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Journey through Data: Exploring Wellness Tourism through Bibliometric Analysis with Dimensions.ai Database

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Abstract

Overarching the benefits of tourism a niche kind of tourism motivates people around the world to travel for wellness overcoming level of stress, enhance a sense of joy, harmonised body, mind, and spirit last but not the least gratifying customer experiences boosting an individual well-being has been highlighted as wellness tourism. Wellness Tourism is often erroneously conflated in the literature with medical tourism, despite constituting an entirely distinct segment of health tourism. Furthermore, very few thorough reviews have been done up to the current times to evaluate the after effects of COVID-19 on wellness stream of research and emergence of its prominence in wellness tourism studies. Fulfilling the gap bibliometric analysis technique using dimension.ai is used to evaluate the article authorship, publication trend, co-authorship with synthesis of total article with a total of 1005 pertinent publications written in English-language using mapping technique of VOSviewer programme, relational approaches and evaluation methodologies based on productivity and impact indicators. Proposals and recommendations for future research are highlighted to explore the future dimension of the research in wellness tourism field.

Keywords: *wellness tourism, health tourism, medical tourism, dimensions.ai, bibliometric analysis, COVID-19*

Introduction

The two most important words in today's common dictionary of every human being are identified as "well-being" and "fitness" merging into an area of research on wellness (Dunn, 1959). Wellness with its major characteristics' has been characterised as "a form of self-discovery lifestyle in an era of rising stress," and further well-being is seen as an all-encompassing idea that fosters both immediate gratification and long-term fulfilment (Chen et al., 2013). Wellness

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establishments have been around since 5000 BC, with Roman baths and Turkish hammams serving as examples of their steady development (Rancic et al., 2013). The Global Wellness Institute (GWI) highlights, wellness sector and tourism are two sizable, rapidly expanding industries that come together to form wellness tourism (GWI, 2018b). A yearly growth rate on average of 8.1% was recorded by the wellness industry between 2017 and 2019, with expected revenues of US$617.0 billion and US$720.4 billion, respectively (GWI, 2019b). The COVID-19 pandemic has caused significant disruptions in the world's political, social, and financial institutions whereas the tourism industry has seen one of the most severe shocks in history (Gousiou et al., 2021). Economic sectors across the borders have felt the effects of the global health crisis (Borges et al., 2022).

The wellness economy showed positive response and bounced back from the pandemic quite swiftly showcasing the size of the overall global wellness economy at $5.6 trillion in 2022 surpassing the figures highlighted in data revealed to be 14% more as compared to figures of 2019 (GWI, 2023). In the modest way possible Global Wellness Institute (GWI) predicted economic growth by 8.6% in wellness sector on an average year, totalling to value of $8.5 trillion (GWI, 2023). Beauty treatments, bodywork or massage, sports and fitness, spas, nutrition and detox programmes, holistic retreats, meditation, and nutrition are just a few of the many activities that come within the realm of wellness travel (Voigt, 2013). Modern and contemporary idea of wellness is not limited to few areas rather new and modern techniques are pressing hard in search by wellness tourists for authentic new experiences with latest additions to wellness like Inner detox programmes, body sleep programme, deep tissue massage, emotional detox therapy, Reiki, Shirodhara, toning massage etc (Charak, 2019; Koncul, 2012; Meikassandra et al., 2020; Wray et al., 2010). Smith and Puczkó (2015) asserts wellness tourist to be typically self-aware and prioritise their health, happiness, and well-being all together originating from travel motives, selecting a destination and experiencing best fit destinations. Throughout the world, tourism has been accepted as an important revenue generator fostering social and personal growth in numerous disciplines (Mishra, Panda, 2023). Further it has been highly realised tourism improves standard of living among the masses with better earnings with job creation mechanism (Romão et al., 2022). Since overall happiness and quality of life are strongly associated with health and wellbeing, most tourist sites in modern contemporary tourism have identified considerable traveller demand for specialised wellness services (Garjan et al., 2023).

Wellness vacations can help people feel less stressed and happier, which supports a balanced body, mind, and spirit as well as they can also provide customers with rewarding experiences that enhance wellbeing (Backman et al., 2023). With the rise in number of people selecting to travel abroad with keen focus on improvement to their health and wellbeing, the global tourism industry has profited from highlighted rising demand for wellness (Bushell, 2009). Travellers are particularly interested in locations highly linked to alternative medicine, naturopathy, ayurveda, yoga, energy healing, and other health-related pursuits, as well as spirituality (Karn, Swain, 2017). The greater interest in global wellness sector has emerged as one of the highly benefiting to the tourists and economic interest oriented to the host which is result of people's increasing need for experiences ending to encourage rest and renewal, especially throughout the pandemic and the aftermath (Mishra, Panda, 2023). Additionally, investigations in contemporary area of research in wellness (i.e. physical, emotional, spiritual, social, intellectual, environmental and financial wellness) are becoming more numerous, with some aiming to comprehend the mechanics underlying the want for wellness travel (Kemppainen et al., 2021). Zhong et al. (2021) reviewed the research done between 1970 and 2020 on medical,

health, and wellness tourism, and the analysis confirmed an increase in interest among these tourist segments for wellness tourism further a greater showcase has also been seen in scientific community between 2013 and 2017. Globalised health markets have drastically transformed the conventional local and national nature of health care (Österle et al., 2013). Increased living standards, more flexible lifestyles, and individualistic notions about self-care all have influenced more common notion for travel for wellness and health-related purposes (Majeed et al., 2017). Though travel for medical treatments has been around for 25 years, the idea of medical-health-wellness tourism has just lately become a recognised academic discipline in the tourism industry (Mueller, Kaufmann, 2001). Large tertiary hospitals in India are increasingly creating on-site holistic centres with departments dedicated to homoeopathy, herbal medicine, naturopathy, and acupuncture in addition to yoga and meditation courses (Manhas, 2015).

Over the past decade, there has been a noticeable increase in the field of wellness tourism within the health tourism industry (Blešić et al., 2019).

To meet up the objectives to deep dive the subject it becomes necessary to undermine the academic databases. Scholarly databases, such as Scopus or Web of Science, are commonly used for research assessment in scientometric investigations (Mongeon, Paul-Hus, 2016). Recently, new databases like Microsoft Academic Search and Dimensions.ai have gained popularity among the bibliometrics research community (Martín-Martín et al., 2021). Dimensions.ai, a newer scholarly database, is a strong challenger alongside Scopus and Web of Science as it could be a viable alternative to existing databases (Thelwall, 2018). Scopus and Web of Science focus on Physical Sciences, Life Sciences, and Technology, while Dimensions.ai covers Arts & Humanities and Social Sciences more comprehensively (Singh et al., 2021). Dimensions.ai outperformed Scopus and Web of Science in terms of coverage, (Visser et al., 2021) found that the Dimensions database provides 25% greater coverage than Scopus.

Literature Review

The wellness, health and medical tourism sectors are one of the rapidly expanding tourism business with a global upsurge in activity, and further seen as some of the most advanced and speedily growing areas (Costa et al., 2014). The sector is multifaceted, encompassing several categories such as holistic, spiritual, and spa tourism (Smith, Puczkó, 2015). Health, wellness, and medical tourism have become among the booming fields of academic study interest in both health and tourism studies due to its rapid rise over the previous few decades, with an emerging trend since the 1980s (Álvarez García et al., 2014). Given its history, health, wellness, and medical tourism are complex fields of study among wide range of subjects covered by research, depending on the disciplinary and cultural environment in which it is conducted (Hall, 2011). In the context of specific tourism goods, the relationship between health and tourism is referred to by a number of terms, such as wellness tourism, hospital and clinical tourism, health tourism, and occasionally medical travel (Kušen, 2011). It has been identified for organisations to come out as winners need to set the strategic goals that centre on the promotion of wellness tourism, slow tourism, yoga and health packages, and other new and healthy travel options (Hossain et al., 2022). Many decades ago, the identification of an idea among people to "redesign their life, sometimes in superficial and sometimes in profound ways, to achieve higher levels of physical, emotional, mental, and spiritual wellness" gave rise to the so-called "wellness revolution" (Bushell, Sheldon, 2009a).

Wellness tourism is similar to other forms of travel emphasising lifestyle from a lifetime perspective, embraces personal accountability for one's actions as part of a more holistic approach to health, and makes use of each person's potential for improved quality of life (Mueller, Kaufmann, 2001). Many other activities have been defined as part of or related to wellness tourism as a result of a holistic approach, such as volunteer travel, new age travel, outdoor, sports, and adventure activities like yoga and hiking, as well as spiritual and religious travel (Smith, Kelly, 2006). However, it is important to include the contributions coming from variety of fields, including sociology, public health, business, psychology, management, and marketing, in order to develop a uniform definition of wellness tourism (Bushell, Sheldon, 2009b). The primary reason for travel in healthcare tourism is to treat sickness, whereas the primary reason for travel in wellness tourism is to avoid illness or preserve one's health and wellbeing (Mueller, Kaufmann, 2001). With identification of tourism impact on health and holistic wellbeing emerging to be complex and multidimensional, investments in the travel and increasingly sought-after happiness is taken over by the businesses fulfilling the WHO's (World Health Organisation) recommended paradigm (Leandro et al., 2015). Uncovering the research dimension in health tourism allow to gain an insight into the futuristic approach emerging from opportunities and problems that lie ahead as health tourism gains traction in both theoretical and practical areas of travel (Garcia-Altes, 2005). The phrase "medical tourism" describes the movement of people across international borders for the purpose of accessing healthcare distinguishing it from health tourism; medical Tourism largely attracts travel by individuals abroad, usually for surgery and without a specific formal referral to access the healthcare system of host nations for operations and other invasive therapies, usually at their own expense (Johnston et al., 2010). More broadly, medical tourism can also be defined as travelling overseas to receive medical treatment (Balaban, Marano, 2010). This type of travel occurs for a number of reasons, including extensive waiting lists in the country of origin, medical specialisations not offered by the local or national healthcare system, and inadequate infrastructure in the patient's home country (Moira, Mylonopoulos, Parthenis, 2022). It is largely evident from the literature that medical tourism and wellness are intertwined within the broader framework of health tourism, and that health and wellness are always related to one another in terms of preventive and curative medical techniques (Connell, 2006) based of the principle of good health.

Conducting a bibliometric review using **Dimensions.ai Database** of wellness tourism, which includes articles about wellness tourism, medical tourism and health tourism, was thought to be relevant in fulfilling to fill in the below mentioned gaps.

Methodology

The following research questions have been addressed in the study:

RQ1. Which publications have received the most citations in wellness tourism research, and which nations, journals, and authors have contributed the most?

RQ2. What is the relationship among Co-authorship network based on country and bibliometric coupling of authors?

RQ3. How did the pandemic affect the quantity of publications in the wellness tourism field, and what subjects received the greatest attention?

Bibliometric Analysis

A bibliometric strategy is acknowledged as one of the sophisticated modern methods that uses fundamental and/or sophisticated statistical methods to sort data, including citations, author affiliations, keywords, themes investigated, and methodologies used for published research in the disciplines, with the goal of evaluating and monitoring the progress of a particular academic field (McBurney, Novak, 2002). Various approaches exist for organising contributions related to a certain subject; nevertheless, the advantage of bibliometric is that it is a methodical, uncomplicated, and repeatable procedure (Koseoglu et al., 2016). The technique of bibliometric analysis is widely applied in the fields of business, management, and tourism since the mentioned technique allow to do research on the multidimensional issues and determine its current state of knowledge (Cuccurullo et al., 2016). In order to demonstrate the degree of development in the tourism industry, bibliometric analyses have proved to well accept mechanism to determine intellectual framework, academic basis, knowledge domain, and social structure of the sector (Zhao, Ritchie, 2007). Bibliometric analysis is used to evaluate the areas that need more attention and to recognise the domain's state-of-the-art advancement (John, Firoz, 2022). In a bibliometric study by Kim and So (2021), 1,248 articles related to customer experience in tourism were analysed to find key writers and conceptual frameworks. This way of approach represented a structured review of trends, seminal works, and knowledge development and illustrated how the study of the development of a field over time can be traced through the use of bibliometric analysis.

Data Collection

Data was gathered as on 4th April, 2024 using the Dimensions.ai database, which is accepted as one of the most reliable and preferred tourism industry's databases. The after approach was based on evaluating the quantity of publications in wellness, health tourism, and medical tourism. The articles determination criterion was fixed with, articles released between January 2004 and December 2023. The Boolean operators "AND" and "OR" were paired with the keywords "wellness tourism," AND "health tourism," OR "medical tourism" OR "covid-19". Only peer-reviewed literature published in English-language journals were chosen by the authors in order to hone the findings. 5795 pertinent records in all were located. The record is filtered based on research category, field of study (tourism only), and publication type (only articles are chosen for this research), and 1005 papers made it through the screening procedure; the full texts were analysed in more detail.

Data Analysis

Bibliometrics is a quantitative analysis technique that employs statistical and mathematical approaches to gauge the importance and worth of research papers within a certain topic (Santos-Rojo et al., 2023). The most popular approaches are productivity and impact measure-based evaluation techniques, citation and publication totals-focused methods (Coll-Ramis et al., 2023), and relationship-building tactics through outcome mapping (Van Eck, Waltman, 2010). Co-authorship and co-occurrence analysis have been used to map the results using VOSviewer version 1.6.19 (Van Eck, Waltman, 2010). VOSviewer has been accepted as one of the best tools in field of syntheses of articles. A software programme for creating, displaying, and evaluating bibliometric networks is called VOSviewer. Publications, authors, keywords, journals, or

Figure 1. Data collection

nations can all be mapped with VOSviewer (Rocio et al., 2023). Higher weight objects are displayed more prominently than lesser weight objects with keyword in a map display. According to Santos-Rojo et al. (2023), each link contains an attribute displayed with an, example, the quantity of articles in which two researchers co-authored them (co-authorship linkages) or the quantity of articles in which two phrases appeared together (co-occurrence links).

Results

Sample Characteristics

The primary focus of the current study is on journal articles that were included in the Dimensions.ai database and published between January 2004 and December 2023. The sample is made up of 2440 authors from 75 different nations with 1005 articles published in 425 journals. The major output of the result is highlighted in collaborative work with 2243 people showcased collaboration in the research output and contrary to the same and only 197 authors wrote independent articles.

Performance Analysis

Publications Trends

From 2004 to 2023, the annual number of publications (Figure 2) indicates a consistently rising trend in the identified field. Although there are occasional annual variations in the quantity of publications, the tendency is generally seen an upward curve. The number of publications increased steadily between 2013 and 2023, with some years experiencing more notable upsurge than others. Between 2021 and 2022, the number of publications increased from 144 to 206, marking the biggest rise. During the pandemic, the key terms associated with wellness and pandemic showed a greater interest among the academic fraternity and growth of publications was evident. The overall growth rate of wellness, health, medical and covid-19 publications is 32.7% which is calculated from 2001 - 2023. There were 72 articles in 2018 prior to the covid-19 pandemic, and by the end of 2023, there were 216, indicating an increase in research on wellness tourism both during and after the pandemic.

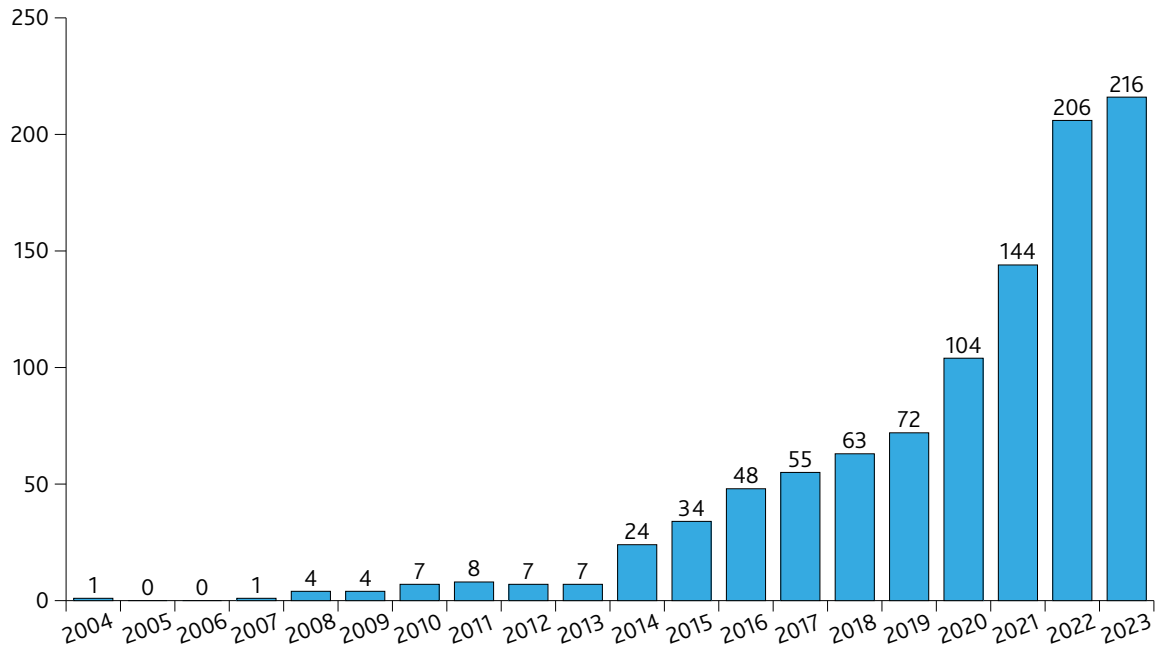

Figure 2. Number of Publications from 2001 – 2023

Top Authors and Countries

Table 1 display, based on citation metrics, the most important writers and the top nations with the greatest number of publishing documents in the field of wellness tourism, health tourism, medical tourism and COVID-19 pandemic research. With 6 publications, Kim H. (University of Nevada, Las Angeles, USA), Kim J. (University of Florida, USA), Song H. (The Hong Kong Polytechnic University, China) and Wen J. (Western Sydney University, Australia) have the most, indicating that their contributions to the field have received substantial attention and acknowledgment. Amongst the 75 nations publishing work in domain of wellness, health, and medical tourism data revealed, United Kingdom (89 publications), followed by China (65 publications). The large number of publications is indicative of the importance and acknowledgment with higher importance and future direction given by academics of UK.

