spanning from 2008 to 2022, were gathered from the Scopus database. This study examines the core aspects and features of Ecotourism on Geoheritage in academic research. It employs topic analysis, concurrence analysis, and timeline analysis of author keywords to investigate factors such as annual publication contribution, popularity, and focus. Furthermore, the analysis incorporates many productive entities, including journals, authors, institutions, countries, regions, and the mapping of significant collaboration links. These elements are utilized to determine the level of attention received by different entities in the field of Ecotourism on Geoheritage research. Furthermore, this study examines the citation structure of authors and journals and provides a detailed analysis of burst detection in cited authors, journals, and references. Ultimately, the study findings will be integrated with the present financial circumstances to delve further into future development obstacles and prospects. This bibliometric analysis reveals a consistent rise in yearly publications, a notable shift in emphasis towards financial inclusion, a prevailing presence of authors from Australia, and a growing number of international collaborations and publications from diverse sources. These findings indicate that the field of Ecotourism on Geoheritage is dynamic and holds promise for future scientific advancement. Hence, this exhaustive analysis of the Ecotourism on Geoheritage document not only examines the features and course of existing research but also assists researchers in identifying the appropriate research starting point and conducting thorough investigations.

Key words: Ecotourism, Geoheritage, Research, Bibliometric Analysis, Scopus,

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INTRODUCTION

Geoheritage refers to geological characteristics and processes that influence the development of the earth throughout millions of years (Németh, 2023). Combining ecotourism principles with the understanding and conservation of geoheritage offers a great opportunity to promote sustainable tourism practices while protecting our geological wealth (Chandel et al., 2023; Zhang et al., 2023). Investigation of geoheritage sites is a recent undertaking in the field of tourist research (Drinia et al., 2023). Ecotourism is primarily focused on more than just admiring the visual appeal of the natural surroundings (Carrascosa-López et al., 2021). The concept of “geotourism” is well established in tourism science, as evidenced by a large number of scientific and mass market works published internationally every year (Štrba et al., 2023). Geotourism has emerged as a solution to mitigate the negative effects of mass tourism in environmentally and geographically delicate and important destinations within tourist settings (Rohaendi & Herlinawati, 2024; Zabielska, 2023). The urgency of studying value chains in marketing channels is underscored by the dynamic and continuously evolving nature of global markets. Therefore, a multidimensional need for the evolution of this field can be recognized.

Progress in this particular research domain continues to be dispersed, despite its distinct nature (Lewis, 2023), especially due to the field's dependence on different domains related to ecotourism and tourism development (Abioui et al., 2021; Anokhin et al., 2021; Chlachula et al., 2021; Román and Umaña, 2020). Both the research's dependence on qualitative evaluations and the possible necessity for a more thorough quantitative analysis to fully comprehend the region's tourist

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potential are limitations of the study. This study only looked at one place, thus its results might not apply to other parts of the world. Moreover, the broadening of the field's horizons due to the rapid progress of cultural tourism (Herrera-Franco et al., 2022; Mirari et al., 2020; Xu et al., 2023) has resulted in inharmonious perspectives on Ecotourism on Geoheritage among researchers (Ellegaard & Wallin, 2015), which complicates the synchronized development of the field. Each uses a variety of geographic and environmental assessment techniques, such as mapping with geographic information systems (GIS) and conducting field research, to assess the tourism potential of a particular location. This research emphasizes the need to maintain the integrity of cultural and environmental landmarks while expanding tourist attractions.

However, every research effort must have inherent obstacles (Herrera-Franco et al., 2022). An inherent obstacle is the limited applicability of their findings due to their focus on specific geographic areas (Mirari et al., 2020). Additionally, this method relies heavily on subjective evaluation and could potentially benefit from including more objective data. Issues of accessibility and infrastructure development in these places are emphasized, which have the potential to affect the feasibility of tourism development (Tičar et al., 2018). In summary, these studies provide valuable insights into the geotourism and ecotourism potential of specific places. However, its usefulness is limited due to its concentration in certain regions and the need for broader data. This research acknowledges the lack of conceptual uniformity and unanimity in this field, as noted by Németh's and Procter (2021), this paper discusses the challenges in decision-making due to the complexity of value interests and how this often neglects geo-education. Researchers used automated landform classification and crowdsourcing through platforms such as Flickr to analyze visitation rates and identify key geoeducational sites. This study emphasizes the integration of geoscience data and public interest for urban planning and conservation strategies.

However, this study did not explicitly address potential temporal variability in visitation rates. Tourism trends and visitor preferences may change over time, thereby influencing the relevance of identified geoeducational sites. This study attempts to address this issue by showing recent advances, as well as prominent authors whose contributions have been essential in leading scientific work in this area, as well as current trends and possible future research directions.

The questions that are addressed in this study include inquiries regarding the current state of advancement, the primary individuals who have made significant contributions, the sources that have had the most influence, including countries and journals, the patterns in publications on the subject, as well as the extent and prevalence of these trends, the distribution of current knowledge, and the prospective paths for study in the scientific domain of ecotourism on geoheritage. To address these problems, this study employs bibliometric analysis as well as citation and co-citation analysis on previously published scientific publications. This research has numerous benefits. The publication trends provide insights into the current advancements and stages of growth in the sector. These findings could enable other researchers to assess the suitability of their research objectives. Furthermore, through the process of identifying the most significant papers and writers on the subject, together with the often-utilized keywords, researchers may effectively recognize the prominent people in the field and construct a conceptual framework that aims to facilitate peaceful advancement. Furthermore, the cluster analysis performed in this work unveiled the magnitude of existing information and the potential range of future investigation. Furthermore, this research aids future researchers in comprehending the extent of international collaboration that can promote the transfer of information and contextualization of such adoption, hence expediting funding. Through ecotourism on geoheritage, inclusiveness and sustainability in the global financial sector can be achieved. This can be accomplished by identifying the nations that have contributed the most, which provides an indication of the current status of the adoption of ecotourism on geoheritage in their respective regions. Further research is structured as follows. In the second part, the methodology adapted from this research has been explained. Subsequently, the findings of the analysis are presented and deliberated upon in sections four and five. Ultimately, the paper finishes by discussing the practical and theoretical consequences of this research while also acknowledging its limits.

