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Exploring research trends in sustainable mountain and rural tourism (SMRT): A bibliometric study with biblioshiny and VOSviewer

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Abstract

Purpose – This study aims to analyse the development and trends of sustainable mountain and rural tourism research from 1990 to 2025, with a focus on identifying key themes, influential contributors, and emerging directions in the literature.

Methodology/Design/Approach – The study employs a bibliometric analysis of Scopus-indexed publications, utilizing tools such as VOSviewer and Biblioshiny to map research clusters, authorship patterns, and geographic distributions.

Findings – The results indicate that countries such as China, Spain, United Kingdom, and Italy are leading contributors to the field. Key research themes include socioeconomic empowerment, gender dynamics, rural demographic change, and sustainable tourism development. The findings also highlight a growing emphasis on balancing economic growth with environmental conservation, driven by increasing demand for nature-based tourism linked to health awareness and urban stress.

Originality/Value – This study provides a comprehensive synthesis of sustainable mountain and rural tourism research, offering insights into evolving academic trends and future research directions. It underscores the importance of integrating community participation, policy innovation, and environmental stewardship to support resilient economies, ecosystem sustainability, and cultural heritage preservation.

Keywords: Sustainable Mountain Tourism, Rural Tourism, Bibliometric Analysis, Vosviewer, Biblioshiny

Introduction

Sustainable mountain and rural tourism, a vital component of the global tourism industry, is renowned for its ability to promote economic development while preserving the fragile natural and cultural landscapes that characterise these regions (Dobre et al., 2024; Nag et al., 2024). Due to their visual splendour, plenty of recreational options, and rich cultural legacy, mountains are the second most popular destination type in the world (Dhungana, 2024). Similar to mountain tourism, rural tourism is often found in outlying villages that are addressing social, economic, and environmental issues and focuses on authentic interaction with rural lifestyles, regional customs, and natural settings (Dax & Tamme, 2023; Lun et al., 2016). However, mountain and rural areas often face unique challenges, such as environmental susceptibility, seasonality in tourism demand, a lack of infrastructure, and susceptibility to climate change impacts like shifting snow cover and extreme weather (Nag et al., 2024). These vulnerabilities necessitate integrated strategies that prioritise low-impact tourism products such as ecotourism, agritourism, wellness tourism, and cultural heritage activities. These tactics can boost year-round tourism while ensuring that the benefits are shared equitably with the local populace (Lane, 1994; Sanagustín Fons et al., 2011). But alpine and rural areas often face unique challenges like environmental susceptibility, seasonality in tourism demand, poor infrastructure, and

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susceptibility to climate change impacts like altered snow cover and extreme weather (Mitra & Paul, 2025).

These vulnerabilities necessitate the implementation of comprehensive strategies that prioritise low-impact tourism offerings, such as wellness tourism, ecotourism, agritourism, and cultural heritage activities (Kumar et al., 2025). These tactics can boost year-round tourism and ensure that benefits are distributed fairly among locals (Mohamed, 2023). Community-based tourism models are crucial to sustainable development because they empower locals, particularly in rural and mountainous areas where socioeconomic inequality may be high. Engaging in tourism management fosters social inclusion and capacity-building, which enhances conservation results and rural livelihoods (Okazaki, 2008; Sharma et al., 2025). Furthermore, local and national legislative frameworks, as well as stakeholder engagement, are essential to striking a balance between tourism development, environmental stewardship, and cultural preservation (Almasov & Orujov, 2025). Sustainable mountain and rural tourism represent a challenging but promising path to inclusive, resilient, and ecologically conscious growth. Future studies and policy initiatives must continue to refine models that integrate economic, social, and ecological factors to help destinations manage the benefits and challenges of tourism in a just and sustainable manner (Bisht et al., 2025).

The purpose of this study was to use bibliometric analysis to examine the publications on Sustainable Mountain and Rural Tourism (SMRT) in the Scopus database. This approach allows us to identify the trends in SMRT research and provide recommendations for future studies. Our research aims to address the following topics: (1) How does Bradford's Law help identify the most important journal sources in Sustainable Mountain and Rural Tourism (SMRT)? What is the general growth trend in scholarly publications on SMRT from 1990 to 2025?; (2) How does Lotka's Law explain the distribution of authorship and contributions in this field? Who are the most prolific and significant authors in SMRT research?; (3) Which universities and countries produce the most SMRT research? What trends emerge in contributions globally and across different regions?; (4) How does international collaboration show up in SMRT research? Which countries and groups have the strongest global research partnerships and co-authorship networks?; (5) How can citation and co-citation studies reveal the intellectual framework and key works in SMRT?; (6) Which publications and authors are cited the most in this area?; (7) Which keywords are most common and relevant in the SMRT literature? What new research trends and theme clusters emerge from keyword co-occurrence analysis?; and (8) How does Zipf's Law explain their distribution?

