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Research Article

Analyzing Research Patterns And Impact Of Natural Heritage And Tourism: A Bibliometric Study

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ABSTRACT

The term "natural heritage" refers to natural features, geological and physiographical formations, and defined regions that constitute the habitat of endangered species of animals and plants, as well as natural locations that are valuable from the perspective of research, conservation, or natural beauty. Natural areas that are protected by the government and private organisations, zoos, aquariums, botanical gardens, natural habitats, marine ecosystems, sanctuaries, reservoirs, and other lands are included in this category. The tourism sector has produced a significant volume of information related to Natural Heritage. The significant impact of researchers' contributions on the advancement of knowledge in various scientific fields is generally recognized. Therefore, it is crucial to assess this growing reservoir of information in order to ascertain the present condition of the field. The main objective of this study is to analyze the different research patterns in the literature on Natural Heritage and assess the development, progress, and influence of authors, sources, and countries on Natural Heritage. The data was obtained from publications sourced from the Scopus database, covering the time period from 2008 to 2023. Following the filtering process, a grand total of 157 articles were obtained for examination utilizing the VOS viewer program. Our bibliometric analysis of the intersection between "Natural Heritage" and "Tourism" indicated that the year 2023 had the highest volume of published works. China is the first nation in terms of contributions, having produced 25 articles. The 2011 study undertaken by Ramkissoon et al., which was accepted for publication in the journal "Current Issues in Tourism," has received 191 citations as of 2023, making it the most referenced study up to this point. There is evidence to suggest that the accumulation of information about Natural Heritage is expanding.

Keywords: Natural Heritage, Bibliometric Analysis, Geoheritage, Citations, Journal, Author, Article.

1. Introduction

Earth's natural history, which includes a wide range of ecosystems, plant life, and animal species, serves as evidence of the complex relationship between evolution and environmental factors that has developed over thousands of years. As society faces the difficulties presented by a swiftly evolving world, the significance of safeguarding this natural legacy becomes more and more apparent. This study paper explores the complex aspects of conserving natural heritage, with a focus on understanding the interconnections between biodiversity, cultural importance, and the sustainable health of our world.

Natural heritage encompasses the cultural and environmental elements of a particular area that are deemed significant and deserving of conservation. The management of natural environments entails evaluating the notable characteristics of a region and guaranteeing their preservation or reinstatement, ideally in a self-sufficient state. The importance of natural heritage has increased as a result of environmental degradation and climate change, which highlights the evolving connection between society and the environment. Conservation criminology is a developing discipline that focuses on the threats to protecting natural heritage, specifically from criminal networks engaged in environmental offenses. Museums and other cultural institutions have a crucial role in safeguarding and portraying the natural heritage, as well as influencing social, political, and cultural identities.

Natural legacy encompasses not just biological diversity, but also the intricate network of ecosystems, landscapes, and geological formations that have influenced the Earth's history. At this critical juncture of environmental responsibility, it is crucial to acknowledge the inherent worth of natural heritage in preserving ecological equilibrium, delivering vital ecosystem functions, and promoting resilience against the detrimental effects of climate change.

Natural heritage encompasses the entirety of biodiversity, which includes plant and animal life as well as other types of ecosystems, along with the accompanying geological structures and formations (geodiversity). The Science Division of The Nature Conservancy adopted the term "Natural Heritage" when it initiated the establishment of state natural heritage programs in 1974. These programs, led by Robert E. Jenkins, Jr., were implemented in every state and followed a standardized methodology. They are permanently funded by state governments due to their role in scientifically documenting conservation priorities and facilitating science-based environmental reviews. Upon expanding this network beyond the borders of the United States, Guillermo Mann proposed the term "Conservation Data Center (or Centre)" which subsequently gained preference for initiatives operating outside of the US. Although they have different names, these programs also employ the identical fundamental approach as the 50 state natural heritage programs.

The notion of natural diversity can be categorized into biotic and abiotic components (Boothroyd and McHenry 2019). Geodiversity, a term frequently employed in the field of geoconservation in recent years, was coined to serve as the non-living counterpart to biodiversity. Currently, there is a lack of a definitive and globally acknowledged definition of geodiversity (Boothroyd and McHenry 2019; Ibáñez and Brevik 2019). Geodiversity is commonly defined by geoscientists as the assortment of geological (rocks, minerals, fossils), geomorphological (landscapes, geomorphic processes), and soil elements found in a specific area. This includes their compositions, connections, characteristics, interpretations, and systems, as proposed by Gray (2004). Subsequently, Gray (2013) incorporated hydrological components into the core framework of this paradigm. Gray's concept of geodiversity encompasses all aspects of diversity in the non-living environment, including geological diversity, geomorphodiversity, pedodiversity, hydrodiversity, and climodiversity. However, in reality, the majority of geodiversity specialists have disregarded many features of the non-living environment in order to focus on the geological variety of locations. Considering that geology focuses on the examination of the Earth's structure, evolution, and dynamics, as well as its natural mineral and energy resources (Royal Geographical Society 2020), it is clear that the scientific research on geodiversity has been limited to a narrow aspect of non-living nature. However, the expertise of professionals should encompass not only geological aspects and processes, as has predominantly been the case in scientific research connected to the subject, but also the entire non-living diversity of the environment. The concept of geodiversity encompasses the diverse elements and processes of the non-living environment, including geological diversity, geomorphodiversity, pedodiversity, hydrodiversity, and climodiversity. These aspects can manifest in various forms, spatial and temporal scales, and modes of interaction. Geodiversity refers to the Earth's physical structure that supports life, which has developed gradually since its formation. Geodiversity is linked to the physical environment and encompasses a variety of occurrences and processes that result in the formation of rocks, minerals, landscapes, topography, temperatures, rivers, soils, fossils, and deposits that support the growth of life on Earth. The notion is to engage in direct communication with the general public to emphasize the significance of understanding not only the diversity of living organisms on Earth (biodiversity), but also their specific habitats, reproductive processes, and developmental stages. Expanding the definitions of geodiversity to include all forms of non-living diversity is crucial to facilitate more extensive scientific research on the topic and encourage the involvement of professionals from various fields, beyond geology. This approach aims to promote the conservation of both non-living and living aspects of nature. Geoheritage refers to the geological heritage of a specific location. The Geological Society of America and most literature on the subject define geoheritage as a broad yet descriptive term used to refer to areas or sites that possess geological features of considerable scientific, educational, cultural, or aesthetic importance (Geological Society of America 2012). From a non-living perspective, this notion is very limiting. While it is possible to interpret "geological features" as encompassing all non-living elements, this interpretation does not align with the principles of modern sciences and facts. In the field of Earth Sciences, objects are clearly defined, and this should also be the case in geodiversity and geoheritage. Geoheritage can be defined as the collection of geological heritage, geomorphoheritage, pedoheritage, hydroheritage, and climoheritage. These terms encompass the various abiotic elements that hold significant scientific, educational, cultural, or aesthetic value to society. They encompass a wide range of processes, forms, and scales. The term "hydroheritage" was used by Seymour (1992) to refer to manmade heritage related to water, such as dams. The author in question does not ascribe the same