METHODOLOGY

A bibliometric analysis, including citation and co-citation analysis, has been conducted on published scientific publications to examine the evolving trends and characteristics in the scientific field of Ecotourism on Geoheritage. Bibliometric analysis has demonstrated its efficacy in identifying prevalent terms and evolving concepts, as well as predicting future trends (Donthu et al., 2021; Ellegaard & Wallin, 2015). This method employs quantitative measurements and investigative procedures to analyze textual documents, adhering to an objectivist worldview (Rialti et al., 2019). Citation and co-citation analysis aims to reveal emerging patterns and assess the influence of various journals, authors, related keywords, and common concepts. Furthermore, it discerns the trajectory of the establishment and advancement of scientific disciplines, which is linked to specific authors and collaborative efforts (Bu et al., 2018).

Bibliometric studies, such as citation and co-citation analysis, have the ability to derive patterns and attributes from written sources. Bibliometric studies aid in the examination, arrangement, and expression of the research conducted in a specific topic within a specific timeframe by measuring its expansion, institutional scientific prowess, and potential intellectual movements (Hasana et al., 2022; Herrera-Franco et al., 2020). Citation and co-citation analysis is a method used by researchers to analyze written materials published in academic sources, such as journals, books, and articles. It involves using analytical skills, strategies, and tools to study and observe a specific research field or a section of a scientific discipline (Chang et al., 2015; Zupic & Čater, 2015). Bibliometric studies offer a thorough overview of the historical, current, and future trajectory of an area or subfield under investigation.

The utilization of bibliometric research techniques enables researchers to apply quantitative tools and analyze published written documents in an effective and unbiased manner. This approach aligns with the objectivist research philosophy and facilitates the understanding and presentation of findings in quantitative terms (Chang et al., 2015; Donthu et al., 2021;

Khasseh et al., 2018; Linnenluecke et al., 2020). Figure 1 displays a concise overview of the methodological procedure. The researchers extracted the written documents for the bibliometric study from the Scopus Database, specifically using the keywords "ecotourism AND geoheritage," which are commonly found in articles within the selected scientific topic. The study's limitations can be attributed solely to the application of these keywords. Furthermore, the authors did not choose or utilize databases other than Scopus because they did not have official access to them. The authors exclusively granted access to the Scopus Database, so enabling the utilization of additional pertinent keywords, including those from other reputable databases such as Web of Science, ScienceDirect, DOAJ, and JSTOR, for future research purposes.

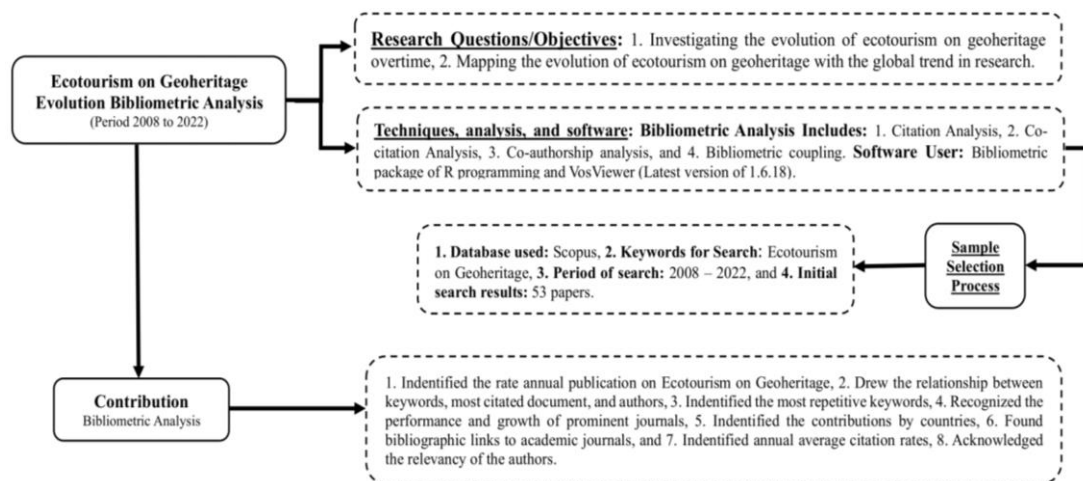


Figure 1. Outline of the methodology

Upon completing the database loading process, the authors implemented a periodic filtering technique to selectively retrieve documents spanning from 2008 to 2022. As an emerging academic discipline, the database comprises a total of 53 documents, commencing from 2008. The period between 2008 and 2022 was chosen because the development of this field began after 2008, and 2023 was not included, as the total number of published documents was unknown at the peak of this research. The authors have not applied the “Document Type” filter, as they have considered all document types (e.g. articles, books, book chapters, conference papers, short surveys, and note previews) that are applicable and relevant to bibliometric analysis. The author did not exclude certain types of documents, because applying the keywords “ecotourism AND geoheritage”, and other related documents, only obtained 53 results. Other studies conducted in recent years applied similar strategies to shape the overall Ecotourism on Geoheritage research (Hasana et al., 2022; Herrera-Franco et al., 2020, 2022). To calculate the “average citations per document” the researchers considered both highly cited and low-cited papers, which facilitated the process of identifying good and mediocre research. In addition, all sources of scientific work are considered to maximize the total number of papers. Using this filtration technique, the author took 53 documents. The R programming bibliometric package has been used on these documents from the Scopus Database for analysis. VOS Viewer (latest version 1.6.18) has also been used to present network analysis.