Table 1. *Top Authors and Countries*

Authors	Total Publications	Country	Frequency
KIM H	6	UNITED KINGDOM	89
KIM J	6	CHINA	65
SONG H	6	INDONESIA	49
WEN J	6	SPAIN	49

Most Global Cited Document

Table 2 shows the ranking of the top five referenced articles on wellness, health, and medical tourism research according to the total number of citations. With significant 586 citations, the research paper "COVID-19: potential effects on Chinese citizens' lifestyle and trav-

el", written by (Wen et al., 2021), stood out as the most cited out of 1005 chosen articles. The results of the most cited article highlighted more impetus to the COVID-19 which is predicted to have far-reaching effects on visitor consumption habits, particularly in the areas of wellness and health travel from the results of the research article. Tourists are becoming pickier in their travels, spending more time in their preferred destinations. The current pattern of travel post COVID highly believe a similar pattern of travel would allow to mitigate the detrimental effects of travel and tourism on climate change and environmental degradation. Travellers in the post-COVID-19 period will not want to engage in mass tourism; instead, they will favour more planned journeys that prioritise longer stays and vacations.

Table 2. *Most Cited articles globally*

Authors	Title	Journal	TC
Wen, 2021	COVID-19: potential effects on Chinese citizens' lifestyle and travel	TOURISM REVIEW	586
Scott, 2010	Weather and climate information for tourism	PROCEDIA ENVIRONMENTAL SCIENCES	259
Hosany, 2016	Mediating effects of place attachment and satisfaction on the relationship between tourists' emotions and intention to recommend	JOURNAL OF TRAVEL RESEARCH	251
Afshardoost, 2020	Destination image and tourist behavioural intentions: A meta-analysis	TOURISM MANAGEMENT	230
Baum, 2015	Human resources in tourism: Still waiting for change: A 2015 reprise	JOURNAL OF TRAVEL RESEARCH	219

Key Journals

Figure 3 offers a list of top ten journals for research on wellness, health, and medical travel. Sustainability stands out on the top among 425 journals with notable publications totalling to 137 papers, followed by International Journal of Environmental Research and Public Health with 31 articles.

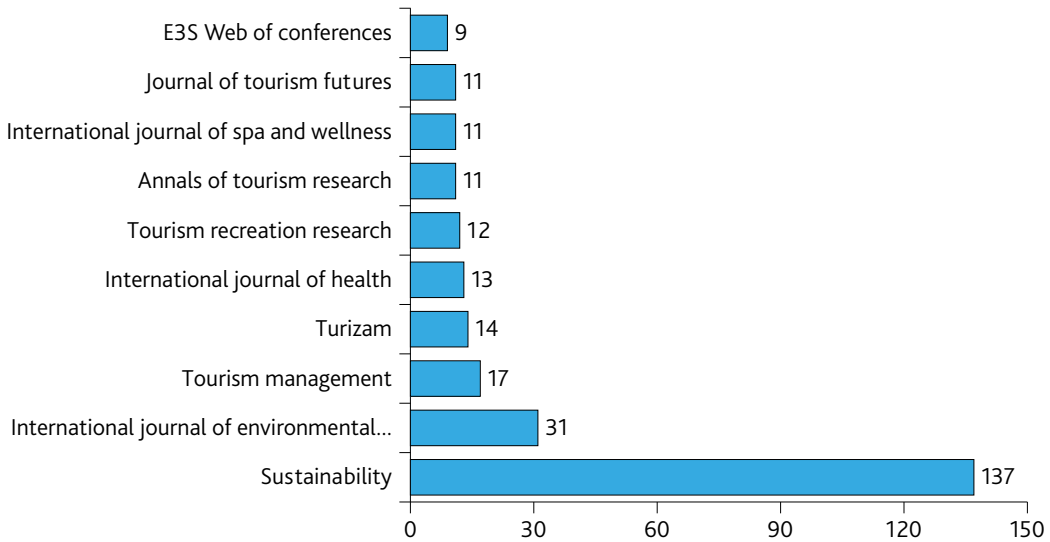

Figure 3. Top 10 Key Journals – number of published articles

Co-authorship by Country

Analysis of co-authorship looks at the networks of collaboration between authors, institutions, or nations to further buildup knowledge matrix in a particular field of study (Rocio et al., 2023). Co-authorship analysis is a well-established and visible technique that provides valuable insights into scientific collaboration. Researchers no longer operate alone; instead, they collaborate with others, utilising a range of viewpoints and complimentary showcase abilities of multiple researchers accomplishing shared objectives. Consequently, co-authorship analysis effectively assesses patterns of collaboration and identifies significant contributors (Hanaa, Abdul, 2024). The purpose of the present study is to examine co-authorship research by country because it is important to understand the contributions and patterns of collaboration within certain geographic connections. Of the 75 countries, 40 engage in international co-authorship. Figure 4 shows these countries as labelled circles, with the size of each circle denoting the total number of articles written by authors from that nation. These relationships lead to the emergence of five different clusters. There are 12 elements in Cluster 1, 9 in Cluster 2, and 8 in Clusters 3 and 4 respectively. There are 3 entries in Cluster 5. UK has the most linkages, with total link strength of 90 and 27 links. With total 78 and 55 linkages, respectively, China comes in second place and the United States comes on third rank with the most links. It's interesting to note that 35 of the countries function independently, indicating a necessity for international collaboration between their authors.

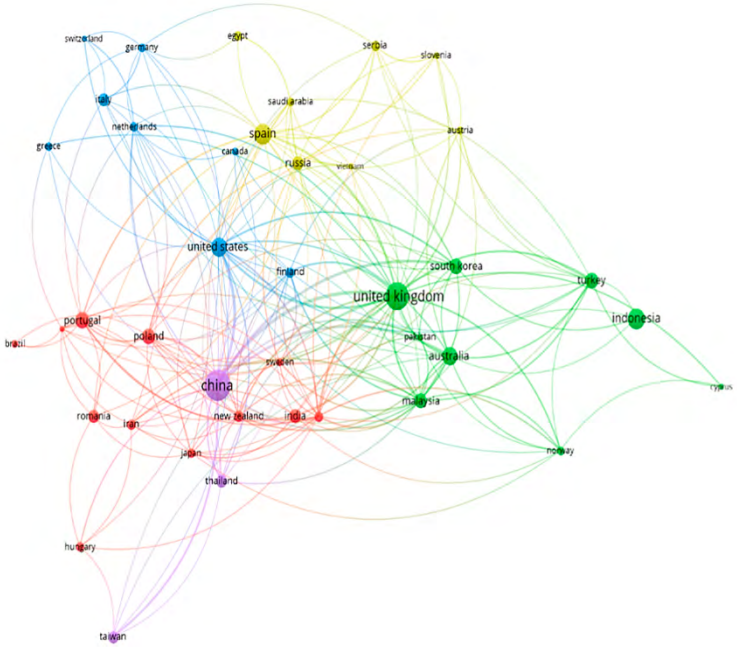

Figure 4. Co-authorship Analysis Based on Countries

Bibliographic Coupling by Country

Bibliographic coupling refers to the situation where two documents cite the same third document. Depending on how many references are exchanged, the relationship value between two papers that share one or more references is specified as being of strength one, two, etc., according to (Martyn, 1964, p. 236) "two papers that share one reference contain one unit of coupling". Figure 5 depicts these nations as labelled circles, with each circle's size according to its country. As a result of these connections, five distinct clusters with a total of 42 items appear. Fifteen elements can be found in Cluster 1, eleven in Cluster 2, six in Cluster 3 and 4 respectively and four in cluster 5.

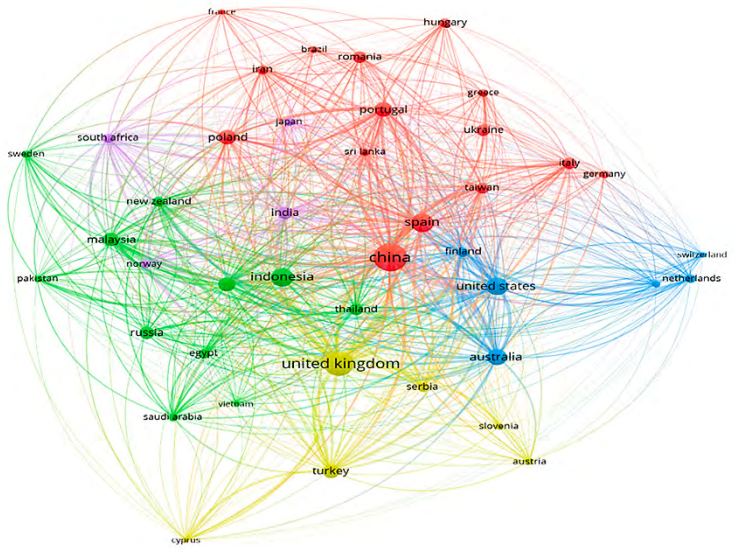

Figure 5. Bibliographic Coupling Based on Countries

Bibliographic Coupling of Authors

Citations are used in bibliographic coupling to provide information on the similarities between two works, authors, organisations, or nations (Andersen, 2021). The procedure is predicated on the idea that two papers that cite a third paper are closely related and ought to be grouped together in the visualisation map's cluster solution. The total number of references or citations of other third texts that each paper share establishes the strength of the bibliographic coupling. Figure 6 depicts 2 clusters with total 10 items, 45 links and a total link strength of 1537.Cluster one in green colour consists of 6 items, link 9 and total link strength of 382. Deepak Chhabra (Arizona State University, USA), Heesup Han (Seojong University, South Korea), Hak-seon Kim (Kyungsung University, South Korea), Alaistair M. Morisson (University of Greenwich, UK), Jun Wen (Edith Cowan University, Australia), Shaohua Yang (Anhui University of Technology, China) are the authors in this cluster. The writers in before mentioned cluster typically showcased their interest in the research domain before the pandemic too and also conducted research after the pandemic phase. The results of the cluster showcase a high emphasis focus on elaborating wellness tourism and medical tourism role as a transformational catalyst in the lifestyle of travellers. It also highlighted the keen interest among the

travellers well suiting their transformational needs post covid with change in their travelling patterns and behaviours helping destinations to recognize their destination image. Cluster 2 in green colour comprises of 4 items, link 9 with total link strength of 547. PongpunAnuntavoranich (Chulalongkorn University, Thailand), Achara Chandrachai (Arizona State University, USA), Thadathibesra Phuthong (Silpakorn University, Thailand), KrerkPiromsopa (Chulalongkorn University, Thailand) are the authors in this cluster with focus on wellness tourism destinations with elaborating their efforts to undermine the role of wellness tourism to economic wellbeing of the nations after COVID-19 pandemic. The research post covid allowed destinations to rebrand with realigning the thoughts on creating international standards for the development of wellness tourism and allied activities, measurement models to depict trend analysis in the similar research domain, and lastly showcasing the opportunities arising from the niche segment of wellness tourism to stakeholders using Global Tourism Wellness Index.

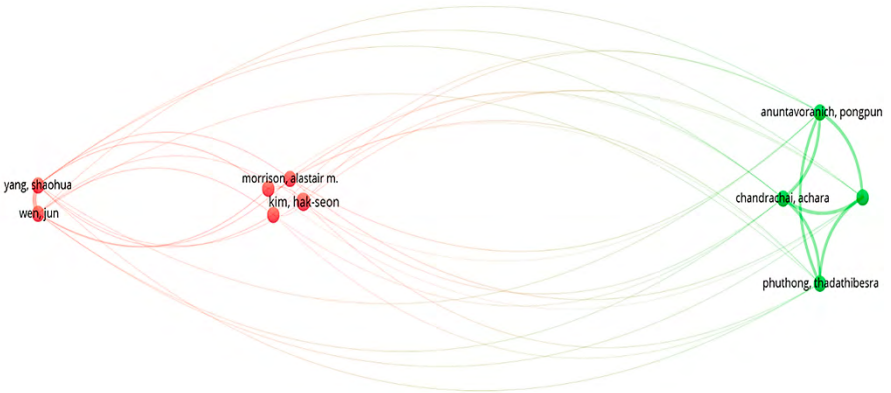

Figure 6. Bibliographic Coupling Analysis Based on Authors

Conclusion

Wellness tourism is a niche area of the travel business that emphasises encouraging and improving people's wellbeing via a range of experiences, events, and offerings (Sthapit et al., 2023). It entails travelling to locations in order to preserve or enhance one's own wellbeing and promote body, mind, and spirit in harmony (Patterson, Balderas-Cejudo, 2023). In current research context, 1935 publications from the dimensions.ai database published between January 2001 and December 2023 were extracted and examined. Relational approaches were also used to map the results using the VOSviewer software version 1.6.19. (Van Eck, Waltman, 2010). The total number of citations and publications was the main focus of the assessment techniques utilised to analyse the data.

RQ1. Which publications have received the most citations in wellness tourism research, and which nations, journals, and authors have contributed the most?

The most referenced publications as well as the most contributing authors, nations, and journals were determined via a performance analysis. Kim H (University of Nevada, Las Angeles, USA), Kim J (University of Florida, USA), Song H (The Hong Kong Polytechnic University, China), and Wen J (Western Sydney University, Australia) have the most publications (6 each), indicating that their contributions to the field have received significant attention and recogni-

tion. The United Kingdom tops among the 75 nations with at least one paper published in the field of wellness tourism, with China and Indonesia on 2nd and 3rd rank. With 586 total citations, the research paper "COVID-19: potential effects on Chinese citizens' lifestyle and travel" by Wen et al. (2021) was the most-cited work. With 137 and 31 articles, respectively, Sustainability and International Journal of Environmental Research and Public Health were the most prominent journals. The majority of the top five journals that specialise in research on wellness highlighting the importance of publications with a tourism focus in this field. The analysis of data using VOSviewer software for mapping analysis, data was evaluated according to co-authorship. Co-authorship analysis as a technique looks at the networks of collaboration between writers, groups, or nations. Countries were chosen for analysing co-authors in the current study. 40 of the 75 identified nations participate in international co-authorship projects. The United Kingdom has the most links due to the authors engaging with 27 countries.

RQ2. What is the relationship among Co-authorship network based on country and bibliometric coupling of authors?

The country's co-authorship network included 843 linkages, 5 clusters with a total of 42 items each, and 98800 link strengths overall. The co-authorship between Brazil, China, France, Germany, and the other eleven nations is displayed in Cluster 1with 41 links. Egypt, Indonesia, Malaysia, New Zealand, Pakistan, Russia, Saudi Arabia, Thailand and another three countries depicted in Cluster 2 with 42 links. Cluster 3 is made up of six countries, including Australia, Canada, Finland, Netherlands, Switzerland and USA with 41 links. Cluster 4 is made up of six countries that form a network, including Austria, Cyprus, Serbia, Slovenia, Turkey and UK with 41 links. Cluster 5 is made up of India, Japan, Norway, and South Africa with 41 links.

RQ3. How did the pandemic affect the quantity of publications in the wellness tourism field, and what subjects received the greatest attention?

The travel and tourism sector were adversely affected by the COVID-19 pandemic (Bhatta et al., 2022). Travel bans and lockdowns were implemented by several nations to stop the virus's spread (Wang et al., 2022). Travellers' reluctance to go abroad was a major restraining factor affected the market centred around wellness (Li, Huang, 2022) for excursions. However, the epidemic increased people's consciousness towards their health and wellbeing, which sparked an increased interest in wellness-related pursuits (Tiwari, Hashmi, 2022). Similarly, there has been tremendous increase in research agenda to comprehend around pandemic and its after affects underlying the demand for wellness travel. The number of publications annually from 2004 to 2023 showed a discernible increase tendency, according to the sample of 1005 chosen articles. The synthesis of data revealed no dip in research productivity since 2020 at the time of first impressions of start of the pandemic. But between 2020 and 2021, the number of publications significantly increased. The same upward surge showcased with an increase with sustained growth output in 2022 and a total outcome of 216 publications in 2023. It is plausible to anticipate continued rise in publications throughout 2024 as prior pattern seen in previous years is maintained with similar interest in the same direction in current times. The aforementioned results raise an intriguing question regarding the potential impact of the COVID-19 pandemic on scholarly interest in wellness tourism research. The same raises a series of interesting questions with similar kind of interest to similar kind of situations in the next coming future to the world. The present synthesis of the research topic largely sets its merits for further investigation in the next upcoming studies in similar or closely collaborating fields (Bočkus et al., 2023). The insightful elaboration on data offers revealing information from greater

interest in wellness tourism research and its impact as a global health crisis. Researchers are investigating on destinations and destinations guarantee towards safety, satisfaction emerging from pandemic tourists' demands, and fostering loyalty converging from changed travellers' impressions selected locations and services (Handler, 2022). Travellers may now be increasingly interested in immersive and mindful experiences coming out of health concerns; with increased interests research on authenticity, engagement, and wellbeing as acclaimed critical factors in wellness tourism (Loureiro et al., 2013). The predominance of before mentioned subject areas in research from and after 2020 on highlighted wellness tourism, as a whole, demonstrating industry's position and counter act strategies with adaptability and resilience towards the obstacles presented by the epidemic. In uncertain times, scholars and practitioners acknowledge the significance of attending to the evolving needs and expectations of travellers (Kongtaveesawas et al., 2022).

Implications and Limitations

Bibliometric reviews allow practitioners, researchers and industry stakeholders to detect current research trends with the help of this bibliometric review (citation analysis, co-citation analysis and bibliographic coupling) on wellness tourism. The most researched subjects, new research fields, and possible holes in the body of literature are all identified with assistance of bibliometric analysis. The review's co-authorship and co-citation network analysis provides information on the existent academic relationships and influence between scholars. In the academic community, similar studies can promote information sharing and open doors for future collaborations (Rocio et al., 2023). Additionally, the undertaken study adds to the knowledge of wellness tourism research impacted by the COVID-19 pandemic. Similarly, it also provides future dimension of travellers' interest overcoming the world's most recent havoc of COVID 19 thereby underlying the future ready strategies for destinations in similar conditions. It sheds light on the most researched themes during the pandemic, as well as the more focus on the topics like health and medical tourism. The conclusions from the can be used by industry players in the wellness tourism sector to modify tourism products, marketing plans and actions and services delivery in response to shifting consumer demands. Kazakov and Oyner (2021) states that 2020 marks the beginning of another 75 years of study development on wellness tourism, the impact of wellness tourism on social and economic health is another factor contributing to the growing interest in this field.