significance to it as the one presented here, as the concept of geoheritage discussed in this study specifically pertains to non-living components. However, the term "hydroheritage" was chosen (modified from "hydro heritage" to "hydroheritage") to symbolize significant natural hydrosystems, components, or processes that hold great societal importance, such as springs in arid regions, significant river captures, and extraordinary tides or currents, among other examples. Regarding climoheritage, a concept that has not been addressed in the literature, it can be described as a type of natural intangible heritage. Its characteristics may include cold climates in hot regions (such as mountainous areas in the tropics) or the occurrence of dew in desert environments.

2. Bibliometric Analysis and Methods

By assessing the corpus of existing empirical literature, bibliometric research aims to highlight the boundaries of knowledge and identify any potential gaps in knowledge (Fahimnia et al., 2015). The bibliometric analysis is recognised as a useful method of analysing the characteristics of research themes, authors, journals, organisations, and other entities. It classifies data using quantitative approaches and produces representative summaries (Li et al., 2020). Therefore, the goal of the proposed study is to determine the many research patterns found in the literature on “Natural heritage” as well as the advancement, development, and contribution of writers, sources, and nations in relation to “Natural heritage”. The publications included in the Scopus database between 2008 and 2023 served as the source of the data. Errors might occur when gathering data for bibliometric analysis, therefore minimizing repeating incorrect data is essential. To avoid duplicate data, only Scopus was used as a source for data retrieval. The terms "Natural Heritage" AND "Tourism" were entered into the document search field. We used the Scopus database, which is one of the most widely used databases in the academic community for compiling big data sets and creating bibliometric indicator-based statistics. The search was conducted in the "topic, title, abstract, keywords" category. There were 566 total documents found in the Scopus database during the first search, comprising articles, reviews, and editorial content. The search was narrowed down from 566 papers to 336 documents by using the keywords "Natural Heritage" OR "Geoheritage" OR "Heritage Tourism" OR "Intangible Cultural Heritage Tourism" OR "Geo Conservation." Additional document improvement included finishing the last publishing step, using just English, and removing any papers that weren't articles. Only 157 papers were evaluated using VOS viewer software after the filtering procedure.
The following four parameters were investigated in relation to the retrieved data:
I. Annual growth of the publications.
II. Most contributing countries.
III. Most cited articles.
IV. Top contributing Journals.
The study focused on utilizing data visualization to employ science mapping analysis in order to map the data. The study focused on utilizing bibliometric maps to illustrate the organization and interconnections among Authors, Journals, and Countries. The study investigated the simultaneous presence of author keywords, co-citation analysis, and bibliographic coupling. Author keywords refer to keywords that appear below the extract. Co-citation analysis involves citing the same article in two separate publications. Bibliographic coupling occurs when two publications quote the same third article. These analyses were chosen due to their high frequency of usage in bibliometric research.

2.1 Inclusion-Exclusion criteria:

For this analysis, an initial search was conducted in the Scopus database covering the period from 2008 to 2023. A total of 566 publications on the topic of Natural Heritage were extracted. Through the process of refining, a total of 176 papers that did not pertain to Business Management, Accounting, and Social science were excluded. As a result, 390 documents were extracted. After additional refinement, only articles were retained, while book chapters, conferences, review articles, and books were excluded. The total number of excluded items was 96, resulting in a final selection of 294 articles. Moreover, only the pieces written in English were retained, while those written in other languages, totaling 57, were deleted. Consequently, we obtained a total of 237 articles. Subsequently, the selection process was refined to include just journal articles, while excluding articles from book series that have a number less than 2. Consequently, we obtain a total of 235 polished articles. At the conclusion, the papers from the final stage of publication were extracted, excluding the 5 articles in press. As a result, the researcher ultimately obtained 230 articles as shown in Figure A. Further filtering by including keywords gave us 157 documents.