RESULTS

1. Summary Statistics

This chapter presents the results of a bibliometric study carried out on 53 publications focused on the research subject of ecotourism on geoheritage. These documents were published between 2008 and 2022. Table 1 presents a concise overview of the results obtained from the analysis. The average number of citations per document obtained from the Scopus Database was 24.87. A higher average citation count indicates a significant increase in the number of research papers that have contributed to the scientific field of ecotourism on geoheritage during a specific time frame. The results also provide the count of distinct authors contributing to the field. In total, there were 176 authors who contributed by publishing a combined total of 53 papers.

Out of them, 7 authors submitted 8 documents individually. The average number of authors involved in the completion of each document is 3.58, with each author contributing to a minimum of 8 papers. To clarify, there are 8 papers per author on average, and each document has an average of 3.58 co-authors. Furthermore, these findings demonstrate the significant prevalence of author partnerships within the ecotourism area, specifically pertaining to geoheritage. The findings of this study additionally demonstrate the presence of a substantial number of global partnerships, facilitated by 20.75% of foreign co-authorships.

Table 1. Summary Statistics

Description	Results
Main Information About Data	
Timespan	2008:2022
Sources (Journals, Books, Etc)	26
Documents	53
Annual Growth Rate %	16,99
Document Average Age	6,06
Average Citations Per Doc	24,87
References	2618
Document Contents	
Keywords Plus (ID)	280
Author's Keywords (DE)	175
Authors	
Authors	176
Authors Of Single-Authored Docs	7
Authors Collaboration	
Single-Authored Docs	8
Co-Authors Per Doc	3,58
International Co-Authorships %	20,75
Document Types	
Article	48
Conference Paper	1
Review	4

2. Performance Analysis

Figure 2 displays the yearly changes in scientific productivity from 2008 to 2022. This shows the novelty of the scientific field of ecotourism on geoheritage. The development of annual publications in this field has experienced less stable development. This growth continues to be seen in 2020. The increasing implications of ecotourism on geoheritage globally can justify the annual growth rate in research figures depicted in Figure 2. By obtaining a Pareto's Law perspective to observe this growth, publications account for 99% of the total number of documents (53) in the scientific field of ecotourism on geoheritage can be attributed to contributions made in just 8 years (2014 to 2022), although this study experienced ups and downs. These studies, taken from the Scopus database, mostly focus on ecotourism, tourism development, geotourism, heritage conservation, and heritage tourism.