Literature Review

The potential of sustainable mountain and rural tourism (SMRT) to promote socioeconomic growth while protecting environmental resources has made it an important area of study (Tang & Xu, 2023). According to recent studies, there has been a clear shift toward more eco-friendly tourism practices. This includes developing combined policies and encouraging community involvement (Cronjé & du Plessis, 2020). Important research findings highlight the need to support social justice, economic health, and environmental sustainability. This is crucial to reduce the potential negative impacts of tourism (Uhai et al., 2024). Promoting sustainable practices requires creating and implementing effective tourist policies. This depends on strong cooperation among all parties involved, including local communities and government organisations (Dhungana, 2024). Since mountains make up 15% to 20% of all tourism worldwide, a focused study is needed to address the potential and challenges they bring (Ng, 2022). Tourism has been shown to strengthen local economies and enhance the quality of life in rural areas. However, its success depends on how well it aligns with local values and environmental sustainability (Wijijayanti et al., 2023). Stakeholder participation is essential. Studies show that when communities get involved, cooperation improves, and local needs are met (Suherlan & Cheer, 2024). The growing connection between outdoor recreation, sustainable tourism, and rural tourism is recognised for its helpful benefits (Ferreira et al., 2023; Bozok et al., 2017). Even with these encouraging developments, there are still issues to be resolved, such as finding a balance between conservation and development and making sure everyone involved has a fair say (Higham & Miller, 2018). According to the literature, more research is needed to address these issues and improve ways to implement sustainable tourism in rural and mountainous areas.

Materials and Methods

The Scopus database was chosen to collect academic articles. It is now thought to be one of the most prestigious, complete, and dependable databases in the scientific world. It has a low duplicate document ratio and a wide range of time for searching. The Scopus database indexes peer-reviewed journals across all disciplines and categorises them by subject area and Cite Score-based quartiles (Q1–Q4), serving as a comprehensive alternative to Web of Science indices like ESCI, SSCI, and SCI-E. Afterwards, the following equation was introduced: "TS = ("Mountain tourism" OR "Rural tourism") AND "Sustainab*" to collect all the papers published until July 07, 2025, obtaining a total of 1190 documents. Then, the PRISMA statement (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) was applied to filter these studies (Page et al., 2021), as shown in Figure 1.