Considering an important contribution made by the study, some limitations must be recognised and addressed. Comparing these findings with those from other databases, like Scopus or Google Scholar, is advised for further study (Montero-Díaz et al., 2018). Using dimensions.ai, a single database, as opposed to several sources for data retrieval is one significant drawback. Additionally, unpublished book reviews, conference proceedings working papers and doctorate theses were not included in the inclusion criteria, which may have led to the omission of important studies. Furthermore, study only included English-language publications; important research done in other languages might be missed. Future study addressing these constraints would offer a more varied and all-encompassing perspective on the topic.

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Attitudes of Local Community about Revitalization of Hunting Tourism in Hunting Ground "Karadjordjevo"

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Abstract

Hunting activities were considerably developed on the territory of hunting area "Karadjordjevo", but the development stopped due to economic and political instability at the end of the 20th century and beginning of the 21st century. This research aims to evaluate support of the local community in the previously well-known hunting destinations nowadays when hunting tourism are under the pressure of different groups who underestimate their importance. The survey was conducted in the municipality of Backa Palanka in 2018, and the results show that the local population is generally prone to the revitalization of hunting tourism. According to the results analysed in this research, local population on the territory of Mladenovo and Karadjordjevo generally supports development of hunting tourism. Local people do not have negative attitude about hunting, and, in most cases, are prone to hunters and hunting regardless of being hunters themselves or having a hunter in their family.

Keywords: *hunting tourism, hunting, revitalization, Karadjordjevo, local community*

Introduction

In the end of the 20th century, Serbia represented one of the most famous hunting destinations in the region (Ristić et al., 2009), and hunting activities were mostly present in Vojvodina, northern part of Serbia. Convenient geographical position, big number and variety of wild animals, long hunting tradition and hospitality culture contributed to the development of mass hunting tourism in Vojvodina with 3-4 thousand hunters per year on average. They came from Italy, Germany, Austria, Spain, the UK, Belgium, France, Hungary and Russia (Dragin, 2006; Marković et al., 2017). At some periods, up to 10 000 foreign hunters stayed at the territory of Serbia (Prentovic, 2004).

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Hunting area "Karadjordjevo" is located in Vojvodina, around 50 km from Novi Sad, the main city of the region. It lies along the left bank of the Danube, between 45°15' and 45°22' of the north geographical latitude and 19°13' and 19°22' of the east geographical longitude. The species of wild animals that live in this area are: red deer, fallow deer, white-tailed deer, mouflon, roe deer, wild boar, hare, pheasant, grey partridge (Jovanovic, 2001). This hunting area is part of military institution "Karadjordjevo" which has long tradition. The president of ex Yugoslavia, Josip Broz Tito, used this hunting area as his residence where many important meetings took place. Josip Broz Tito organised numerous "diplomatic" hunts in the hunting area "Karadjordjevo" and this is the place where he hosted many great world leaders (Brezhnev, Causesku and others). Until 1980 the hunting area was closed for public and from that year it became open and more commercial.

Hunting area "Karadjordjevo" kept its most important characteristics and qualities, for example big number of wild animals which is the most significant attraction of this area. The fund consists of 250 deer, 200 fallow deer, 250 wild boars, 10 mouflons and the same number of white-tailed deer. Hunters are mostly interested in hunting trophy specimens of deer and in group hunts of wild boars. Foreign and domestic hunters appreciate good organization and successful hunts. Every year around 40 deer, from 30 to 50 fallow deer and over 100 wild boars get hunted. "Karadjordjevo" could become the main factor of hunting tourism development nationally, with adequate investments and programme (Tufegdzic, 2005).

Literature review

In many societies hunting is important economical activity, but also very important part of cultural heritage (Stedman, Heberlein, 2001; Bauer, Herr, 2004; Rutanen et al., 2007; Willebrand, 2009; Hunter, Watts, 2010). Hunting tourism represents travelling and tourist activities whose basic motives are hunting and shooting game (Brainerd, 2007; Lovelock, 2008; Leader-Williams, 2009; Nygard, Uthardt, 2011), and as such, considerably contributes to valorization of peripheral or insufficiently used areas where tourist activities are poorly developed (Baker, 1997; Lindsey et al., 2006; Gunnarsdotter, 2006; Samuelsson, Stage, 2007; Matilainen, 2007; Willebrand, 2009;). Hunting tourism can have significantly positive effect on the local community (Chardonnet et al. 2002; Bauer, Herr, 2004; Samuelsson, Stage, 2007; Sharp, Wollscheid, 2009; Mbaiwaa, Stronza, 2010; Naidoo et al., 2016) and bring it considerable economic benefit (Barnes 2001; Bauer, Herr 2004; Hull et al., 2007).

Some of the most important conditions for the successful development of all types of tourism, hunting tourism as well, are support of a local community and positive attitudes of local people (Gursoy, Rutherford, 2004; Blešić et al. 2014; Williams et al. 1995; Teye et al., 2002; Oviedo-Garcia et al., 2008). Local population forms different opinions about economical, socioocultural and ecological effects of tourism on local community and environment (Andereck et al. 2005; Wang, Pfister, 2008; Stylidis et al. 2014, García, et al., 2015). The attitudes towards hunting and hunting tourism are influenced by environment`s ethical attitudes towards the consumption of wild game (Willebrand, 2009). The opinion of local people about hunting is often more positive if hunting activities are conducted in order to manage the population of wild animals, and it is more negative about sport and trophy tourism, that is hunting tourism (Campbell, MacKay, 2003).

However, the research conducted in Sweden showed that the support of local people for hunting and hunters is very important (up to 82%) with higher percent in rural areas compared

to the urban ones (Heberlein, Ericsson, 2005; Ljung, 2014). Mostly younger respondents and women support hunting and hunting tourism less, while positive attitudes appear in respondents whose family members or close friends are hunters (Ljung et al., 2012; Gamborg, Jensen, 2017; Byrd et al., 2017).

The aim of this paper is to determine attitudes of local people, hunters and non-hunters towards re-development of hunting tourism in one of the most attractive tourist areas in Serbia. This research comprises the analysis of influence of sociodemographical variables (sex, age) on forming of the attitudes towards hunting tourism. The main aim was to determine whether the local community has an understanding for re-development of hunting tourism in the region which had significant economic benefit from this tourist activity in the end of the last century.

Methodology

Research instrument

In order to evaluate the attitudes of the local community towards hunting tourism development, we used a questionnaire with three parts. The first part contains sociodemographical characteristics of respondents (sex, age, education, income). In the second one, respondents were asked about their opinion on hunting and hunting tourism. Respondents, that is local inhabitants, gave their answers in the form of Likert scale (1=I completely disagree, 2=I mostly disagree, 3=I am not sure, 4=I mostly agree, 5=I completely agree). In the third part, respondents were asked whether they participate in hunting activities, how much they know basic hunting rules, whether they have hunters in their family. Respondents scaled the importance of family tradition, love for nature, hunting usefulness etc.

Questionnaire

Research was conducted in 2018 in the rural areas of Mladenovo and Karadjordjevo (municipality of Backa Palanka). Questionnaires were distributed in towns by the authors of this article.The sample of the local inhabitants consists of 200 residents who wanted to participate in the survey. With 27 questionnaires that were not complete and in the end dismissed, the final sample consisted of 176 filled in questionnaires.

Results and discussion

Characteristics of respondents

When the sex structure is concerned, male respondents make up the majority (N=113) which is 64,2%, while women (N=63) make up 35,8% of respondents. In the category of age, majority of respondents were between 40 and 60 yers old, which respresents 42% respondents, while 20% of respondents were older than 60, and 18,8% of them were between 30 and 40 years old. The smallest group of respondents were people under 30 years old (18,7%). In the category of educational structure majority of respondents (46,6%) finished secondary school, while the second biggest group consists of people with higher education (28,4%).The third group make up respondents with finished elementary school (15,9 %). Only 2,3% hold PhDs and 6,3 % are people with Master`s degree.

After analysing the factor of monthly income, the most dominant are respondents who earn between 200-400 euros (44,3% of respondents), then those who earn less than 200 euros (34,7% of respondents), while 17,6% of respondents earn between 400-600 euros. Only 3,4% of respondents earn more than 600 euros, 23,9% of respondents are hunters, and 27,8% of them have a hunter in their families.

Results

In the analysed population sample, the biggest number of respondents (70,5%) have basic conditions for becoming a hunter, which is hunting permission, passing hunting exam and passing exam for weapon handling. The results show that most of the local population think that hunters like hunting activities because of spending time with others (88,64%), and because of being in nature (88,64%). Most respondents thinks that shooting of animals respresents the least important or irrelevant aspect of hunting (43,18%).

Analysis of the respondents' answers shows that, generally speaking, local population supports hunting tourism. According to the results of descriptive statistics (table 2) it can be noticed that local population, on average, has positive attitude towards hunting and hunting tourism. Statements that the respondents agree on positively describe this economy branch.

However, there are differences in attitudes depending on the respondents gender, family relations to hunters and their participation in hunting activities.

Normality test showed that there is variable normality "Gender", "whether a respondent is a hunter" and "family connections with a hunter", which indicates that the survey was successfully conducted (table 1).

Table 1. *Normality test*

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Gender	,414	176	,000	,606	176	,000
Do you hunt?	,473	176	,000	,528	176	,000
Does any in your family hunt?	,454	176	,000	,561	176	,000

Most respondents agree (81,2) with the following statement *"Hunting tourism can contribute development of local community and economy"*, with 63,07% of the respondents who completely agree with this statement. Only 4,54% of respondents consider this statement not true. Thus, this statement has high average values of M=4,3864, (SD= ,93114). However, there are statistically important differences in attitudes between sexes (sig=0,018) and between the respondents who are and who are not hunters (sig=0,017). Men (88,48%) generally speaking agree that hunting tourism can contribute the economy of the local community, which can be said for the female population of respondents as well (74,6%).

Women are less certain than men on the question of contribution of hunting activities to local community (only 22,2% of female respondents and only 7,9% of male respondents). Hunters believe that hunting tourism can considerably contribute the development of economy of the local community (97,6%), while smaller number of non-hunters states the same (79,1%). There are, also, the differences in attitudes between the respondents who are related to hunters and those who are not related to hunters (sig=0,029). The respondents who have a hunter

in their family support this statement to a higher extent (87,7%) compared to those who do not have a hunter in their family.

Table 2. *Descriptive statistics*

	N	Min	Max	Mean	Std. Deviation
Hunters are killers of wild animals	176	1,00	5,00	1,9659	1,32621
Hunters are people who love weapons	176	1,0	5,0	3,170	1,4907
Hunting tourism destroys flora and fauna	176	1,00	5,00	1,8182	1,19087
Hunting tourism can contribute to development of the local community and its economy	176	1,00	5,00	4,3864	,93114
We should invest in hunting tourism because it is one of the leading generators of nature	176	1,00	5,00	4,2955	1,01034
Hunting tourism is one of the most expensive types of tourism	176	1,00	5,00	3,7898	1,37159
The numbers of deer, roe deer, pheasants and other wild animals would be smaller if people did not feed and protect them in winter.	176	1,00	5,00	4,1932	1,19387
Development of hunting tourism in this municipality affects general development of nature and other economical activities	176	1,00	5,00	3,0795	1,55818
Valid N (listwise)	176				

The biggest number of respondents believe that the development of hunting tourism is very important for the local economy (M=4,4602, SD=,86758), due to the fact that it can contribute to the development of other economic activities (M=3,0795, SD=1,55818). Majority of local population (76,71%) thinks that hunting tourism represents economic activity that should be invested in (M=4,2955, SD=1,01034) and that this is one of the most expensive type of tourism (M=3,7898, SD=1,37159). There are statistically important differences in the attitudes of hunters and non-hunters (sig=0,042, sig=0,007). The bigger number of respondents who are hunters (85,7%) believe that we should invest more in hunting tourism, compared to non-hunters (73,8%) who share the opinion. Whereas, only respondents who do not take part in hunting activities, that is who are not hunters, do not agree with this statement (only 8,9%).

Big number of respondents (78,4%) agree that the number of wild animals would be considerably smaller if hunters did not actively feed and protect them (M=4,1932, SD=1,19387). However, there are statistically important differences in the attitudes of men and women (sig=0,002). Most men agree and completely agree that hunters actively keep the numbers of wild animals (84,9%), while smaller number of women has the same opinion (66,6%). In most cases, women disagree with this attitude, considering the fact that 17,4% of female and only 5,3% of male respondents disagree with that statement. There are, also, the differences in the attitudes of hunters and non-hunters (sig=0,038). Almost all the respondents who are hunters (95,2%) consider that hunters maintain the numbers of wild animals, which is also the opinion of smaller percent of non-hunters (73,1%). The difference in attitudes of the respondents who have a hunter as a family member and those who do not have a hunter (sig=0,028) shows that the respondents with a hunter in their families considerably support this statement. This result was confirmed by the answers to the question in which 63,07% of respondents said that the number of wild animals would be lower if the hunters did not do their activities. The local population thinks that hunters save the biggest number of animals in cases of storms or natural disasters (86,36% of respondents) and only 11,93% of respondents think that in natural disasters the biggest number of wild animals get saved by farmers and non-government organizations.

Lower number of respondents have a negative attitude to hunting, because the majority of local population (68,75 %) thinks that hunters are not only killers of wild animals (M= 1,9659, SD=1,32621), and 52,27% of respondents consider hunters as people who like weapons (M=3,170, SD=1,4907). However, there are statistically significant differences in the attitudes of the respondents who are and who are not hunters (sig=0,006). Namely, 63,3% of respondents who are not hunters think that hunters are not only killers of wild animals, while 85,7% of hunters share that opinion. Also, majority of local population (72,16%) does not believe that hunting tourism destroys flora and fauna (M= 1,8182, SD=1,19087). The opinions of hunters and non-hunters are statistically different (sig=0,033). Higher percent of hunters (85,7%) compared to non-hunters (67,9%) think that hunting tourism does not destroy flora and fauna, that is wild animals habitat.

Conclusion

According to the results which were analysed in this research, local population on the territory of Mladenovo and Karadjordjevo generally supports development of hunting tourism. Local people do not have negative attitude about hunting, and, in most cases, are prone to hunters and hunting regardless of being hunters themselves or having a hunter in their family. Hunters and those related to them consider hunting and hunting tourism useful for the possible development of the community. The main reason is the fact that this group of respondents is directly involved in hunting activities or it is indirectly connected to them through family members. Thus, they accept hunting as an economic activity. Women support development of hunting tourism less than men, because women are less likely to do it or their participation in hunting activities is rare. Despite widespread opinion about hunting in the modern world, and especially hunting tourism, the results have shown that the local community is aware of the advantages of the hunting tourism and that it is interested in reactivation of this type of tourism. Taking into consideration the fact that hunting and tourist activities were rather developed in the end of the last century, it can be easily presumed that the local population still remembers the benefits that these activities bring.

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Spatial Patterns and Road Network Accessibility of Cultural Heritage for Tourism Potentials in Banswara District, Rajasthan (India)

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Abstract

Integrating cultural heritage with tourism helps reveal the tangible and intangible characteristics of a place that are the outcome of long-term interactions between the local population and their natural environment. The goal of this study is to investigate cultural heritage in relation to the tourism development in Banswara district, Rajasthan, India. The study first identified and classified the cultural heritage sites of Banswara district; thereafter, it used spatial statistical tools from ArcGIS 10.7 to find out distribution patterns as well as clusters and hotspots of cultural heritage. In addition to this, accessibility to cultural heritage sites is examined using buffer analysis. The results derived show the presence of hotspots and coldspots in the central part of Banswara district, which includes the Talwara block. Compared to intangible cultural heritage, which is more sporadic, tangible cultural heritage tends to form hotspots and exhibits a more clustered pattern. Also, tangible cultural heritage sites are frequently found close to major highways when compared to intangible cultural heritage. This research can help planners formulate different strategies for incorporating cultural heritage for tourism development in this area. Policymakers can promote the tangible heritage sites for year-round tourism, whereas the fairs and festivals that constitute an important segment of intangible heritage happening during specific times of the year can be made more accessible through enhancing direct transport connectivity.

Keywords: *cultural heritage, intangible, tangible, tourism, accessibility, spatial autocorrelation*

Introduction

According to the United Nations Educational, Scientific, and Cultural Organization (UNESCO), "Cultural heritage includes artifacts, monuments, and groups of buildings and sites that have a diversity of values, including symbolic, historic, artistic, asthetic, ethnological or anthropological, scientific and social significance (UNESCO, 1972). "Intangible cultural her-

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itage, or ICH," is another aspect of heritage that is regarded as living and immaterial. ICH includes "the practices, representations, expressions, knowledge, skills - as well as the instruments, objects, artifacts, and cultural spaces associated therewith - that the communities, groups, and, in some cases, individuals recognise as part of their cultural heritage that is being constantly recreated by them in response to their environment" (UNESCO, 2003). Simultaneously, the UNESCO convention of 2003 on the "Safeguarding of the intangible cultural heritage" reaffirms the interdependence of tangible and intangible heritage.

Cultural heritage is regarded as an important segment of the modern tourism industry that has grown significantly in recent years (Seraphin et al., 2018), as it allows tourists to integrate themselves with the region's historical fabric, increasing their knowledge and cultivating a sense of appreciation and pride for the region's history and culture (Arumugam et al., 2023). Tourism yields potential benefits such as enhancing business opportunities, improving transport, and so on, thus adding value to the cultural heritage, which can provide reasons to focus more on conservation and sustainable use of these assets (Brooks et al., 2023). The United Nations World Tourism Organization (UNWTO) has argued that a lack of visits to monuments results in significant decay of tangible heritage, whereas intangible heritage may be forgotten if tourists show no interest in them; thus, tourism aids in the revival of intangible aspects of culture while also encouraging the preservation of tangible heritage (World Tourism Organization, 2018).