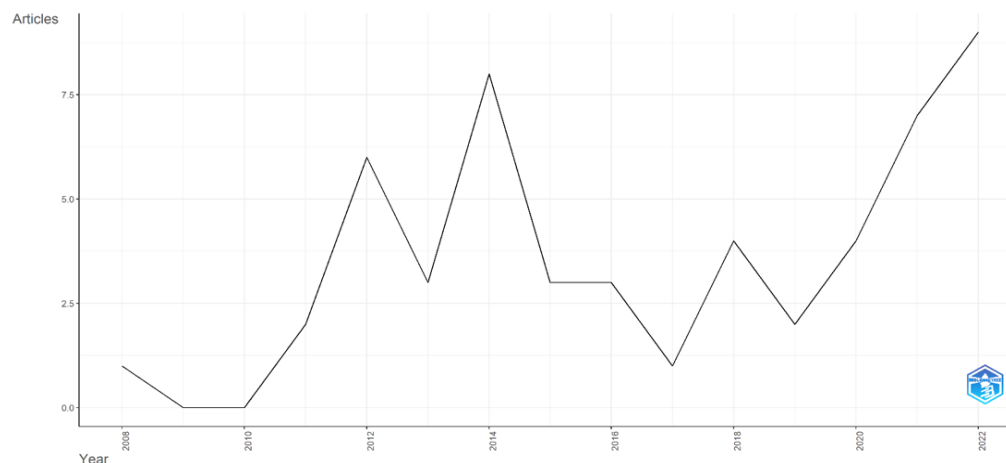


Figure 2. Annual Scientific Production on Ecotourism on Geoheritage

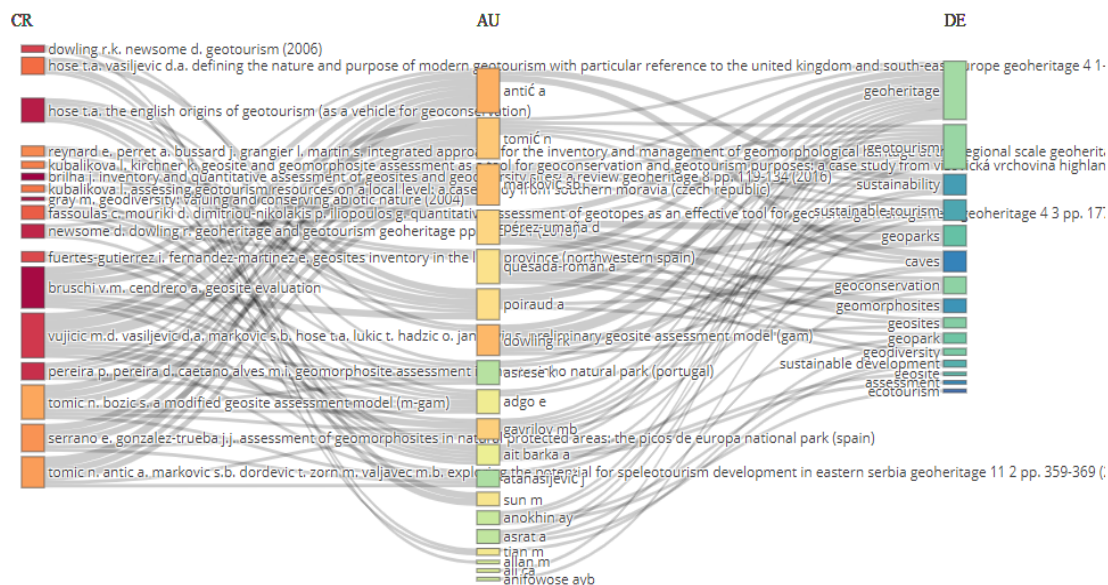


Figure 3. Three field analyses in Ecotourism on Geoheritage

3. The correlation between Keywords, Highly Cited Documents, and Authors

Figure 3 illustrates a comprehensive study conducted on keywords, highly referenced publications, and prominent authors of documents published in the Scopus database within the domain of ecotourism on geoheritage from 2008 to 2022. The diagram illustrates the correlation between the variables of the articles with the highest number of citations (left column), the authors with the highest number of citations (middle column), and the keywords (right column). The image illustrates that CR denotes the title of the article with the highest number of citations, AU signifies the author who is being cited, and DE represents the keywords employed by both the author and the article. The analysis confirms that Ecotourism on Geoheritage is the keyword that appears most frequently and is chosen by authors in this field. However, “geoheritage”, “geotourism”, “sustainability”, “sustainable tourism”, “geoparks”, “caves”, and “geoconservation” are used repeatedly with terms closely related to Ecotourism on Geoheritage. Commonly appearing keywords are also presented in Figure 4, using word power Cloud Analysis. New trends in ecotourism and tourism development clearly emerge through this analysis. This also shows the increasing interest in ecotourism and tourism development to the wider community. The implications of this field usually cover a wide range of topics regarding environmental conservation, sustainable tourism practices, and socio-economic development in tourist destination areas. Nevertheless, a greater emphasis has been placed on investigating the relationship between Ecotourism and Geoheritage in a more

comprehensive manner compared to the keywords. Several researchers have made contributions to this topic, including Antić (2020), Dowling (2011), Marković (2022), Tomić (2018), Gavrilov (2022), and Poiraud (2017) are equally important in developing the keywords “Ecotourism AND Geoheritage”. The use of peripheral keywords related to ecotourism and geoheritage implies that this area is still in its infancy. Therefore, future researchers can work on ecotourism and geoheritage to expand and develop ecotourism on geoheritage as an academic research field.



Figure 4. Word Cloud Analysis in Ecotourism on Geoheritage

4. Academic Journal Performance

Figure 5 shows the contribution of various journals based on the number of documents published in the field of ecotourism on geoheritage. The international journal “Geoheritage” based in Germany has the highest contribution in this domain. This journal only published 19 research papers from 2008 to 2022. “Sustainability (Switzerland)” which has published 5 papers and “International Journal of Geoheritage and Parks” published 3 papers. “GeoJournal of Tourism and Geosites”, “Geosciences (Switzerland)” and “Annales De Geographie” have each published 2 papers. Despite having strong editorial boards, the journals “Anuario do Instituto de Geociencias”, “Applied Geography”, “Arabian Journal of Geosciences”, and “Baltic Region” have not made significant contributions to the field of ecotourism on geoheritage.