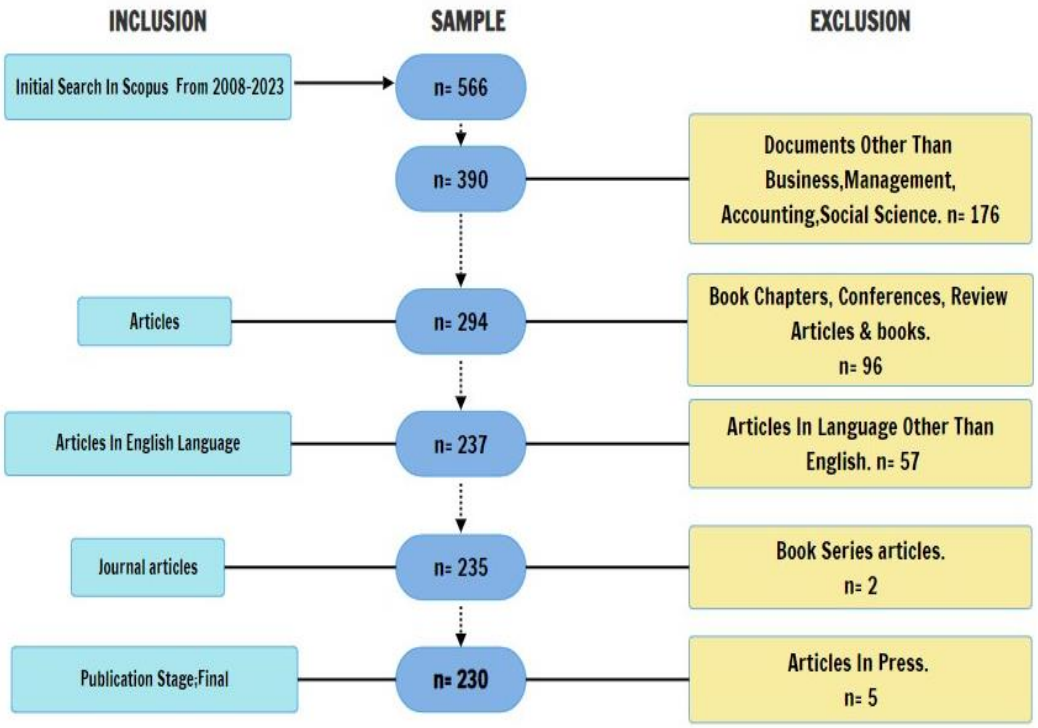

Figure A: Refinement of search results via Inclusion-Exclusion criteria
Source: Own Elaboration

3. Data Analysis and Results

3.1. Descriptive Analysis

3.1.1. Annual number of publications

Since 2008, there have been a small number of articles published regarding "Natural Heritage," but till 2009. However, Figure 1 illustrates the findings that after 2009, the number of publications increased gradually upto year 2012 and again after 2012, the number of publications decreased upto 2014. After 2014, there was again a gradual increase in the number of publications and the year 2023 saw the highest number of publications (23 publications).

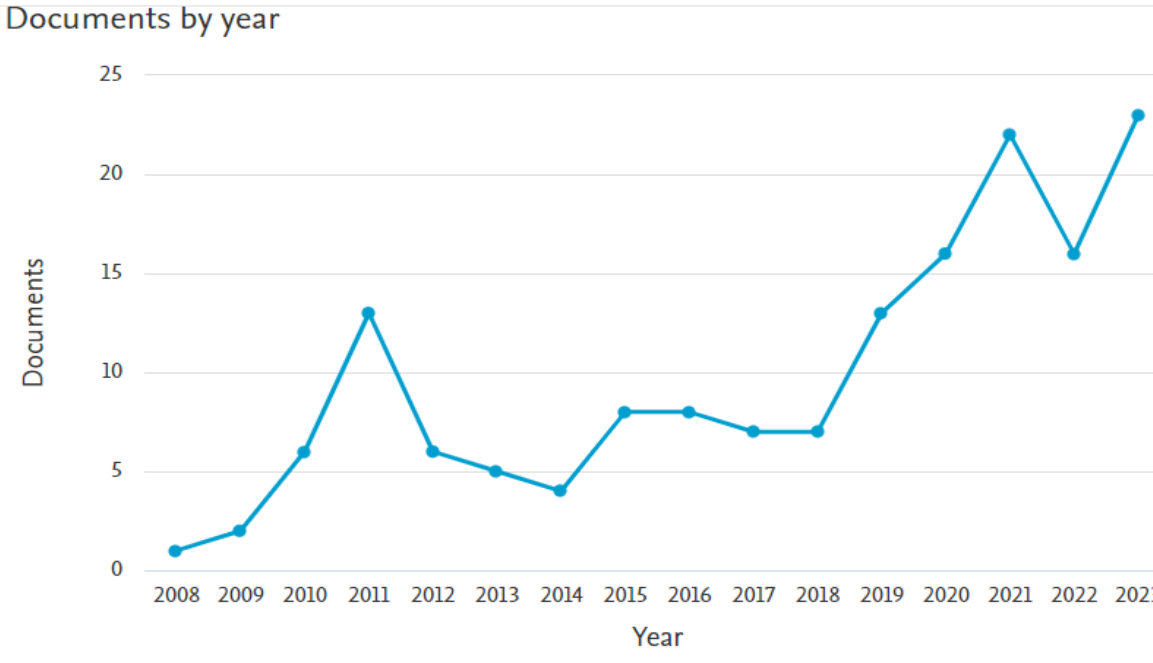

Figure 1: The Annual Number of Publications
Source: Scopus Database

3.1.2. Most Contributing Countries (Top 10)

The nations having at least five articles are displayed in Figure 2. China leads the way in terms of contributions made by nations, with 25 articles, followed by Italy (18), Spain (17), Australia (14), US (12), Bulgaria (6), South Africa (6), Turkey (6) and Brazil (5). China's leading position in the number of publications is not surprising, given that its natural heritage is not a recent development.