Rajasthan is well-known for its heritage tourism, as there are several tangible and intangible cultural elements that attract tourists (Chandel, Sharma, 2020). The 2020 Rajasthan Tourism Policy has highlighted cultural heritage tourism by focusing on the lesser-known attractions of rural areas, establishing clusters that can be promoted as 'Special Heritage Village' or 'Special Craft Village', and fostering tribal culture and heritage (Department of Tourism, Government of Rajasthan, 2020). The Banswara district in Rajasthan State of India, has a rich cultural legacy. Research on the material heritage of Arthuna, Talwara, and other areas (Trivedi, 1995), the customs of the indigenous tribes (Rana et al., 2014), and the celebrations of the Bhil tribal community (Sharma, 2019) provide insight into the region's tangible and intangible cultural heritage. Within the planning hierarchy, there are several stages at which tourism planning takes place (Sarıkaya Levent et al., 2024). Promoting cultural heritage tourism at the local level demands a symbiotic strategy that includes not only top-level planning but also a 'bottom-up approach' in which local people make decisions about the use and conservation of their heritage resources (Theerapappisit, 2012). This study attempted to identify cultural heritage clusters at the block level in Banswara district, which can aid in effective policymaking at micro level administrative unit and long-term cultural heritage tourism planning. Block is considered to be an important administrative unit for planning at grassroot level below the district level (Maheshwari, 1984).

Literature review

Culture, heritage and tourism

The tourism industry started developing rapidly in the second half of the twentieth century (Virginija, 2016). In the modern tourism industry, the concepts of 'special interest tourism' and 'niche tourism' have gained prominence. In such a kind of tourism, the specific needs of the tourists are taken into account (Sert, 2017). The integration of cultural heritage and tourism is one such example of special interest tourism intended to fulfill the aspirations and motivations of tourists related to cultural experiences (Kruja, Gjyrezi, 2011).

In terms of cultural heritage and tourism, there have been considerable attempts to understand tangible cultural heritage from the perspectives of social impacts such as sense of belongingness for the host population, pride, identity and so on (Butler et al., 2022), and economic impacts (Matečić, Kesar, 2019), as well as its protection and conservation (Cai et al., 2021). However, systematic attempts have been made to understand the intangible cultural heritage through the lens of tourism in recent years. The research on ICH and tourism has mainly focused on certain themes, such as planning ICH to achieve sustainable development, understanding the positive and negative impacts of tourism on ICH, and forecasting tourist motivations and behaviors towards ICH (Qiu et al., 2022). Arenghi et al. (2019) claimed that because cultural heritage is so complex, examining it from just one perspective—whether it be material or immaterial, tangible or intangible—is impractical and that a more comprehensive strategy is needed to change the way both the host communities and the tourists view it. Nevertheless, there has been less research on this integrated perspective.

Inventorying and classifying cultural heritage

The first step in appreciating the worth of tourism resources at a place is often to identify the cultural heritage. The process of identification leads to the inventorying of cultural heritage (UNESCO, 2009). Inventorying and data collection related to cultural heritage can be done at variety of geographic scales ranging from international, national, regional, local, and so on (Myers, 2016). At the national level, inventories for both tangible and intangible heritage have been prepared in India; nevertheless, the attempt is still inadequate at the district level of administration. Shah (2015) highlighted the processes that were undertaken towards the preparation of inventories for the historic world heritage city of Ahmedabad, India. Such inventories are useful databases for acquiring information pertaining to the intangible and tangible heritage sites of that place.

Spatial distribution pattern and cultural heritage

GIS offers a wide variety of tools to map the spatial distribution patterns of any phenomenon. Studies dealing with the analysis of spatial distribution patterns have been less pronounced in cultural heritage and tourism compared to those in other disciplines such as disease mapping, ecological studies, and so on. However, in recent years, there has been a growth in the amount of literature that has attempted to understand the distribution patterns of cultural heritage using GIS. Systematic analysis of the literature reveals that the entire gamut of works in this direction can be categorized based on the purpose or methodology. The purpose generally differed, ranging from tourism to preservation and conservation of cultural heritage and identification of the influencing factors, whereas in terms of methodology, studies have used different GIS techniques such as Nearest neighbor analysis, Kernel density estimation (KDE), Global and local spatial autocorrelation measures, Geodetector, and so on. In this regard, the main focus of the discussion here has been concentrated on the purpose behind using spatial distribution analysis in cultural heritage, which eventually reflects the methodology.

Studies have used spatial analysis methods like Global and local spatial autocorrelation in conjunction with other remote sensing data to assess the geoenvironmental risks (Elfadaly et al., 2018) and devise sustainable planning strategies (Elfadaly, Lasaponara, 2019) for tangible heritage sites. Researchers have also used spatial analysis methods like KDE and Nearest neighbor analysis along with other techniques to understand the spatial distribution, such as

standard ellipse (Liu et al., 2022), Imbalance index (Runze, 2023; Wang et al., 2021), DBSCAN (Wang et al., 2024), Unbalance index (Gao et al., 2023), Global and local spatial autocorrelation (Nie et al., 2023; Zhang et al., 2023; Zhang et al., 2022; 2024) to find out the factors influencing the spatial distribution pattern of the intangible and tangible cultural heritage sites.

Spatial analysis gives information about the presence of the clusters that can help in evaluating tourism potential. Chang et al. (2023) used spatial analysis tools to find out the potential intangible cultural heritage clusters in the Yellow River basin in China that can be utilised for stimulating tourism. Yuan et al. (2022) integrated spatial analysis tools with buffer analysis to determine the patterns of ICH along the transport network for cultural tourism in Hunan province, China. Li et al. (2024) considered both tangible and intangible heritage in unison when determining the spatial heritage clusters in southwest China. Overall, there have been limited attempts to find out the spatial patterns, considering cultural heritage as a whole.

Transport network and cultural heritage

Tobler in 1970 formulated the "first law of geography" by stating that "everything is related to everything else, but near things are more related than distant things." This law certainly can fit the cultural heritage sites, as those located in the vicinity of the main transport network are more likely to get the attention of the visitors. Transportation and tourism have been considered to have a complimentary relationship, whereby transportation provides an initial impetus to the tourism industry; however, this symbiotic relationship is subject to policies related to heritage and environment protection (Yu et al., 2023). GIS has been utilised by researchers to formulate strategies for tourism management considering infrastructure facilities like roads, railways, and so on. Network analysis is one such tool that helps in determining the best route, and this has been used to design routes for geotourism in Safranbolu Turkiye (Keskin Citiroglu, Arca, 2023). Idajati and Nugroho (2019) attempted to create a cultural heritage tourism route using GIS in Surbaya city, East Java.

The aforementioned discussion reveals that there have been academic works focusing on classifying heritage and finding out the spatial distribution patterns of cultural heritage using different spatial statistical tools and techniques. However, it is worth noting that the majority of studies have focused on tangible or intangible cultural heritage. An integrated approach to understanding cultural heritage tourism by identifying the sites and analyzing its spatial distribution patterns at the block level has received insufficient attention. Taking all of this into account, this study sought to fulfill the following objectives: 1. Identifying and classifying cultural heritage sites in Banswara district. 2. Determine the density of cultural heritage sites and the presence of heritage clusters and hotspots in Banswara district. 3. Find out and explain the spatial distribution patterns of cultural heritage sites at block level. 4. Analyze the distribution of cultural heritage sites along the main transport network.

Study area

The study area (Figure 1) is situated in the southern region of Rajasthan State, India, and is known as the Banswara district. Administratively, the district consists of eleven blocks/panchayat samiti, and based on the last census enumeration of 2011, the district has a total population of 17,97,485 with the majority (92.9%) living in rural areas relying on agriculture for their economic base. Ethnically and culturally, Banswara district consists of the Bhil tribal

population, which overwhelmingly constitutes 76% of the total population of the district (Saroj, 2019). In terms of transportation, road transport is the main mode of transport available in the district due to the absence of railways. Approximately 138 villages lacked bituminous roads in 2019–20, despite the road network's total length of 4372.72 km, according to estimates taken from the Banswara district Gazetteer (Government of Rajasthan, 2022). The topography of the Banswara district varies greatly. The merging of two distinct major physiographic units—the Malwa plateau in the east and the Aravalli hills in the west—has shaped its unique character. Compared to the western portion of the district, the eastern portion is more elevated. The elevated areas have fewer hills and are more dotted with flat-topped plateaus.

The Mahi River, which enters Banswara from the east and flows to the west along the northern edges of the district boundary, is a geographical feature that has had a distinctive influence on the physical and cultural landscape of the district. The Mahi River and its tributaries have contributed to the topography of Banswara district by highly dissecting and eroding the area which is locally known by the names such as Vagad region and Chappan plains (Misra, 1967). The development of a varied historical cultural milieu has been greatly aided by topographic diversity. Many cultural characteristics, both tangible and intangible, have emerged over several centuries, demonstrating a distinct symbiosis between the environment and humans.

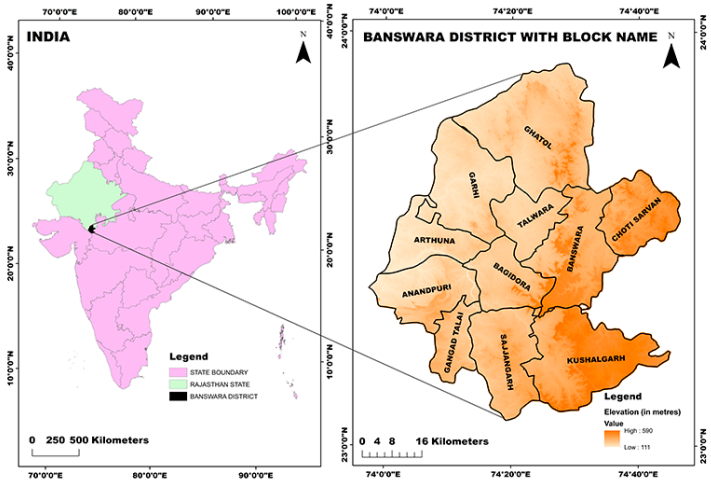

Figure. 1. Study area map

Materials and methods

Data Sources

The geographical locations of cultural heritage, both tangible and intangible, were identified by consulting experts and literature and by conducting fieldwork. Subsequently, the sites were classified according to their primary characteristics and significance. The base map for the Banswara district was produced from the data downloaded from the Survey of India website (https://onlinemaps.surveyofindia.gov.in/Digital_Product_Show.aspx). Additionally, to better understand the district's cultural heritage from a transportation perspective, the road network is derived at a scale of 1:50000 from the Open Street Map (OSM) and Survey of India topographical maps. A handheld GPS device was used to obtain the geographic coordinates of each site.

Methods used

The study of literature found a number of methods for recognizing spatial distribution patterns. There are numerous software packages that provide these tools, including ArcGIS, GeoDa, R, QGIS, and others. ArcGIS 10.7 is utilized in this work because it offers a variety of spatial analysis tools that enable the visualization and analysis of spatial distribution patterns. The goal of this study is to identify block-level clusters of cultural heritage sites in order to provide policymakers with places for micro-level tourism planning in the Banswara district. Methods that can help with both visualization and analysis were included in order to achieve this goal. On the other hand, multi-ring buffers are used to create multiple buffers along major thoroughfares, and network analysis is done to find the shortest path to each cultural heritage site. These are done to get detailed insights regarding the connectivity and accessibility component and the site's location in relation to the network of transportation.

Classifying cultural heritage

To place each site according to its primary characteristics and significance, a number of international standardised classification schemes were referred to, framed by international bodies such as the International Council on Monuments and Sites (ICOMOS) and UNESCO. In general, UNESCO has identified two subcategories of cultural heritage: intangible and tangible heritage. However, ICH has been divided into five main categories by the UNESCO convention on the "safeguarding of the intangible cultural heritage" in 2003. These categories include: (1) Oral traditions; (2) Performing arts; (3) Social practices, rituals, and festive events; (4) Knowledge and practices concerning nature and the universe; and (5) Traditional craftsmanship. These categories were being used for classifying the ICH identified during this study. Moreover, Mason and Avrami's cultural heritage value typology, which divides heritage into seven categories—economic, historical and artistic, spiritual or religious, social and civic, symbolic or identity, research, and natural—was used to further classify the tangible heritage (Mason, Avrami, 2002).

Analysing point distribution patterns

Kernel density estimation is selected over methods such as Standard deviation ellipse because of its better output, showing the hotspot locations. The density surface generated by Kernel density estimation provides a better visualization than point data and more possibilities for grasping spatial patterns (Krisp, Špatenková, 2010). However, the KDE findings are dependent on the bandwidth choice, and the output leaves room for subjective interpretation as it does not reveal whether the pattern is dispersed, random, or clustered. A variety of methods, including the Imbalance index, Geographic concentration index, Nearest neighbor ratio, Global and Local spatial autocorrelation, and others, can be used to analyze patterns, such as whether point locations are clustered or dispersed. The Nearest neighbor ratio, as well as Global and Local Spatial Autocorrelation measures are used in this study. The Nearest neighbor analysis uses the distance component to determine whether the distribution pattern is clustered or random, whereas the global and local spatial autocorrelation measures use the attribute value in addition to the distance to determine the pattern. To determine whether or not the patterns are statistically significant, P values and Z scores are also offered by each of these approaches. Two global spatial autocorrelation methods, Global Moran's I and Getis Ord General, were utilized, whereas Anselin Local Moran's I and Getis Ord Gi* were used for local spatial autocorrelation. By taking into account variables like area, time, and distance, spatial

autocorrelation assists in determining how the objects under study are correlated in a specific space (Sobari et al., 2023). Furthermore, global measures such as Moran's I and Getis Ord General offered global values, while local measures such as Anselin Local Moran's I and Getis Ord Gi* assisted in decomposing global values, allowing for site-specific visualization. This study used the block-wise number of cultural heritage sites as the attribute value/weights to derive results from Global and Local spatial autocorrelation measures.

A) *Kernel Density Estimation (KDE)*

In this study, the kernel density surface is derived using the kernel density spatial analyst tool in ArcGIS 10.7. KDE is a non-parametric statistical technique (Wang et al., 2015) that aids in smoothing the spatial x and y coordinates so that a probability density surface can be produced (Makhadmeh et al., 2020). The degree of smoothing is determined by choosing the appropriate kernel width; this process is frequently referred to as bandwidth selection (Medrano et al., 2021). In this study, ArcGIS 10.7's Silverman rule of thumb is used to derive bandwidth. Silverman's rule is considered robust for spatial outliers. Kernel density is computed for the chosen cultural heritage sites using the following formula (Yuan et al., 2022).

$$fn(x) = \frac{1}{nh}\sum_{i=1}^{n} K\left(\frac{x - xi}{n}\right) \tag{1}$$

where K is the nuclear function; $h>0$, for bandwidth; and (x- xi means the distance from valuation point x to the event $x1$.

B) *Nearest Neighbor (NN) analysis*

To determine how evenly distributed or clustered the locations of cultural heritage sites are in the study area, the present study has utilized ArcGIS 10.7's average NN tool. Using the NN tool, one can determine whether a distribution pattern is dispersed or clustered by averaging the distances between each centroid feature and its neighboring centroid location (Aziz et al., 2012). The values that are derived by calculating NN are the Nearest neighbor ratio, the average Distance expected (D_E), the Distance observed (D_O), Critical value (z score) and Significance level (p value). The ratio in NN is calculated by dividing the D_E by the DO (Hazrin et al., 2016). If the ratio is less than one, then the pattern exhibits clustering, whereas if it is greater than one, then there is the presence of a random pattern (ESRI, 2009).

$$NN = \frac{D_O}{D_E} \tag{2}$$

where D_O is the observed mean distance between each feature and their nearest neighbor expressed as

$$D_O = \frac{\sum_{i=1}^{n} di}{n} \tag{3}$$

and D_E is the expected mean distance for the features, which are in a random pattern calculated as

$$DE = \frac{0,5}{\sqrt{\frac{n}{A}}} \tag{4}$$

A spatial pattern is categorized as clustered if the average observed distance is smaller than the average expected distance and dispersed if the average observed distance is larger than the average expected distance (Mansour, 2016).

C) *Global Morans I*

Global Morans *I* help in comprehending the clustering between the feature datasets using the feature location and its attribute value using the given formula (Anselin, 1995). The values derived were Moran's *I* index, z score, and p value.

$$\text{Global Moran's } I = \frac{n}{S_O} \frac{\sum_{i=1}^{n} \sum_{j=1}^{n} w_{i,j} z_i z_j}{Z_i^2} \tag{5}$$

Here Z_i is considered the deviation of an attribute for feature I from its mean $(x_i\text{-}\overline{X})$, while S_o is the aggregate of all spatial weights.

$$SO = \sum_{i=1}^{n} \sum_{j=1}^{n} w_{i,j} \tag{6}$$

The Z_i score is computed using the following formula:

$$Z_i = \frac{I - E[I]}{\sqrt{V[I]}} \tag{7}$$

Where,

$$E[I] = \frac{-1}{(n-1)} \tag{8}$$

$$V[I] = E\left[I^2\right] - E[I]^2 \tag{9}$$

The block-wise total number of cultural heritage features in Banswara is the attribute value chosen for this study. The range of values for global autocorrelation is -1 to 1, where a value of 1 denotes positive spatial correlation and a clustered pattern, -1 denotes negative spatial correlation and randomness in the spatial distribution, and 0 denotes dispersal (Kianfar, Mesgari, 2022).

D) *Getis Ord General*

While the Global Moran's *I* give information about the presence or absence of clustering, the Getis Ord General helps in knowing the degree of clustering between the cultural heritage sites using the following equation:

$$G = \frac{\sum_{i=1}^{n}\sum_{j=1}^{n} w_{i,j}x_i x_j}{\sum_{i=1}^{n}\sum_{j=1}^{n} x_i x_j}, \forall j \neq i \tag{10}$$

Here, x_i and x_j are attribute values for features i and j; $\forall j \neq i$ indicates no similarity between j and i

The Z_G score is calculated using the following equation...

$$Z_G = \frac{G - E[G]}{\sqrt{V[G]}} \tag{11}$$

where:

$$E[G] = \frac{\sum_{i=1}^{n}\sum_{j=1}^{n} w_{i,j}}{(n-1)}, \forall j \neq i \tag{12}$$

$$V[G] = E\left[G^2\right] - E[G]^2 \tag{13}$$

The obtained values comprise the Getis z score, the observed *G*, and the expected *G*. A positive Getis z score and a value of observed *G* greater than the expected g value tend to indicate a higher clustering scenario, contrary to this scenario, which indicates lower clustering (Zheng et al., 2023).