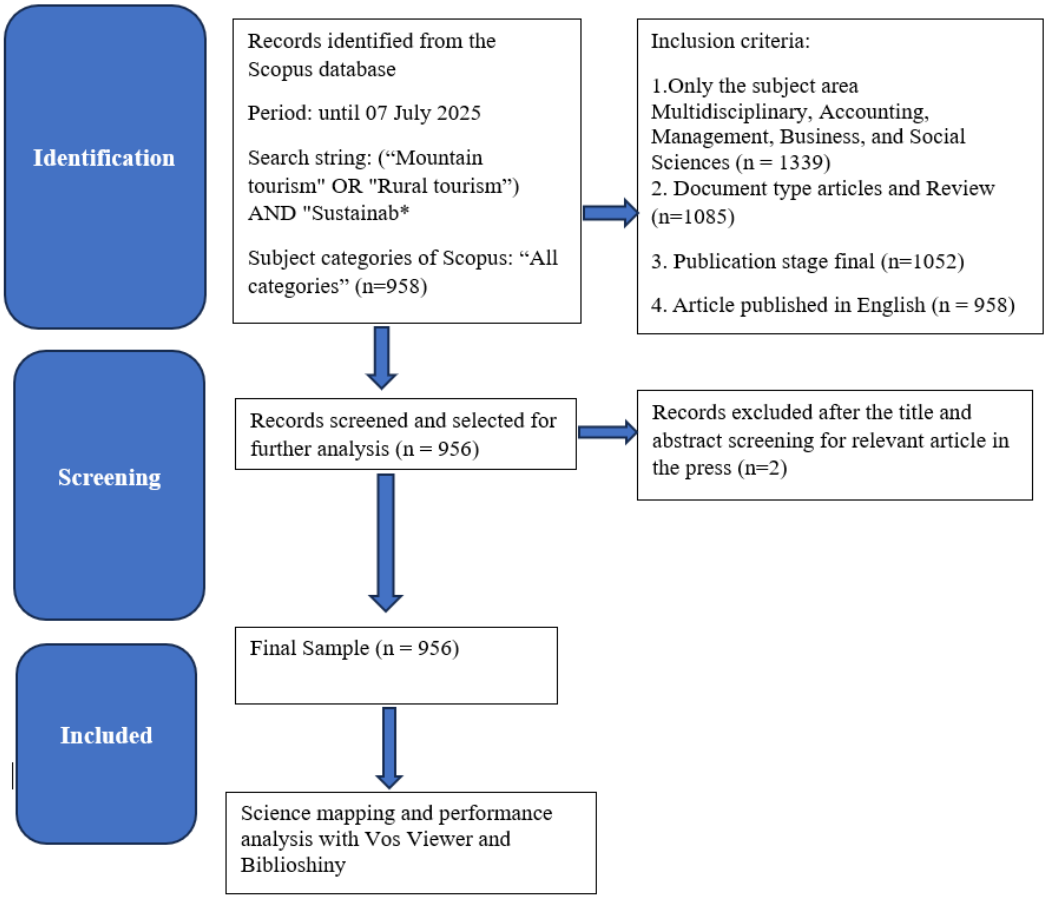

Figure 1. Screening by using the PRISMA methodology. Source: Author's fieldwork, 2025

This strict method has now gained fame to enhance the validity of literature review evaluations. We obtained 956 articles by discarding any redundancies and screened for peer-reviewed "articles" and "review articles" to guarantee certified knowledge. The system's systematic, tested data acquisition maximizes the validity of the study (Pahlevan-Sharif et al., 2019). The bibliometric analysis in this research is utilised to estimate significant scholarly contributions to sustainability research in the wine industry. Research trends, influential publications, and new concepts in the area are systematically charted through the use of this method (Passas, 2024). By analysing crucial papers, journals, authors, institutions, and countries, bibliometric analysis effectively measures an academic subject and visualises collaboration networks. This process allows one to deeply analyse published work, both at the macro and micro levels, uncovering neutral, underlying patterns within any scholarly discipline (Pahlevan-Sharif et al., 2019). Aria and Cuccurullo, scientists and developers at K-Synth, a Naples-based scientific intelligence firm, created Bibliometrix®. The R-based software's easy-to-use "Biblioshiny" interface enables systematic reviews of the literature and scientific mapping analysis. The software provides full bibliometric capabilities to evaluate patterns and trends in research (Aria & Cuccurullo, 2017). As per the report, scientific progress in this field is cumulative, with newer research complementing previous results. The research looks at important bibliometric variables like

publication numbers, citation frequency, and sustainability developments in the Mountain and Rural Tourism, in an attempt to gauge its influence. These outcomes are quantitatively measurable and visually presentable due to Bibliometrix® (Tsilika, 2023).

Performance Analyses

With 956 publications from 273 sources, this bibliometric study covers a significant amount of work from 35 years (1990–2025) and boasts a healthy 14.34% per annum growth (Fig. 2). With a total of 52,179 references and an average of 26.89 citations per document, the 6.04-year-old study corpus, on average, has a significant intellectual impact. A 2,518-author collective research community, 87% of whom contribute to multi-authored work (an average of 3.3 co-authors per document), support the field's 2,629 author keywords and 1,396 Keywords Plus terms rich keyword diversity. There is significant global research participation in international collaborations, 24.16% contribution to all collaborations. With a higher proportion of research papers (921) than review papers (35), the document collection shows an active field with ongoing empirical research and frequent synthesis attempts.