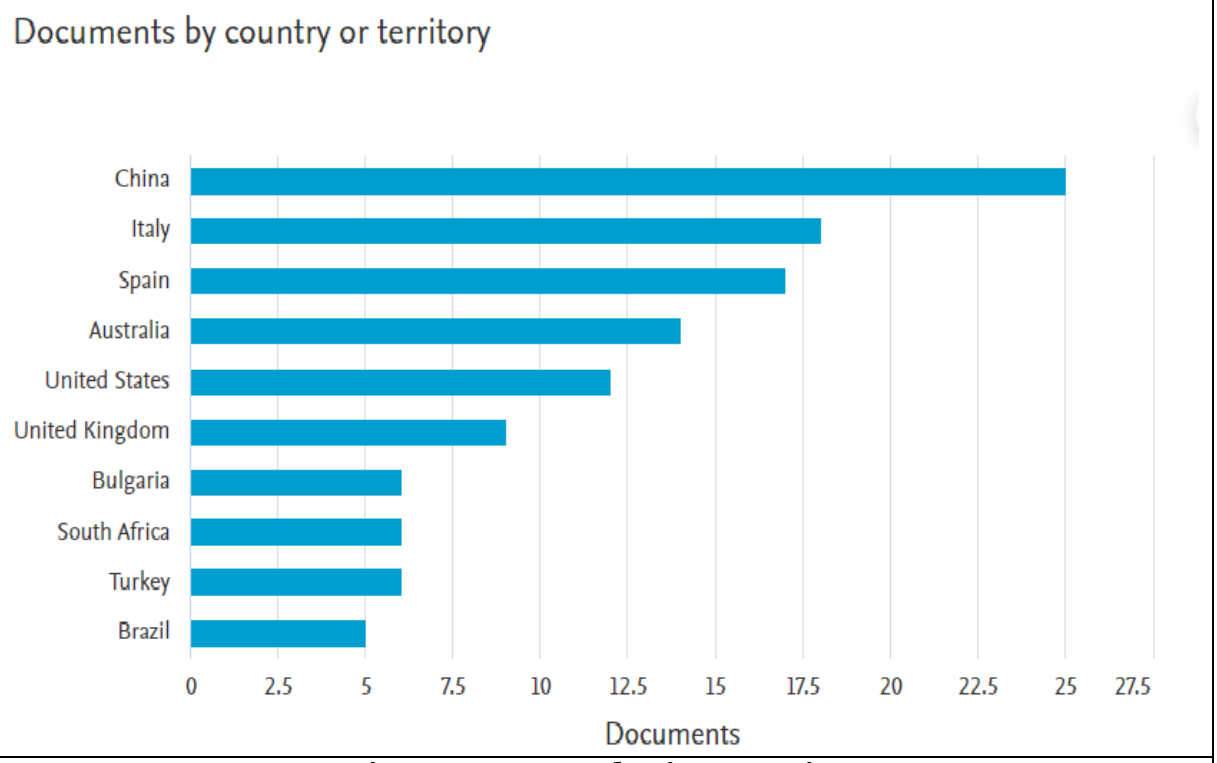

Figure 2: Most Productive countries

Source: Scopus Database

3.1.3 Top 5 Cited Articles

The papers with the highest number of citations through 2023 are listed in Table 1. Ramkissoon et. (2011) published the most cited paper, with 191 citations, titled "The effects of perceived authenticity, information search behaviour, motivation and destination imagery on cultural behavioural intentions of tourists" by the "Current Issues in Tourism". In this article, A structural model was used to evaluate how perceived authenticity, motivation, information search behaviour, and destination images affect tourists' cultural attraction behaviour. Cultural and natural heritage sites in Mauritius provided 600 samples. Analyses used structural equation modelling and hierarchical multiple regression. Perceived authenticity and location imagery positively influenced travellers' cultural behavioural intentions. Information search behaviour negatively affected cultural intentions, although motivation did not. Perceived authenticity moderated tourist motivation, information search behaviour, destination images, and cultural behavioural intents. The second-most cited article, Vujicic et al. (2011), with 170 citations, the research introduces a preliminary geosite physical assessment model (GAM) for sustainable tourism planning and management of natural heritage sites. The model has main and extra values, indicators, and subindicators, creating a nine-field graph. Natural heritage protection and tourism managers can use this approach to evaluate a geosite and suggest a future course. Cetin et al. (2015) with 136 citations, the author of third most cited article, The study examines how the caretakers of Pompeipolis in Kastamonu might employ modern conservation methods, balance conservation and use with cultural tourism, and identify issues and opportunities.

Table 1: Most Cited Articles

Year	Author(s)	Citations	Journals	Title
2011	Haywantee Ramkissoon & Muzaffer S. Uysal	191	Current Issues in Tourism	The effects of perceived authenticity, information search behaviour, motivation and destination imagery on cultural behavioural intentions of tourists.
2011	Vujicic et al.	170	Acta geographica Slovenica	Preliminary geosite assessment model (gam) and its application on Fruška gora mountain, potential geotourism destination of Serbia

2015	Cetin et al.	136	International Journal of Sustainable Development & World Ecology	Evaluation of the sustainable tourism potential of a protected area for landscape planning: a case study of the ancient city of Pompeipolis in Kastamonu
2013	Su et al.	136	Journal of Travel & Tourism Marketing	Service Fairness, Consumption Emotions, Satisfaction, and Behavioral Intentions: The Experience of Chinese Heritage Tourists
2013	Yap et al	117	Tourism Analysis	DO POLITICAL INSTABILITY, TERRORISM, AND CORRUPTION HAVE DETERRING EFFECTS ON TOURISM DEVELOPMENT EVEN IN THE PRESENCE OF UNESCO HERITAGE? A CROSS-COUNTRY PANEL ESTIMATE

3.1.4. Top 5 Contributing Journals

Figure 3 shows the top 5 journals that published articles on natural heritage between 2008 and 2023. "Sustainability Switzerland" has published 28 articles, followed by "Geoheritage" with 18, "Current Issues in Tourism" with 7, "Journal of Sustainable Tourism" with 6, and "Journal of Heritage Tourism" with 5 published articles.