E) *Local Moran's I*

Local patterns are undermined by global-level measures of spatial autocorrelation because they are not identified (Elfadaly et al., 2023) and are expressed as a single value (Fan & Myint, 2014). Therefore, Local Moran's *I* was used in this study in order to understand the local patterns of cultural heritage. It is calculated using the following equations:

$$I_i = \frac{x_i - \overline{x}}{s_i^2}\sum_{j=1, j\neq 1}^{n} w_{i,j}\left(x_j - \overline{X}\right) \tag{14}$$

Where x_i is an attribute of the i feature, $\overline{X}$ represents the mean of the corresponding attribute.

$$s_i^2 = \frac{\sum_{j=1, j\neq 1}^{n}\left(x_j - \overline{x}\right)^2}{n-1} \tag{15}$$

n equates to the total number of features.

The computation of the Z score is done using the following equation:

$$ZI_i = \frac{I_i - E[I_i]}{\sqrt{V[I_i]}} \tag{16}$$

where:

$$E[I_i] = \frac{-\sum_{j=1, j\neq 1}^{n} w_{i,j}}{n-1} \tag{17}$$

$$V[I_i] = E[I_i^2] - E[I_i]^2 \tag{18}$$

Local Moran's *I* give an opportunity to visualize the patterns through the representation of clusters and outliers (Fatima et al., 2021). Attributes having higher values are represented as High-High clusters, whereas those with low values are given as Low-Low clusters. Some attributes having higher values but surrounded by low values are considered as outliers, whereas those with low values surrounded by high values are shown as Low-High outliers.

F) *Getis Ord Gi**

It is also a tool for identifying local patterns. It gives specifics about where hot and cold spots are located. A location with higher values than the surrounding area is referred to as a hotspot (Kim et al., 2021). It is computed using the following formula.

$$G_i^* = \frac{\sum_{j=1}^{n} w_{i,j}x_j - \bar{x}\sum_{j=1}^{n} w_{i,j}}{S\sqrt{\frac{\left[n\sum_{j=1}^{n} w_{i,j}^2 - \left(\sum_{j=1}^{n} w_{i,j}\right)^2\right]}{n}}} \tag{19}$$

where x_i is the attribute of *j*.

$$\overline{X} = \frac{\sum_{j=1}^{n} x_j}{n} \tag{20}$$

$$S = \sqrt{\frac{\sum_{j=1}^{n} x_j^2}{n} - \left(\overline{X}\right)^2} \tag{21}$$

Coupling cultural heritage and transport network

The ability to choose and define a region surrounding a specific point of interest for multiple analyses is made possible by GIS technology. This study looks into the distances between cultural heritage sites and roads to find out how near the locations are to the main hub of transportation. Buffers at various distances can be created using the multiple ring buffer tool. This

study has mapped the spatial distribution of cultural heritage sites at 1, 2, 3, 4, and 5 km from major thoroughfares. Since there are no other modes of transportation in the Banswara district other than roads, shortest path analyses are conducted by incorporating all the roads within the study area. Banswara city is used as the primary hub from which connectivity to the sites is obtained in order to determine the shortest route to each and every cultural heritage site. The main reason Banswara city was chosen is that it serves as the central administrative hub, making it possible for any visitor to determine the best means of transportation to any given location. Network topology and network datasets were then created in order to perform shortest path analyses in ArcGIS 10.7.

Results and Discussion

Classification of cultural heritage sites in Banswara

Figure 2 shows the number of cultural heritage sites in each of the nine categories of cultural heritage. Out of the 59 locations that have been identified, 42 are categorized as intangible cultural heritage, and the remaining 17 are classified as tangible cultural heritage. Festive events and traditional knowledge each account for ten of these 42 intangible cultural heritage sites, with social practices accounting for the highest number at 14. The customs of "Gadhbhedan" and planning weekly haats for socioeconomic and cultural exchanges are two significant social practices. Festive events encompass the diverse methods used by the native tribal community to celebrate the Holi festival, as extensively documented by (Sharma, 2019).

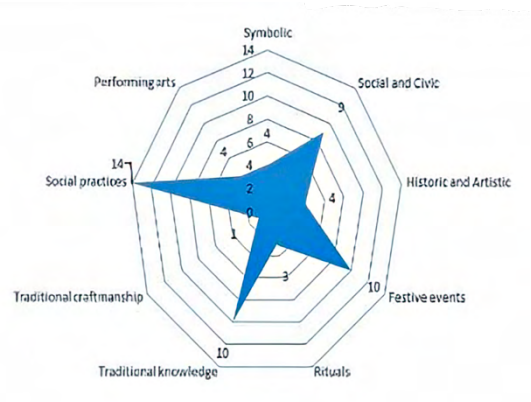

Figure 2. Cultural heritage typology in Banswara district

One aspect of traditional knowledge that is passed down as a legacy is the local tribal community's awareness of the therapeutic value of the nearby botanical resources. Singh, (1983) and Rana et al. (2019) have both documented the variety of botanical resources that the indigenous community uses. The tribal people's ceremonial dances, which fall under the performing arts category, were observed at four documented locations on special occasions. The fairs at Beneshwar Dham, Ghotia Amba, and the Raj talav lake are three significant rituals that the people of Banswara observe on special occasions and at distinctive locations.

The Sompura community's sculpting tradition in Talwara, Banswara, is the final subcategory of intangible cultural heritage. This is the only known traditional craftsmanship identified in Banswara during the course of the investigation. The Banswara district's four "historic and

artistic heritages" include Solanki-era temples in Arthuna and Talwara, as well as early medieval Paramaras. The four Maharawal symbolic heritages, on the other hand, hold great symbolic value for the local populace. Banswara District's social and civic heritage includes stepwells. These stepwells were built utilizing information about the Mahi River's high water table, and in many cases, they still bear the imprint of common ownership.

The classification of cultural heritage sites into tangible and intangible cultural heritage can aid in gaining a better understanding of the cultural fabric of the area. The study, through an attempt to identify and thereafter classify the intangible and tangible cultural heritage, can provide an opportunity for the policymakers and stakeholders to evaluate all the cultural tourism resources and formulate a sustainable strategy so that it can benefit the local community. Tangible heritage sites can attract year-round tourism, but this may not be the case for intangible cultural heritage, which includes fairs and festivals held at specific times of the year. As a result, policymakers may need different strategies for preserving and promoting tangible and intangible heritage.

Spatial distribution of cultural heritage sites

A) *Kernel Density Estimation*

The spatial distribution of cultural heritage sites in the study area is being understood through the application of various methods. Spatial distribution patterns helped reveal the processes acting behind them. As demonstrated in Figure 3, the kernel density tool in ArcGIS 10.7 is used to derive the density distribution. It shows the core area of concentration of cultural heritage sites in Banswara district.

The central part of the district, specifically the Talwara and Banswara blocks, is home to a high density zone with numerous tangible and intangible cultural heritage sites, according to

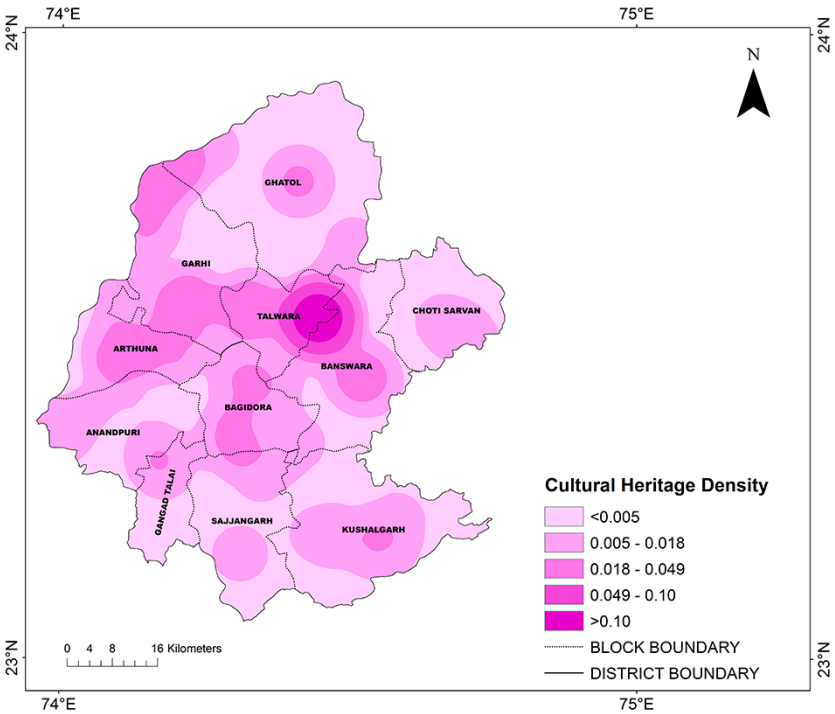

Figure 3. Banswara District's cultural heritage site density

the findings. There is a medium density zone in Banswara block to the south of the high density zone. There are medium density zones in Talwara, Arthuna, and Bagidora blocks. There are two significant medium-density zones in the Garhi block. Other blocks like Ghatol, Kushalgarh, Sajjangarh, Gangartalai, Anandpuri, and Choti Sarwan have low density zones showing less concentration of cultural heritage sites.

B) *Nearest Neighbor Analysis*

Average Nearest Neighbor (NN) was used on 59 cultural heritage sites of Banswara district to determine whether the sites are scattered, random, or clustered. The result derived shows the nearest neighbor ratio of 0.74 (with a z score of -3.74 and a $p < 0.01$), whereas the D_E and D_o are 4173 and 3164, respectively, which makes it evident that the observed pattern is clustered.

C) *Global Moran's I*

By computing Global Moran's I, values like the p value, z score, and Moran's *I* were generated. The positive z value (16.33) and Moran's I of 0.53 at $p<0.01$ indicate the spatial clustering of cultural heritage features in Banswara District.

D) *Getis Ord General*

After using Global Moran's *I* to confirm the existence of clustering, the Getis Ord General statistic or high/low clustering was used to determine the degree of clustering. A variety of values, such as observed *G*, expected *G*, z score, and p value, are obtained from the General *G*. There are high clusters among the cultural heritage sites in the Banswara District at $p<0.01$, as indicated by the derived observed *G* value of 0.48, which is significantly higher than the expected *G* value of 0.28.

E) *Local Moran's I*

Cultural heritage sites in Banswara district are spatially clustered significantly, as shown by the results of global spatial autocorrelation measures. The Anselin Local Moran's *I* provide information about the presence of clusters and outliers at the block level by decomposing the global value (Figure 4). Locations with similar values form clusters, and those with different values form outliers.

Figure 4 depicts the presence of high-high clusters in the central Banswara district, primarily in Talwara block. Low-high outliers are areas with low values surrounded by high values. These locations can be seen in the Banswara block, and the south-east part of Ghatol block. The sites of the remaining Ghatol and Garhi, Arthuna, Sajjangarh, and Choti Sarwan blocks do not form clusters or outliers. This could be owing to its greater distance from the center high-high cluster. These blocks primarily have intangible cultural heritage sites, with the exception of one tangible heritage site each in Garhi and the Arthuna block, which contains archaeological monuments such as the Parahera temple and the Arthuna temple complex. The blocks of Bagidora, Kushalgarh, Anandpuri, and Gangadtalai contain low-low clusters. Most of these blocks are also associated with intangible cultural heritage.

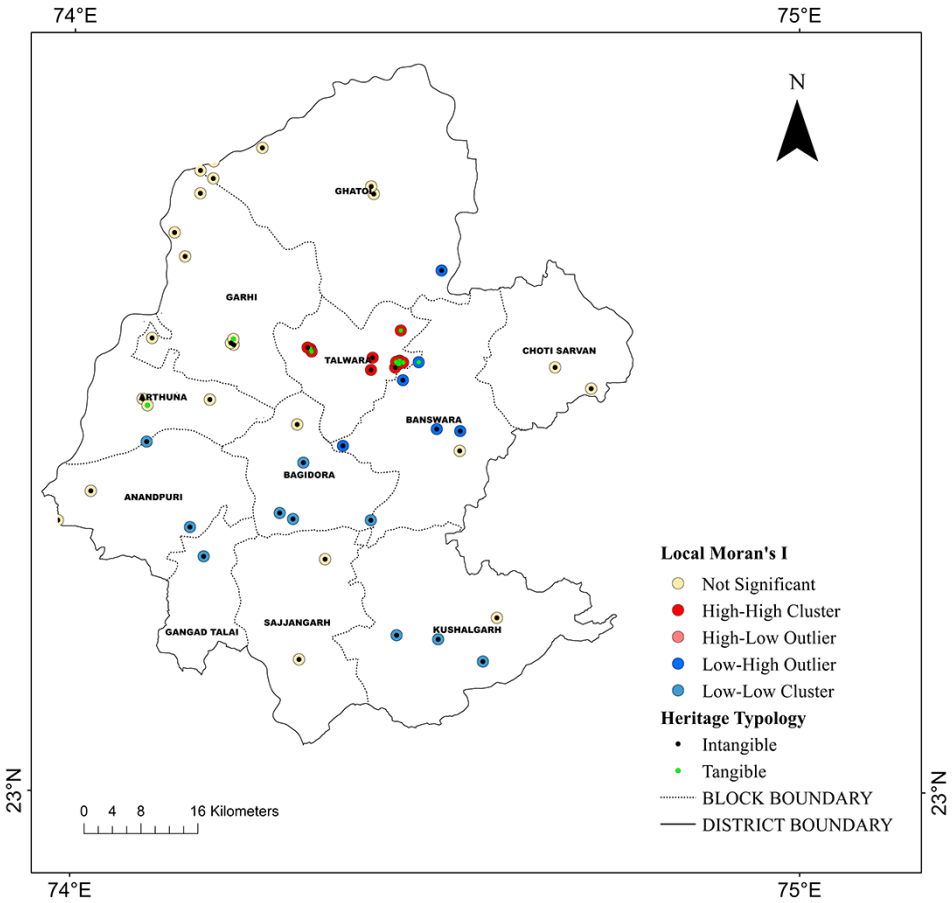

Figure 4. Block-wise tourism clusters

F) *Getis Ord Gi**

While the global values produced from Getis Ord General results suggest that Banswara district has a high concentration of cultural heritage sites, the Getis Ord Gi*, which offers local values, demonstrates the presence of statistically significant hotspots and coldspots (high and low values). These are derived with three different confidence intervals of 99, 95, and 90%, respectively. Getis Ord Gi* provides the decomposed values for the Getis Ord General measure. The locations of these hotspots and coldspots are shown in Figure 5.

Hotspots with a 99 % confidence interval are found in Talwara and Banswara blocks. These hotspots contain both tangible and intangible cultural heritage. Cold spots are found in Kushalgarh, Bagidora, Choti Sarwan, Gangadtalai, and some parts of Anandpuri and Sajjangarh blocks, respectively. However, only in Bagidora, a cold spot with a 99% confidence interval is visible; rest of the cold spots are associated with lower confidence intervals. In consonance with the results of Local Moran's *I*, Garhi, Arthuna, and most of the area of Ghatol block does not have either of the hotspots or coldspots. These blocks have sites of intangible cultural heritage. Therefore, it can be seen that the sites of intangible cultural heritage show a more random pattern than the sites of tangible heritage.

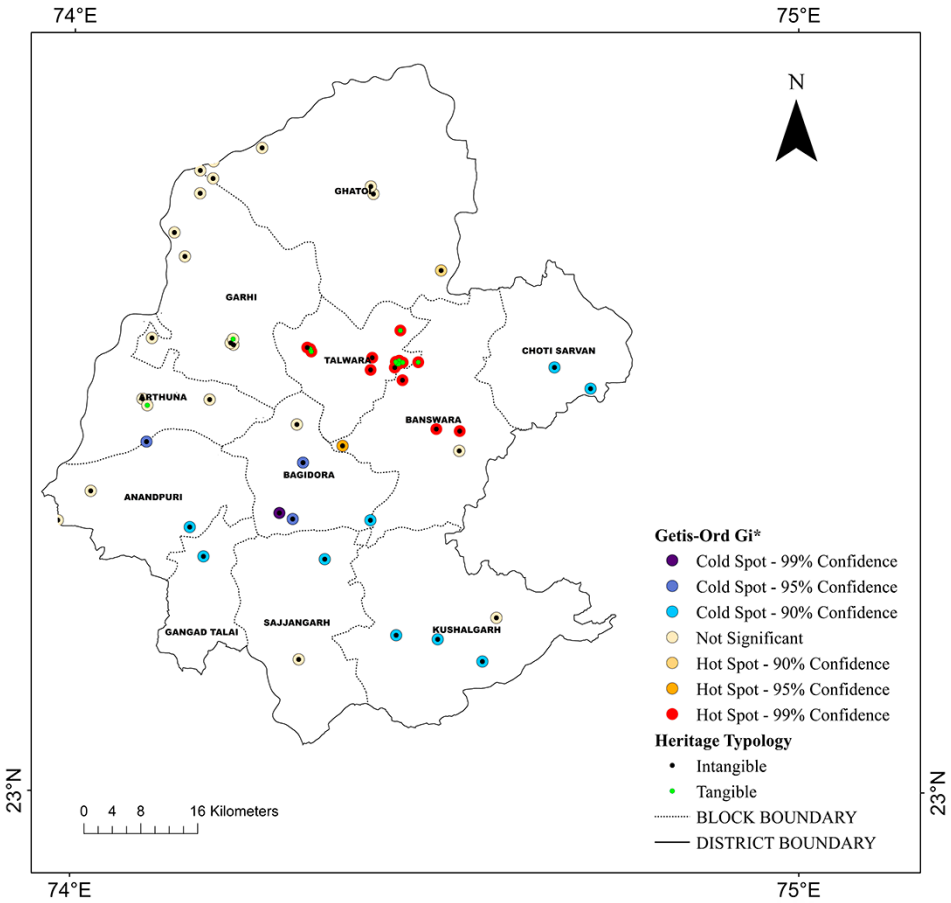

Figure 5. Block-wise hotspots and coldspots

The district's center area contains 17 cultural heritage sites, both tangible and intangible. The Talwara block includes medieval archaeological structures like the Dwarkadheesh and Mahalaxmi temples, as well as intangible assets such as Sompura sculptors' work and customs. The eastern portion of Banswara block contains a number of stepwells, as well as the 16th-century structure at the core of Banswara city, which served as an administrative and strategic nucleus in previous centuries. The structure comprises a bastion, rampart, watchtower, gates, and other features built by the Maharawals, who were the rulers of Banswara state in earlier eras. The relationship between human activity and the physical environment is revealed by the overall distribution pattern of these cultural heritage sites. Both affect and restrict each other (Lin et al., 2022). The distribution pattern reveals that while intangible cultural tourism heritage is primarily found farther from urban centers in more condensed rural settings, urban areas are primarily associated with tangible tourism heritage, such as ancient temples, palaces, stepwells, and so on. Historically, the forest tracts that served as the primary source of the botanical plants and herbs were found in areas that were remote from urban centers. These are also the locations of the places where fairs and festivals have been held in close proximity to natural features like waterbodies.