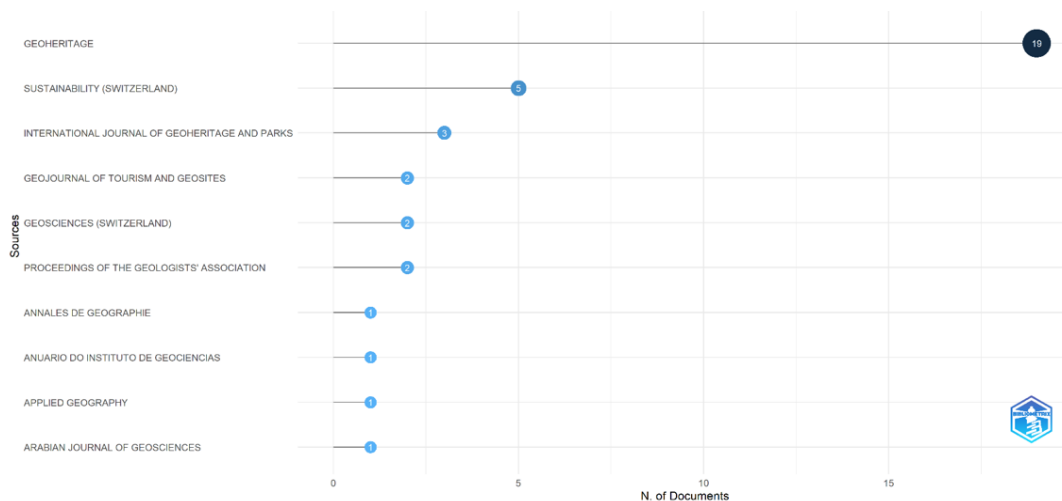


Figure 5. Most Contributing Journal in Ecotourism on Geoheritage

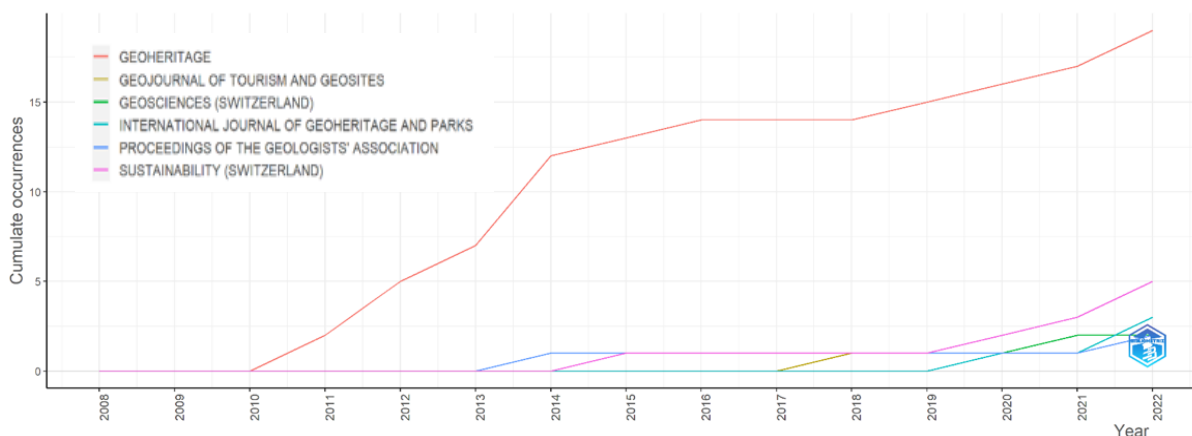


Figure 6. Sources' Dynamics Over Time

5. Sources of Growth in Ecotourism on Geoheritage over Time

As previously said in this paper, "Geoheritage" plays a significant role in the field of ecotourism, specifically in relation to geoheritage. Nevertheless, funding from this source did not commence until 2009. This source commenced its expansion in the field of academic study in 2010. Figure 6 illustrates a consistent and rapid increase in the number of articles from this source between 2010 and 2022, following an exponential growth pattern. The journals "Sustainability (Switzerland)" and "Applied Geography" commenced publishing articles in 2015 and 2016, respectively. However, their growth rates up until 2022 have been fluctuating and unpredictable. The "International Journal of Geoheritage and Parks" only published papers in this field in 2020. "Geojournal of Tourism and Geosites" has been a journal that has been published stably in this field since 2014. Although "Geosciences (Switzerland)" is a journal that has a special theme related to this field, but publication of new papers began in 2020.

6. Impact by Country

Figure 7 illustrates the hierarchy of different nations according to their influence on the scientific domain of ecotourism on geoheritage from 2008 to 2022. According to bibliometric data, authors from Australia have the most influence. The American author has amassed a grand total of 414 citations. The substantial volume of citations, despite the relative novelty of the academic field, indicates the swift progress of banking services in the region towards incorporating financial technology. As expected, Greek writers played a crucial role in shaping the advancement of this discipline, advocating for a profound alteration in Greece's monetary system and methods of conducting transactions. At the conclusion of the specified research period, Greek authors had amassed a total of 172 citations, ranking as the second greatest number of citations among all countries. Nevertheless, the significant influence of Turkish authors has also been recognized. The researchers have garnered 56 citations, positioning them in third place on the list. The impact of other countries (e.g. Italy, Slovakia, Ethiopia, Serbia, Morocco, Costa Rica, and Ecuador) is also visible.

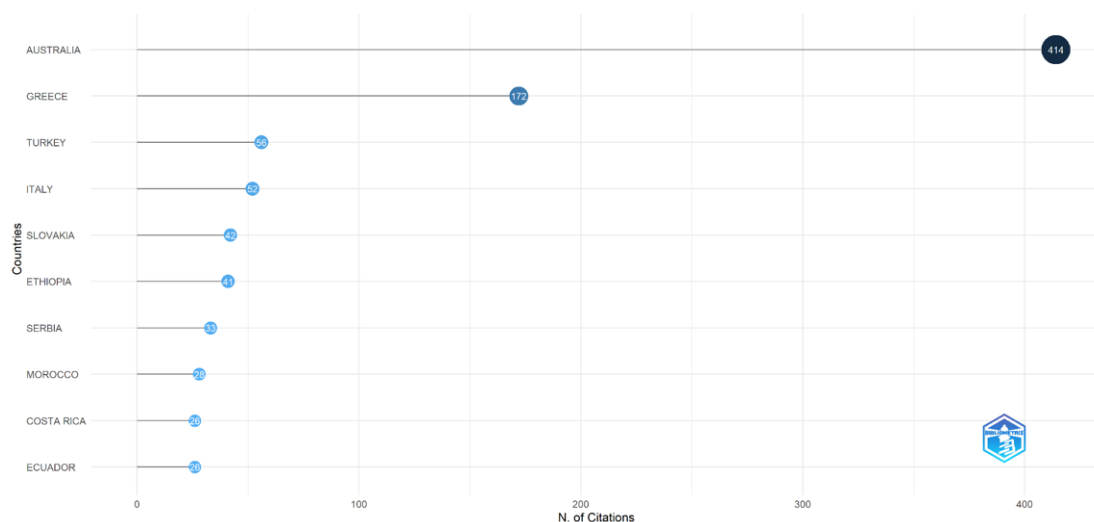


Figure 7. Most Cited Countries in Ecotourism on Geoheritage

The bibliometric investigation also revealed partnerships among authors from diverse nations. The data in Figure 8 illustrate the degree of collaboration, highlighting the prevalent pattern of cross-national co-authorship between academics from the Czech Republic and Kazakhstan. Australia, the country of authors or co-authors with the largest number of scientific papers, tends not to be found on the collaboration map. Iran and Poland collaborate both domestically and with other countries, even with countries on other continents. Belgium, Ethiopia, and Austria also receive significant collaboration traffic from countries such as Poland and Iran.



Figure 8. Country Collaboration Mapping

7. Bibliographic Links to Academic Journals

Figure 9 shows the two groups of studies identified through bibliometric analysis. All clusters in the image are red, this cluster contains keywords such as ecotourism, tourism.development, geotourism, heritage.conservation, heritage.tourism, cultural.heritage, geodiversity, sustainability, education, and environmental.protection. Because there are no significant differences that occur, the author describes the focus area of the cluster in the same area, namely ecotourism.