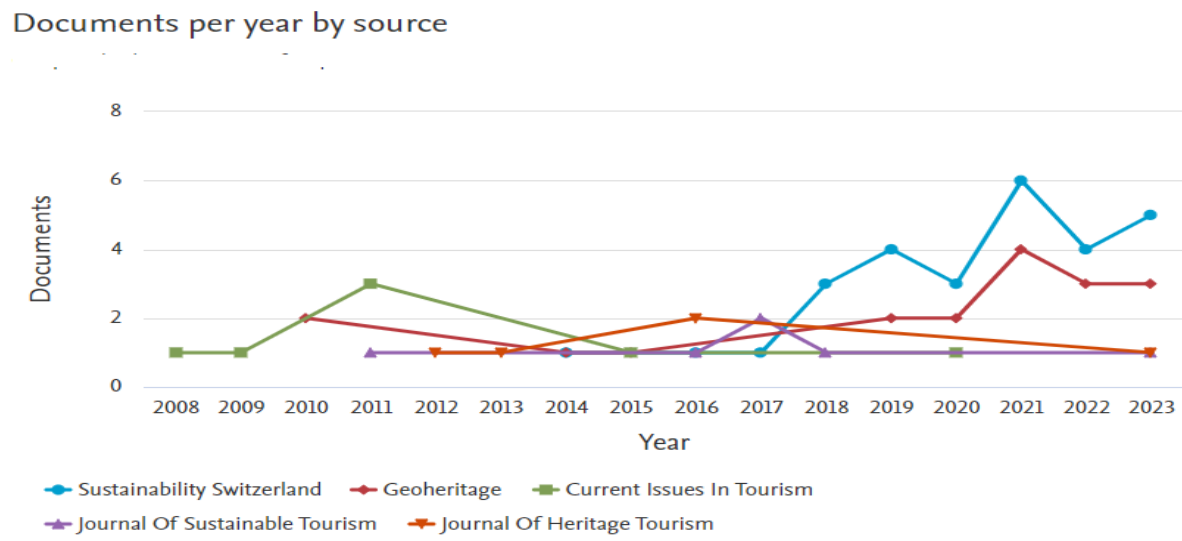

Figure 3: Most Contributing Journals

Source: Scopus Database

3.2. Natural Heritage Science Mapping Analysis

3.2.1. Most Often Used Keywords In Articles

The Co-occurrence feature of VOSviewer was used to analyze each term that met the minimum criteria of appearing at least three times as author keywords.

The research analyzed a collection of academic articles, which had a total of 609 author keywords. However, Figure 4 demonstrates that only 30 of these keywords were repeated at least three times. According to the data, the most commonly used keywords were "Tourism" (33 occurrences), "Natural Heritage" (23 occurrences), "Geotourism" (16 occurrences), "Cultural Heritage" (15 occurrences), "Sustainable Development" (15 occurrences), "Heritage" (12 occurrences), "Sustainable Tourism" (12 occurrences), "World Heritage" (8 occurrences), "China" (6 occurrences), "Conservation" (5 occurrences), "Geoheritage" (5 occurrences), "Heritage Tourism" (5 occurrences), "Environment" (5 occurrences), "Geoconservation" (5 occurrences), "National Parks" (5 occurrences), "UNESCO" (5 occurrences). The remaining keywords were used less than 5 times. Figure 4 illustrates the temporal distribution of these keywords.