Findings from global and local spatial autocorrelation measures can help planners prioritize places with high-high clusters and hotspots for cultural heritage tourism. The low-high

outliers, which are sites with low values surrounded by locations with higher values, can also be prioritized because they are close to the high-high clusters. This type of analysis allows policymakers to design tourism circuits that efficiently connect a number of sites, saving tourists from having to travel longer distances to view a single site. The introduction of museums at locations where there are clusters and hotspots can promote local knowledge, skills, customs, and crafts. This can raise tourists understanding of the local culture and encourage them to visit certain locations. Furthermore, it can help foster a sense of self-pride and communal ownership, which can eventually lead to the preservation and conservation of intangible cultural heritage.

Spatial distribution of cultural heritage sites along the transport network

In the context of culture and tourism, spending more time at the sites rather than on the roads is essential (Yuan et al., 2022). Since the roads are the only available mode of transportation in Banswara district, an effort has been made to comprehend the cultural heritage sites in relation to their distances from the roads. Multiple buffers were created at distances of 1, 2, 3, 4, and 5 km along the major highways of the district. The location of the cultural heritage sites as seen through these buffers is depicted in Figure 6, 32 cultural heritage sites, or roughly 54.2% of the total, are situated within a one-kilometer buffer from major highways, while three sites, or 5% of the total, are situated between one and 2 km from the major highway network. The two- to three-kilometer buffer zone includes five sites, or 8.4% of the total number of sites. Moreover, 3 sites—or 5% of the sites—are included in the buffer zone of three to 4 km. Six cultural heritage sites (10%) are located within the 4 to 5 km buffer zone. There are ten sites that are located outside of the 5km search radius, making up roughly 16.9% of the total.

Using shortest path analysis, the shortest path between each cultural heritage site and Banswara city, which is the district headquarters of Banswara district is, determined. Following that, the shortest path analysis results were divided into six groups. Based on table 1, it can be inferred that approximately 9.52% of sites classified as intangible cultural heritage are situated within 10 km of Banswara city. The number of intangible cultural heritage sites rises with the distance from Banswara city. 19.04% of the sites are located 10 to 20 km from the district headquarters. Of all the sites, 7.14% are located between 21 and 30 km away from Banswara city, and 19.04 % are located between 31 and 40 km away. About 30.95% of the total intangible cultural heritage sites are located between 41 and 50 km from Banswara city. The remaining intangible cultural sites, which make up 14.28% of the total, are located at a distance of more than 50 km from Banswara city. On the other hand, 70.58% of the sites that make up the tangible cultural heritage are located within 10 km of the district headquarters. The number of tangible heritage sites decreases with increasing distance from Banswara City.

The tangible cultural heritage sites are closer to the district headquarters than the intangible cultural heritage, and transportation is the only means for transportation available in Banswara district. As a result, to make the best use of the road transportation network available to reach cultural heritage sites, policymakers can use the shortest path analysis results to prioritize the setting up of specialized transportation vehicles as direct connectivity from district headquarters to certain intangible cultural heritage sites based on their significance at specific times of year.

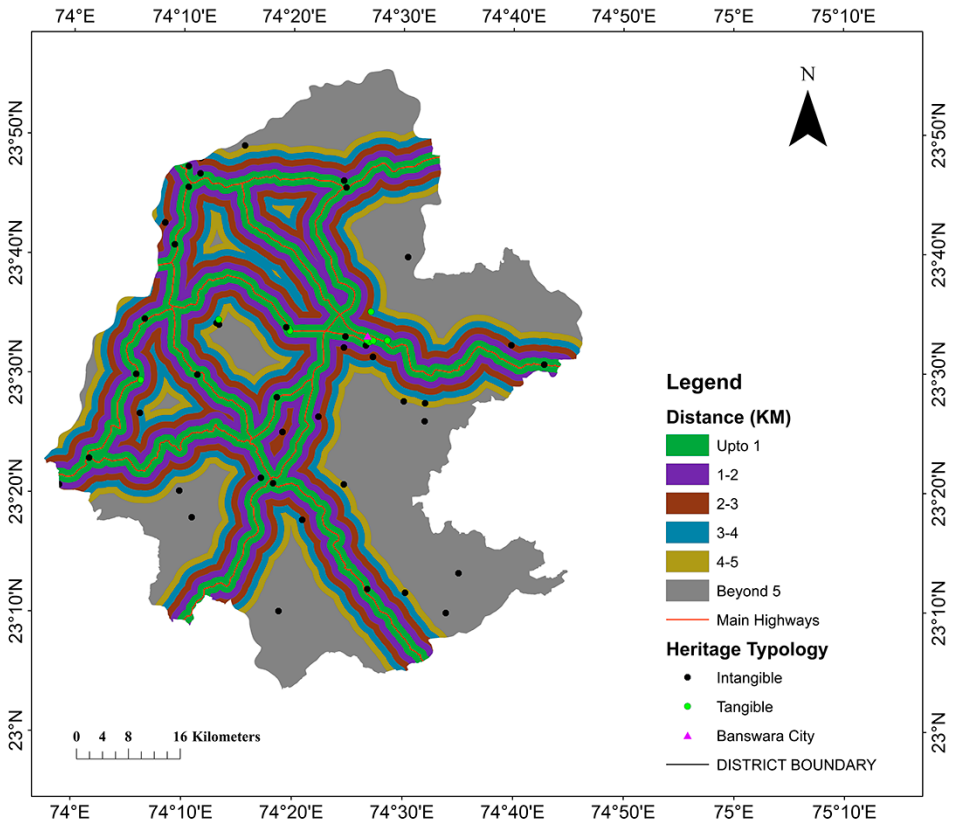

Figure. 6 Coupling cultural heritage and transport network using multiple buffer technique

Table 1. *Sites classified based on their shortest path*

DISTANCE (in km) / NUMBER OF SITES	<10	10-20	21-30	31-40	41-50	>50	Total
INTANGIBLE	4	8	3	8	13	6	42
TANGIBLE	12	2	1	0	1	1	17

Conclusion

This study used a variety of approaches to explore the spatial distribution patterns of intangible and tangible cultural heritage in Banswara district of Rajasthan, India, providing new geographical perspectives that can help plan cultural heritage tourism in the area. In this regard, the sites were first identified and classified based on their distinctive characteristics, and then their block-wise distribution was examined using a variety of tools, including Kernel density estimation, Average nearest neighbour, and Global and Local spatial autocorrelation. Additionally, this study tried to figure out how well the current road transport network could serve cultural heritage tourism in the Banswara district by employing buffer and shortest path analysis. The findings show that the central part of Banswara district, which includes the Talwara

and a portion of Banswara block, exhibits clustering and hotspots of cultural heritage. Based on the heritage typology, tangible heritage demonstrates spatial clustering and is more related with hotspots, whereas intangible heritage sites show dispersal and random pattern and are shown to be less associated with hotspots. The majority of tangible cultural heritage sites are located near the main transportation routes; however, some intangible cultural heritage sites are located far away from the highways, necessitating tourists to use district and village roads to reach there. This study can serve as a benchmark for future research on cultural heritage tourism in the Banswara district. The identification of hotspots and clusters in this study may serve as a starting point for policymakers to concentrate on the most important locations for promoting cultural heritage tourism in the region. The identification of cultural heritage sites was done through the use of literature and consulting with experts. A thorough survey conducted at the village level can uncover more sites of this kind and provide a deeper insight into the region's cultural fabric. As a result, more sites may be discovered in the future, providing ample opportunities to identify new hotspots and clusters. This study chose the block-wise number of cultural heritage sites as the attribute value/weights for deriving outcomes from Global and Local spatial autocorrelation measures. The use of global and local spatial autocorrelation for planning cultural heritage tourism in this area can be made more effective by exploring other attribute value/weight that can provide a more thorough picture of clustering or dispersion of these sites. Future research might study the significance of geographical elements in the distribution of cultural heritage sites by taking into account a variety of characteristics, including terrain, climate, population distribution, rivers, and others.

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Unveiling Progress in Sustainable Tourism Research: A Comprehensive Bibliometric Exploration

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Abstract

This research aims to evaluate the contribution of studies on sustainable tourism to the existing body of literature in this field. A comprehensive analysis of 1310 literary works was conducted using bibliometric analysis. The study followed the parameters outlined in the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) framework, with a primary focus on the Scopus database. The study also emphasizes the importance of accurately identifying authors, references, and links relevant to sustainable tourism research. The analysis highlights the evolution of sustainable tourism research, with consistent publication trends and growth. Key co-citation clusters identify influential works, authors, and institutions. It reveals gaps in integrating sustainability, competitiveness, and tourism in policy development, presenting opportunities for interdisciplinary research. Dominant themes like "sustainable tourism", "ecotourism", and "sustainable development" are identified, alongside the underexplored area of sustainable competitiveness. These findings stress the need for stronger collaborations between developed and developing nations to foster innovative and inclusive sustainable tourism policies. This study provides a comprehensive examination of the literature on sustainable tourism, employing bibliometric analysis to fill the gap in existing research. By identifying key clusters and emphasizing the importance of research collaboration, this study offers original insights into the field of sustainable tourism.

Keywords: *Bibliometric analysis, sustainable tourism, systematic literature review, sustainability*

Introduction

The tourism industry has experienced substantial growth, with international tourist arrivals reaching 1.5 billion in 2019, marking a 3.5% increase from the previous year (UNWTO, 2017). However, this growth has also led to negative impacts on the environment, society, and economy. Sustainable tourism aims to mitigate these issues by promoting positive outcomes for local populations and the environment (Neto, 2003). Sustainable tourism refers to travel prac-

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tices that prioritize environmental conservation, cultural preservation, and economic viability, ensuring that tourism benefits local communities while minimizing ecological impact (Hardy et al., 2002). This concept encompasses responsible tourism and ecotourism, which focus on ethical travel practices that promote sustainability (Baloch et al., 2023), It aims to balance the environmental impact of tourism with local economic growth. It balances the protection of natural resources and cultural heritage with the economic benefits of tourism, contributing to environmental conservation, poverty reduction, and cultural preservation (Neto, 2003).

Sustainable tourism acknowledges the role of socio-cultural factors in expanding the industry, addressing issues like congestion, cultural commoditization, and loss of traditional customs. Community-based tourism initiatives offer authentic experiences, fostering sustainable livelihoods and preserving cultural identities (Weaver, 2007). Sustainable tourism, encompassing economic, environmental, and socio-cultural aspects, aims to strengthen local economic ties by supporting small businesses, regional companies, and employment, reducing economic leakage and ensuring positive economic effects persist in host communities, according to the (UNWTO, 2017).

The public's awareness of Sustainability and the imperative of balanced economic growth is growing. This consciousness is fuelled by the realization that increasing consumption and depletion of natural resources harm the environment (Higgins-Desbiolles, 2018; Lee, 2020). Urgent action is required to address problems, examples of these challenges include the exhaustion of natural resources and the phenomenon of climate change biodiversity loss, and water and air pollution (Higgins-Desbiolles, 2018; Lee, 2020).

This study employs bibliometric to comprehensively assess the growth of research in sustainable tourism, evaluate the effective implementation of sustainable tourism policies, and elucidate outcomes, opportunities, and challenges, advocating for responsible travel that respects the environment, preserves cultural heritage, and benefits local communities, thereby paving the way for a just and environmentally responsible future in the tourism industry.

Objective and Research Question

This study aims to offer a comprehensive overview of the growth of research in sustainable tourism using bibliometric analysis. The listed research questions are analyzed to guide this study:

- What are the authors, sources, and affiliations that are most relevant to the research issue.
- What are the main co-citation clusters in tourism sustainability to ascertain the intellectual structure.
- What are the main trends in research on sustainable tourism?
- Which study topics on sustainable competitiveness are most popular among academics?
- What are the current citation patterns of publication?
- Which country is most productive in research on sustainable tourism and development? Lastly, a research strategy for further exploration of this important topic needs to be developed and improved. A key characteristic that makes this study stand out is its attempt to give an exhaustive bibliometric analysis of tourism sustainability reported across all relevant publications. This study can add to the knowledge previously known about sustainable tourism and provide academics and decision-makers with timely, beneficial recommendations on understanding research trends and structures.

It assists in determining the key contributions and research topics that may be useful to scholars in creating upcoming research papers.

Methods

Under the guidelines outlined in the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) statement (Liberati et al., 2009), this study followed a comprehensive checklist encompassing various aspects, including title, abstract, methods, results, discussion. This approach ensured a thorough and transparent reporting of systematic reviews. Furthermore, the research utilized bibliometrics, a quantitative methodology incorporating mathematical and statistical techniques, to evaluate the importance of academic journals to scholars, institutions, and nations (Pritchard, 1969). Using bibliometrics, you can get a comprehensive picture of a significant body of scholarly work (Alsmadi, Alzoubi, 2022; Van Nunen et al., 2018). Bibliometrics offers a more precise and impartial study of the material compared to other qualitative and quantitative review research approaches (Aria, Cuccurullo, 2017). The employment of relational approaches like co-authorship, co-word, and bibliographic coupling analysis is also included. Bibliometric analysis has been used to gauge the amount of scholarly output in several tourist studies subfields, such as sustainable tourism (Niñerola et al., 2019; Ruhanen et al., 2015), competitiveness and innovation (Comerio, Strozzi, 2019; Teixeira, Ferreira, 2018), and even the consequences of tourism (Burnham, 2006; Falagas et al., 2008). In particular, the tourism industry is examined in this study using bibliometrics to examine the connection between competitiveness and sustainable growth. This study utilized VOS viewer software (version 1.6.17), a widely recognized tool for visualizing bibliometric networks, to analyze and interpret the collected data. VOS viewer was employed for constructing and visualizing the following bibliometric networks: **Citation Analysis**, **Co-Citation Analysis**, Bibliographic Coupling, Co- word analysis, Co-authorship analysis. VOS viewer was used to generate visualizations, including network diagrams, density maps, and overlay visualizations. Each visualization provided insights into relationships among authors, institutions, references, and thematic areas.

Search Strategy

This study analyzed 1310 papers, including 1324 articles and 67 review papers, published in all languages. Non-English-language papers were excluded. The Scopus database was used for data collection, as it has been a popular method for discovering information distribution and research trends in scientific domains with significant social influence. The database was chosen for its extensive single abstract and indexing databases and searchable literature search list. The search criteria included "Sustainable tourism," "Environmentally Sustainable tourism," and "Consumer behavior in tourism." The search query was limited to English-written words, dates, and documents. The Scopus database was chosen for this study because of its reputation as the most extensive single abstract and indexing database (Burnham, 2006) and the most searchable reference and abstract literature search list (Falagas et al., 2008).

Figure 1 shows how collections of tourism research are used in these years to find the desired papers from the preceding ten years. The study highlights the need for more investigation into the period under scrutiny, as it is plausible that the subjects addressed in previous studies were exhaustively examined in subsequent ones (Nunhes et al., 2016). The current study just looked at several years to establish where research should go in the future and what

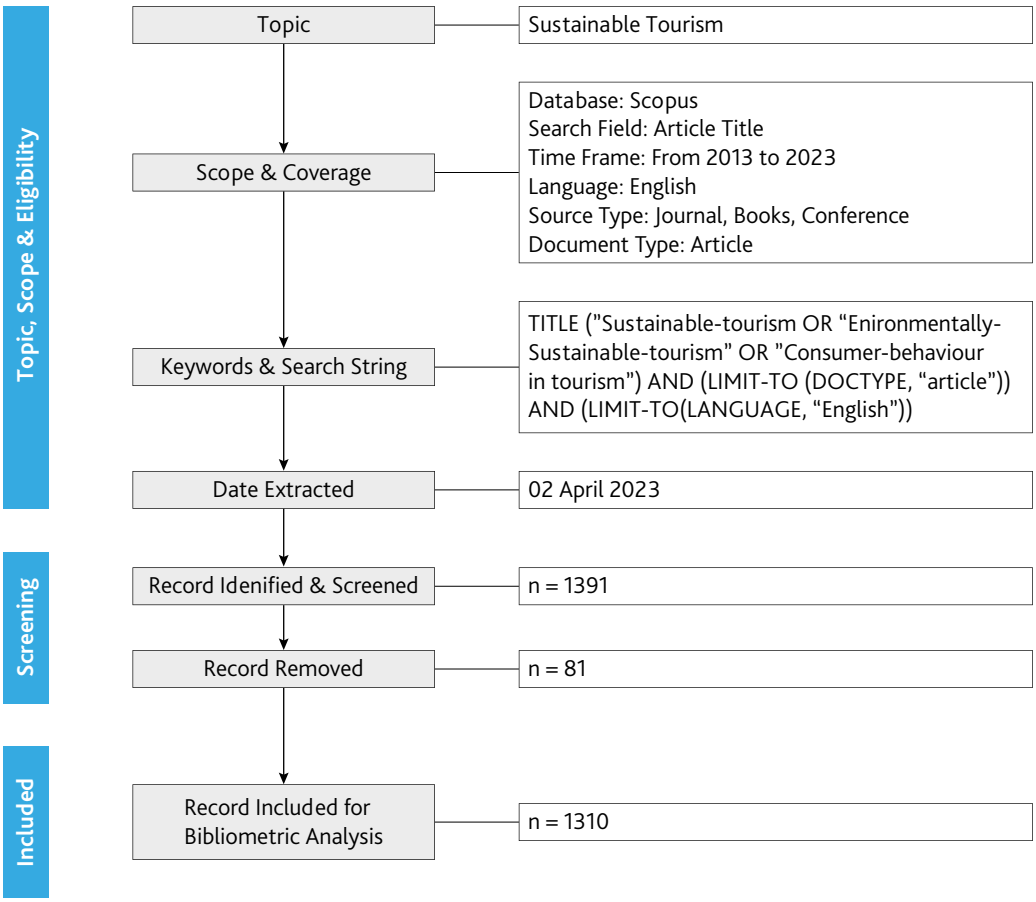

Figure 1. Flow diagram of the search strategy
Source: Zakaria et al., 2021

has to be done based on recent articles. Because there has not been much effort in bibliometric analysis to establish the cause-and-effect relationship between sustainable development and competitiveness, the publications are limited by their titles. Additionally, data is collected and shown using Microsoft Excel (Office 365 A1 Plus) and VOS viewer (version 1.6.17).