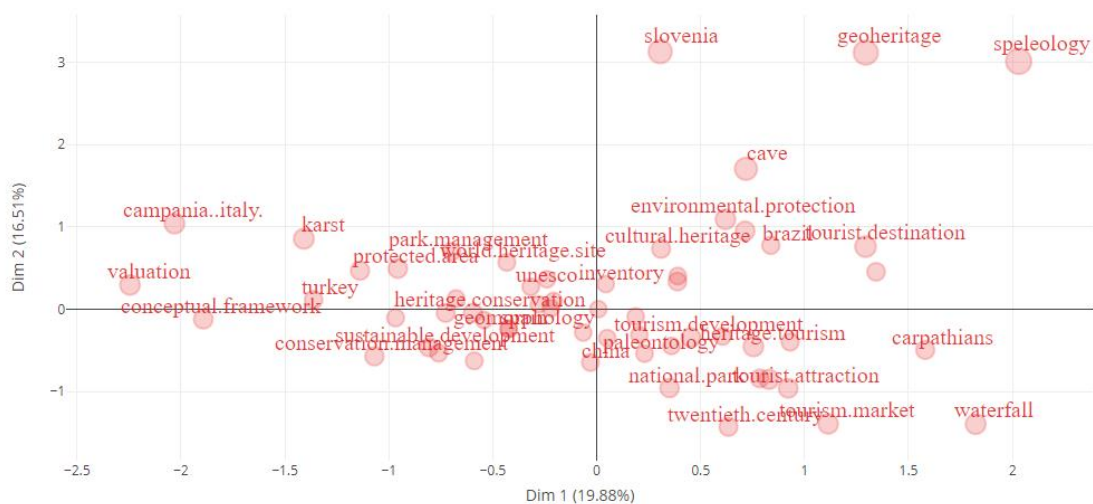


Figure 9. Cluster Analysis in Ecotourism Research on Geoheritage

8. Average Quotes over Time

Figure 10 presents the total number of annual citations in Ecotourism on Geoheritage, from 2008 to 2022. As explained earlier in this paper, scientific research in the field of ecotourism on geoheritage started on a large scale since 2008, which is once again confirmed by the bibliometric analysis of ecotourism on geoheritage annual citation number. The development of citations to papers written with the keywords "Ecotourism AND Geoheritage", and other related papers, began after 2008. Since 2014, the growth rate has started to trend towards negative. The annual number of citations also decreased from 2015 to 2019.

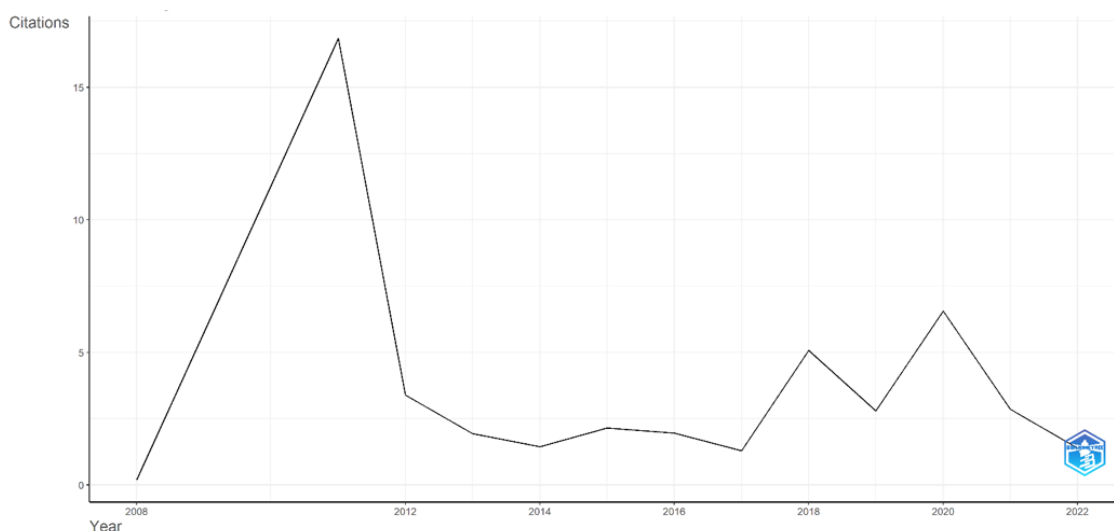


Figure 10. Annual citations on Ecotourism on Geoheritage

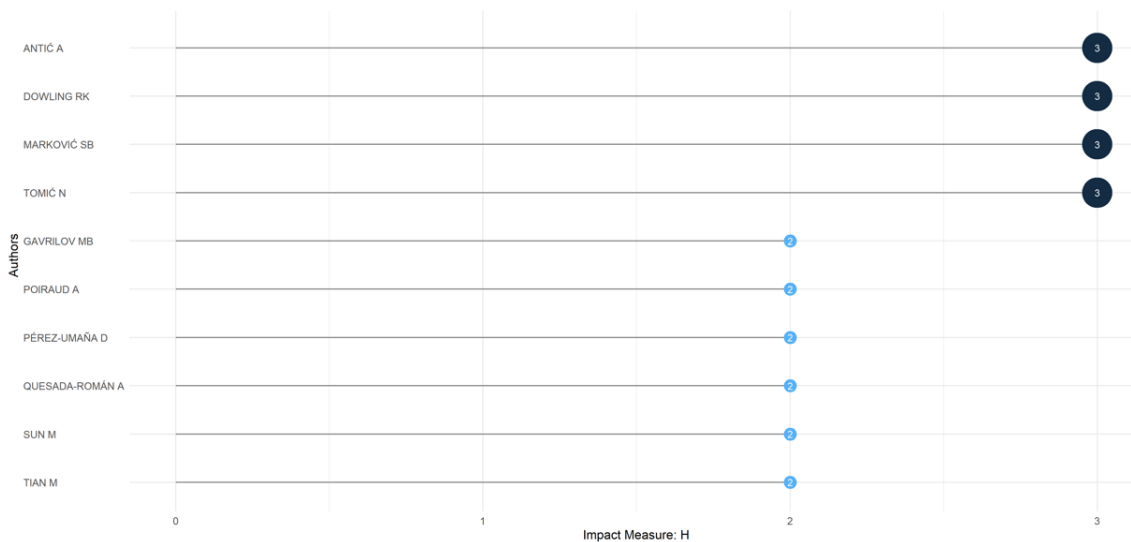


Figure 11. Most Relevant Authors in Ecotourism on Geoheritage

9. Author Relevance in Ecotourism on Geoheritage

Figure 11 depicts the contributions made by different authors that were identified using bibliometric analysis. From 2008 to 2022, Antić A. Dowling R.K., Marković S.B., and Tomić N. contributed equally to the field of Ecotourism on Geoheritage by each authoring or co-authoring 3 papers. Gavrilov M.B., Poiraud A., Pérez-Umaña D., Quesada-Román A., Sun M. and Tian M. wrote about 2 scientific papers. The contributions of these authors are also visible in the Three Field Analysis discussed at the beginning of this paper.