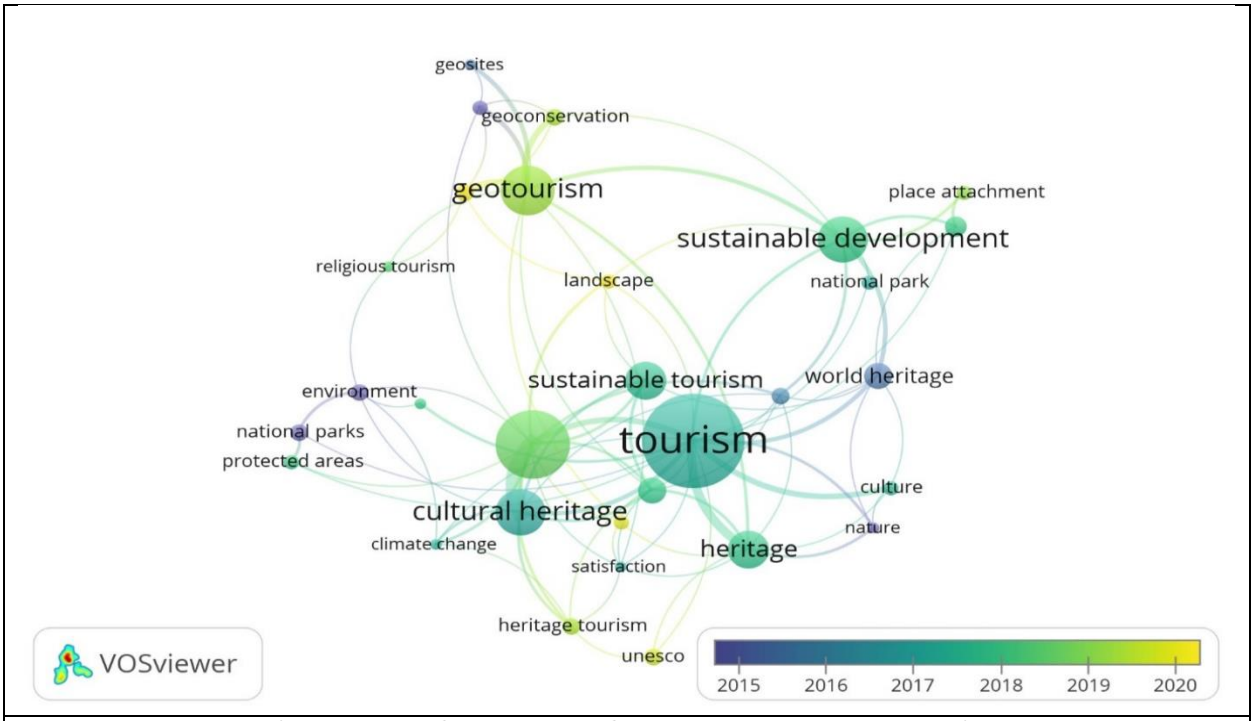

Figure 4: Author Keyword Co-Occurance Map Density

3.2.2. Co-citation Analysis

Utilizing co-citation analysis simplifies the process of identifying the journals and scholars who have had the most impact on the development of the relevant subject. Figure 5 depicts the results of the co-citation analysis for writers who have obtained a minimum of 15 citations. Out of the total of 12883 authors, only 41 meet the minimum requirement of having at least 15 citations. The analysis yielded four distinct clusters, each corresponding to a certain color: blue, red, green, and yellow. The writers with the highest recognition were identified as Hall , who had a total of 54 citations and belonged to the blue cluster. Ramkissoon had 36 citations in the red cluster, while Reynard and Brilha both had 35 citations in the green cluster. Lif had 19 citations in the yellow cluster.

Figure 6 presents the journal co-citation map, which is constructed using 4680 sources. This map focuses on sources that co-cite each other, and only 35 sources meet the criterion of having at least 13 citations. There were 3 clusters identified as the result of this study. The red cluster consists of eighteen journals, with "Tourism Management" having 179 citations and a link strength of 4355. The "tour.manag" journal was ranked among the top ten journals in the green cluster, with a total of 138 citations and a link strength of 3426. The blue cluster consisted of 7 journals, one of which was "Geoheritage" with 139 citations and a link strength of 233. Based on these data, it can be inferred that the magazines "Tourism Management" and "tour.manag" have exerted a significant influence on the literature pertaining to Natural Heritage.