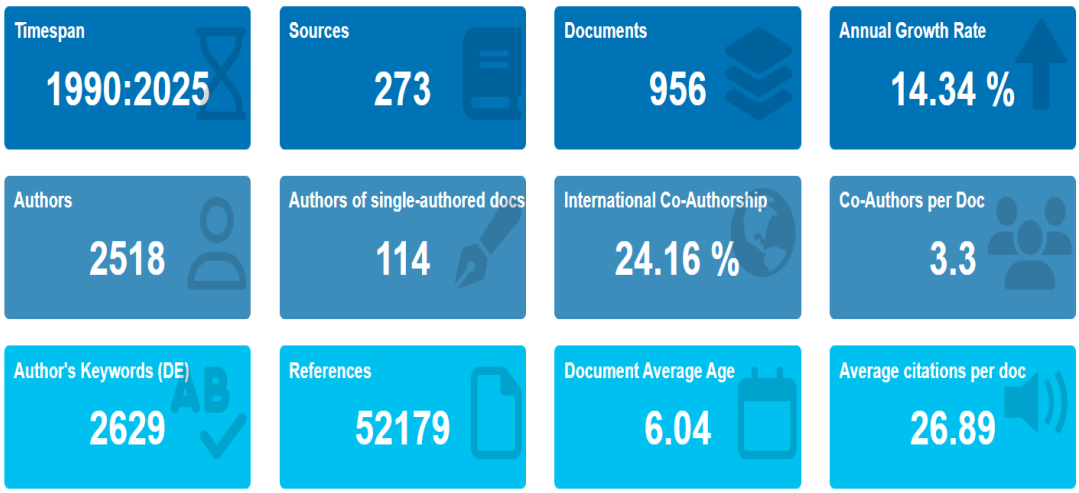

Figure 2. An overview of the key data extracted from RStudio (Biblioshiny). Source: Author's fieldwork, 2025

A rich and well-developed research area with a strong development path and global cooperation is disclosed by this bibliometric overview. Strong scholarly significance is signalled by the high citation rate and large reference base, and an ever-evolving subject with constant new findings is implied by the dominance of research papers over reviews.

Number of documents published

This chart shows the dramatic growth in sustainable mountain and rural tourism (SMRT) research from 1990-2025. Publications remained minimal (under 10 annually) through the early 2000s, then began steady growth starting around 2010. The field experienced exponential expansion from 2015 onward, with publications jumping from 35 in 2016 to 130 in 2024, the peak year. The 12,900% growth rate reflects the transformation from a niche research area to a major academic field. Research output appears to level off slightly in 2025 at 109 publications. The total of 956 publications demonstrates how this field has evolved from occasional studies to a robust research domain, likely driven by increasing awareness of sustainable tourism practices and environmental concerns in mountain regions.

Most Relevant Journal Sources

The top ten journals publishing research on rural tourism and sustainable mountain tourism are represented in this data. With 207 publications, sustainability (Switzerland) is the field leader and publishes over 20% of all research output. With 64 publications, the Journal of Sustainable Tourism is in second position, followed by Worldwide Hospitality and Tourism Themes with 27. Most of the leading publishers are tourism-oriented journals, such as Tourism Geographies (17), Tourism Management (16), and Current Issues in Tourism (13).

Land Use Policy (13), Journal of Environmental Management and Tourism (16), and other policy and environmental journals are also well represented. The dominance of sustainability as the main outlet for this study theme is reflected in the distribution, which has a high cluster in the leading journal with a sharp drop-off to other journals.