Documents Profiles

Table 1. *Document Type*

Document Type	Total Publications (TP)	Percentage (%)
Article	1324	95.18
Review	67	4.8
Total	1391	100.00

Literature review

The tourism industry's economic significance is well-documented, but social and environmental aspects are under-researched, especially in emerging economies (Tokmak et al., 2018) conducted a detailed literature review to explore the contributions of sustainable tourism studies. The study analyzed 143 articles, revealing key findings categorized under seven headings. Notably, the Journal of Sustainable Tourism, particularly in 2017, featured prominently. Qualitative and experimental methods were more prevalent, and case studies were frequently conducted in Australia, the USA, and England. (Shahbaz et al., 2021) offered a comprehensive knowledge map of tourism and environmental degradation literature, spanning 1999 to 2020.

Study of Cavalcante et al. (2021) aims to analyze research on environmentally friendly tourism practices using the Web of Science platform. This study, which used a sample of 694 materials, highlights research gaps and opportunities in Sustainability and tourism marketing while offering insight into the current state of the art (León et al., 2014) used the STIRPAT analytical methodology on a sample size of panels from industrial and emerging economies. They concluded that tourism affects carbon emissions in data panels. Miller et al. (2015) explore sustainable tourist destinations in urban Melbourne, Australia, focusing on pro-environmental behaviors such as recycling, green transportation, sustainable energy and materials, and eco-friendly cuisine through a quantitative online survey. Harun et al. (2018) analyzed the attitudes and perceptions of rural residents in the Kurdistan Regional Government's Sulaimani and Halabja Governorates, Iraq, from March to May 2016, focusing on the development of tourism in these areas. Carvache-Franco et al. (2021) conducted study in Costa Rica's Arenal National Park and Caño Negro National Wildlife Refuge, and found six distinct motivational elements within ecotourism, using a sample size of 246 real-time questionnaires and factor analysis and stepwise multiple regression techniques. The study aims to improve tourism expansion and administration in the 21st century.

Results and Discussion

The sections of the academic works listed below have been examined to respond to the research questions regarding analyzing current trends, making connections about sustainable competitiveness, and forecasting future trends in tourism. The analysis of this publication took into account the document type, publishing output, citation analysis, journal analysis, geographical distribution analysis, and keyword network analysis. The most popular paper is "Sustainable Tourism Development: A Critique" by Liu (2003). It has been cited 609 times and has 14 links (network connections). Table 3 below lists the top 20 publications, the name of the journal they were published in, and the year they were published.

Table 2. *Bibliometric data (Top 20 Publications on Sustainable Tourism (Based on Citation Analysis)*

Author	Article Title	Journal Name	Citations	Publication year
Liu, 2003	Sustainable Tourism Development: A Critique	Journal of Sustainable Tourism	609	2003
Hunter, 1997	Sustainable tourism as an adaptive paradigm	Annals of Tourism Research	573	1997
Byrd, 2007	Stakeholders in sustainable tourism development and their roles: applying stakeholder theory to sustainable tourism development	Tourism Review	373	2007
Bramwell, Lane, 1993	Sustainable Tourism: An Evolving Global Approach	Journal of Sustainable Tourism	330	1993
Briassoulis, 2002	Sustainable tourism and the question of the commons	Annals of Tourism Research	303	2002
Clarke, 1997	A Framework of Approaches to Sustainable Tourism	Journal of Sustainable Tourism	267	1997
Hunter, 1995	On the need to re-conceptualize sustainable tourism development	Journal of Sustainable Tourism	240	1995
Gibson et al., 2012	Small-scale event sport tourism: A case study in sustainable tourism	Sport Management Review	233	2012
Weaver, 2011	Can sustainable tourism survive climate change?	Journal of Sustainable Tourism	208	2011
Hunter, Shaw, 2007	The ecological footprint as a key indicator of sustainable tourism	Tourism Management	208	2007
Cater, 1993	Ecotourism in the third world: problems for sustainable tourism development	Tourism Management	207	1993
Higgins-Desbiolles, 2018	Sustainable tourism: Sustaining tourism or something more?	Tourism Management Perspectives	198	2018
Rivera, 2002	Assessing a voluntary environmental initiative in the developing world: The Costa Rican Certification for Sustainable Tourism	Policy Sciences	198	2002
Twining-Ward, Butler, 2002	Implementing STD on a Small Island: Development and Use of Sustainable Tourism Development Indicators in Samoa	Journal of Sustainable Tourism	196	2002
Høyer, 2000	Sustainable Tourism or Sustainable Mobility? The Norwegian Case	Journal of Sustainable Tourism	184	2000
			171	2005
Hunter, 2002	Sustainable Tourism and the Touristic Ecological Footprint	Environment, Development and Sustainability	167	2002
Bramwell et al., 2017	Twenty-five years of sustainable tourism and the Journal of Sustainable Tourism: looking back and moving forward	Journal of Sustainable Tourism	161	2017
Garrod, Fyall, 1998	Beyond the rhetoric of sustainable tourism?	Tourism Management	160	1998
Simpson, 2001	Strategic Planning and Community Involvement as Contributors to Sustainable Tourism Development	Current Issues in Tourism	149	2001
Budeanu, 2005	Impacts and responsibilities for sustainable tourism: a tour operator's perspective	Journal of Cleaner Production	147	2005

Data Analysis

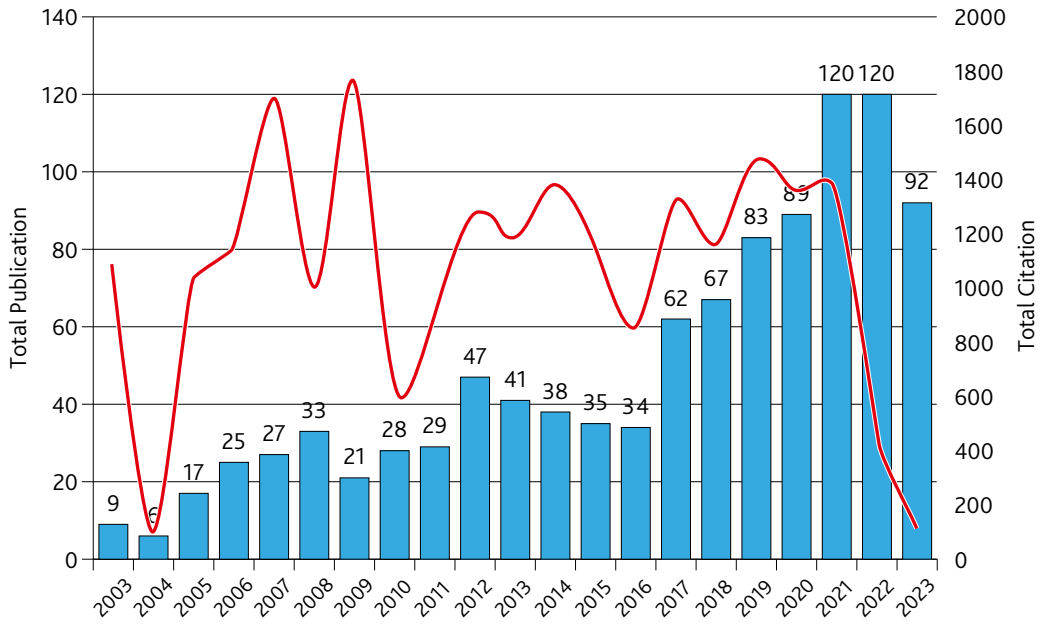

Figure 2. Graphical representation of Publication trend in sustainable tourism

Table 3. *Chronological Trend of publication*

Row Labels	Sum of TP	Sum of TC
2003	9	1069
2004	6	97
2005	17	1017
2006	25	1154
2007	27	1689
2008	33	992
2009	21	1757
2010	28	626
2011	29	923
2012	47	1264
2013	41	1184
2014	38	1375
2015	35	1142
2016	34	847
2017	62	1312
2018	67	1155
2019	83	1463
2020	89	1358
2021	120	1363
2022	120	473
2023	92	110
Grand Total	1023	22370

Analysis Findings

Figure 2 shows the trend of publications on sustainable tourism and consumer behavior. From Table 3, It has been observed that from 2012 to 2013, there was a significant increase, with 2012 being the year with the most publications. The academic community is passionate about the study concept. The highest decrease was in 2016, but since then, there has been a consistent increase in publications, indicating a growing interest in sustainable tourism and consumer behavior.

The citation trend of a particular publication is one of the most critical performance indicators to show the importance of research (Aksnes et al., 2019). Over the decade, the citation distributions in Table 3 remain very stable. This indicates that academics still keep up with current research in pertinent fields. Others contend that although the quantity has declined after 2015, the papers' scholarly value and impact have not changed because they still acquire many citations yearly. Citation analysis is covered in more detail in the following portion of this essay.

Citation Analysis

Table 3 shows the citation patterns of 1023 documents in academic works, identifying the most influential articles and journals from the Scopus database. The study includes metrics for citation, a comprehensive analysis of citations, a compilation of the top 20 frequently cited publications, and a catalogue of the 20 most actively referenced source titles. The 22370 citation metrics obtained over many years are considered the industry standard for evaluating research effectiveness and impacts. The average number of citations per article is another helpful metric to assess the normal influence of a journal or author. With an average of more than 21 citations per publication in 2003-2023 (C/P =21.86), it is evident that performance improved during this time period (Al Husaeni, Nandiyanto, 2022). According to (Nandiyanto, Al Husaeni, 2021), the VOS viewer may provide bibliometric mapping in three visualizations: network, overlay, and density. A colourful circle identifies each publication. A colored circle identifies each publication, with a positive correlation between the circle's size and the publication's citations.

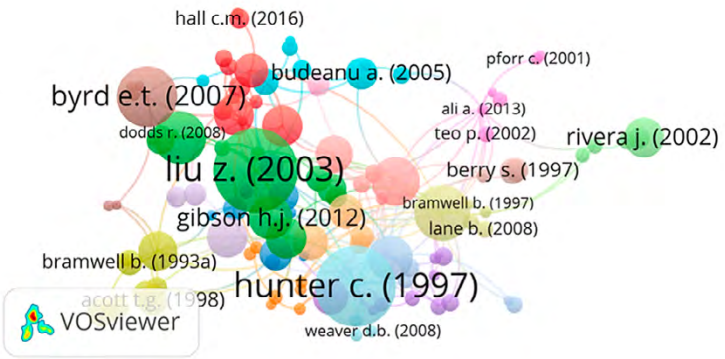

Figure 3. Citation Analysis

Co-citation analysis

This investigation begins with an examination of co-citations. The study's nodes represent the connections between the numerous publications and the various research topics in WT. Hall, c.m., and Gossling, s., which were cited 656 and 417 times, respectively, dominated the ranking, as shown in Figure 4. In terms of link strength, these publications ranked first and second with scores of 19562 and 14847, respectively.

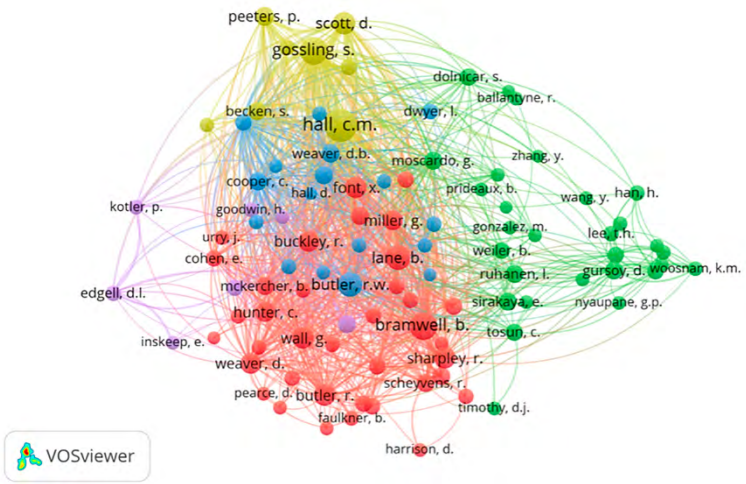

Figure 4. Network of authors who have been cited together

Bibliographic Coupling with Sources

It describes the mapping of bibliographic Coupling on consumer behaviour towards sustainable tourism publications based on source-based network visualization. Five hundred fifty-eight prolific sources produced research articles, but only 48 sources met the minimum threshold of five using the full counting procedure. For each of the 48 sources, the cumulative strength of the bibliographic coupling links with other sources was determined (figure 5). The greatest total link strength (TLS) calculated from this study's sources were 1,402 TLS, with 6 clusters containing 48 items. Cluster 1 (16 items), Cluster 2 (11 items), Cluster 3 (10 items), Cluster 4 (5 items), Cluster 5 (4 items), and Cluster 2 (5 items) were the seven clusters present.

The findings revealed that scientific research in tourism sustainability and competitiveness is frequently published in non-specialist journals. This may be due to the transversal character and multifaceted nature of tourism competitiveness and Sustainability. These topics may be covered in various scholarly disciplines, so the publications are diverse. The maximal number of total link strengths was 3782, with 90 articles and 5359 citations by the source journal "Journal of Sustainable Tourism," which ranked first, followed by "Sustainability" (Switzerland), which ranked second with 1928 and 39 research articles. It demonstrates that the two source journals worked closely together to publish scholarly articles. The journal's interdisciplinary nature, which examines Sustainability and competitiveness from various perspectives, including economics, social contexts, culture, and the environment, has prompted an increase in the number of highly cited articles.

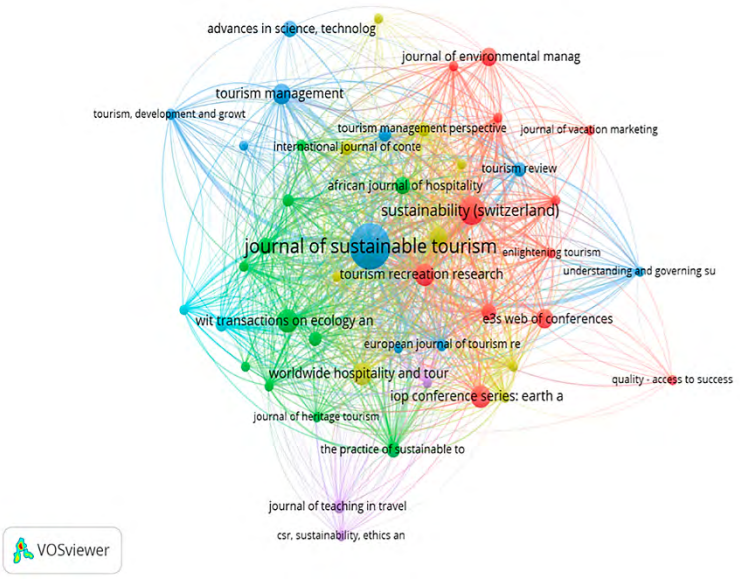

Figure 5. Bibliographic Coupling with Sources

Table 4. *Citations link analysis*

Source	Documents	Citations	Total Link strength
Journal of Sustainable Development	90	5359	3782
Sustainability (Switzerland)	39	476	1928
Worldwide Hospitality and Tourism	26	145	579
Tourism Recreation Research	25	267	994
IOP conference series: Earth and environment	25	28	226
Wit transactions on ecology on ecology and	24	84	742
Tourism management	20	1247	550
Tourism planning and development	18	260	1484
E3s web of conferences	18	22	124
Journal of Environment Management	17	40	158
African Journal of Hospitality and Tourism	16	47	373
Tourism and hospitality research	13	211	630
Springer proceedings in business	13	15	350
The practice of sustainable tourism	12	55	607
Tourism Management perspectives	11	467	914
Proceedings of international conferences	11	4	232
Advances in Science and technology	11	9	46
International Journal of Contemporary	10	318	562
Tourism review	10	480	432
e-review of tourism research	10	20	247

Bibliographic Coupling with Authors

The graph below (figure 7) illustrates the authors' density visualization mapping of bibliographic Coupling on consumer behaviour and sustainable tourism. Two thousand seven hundred twenty-two prolific authors produced research papers, and the minimum number of 5 was selected using the full counting method; however, only 19 authors met the thresholds. There were a total of 10638 link strengths and four clusters with a total of 19 items: cluster 1 (9 items), cluster 2 (5 items), cluster 3 (3 items), and cluster 4 (2 items). Figure 6 displays the total strength of the bibliographic coupling connections between the 19 authors and the other authors. Table 5 and figure 7 demonstrate that 26 articles by (Bramwell, Lane, 1993) are coupled 1258 times, representing the total link strength, followed by 20 research publications by Lane B.(2011) connected 947 times. Therefore, the authors mentioned above collaborated when generating research publications. The inception of the Journal of Sustainable Tourism (JOST) in 1993 reflected the increasing scholarly interest in conducting research and contributing to developing theoretical frameworks and practical implementations within sustainable tourism. The first editorial of the Journal of Sustainable Tourism (JOST), written by Bill Bramwell and Bernard Lane, outlined a comprehensive framework consisting of four core Sustainability principles. These principles emphasized the importance of addressing social well-being, which recognized four key stakeholders: the tourist sector, host communities, government bodies, and visitors.