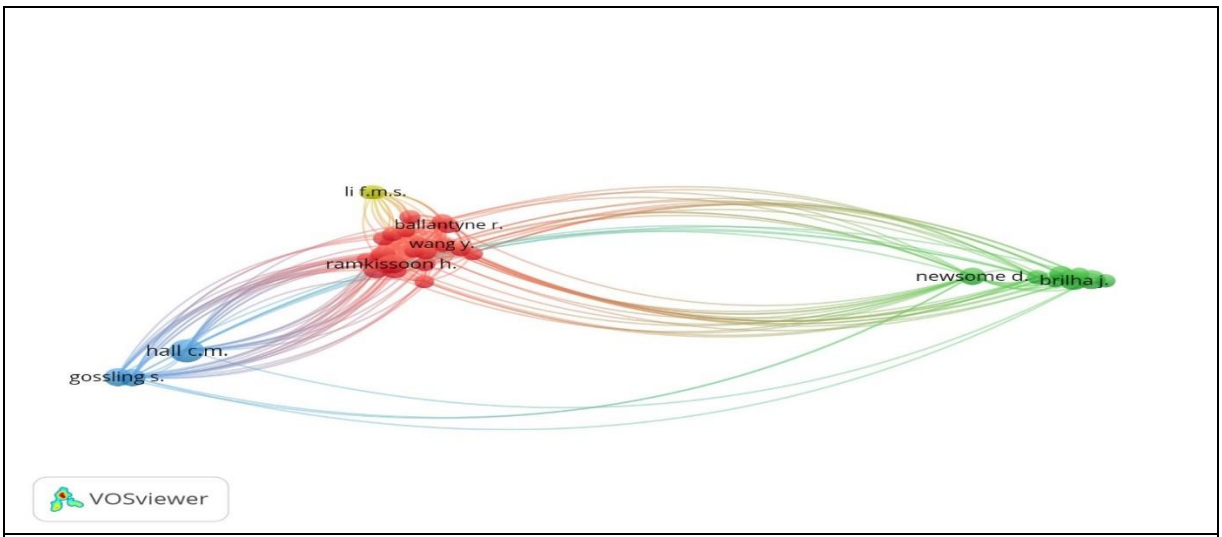

Figure 5: Co-citation Analysis For Authors

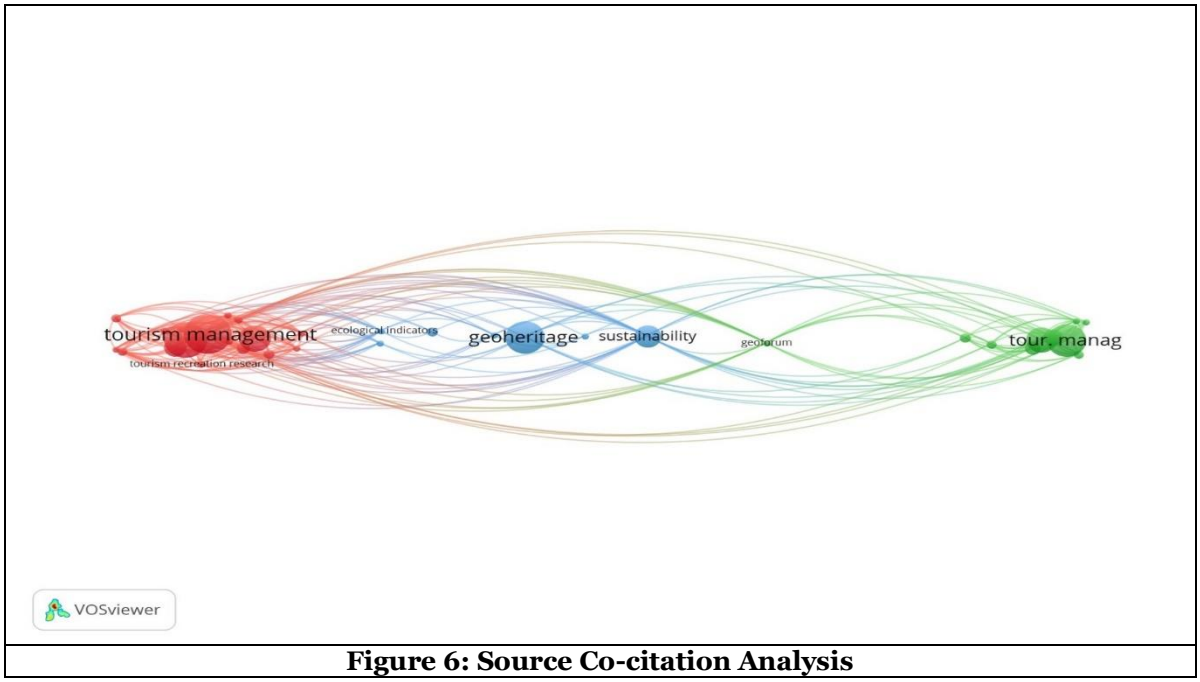

Figure 6: Source Co-citation Analysis

3.2.3 Bibliographic Coupling

Bibliographic coupling is employed as a complement to the co-citation analysis. It conveys a clear and unmistakable perception of a topic or the connection between writers. Figure 7 depicts the author-bibliographic coupling for natural heritage, focusing on authors who have published a minimum of two works and received a minimum of 18 citations. Out of the total of 476 authors, only 32 fulfilled the threshold. Nian, Sifeng stands at the top of the list with 3 documents, each with link strengths of 3321 and 38 citations.

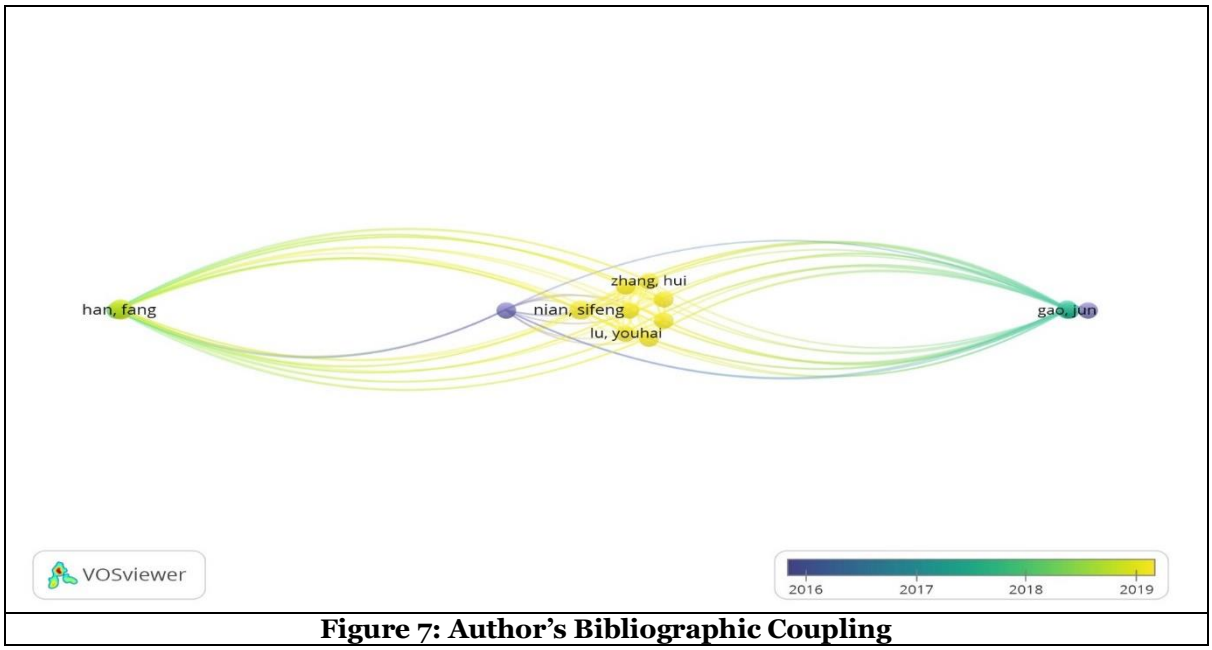

Figure 7: Author's Bibliographic Coupling

Figure 8 illustrates the bibliographic coupling among nations that have made contributions to the literature on natural heritage, using a threshold of 2 publications and a minimum of 26 citations. Out of the 53 countries, only 18 were able to meet the criterion. China has the largest network seen on the map, consisting of 25 items with a link strength of 1011. Based on the literature on natural heritage, it is deemed the most efficient nation. Italy and Spain are prominently featured in the literature on natural heritage, with 18 pieces and 17 articles respectively. Therefore, the results also correspond to those depicted in Figure 2.