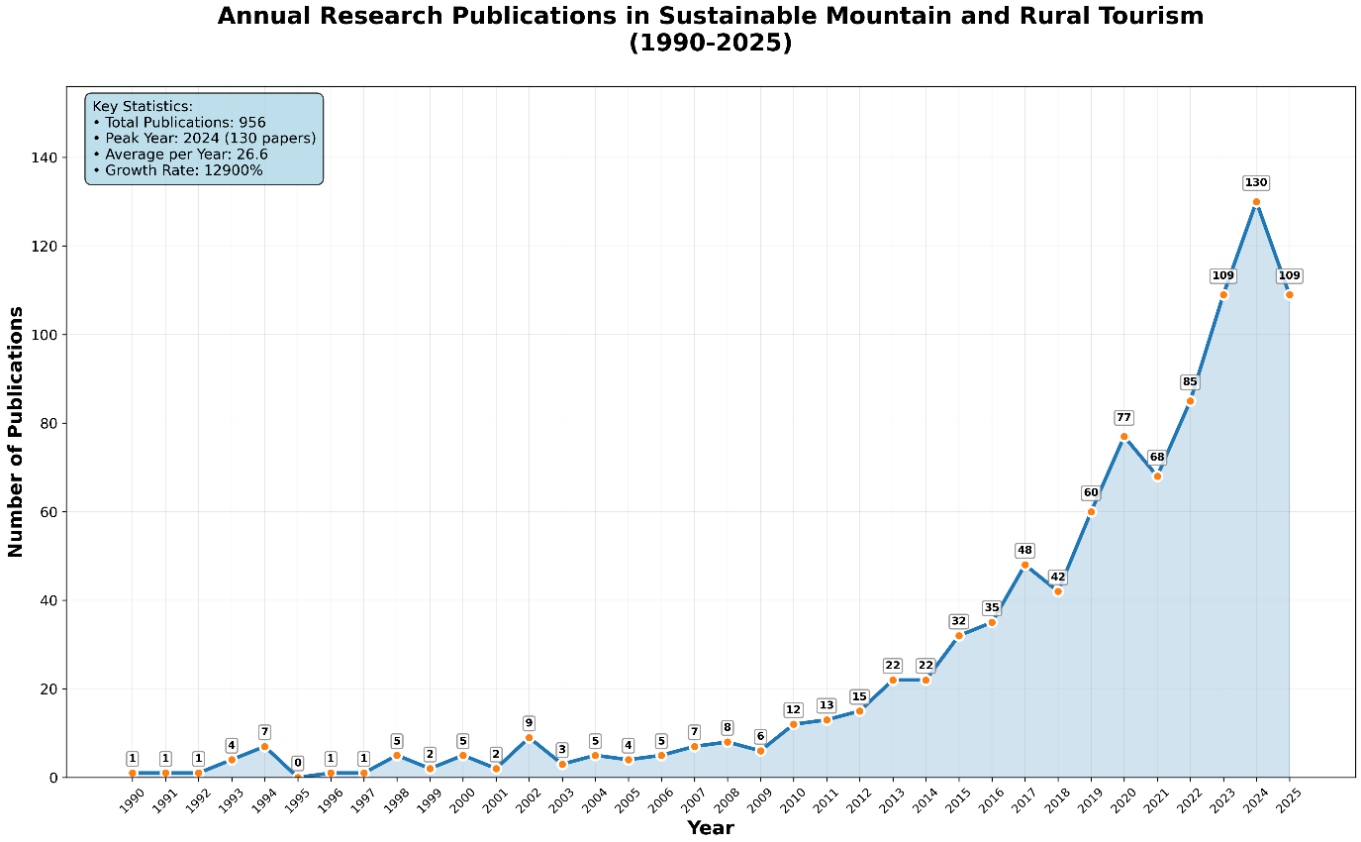

Figure 3. Development Path of Scholarly Works in Sustainable Mountain and Rural Tourism Studies, 1990-2025. Source: Author's fieldwork, 2025