DISCUSSION

This study presents a bibliometric analysis conducted on publications published in the field of Ecotourism on Geoheritage from 2008 to 2022. A total of 53 scientific papers were retrieved from the Scopus Database. The investigation revealed that the phrase "geoheritage" in tourism development was first introduced in 2008 with the publication of a paper. This term was proposed by Bujdosó et al. (2015), demonstrating its recent emergence in the sector. The number of annual publications will increase gradually until 2022 although there will still be several declines. Since 2020, this field has attracted enormous research interest, resulting in an increase in the number of annual publications (Figure 2). In the same period, the adoption rate of ecotourism on geoheritage in geotourism globally also increased rapidly (Hasana et al., 2022; Herrera-Franco et al., 2022). Román and Umaña (2020), Cheablam et al. (2021) argue that after the COVID-19 pandemic the opening of tourist attractions began to be implemented. This analysis reveals a potential explanation for the rise of publications in this subject and beyond starting in 2021. This paper examines publications on this topic using bibliometric analysis and provides its conclusions using graphical figures and tables.

First of all, terms such as Ecotourism and Geoheritage appear most frequently (Figure 3 and Figure 4), indicating the one-way dependence of ecotourism on geoheritage on various environmental factors and cultural heritage. Dependence on other environmental and cultural heritage domains is also suggested by (Anokhin et al., 2021; Gordon, 2018; Heshmati et al., 2022; Štrba et al., 2020). In addition, geoheritage is the second most frequently used keyword (Figure 3), which implies the possibility of a strategic shift in the goals of banking and government businesses to integrate the wider community into natural tourism and geographical heritage. A recent study conducted by Anokhin, Kropinova, and Spiriajevas (Anokhin et al., 2021), demonstrates that ecotourism, when seen as a disruptive technology, has the capacity to expedite geotourism in diverse economic settings. The bibliometric analysis undertaken for this research reveals that geotourism is well recognized and frequently studied by researchers worldwide, indicating a strong interest in exploring its possibilities. Additionally, the bibliometric study demonstrates the influence of authors from various nations on the area, as depicted in Figure 7. Authors from Australia have collected the largest number of citations, highlighting the environment and cultural heritage of the region. Furthermore, the presence of international collaboration was detected (Figure 8). Authors hailing from Poland, Iran, Czech Republic, and Kazakhstan have engaged in many collaborations with various countries within the designated study period. The individual authors, namely Antić (2020), Dowling (2011), Marković (2022), and Tomić (2018), received the highest marks in terms of measuring individual impact. Nevertheless, the yearly count of citations declined after 2015. The bibliometric study also identified publications originating from 26 distinct sources (Figure 5). Out of all these sources, the journal "Geoheritage," which is located in Germany, publishes the highest quantity of scholarly publications. Figure 6 illustrates the rapid increase in the number of papers in these journals and other sources that made major contributions.

With regard to the subject of research, the conceptual structure map illustrates two distinct research directions (Figure 9). Apart from that, these three fields and the word CloudAnalysis show that the keywords ecotourism, tourism development, geotourism, heritage conservation, heritage tourism, and cultural heritage are gradually gaining momentum to become mainstream research sub-fields. Irrespective of the manner and location, the quantity of yearly publications consistently rises (Figure 2), indicating the high level of activity in the field and the potential for further scholars to make contributions. Prior bibliometric studies undertaken by Hasana, Swain, and George (Hasana et al., 2022) have also uncovered similar research issues in the discipline.

This report proposes potential research avenues that could greatly promote scientific advancement in the academic discipline of Ecotourism on Geoheritage. Nevertheless, this work conducts an analysis of publications recorded in the Scopus Database and obtained through certain keywords, restricting the scope of the research. In the future, scientific research will have the capacity to incorporate more approaches to investigate the dynamics of field development.

CONCLUSION

The purpose of this study is to conduct a bibliometric analysis of the subject of ecotourism on geoheritage in order to determine its present development, important authors, publishing trends, and potential future research directions. Research findings show that Ecotourism on Geoheritage is a dynamic and rapidly developing field, with significant growth in the number of annual publications in recent years. The analysis also reveals that this field relies heavily on various ecotourism domains and tourism development is the most frequently used keyword. Geotourism is another important aspect that has received great attention in recent years. This research identifies the authors, countries and sources with the highest contributions, which can facilitate the identification of the most relevant scientific production, international collaboration and knowledge transfer in the field. The conceptual structure map shows two different research directions in the field, and the word Cloud Analysis shows the increasing mainstreaming of sub-fields such as ecotourism, tourism development, geotourism and heritage conservation. This research contributes to the field by providing insight into current developments, key contributors, and possible future research directions. Future research

could expand this research by considering more comprehensive databases and integrating other research methods to improve understanding of the dynamic development of the field. Overall, this research provides valuable insights and contributes to the harmonious development of the field of ecotourism on geoheritage.

1. Implications for Practitioners and Academics

a. Managerial Implications

The study's conclusions on the evolution of Ecotourism on Geoheritage have significant implications for management. This study can offer significant information to tourist institutions, regulators, and policy makers for making strategic decisions about adopting and regulating Ecotourism on Geoheritage.