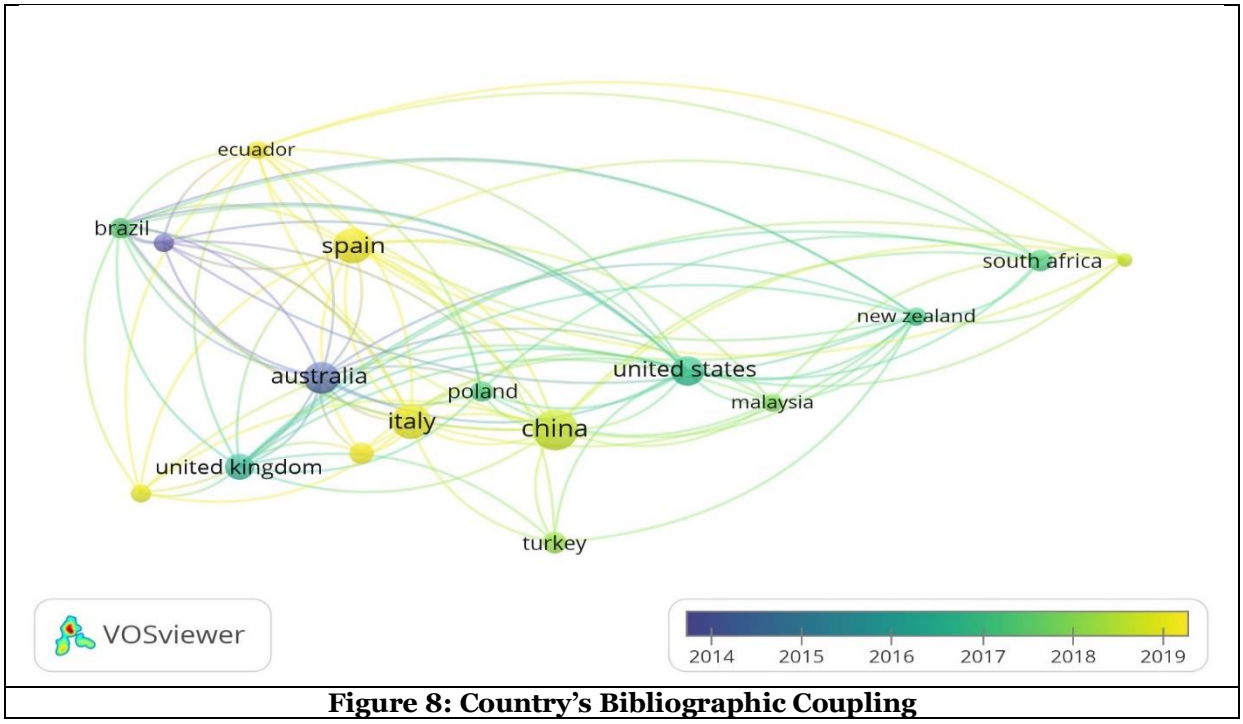

Figure 8: Country's Bibliographic Coupling

Conclusion:

This study utilized bibliometric analysis to provide a methodical examination and assessment of the research articles on "Natural Heritage" and "Tourism" published in the Scopus database between 2008 and 2023. This study employed the VOSviewer program to analyze and evaluate a total of 157 articles. Our bibliometric analysis of the intersection of "Natural Heritage" and "Tourism" indicated a significant increase in scholarly attention towards this subject, particularly from 2014 onwards. Notably, the year 2023 witnessed the highest volume of publications on this issue. China has the highest number of publications, with 25, while Italy and Spain come in second and third place with 18 and 17 publications, respectively.

The study work authored by Ramkissoon et al. (2011) in the journal "Current Issues in Tourism" has garnered the most number of citations, amounting to 191 as of 2023. The findings also revealed that a substantial share of research with the highest amount of citations were published in the identical journal. This paper employed a structural model to assess the impact of perceived authenticity, motivation, information search behavior, and destination pictures on tourists' cultural attraction behavior. Mauritius yielded 600 samples from its cultural and natural heritage areas. The analyses employed structural equation modelling and hierarchical multiple regression. Travellers' cultural behavioural intentions were positively influenced by the perceived authenticity and geographical visuals. Cultural intents were adversely impacted by information search behavior, although motivation remained unaffected. The perceived authenticity of a destination influenced various factors such as visitor motivation, information search behavior, destination pictures, and cultural behavioral intentions.

The goal of the keyword analysis is to determine the most commonly used terms in the research description. Based on the data, the most frequently utilized keywords were "Tourism" (33 instances), "Natural Heritage" (23 instances), "Geotourism" (16 instances), "Cultural Heritage" (15 instances), "Sustainable Development" (15 instances), "Heritage" (12 instances), "Sustainable Tourism" (12 instances), "World Heritage" (8 instances), "China" (6 instances), "Conservation" (5 instances), "Geoheritage" (5 instances), "Heritage Tourism" (5 instances), "Environment" (5 instances), "Geoconservation" (5 instances), "National Parks" (5 instances), and "UNESCO" (5 instances). The remaining keywords were utilized fewer than 5 instances.

The mapping process was advantageous in discerning the writers and periodicals that exerted the most substantial influence on Natural Heritage during the co-citation examination of the documents and sources. The co-citation analysis identified a notable correlation between the "most frequently referenced articles" and the "leading contributing journals," which are two crucial attributes of the study.

The article also analyzed the bibliographic correlation between writers and countries. Bibliographic coupling offers researchers the advantage of identifying previous studies that are connected to their own work. The study examines the author-bibliographic coupling in the field of natural heritage, specifically focusing on writers who have published at least two works and have acquired a minimum of 18 citations. Among the 476 authors, only 32 met the required criteria. Nian and Sifeng are ranked at the highest position on the list, each having 3 documents. The link strengths of these documents are 3321, and they have received 38 citations.

The study employed bibliometric analysis to evaluate research publications on "Natural Heritage" and "Tourism" that were published from 2008 to 2023.

The investigation unveiled a noteworthy surge in scholarly focus on this topic, namely starting from 2014.In 2023, there was a significant increase in the number of publications on this matter. China ranked first in terms of the number of publications, with Italy and Spain following closely behind.
The research conducted by Ramkissoon et al. (2011) in the academic journal "Current Issues in Tourism" has garnered the most number of citations, amounting to 191 as of 2023. The study investigated the influence of perceived authenticity, motivation, information search activity, and destination photographs on tourists' behavior towards cultural attractions.The perceived genuineness of a site impacts several elements, including visitor motivation, information-seeking behavior, destination imagery, and cultural behavioral intents.
The paper's conclusion emphasizes the growing focus on natural heritage and tourism in research, with China taking the lead as the main contributor. The research conducted by Ramkissoon et al. (2011) in the journal "Current Issues in Tourism" garnered the highest number of citations. The study investigated the influence of perceived authenticity on the behavior of tourists in relation to cultural attractions.

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