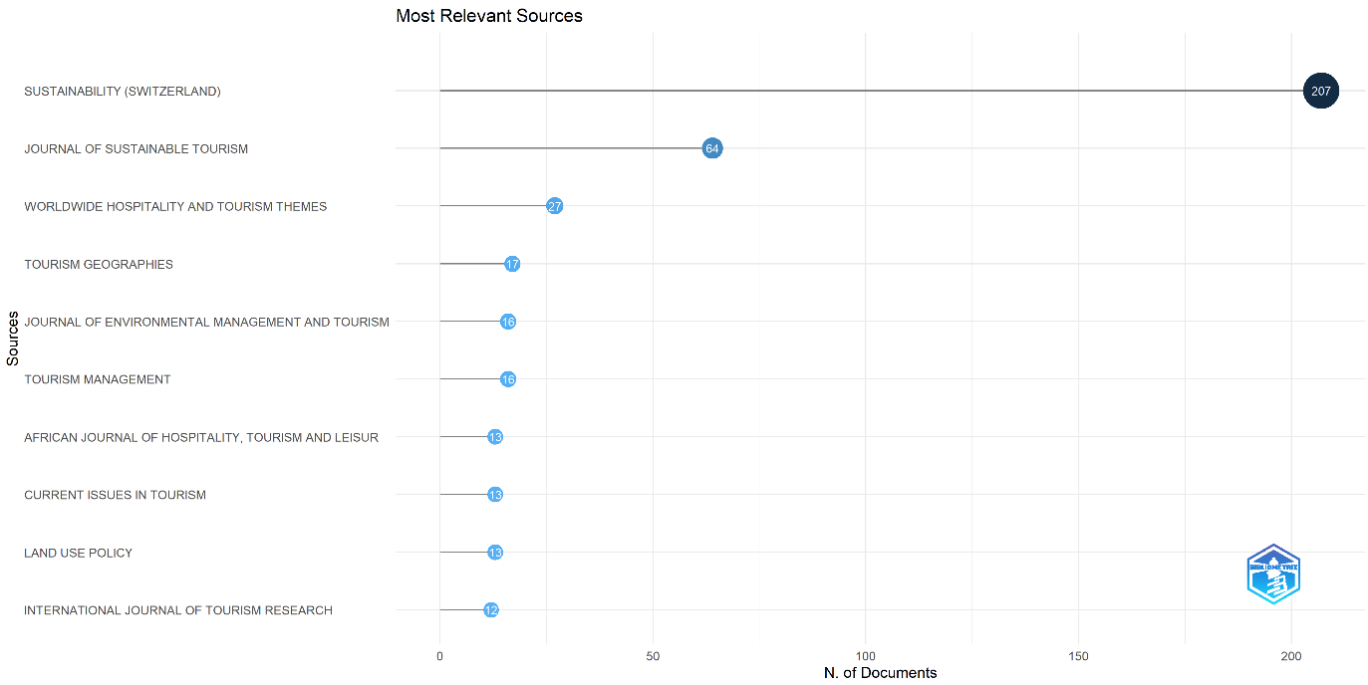

Figure 4. Leading Journals in Sustainable Mountain and Rural Tourism Research Publications. Source: Author's fieldwork, 2025

Sustainable Mountain and Rural Tourism Research: An Examination of the Distribution of Fundamental Sources Using Bradford's Law

Bradford's Law (Fig. 5) illustrates that scientific paper distribution is in a regular pattern where journals fall into zones with an identical number of papers, each next zone geometrically requiring more journals. As Bradford proposed in the 1930s, not everything published in a scientific area is published at the same level, and so it is not necessary to read everything (Kalipçi, 2024). This graph clearly shows Bradford's principle applied to literature on sustainable mountain and rural tourism. Sustainability (Switzerland) is the central source with more than 200 papers, a high-productivity zone that scientists would search first. The exponential decay curve shows the typical Bradford distribution, where a few central journals hold most relevant papers and many peripheral journals add little. According to Bradford's guidelines on journal selection by the quality of information, scientists can target Sustainability and the few other central sources in the shaded area for full coverage of this specialist area.