Understanding developing trends in Ecotourism on Geoheritage research can assist institutions in identifying locations with potential for growth and investment. Second, this study highlights productive objects, such as journals, authors, institutions, countries and regions, as well as mapping related collaborative relationships. This information can be used by tourism agencies and other stakeholders to identify key players in the Ecotourism on Geoheritage industry, understand their areas of expertise, and forge mutually beneficial partnerships. Third, this research can provide information for the development of innovative Ecotourism on Geoheritage products and services by identifying emerging technologies and themes in Ecotourism on Geoheritage research. Institutions can use this information to develop new products and services that meet evolving customer needs. Fourth, this study can help tourism institutions to identify and manage potential risks associated with implementing Ecotourism on Geoheritage. For example, this research highlights the ethical considerations associated with the use of Ecotourism on Geoheritage. Institutions can use this information to develop appropriate risk management strategies. Fifth, this study can provide valuable information for talent management in tourism institutions, including identifying key researchers and institutions in the field of Ecotourism on Geoheritage, which can help in recruiting and retaining talented employees. Ultimately, the findings of this research can be used by tourism institutions, regulators, policy makers and other stakeholders to make strategic decisions regarding the adoption, regulation and development of ecotourism on geoheritage.

b. Theoretical Implications

Theoretical consequences of this bibliometric research could have substantial ramifications in multiple aspects. Initially, it can offer a more comprehensive comprehension of the development of the Ecotourism on Geoheritage research domain, encompassing its underlying issues, distinctive features, and prevailing patterns. This can assist researchers in identifying novel research domains and orientations, as well as providing guidance for future investigations in the field of Ecotourism on Geoheritage. Furthermore, this research aims to identify the most prolific journals, authors, institutions, countries, and regions in the field of Ecotourism on Geoheritage research.

By doing so, it can assist researchers in discovering potential collaborators and networks, while also providing insights into the prevailing research paradigms and communities within this domain. Furthermore, an examination of citation structure might yield valuable information regarding the preeminent authors, journals, and references in the respective discipline. This can assist researchers in discerning the most pertinent and influential studies and comprehending the progression of Ecotourism on Geoheritage research throughout time. This bibliometric research has the potential to enhance the theoretical advancement of the Ecotourism on Geoheritage research field. It achieves this by offering a thorough examination of the current literature and pinpointing potential avenues for future research.

c. Practical Implications

The practical ramifications of this bibliometric research on Ecotourism on Geoheritage are really substantial. This paper offers significant information for professionals and decision-makers in the financial sector, such as policymakers, regulators, tourism agencies, and ecotourism start-ups, specifically focusing on the intersection of geoheritage and ecotourism. Analyzing publishing patterns can assist stakeholders in keeping up with the most recent research and advancements in ecotourism on geoheritage. This information can guide their strategic decision-making and investment selection in the realm of ecotourism focused on geoheritage. Second, identifying productive journals, authors, institutions, countries and regions in ecotourism on geoheritage research can help practitioners and decision makers identify potential collaboration opportunities and build partnerships with relevant stakeholders.

Third, citation structure analysis can help identify the most influential authors, journals and references in the field of ecotourism on geoheritage. This can help practitioners and decision makers identify and learn from best practices and success cases. Finally, discussing the challenges and opportunities for developing ecotourism on geoheritage in the future can provide input for strategic planning and innovation strategies for tourism institutions and ecotourism on geoheritage startups. It can also provide insight for policymakers and regulators to develop regulatory frameworks that encourage innovation while maintaining financial stability and consumer protection.

Limitations and Future Research Directions

Research on the evolution of ecotourism on geoheritage utilizing the Scopus database has numerous possible drawbacks. The Scopus database is a comprehensive and trustworthy bibliographic resource, although it may not encompass all pertinent papers in the domain of ecotourism on geoheritage. Certain publications may be disseminated in other databases or non-indexed journals, hence potentially excluding them from our study. Furthermore, this analysis solely focused on articles written in English, thus disregarding significant research conducted in other languages.

Furthermore, there is a possibility of publishing bias favoring esteemed authors or institutions, perhaps leading to distortion of the research findings. Furthermore, it is important to note that while bibliometric analysis can offer a broad perspective on the subject, it may not accurately gauge the caliber of the publications encompassed.

The analysis may not account for variations in the quality of different publications. Furthermore, bibliometric analysis is a quantitative methodology that disregards the contextual and substantive aspects of the publication. The analysis may fail to detect significant subtleties or patterns in the field that are not evident in the keywords or quotations employed. Furthermore, this study exclusively examined papers spanning from 2008 to 2022, perhaps limiting its representation of the complete progression of research on the relationship between Ecotourism and Geoheritage. Not all significant advancements in the discipline may be accounted for in the analysis if they occur outside of this time span.

Several prospective future study fields might be studied based on bibliometric research findings about the evolution of ecotourism on geoheritage. Ecotourism focused on Geoheritage is a fast-growing area that connects with various scientific fields, including ecotourism, tourism development, and geotourism. Potential future studies may delve into the interdisciplinary aspects of ecotourism on geoheritage and examine the many contributions made by different fields towards its advancement. The driving force behind this is the progress made in the heritage sector, specifically in areas such as heritage conservation, heritage tourism, and cultural heritage. Potential future studies may investigate the implementation of these emerging technologies in the field of ecotourism on geoheritage, as well as their influence on the ecotourism sector. The regulatory framework governing ecotourism on geoheritage is intricate and constantly developing. Further research might explore the extent to which legal frameworks are adjusting to the rise of ecotourism on geoheritage, and the potential consequences for the ecotourism industry. The primary objective of ecotourism on geoheritage is to cater to the requirements of users, and the effective execution and conduct of users play a vital role in determining its success. Future research could investigate how users adopt and use ecotourism on geoheritage products and services, and how their behavior changes. Ecotourism on geoheritage raises important ethical considerations, such as sustainability, education and environmental protection. Future research could explore how these ethical considerations are addressed in ecotourism on geoheritage, and their potential impact on the tourism industry.

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