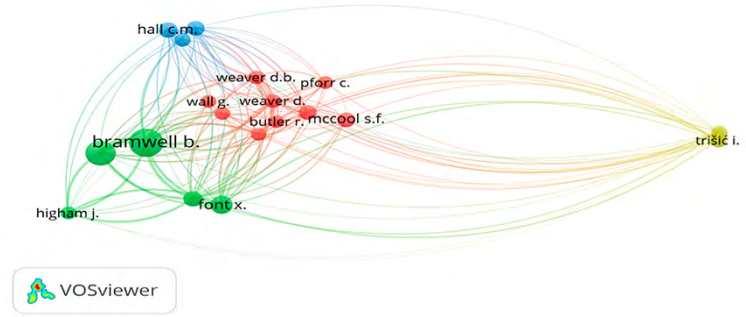

Figure 6. Authors network visualization of bibliographic coupling

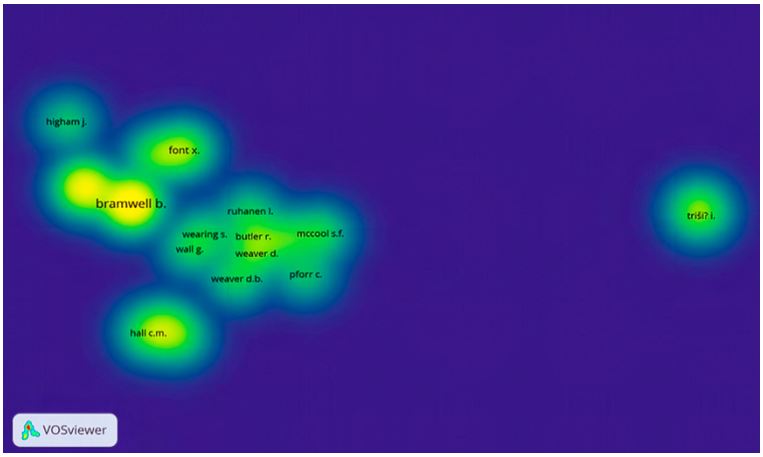

Figure 7. Author's density visualization of bibliographic Coupling

Table 5. *Bibliographic Coupling with Authors*

Author	Documents	Citations	Total Link
Bramwell b.	26	1247	1258
Lane b.	20	1146	947
Font x.	11	312	581
Miller g.	8	505	738
Hall c.m	8	228	527
Gosling s	7	407	613
Saarinen j	7	158	409
Mccool s. f	7	69	103
Trisi i	6	36	956
Steti? S	6	36	956
Weaver d.	6	276	554
Weaver d.b.	6	246	486
Peters p.	6	333	134
Higam j.	5	266	336
Ruhanen I.	5	147	309
Butler r.	5	273	233
Pforr c.	5	59	115
Wearing s.	5	85	97
Wall g.	5	65	44

Bibliographic Coupling with Organizations

The mapping of bibliographic Coupling with institutions about consumer behaviour and sustainable tourism. There were a total of 2167 institutions involved in producing research output; the minimum number of four organizations was selected, and nine institutions met the criterion. In this mapping, there were a total of 139 link strengths and four clusters containing

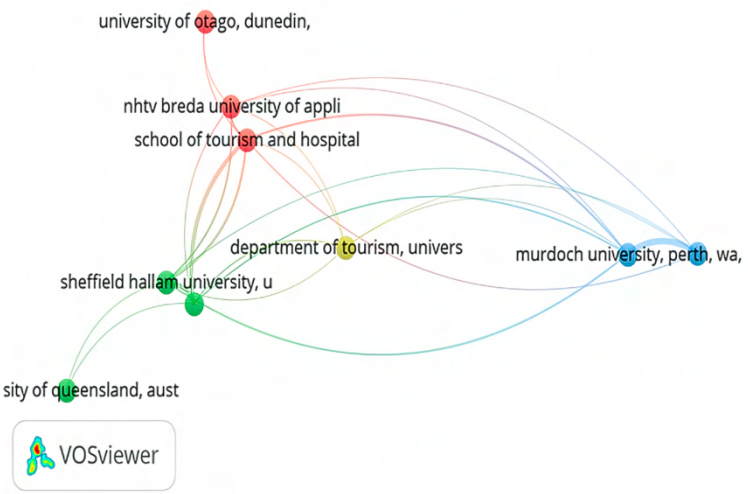

Figure 8. Bibliographic Coupling with Organizations

36 documents, with cluster 1 containing three items, cluster 2 containing three items, cluster 3 containing two items, and cluster 4 containing one item. The total strength of bibliographic coupling connections between the nine institutions has been determined. The preponderance of the four articles from the "Department of Tourism, University of Otago, Dunedin, New Zealand" coupled eight times and demonstrated total link strength, followed by the four research articles from "Sheffield Hallam University, United Kingdom," which coupled forty-two times (Figure 8). In terms of scholarly publications, both institutions had a positive relationship.

Bibliographic Coupling with Countries

Table 6 and Figure 9 illustrate the mapping of bibliographic Coupling with nations of consumer behaviour and sustainable tourism. A total of 124 countries participated in the publication of publications, and the minimal number of five documents was chosen; 61 countries met the minimum requirement. Cluster 1 contained 17 items, cluster 2 comprised 14 items, cluster 3 had 12 items, cluster 4 composed nine items, cluster 5 contained seven items, and cluster 6 contained two items. The total strength of bibliographic coupling connections between each of the 61 countries has been determined. More than 3120 (Japan) total link strengths are contrasted to 23081 (United Kingdom) total link strengths in the table below. It appears 23081 times alongside 156 documents containing 6335 citations in the United Kingdom, followed by 21405 instances alongside 150 documents containing 2905 citations in the United States. In addition, it is measured by the nations with the strongest total link strength, which has been calculated to be 24287. It has been determined that both countries have cited more papers to strengthen their relationship regarding consumer behaviour and sustainable tourism.

Table 6. *Bibliographic Coupling with Countries*

Country	Documents	Citations	Total link strength
United Kingdom	156	6335	23081
USA	150	2905	21405
Australia	103	2476	16507
Italy	71	355	8297
China	63	276	5604
Indonesia	59	108	3492
Spain	54	547	7012
India	53	112	6046
Malaysia	46	510	7207
Canada	45	805	8280
South Africa	36	356	7856
Russian Federation	32	145	4056
New Zealand	31	966	6080
Portugal	29	185	3923
Thailand	29	130	5023
Turkey	29	133	4292
Germany	29	478	2913
Netherlands	28	817	4341
Greece	26	490	4063
Japan	25	249	3120

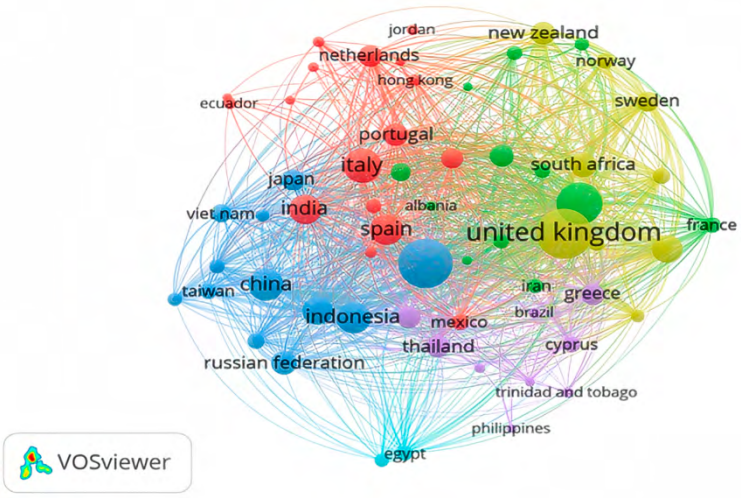

Figure 9. Bibliographic Coupling with Countries

Co- words analysis

As seen in Figure 9, the most common keyword is sustainable tourism, which is utilized in most articles. Sustainable tourism is a popular research theme, with ecotourism and sustainable development appearing in over 200 papers. However, scholars often focus on sustainable competitiveness rather than sustainable competitiveness, especially in the context of tourism. A network visualization map was created using clusters from the VOS viewer application to provide insights into current research trends and future research paths. The map includes travel destinations, ecotourism, sustainability, tourism economics, tourism management, ecology, tourism industry, environmental impact, conservation, environmental protection, protected areas, and cultural legacies.

There are 3366 keywords, and 24 of them show up at least 15 times (Nandiyanto, Al Husaeni, 2021) say there must be at least two links between terms for the VOS viewer to work. VOS viewer can show bibliometric maps in three ways: network visualization, overlay visualization, and density visualization (Figures 10 and 11) (Nandiyanto, Al Husaeni, 2021). A coloured cir-

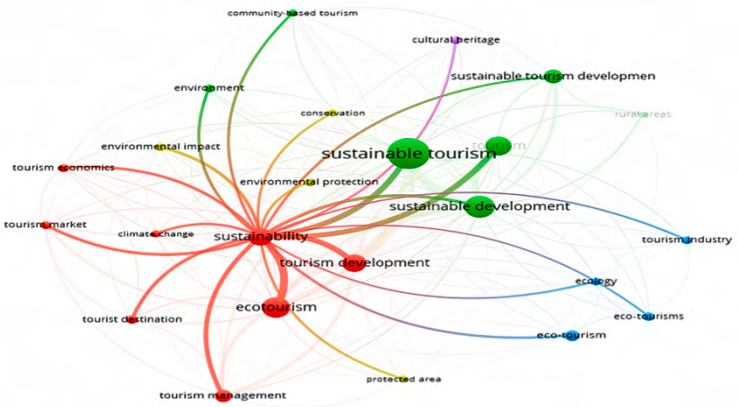

Figure 10. Co-wards Analysis

cle is next to each phrase. There is a strong link between the size of the circle and the number of times keywords appear in the title and description. So, the number of times the circle shows up determines how big it is. The circle will get bigger the more times the term is used. Figure 10 shows how the terms are linked. A network or line that connects one word to the next in network visualization displays the connections between terms (Al Husaeni, Nandiyanto, 2022). Figure 10 shows the clusters for each of the topics that were studied. The keyword for this study, "sustainable tourism," is in cluster 2, marked in green with seven items. "Sustainable tourism" is the term for the study, which has 23 links. The total link value for this keyword is also 456.

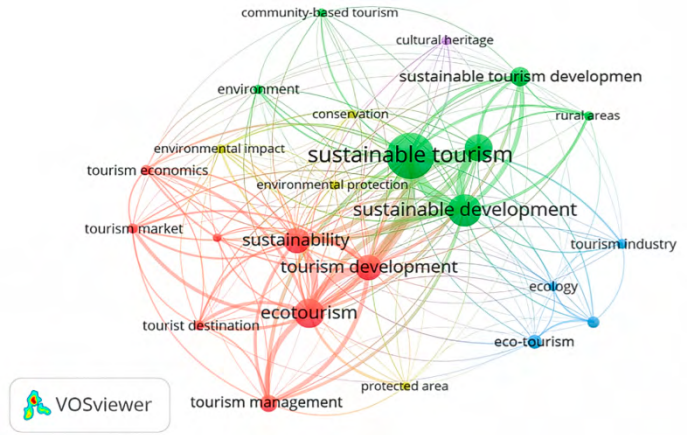

Figure 11. Network Visualization

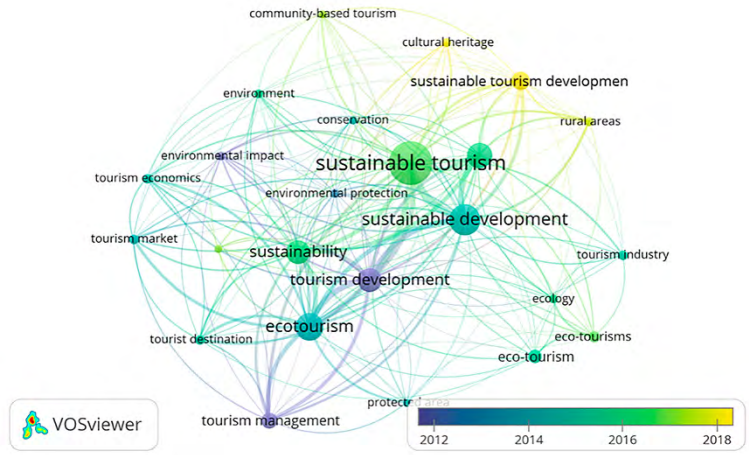

Figure 12. Overlay Visualization

The form of the Density Visualization is shown in Figure 12. Using the colour, we can tell if the keyword is used or studied in Density visualization. The less often a term is studied, the lighter it is.

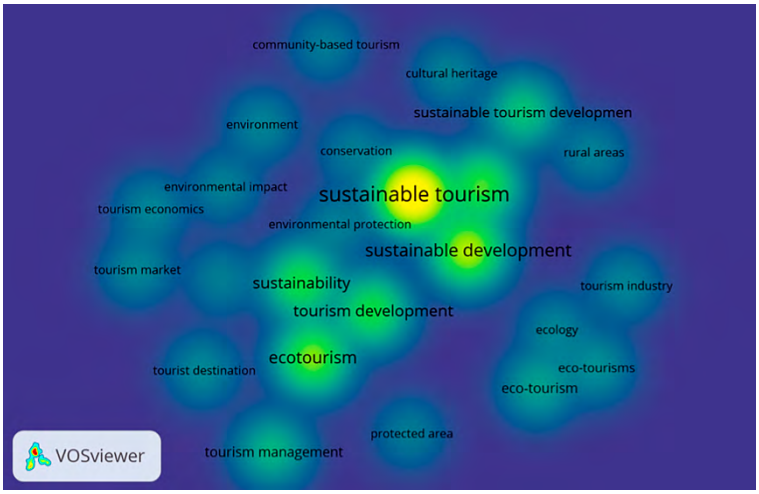

Figure 13. Density Visualization

Co-authorship analysis

The VOS viewer software has calculated the full co-authorship network based on the data. A circle on a map symbolizes each nation, and the size of the circle corresponds to the number of nephrology-related research publications the nation has produced. The circle separation denotes the degree of co-authorship between the two countries. The co-authorship link between two countries is more vital the closer two circles are together.

The data from the participating countries in this study are shown in Table 6 and Figure 13 using complete enumeration records. With a maximum of 25 per document, 124 different countries were represented. At least five countries had to be chosen, and 58 countries did so. In this mapping, there were eight clusters with a total of 61 items: Cluster 1 had nine, Clusters 2, 3, and 4 had eight, Cluster 5 had seven, and Clusters 6, 7, and 8 had six. In contrast to the United States, which had just 150 papers and 77 total connection strengths, the United Kingdom had 156 papers and 92 total link strengths. The findings showed that the UK has the most articles written in collaboration with other academics and scientists. This suggests that they worked together on this investigation.

Co-authorship network with countries

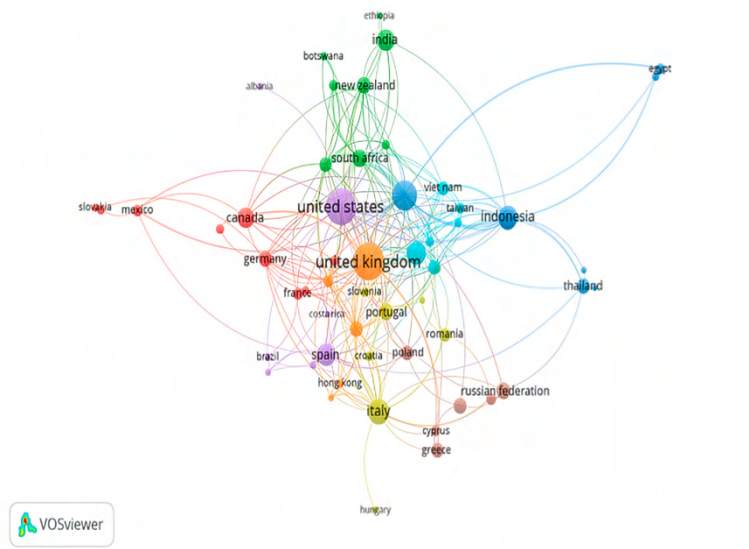

Figure 14. Co-authorship network with countries

Conclusion

This study employed bibliometric analysis to map the current state of the art in sustainable competitiveness, particularly in the tourism sector, through identification, grouping, gap analysis, and research trend evaluation. The findings reveal how sustainability and competitiveness intersect, demonstrating that these concepts work most effectively in tandem, especially within tourism. This relationship represents one of the most cutting-edge topics in the industry, offering opportunities to advance the boundaries of sustainable competitiveness. However, the limited integration of sustainability, competitiveness, and tourism in decision-making and policy development highlights a critical gap in the literature, calling for more interdisciplinary research to address this challenge.

The results underline the robust academic interest in sustainable tourism, with consistent publication and citation patterns over two decades. Notable trends, such as the increase in publications from 2012 onwards and the stabilization of citation metrics, affirm the enduring relevance of foundational works. Influential articles, such as Liu's "Sustainable Tourism Development: A Critique" (2003), and key journals like the *Journal of Sustainable Tourism* highlight the pivotal role of interdisciplinary approaches. Furthermore, keyword analysis underscore's dominant themes, including "sustainable tourism," "ecotourism," and "sustainable development," reflecting the sector's focus on environmental, cultural, and economic dimensions.

Strong international collaborations, particularly from the United Kingdom and the United States, emphasize the global nature of this research domain. However, the clustering of keywords indicates that sustainable competitiveness remains an underexplored niche, presenting opportunities for researchers to delve deeper into how sustainability and competitiveness can coexist and inform policymaking. Integrating computational tools for data mining and anal-

ysis could further enhance the capacity for bibliometric studies to identify emerging patterns and connections.

This analysis not only sheds light on the progress of sustainable tourism research but also serves as a comprehensive roadmap for future investigations. By addressing the scientific gaps identified and exploring novel intersections between sustainability, competitiveness, and tourism, researchers can push the limits of sustainable development. Advancing this discourse will contribute to innovative policies and practices that balance tourism growth with environmental preservation, cultural enrichment, and economic resilience.

Limitations of the study

Despite the paper's benefits, one of them is that it relies on a selected database for information retrieval rather than various sources. However, we think Scopus has a sizable collection of materials that could summarise the total well. Utilizing different databases always provides a better solution to the problem. However, while employing the search approach, restricting the search by using simply the title. The database yielded promising results, many of which had nothing to do with the tourism sector. This is the strongest argument against Scopus' Title-abstract-Keywords option, excluding them. As has been stated repeatedly throughout this evaluation, this topic crosses several disciplines, and we did not want to detract from the focus of the study by taking into account works that were not directly related to the field. The third limitation concerns the type of articles that are reviewed. We eliminated books, PhD theses, conference proceedings, and unpublished working papers from the body of literature on sustainable tourism. Additionally, we ignored studies conducted in other languages because we only considered English-language sources.

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