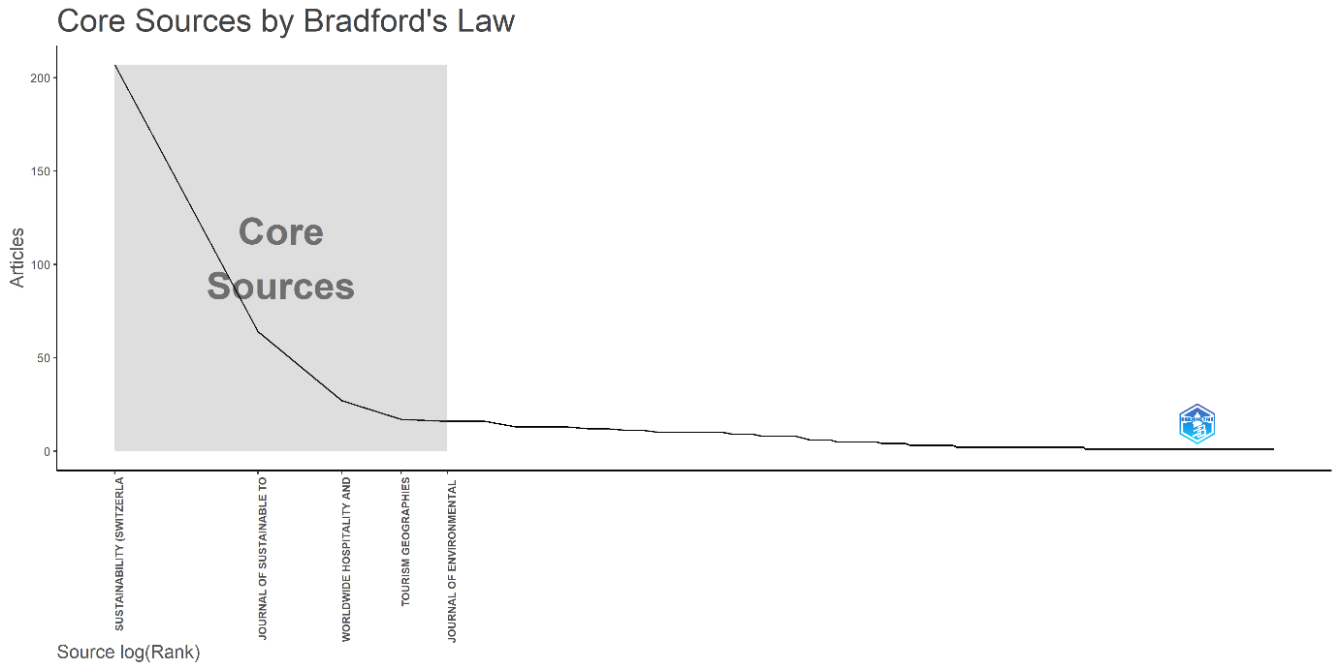

Figure 5. Showing the segregation of the core, intermediate, and peripheral journal zones on the basis of publishing productivity in Sustainable Mountain and Rural Tourism research, clearly demonstrates how Bradford's Law is applied. Source: Source: Author's fieldwork, 2025

Most relevant authors in Sustainable Mountain and Rural Tourism by number of articles published and fractionalized

This chart lists the most productive authors of sustainable mountain and rural tourism research by frequency of publication (Fig. 6). Wang Y stands alone with 15 publications, followed by Kastenholz E with 14 and Li Y with 13. Distribution is apparent, with a top tier of highly productive authors, with several Chinese experts (Wang Y, Li Y, Zhang Y, Wang H, Zhang J) in leadership positions alongside European researchers such as Kastenholz E. The remaining authors (Zhang Y, Castanho RA, Couto G, Wang H, Zhang J, Pimentel P, and Sousa A) each had 7-10 publications, which is a relatively high concentration of authors within this niche research area.

Lodka's Law Distribution in Research Authorship for Sustainable Mountain and Rural Tourism:

A key bibliometrics principle, Lotka's Law, examines the scholarly work of authors in an area (Fig. 7). It claims that a few numbers of extremely productive authors are in charge of a significant portion of the total publications, whilst the majority of authors only contribute one publication (Kalipçi, 2024).

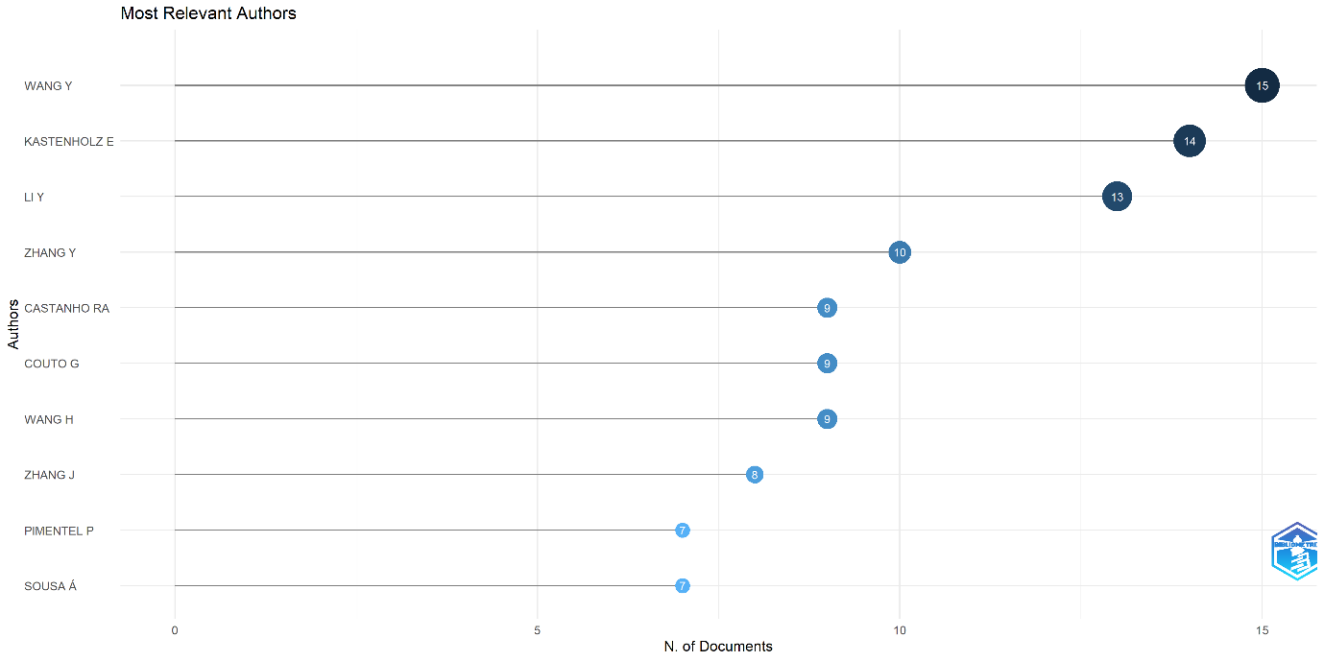

Figure 6. Leading Writers in Research on Sustainable Mountain and Rural Tourism. Source: Author's fieldwork, 2025

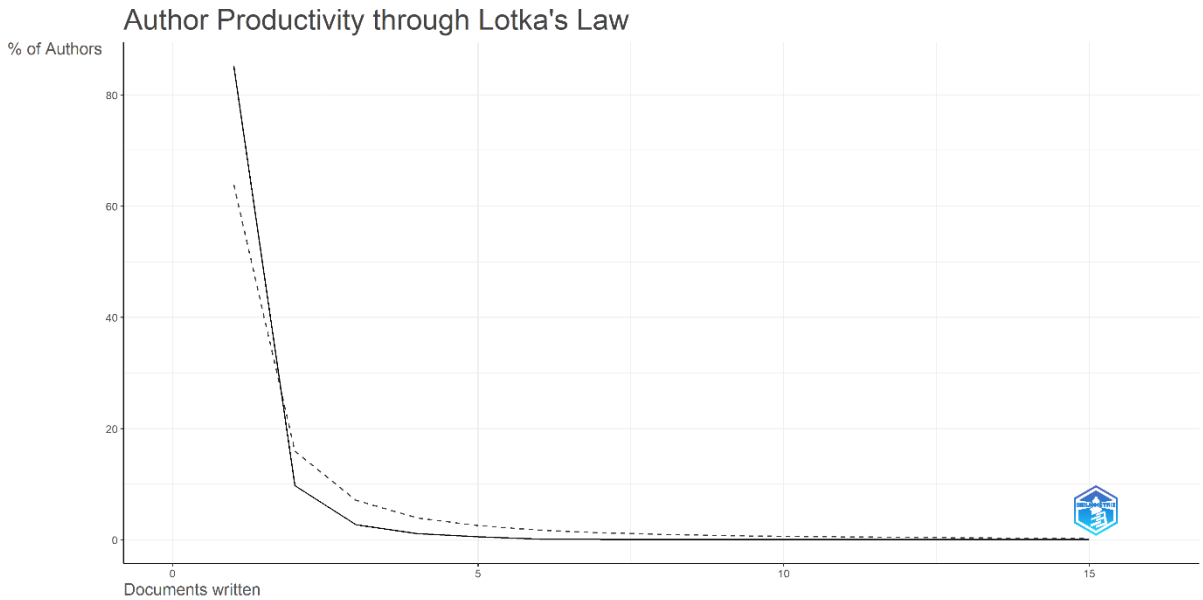

Figure 7. Frequency distribution of scientific productivity of authors**.** Source: Author's fieldwork, 2025

Table 1. Lodka's Law

Written documents	Total number of authors	Proportion of Authors
1	2147	0.853
2	246	0.098
3	69	0.027
4	28	0.011
5	14	0.006
6	4	0.002
7	2	0.001
8	1	0.000
9	3	0.001
10	1	0.000

Source: Author's fieldwork, 2025

This study verifies Lodka's Law in studies of sustainable mountain and rural tourism, where the overall trend is that the majority of authors are low-productive, with few high-productive authors (Table 1). Of the overall number of authors, 771 authors (70.85%) had only a single publication, reflecting the overall clustering of sporadic authors in scholarly studies. The trend follows as expected, with the reverse ratio of 69 authors (6.09%) with 2 publications, 12 authors (0.027%) with 3 publications, and a few authors with successively higher productivity levels. Only 4 authors reached the highest productivity level with 15 publications each, fewer than 0.001% of all contributors, but contributing disproportionately to the overall output. The trend precisely captures Lodka's principle that scholarly production is controlled by a small elite of high-productive researchers, and the remainder are sporadic contributors to the field.

Top-Performing Universities for Research on Sustainable Mountain and Rural Tourism

This data ranks the top 10 most productive academic institutions publishing in sustainable mountain and rural tourism studies (Fig. 8). The highest is Nankai University, China, with 25 publications, followed by the University of Novi Sad, Serbia (22) and the University of Azores, Portugal (21). Chinese universities are also well represented, with four universities in the top rankings: Nankai University, Guangxi University (18), Sun Yat-Sen University (16), Zhejiang University (16) and Henan Polytechnic University (15). European universities are also well represented, with Serbia, Portugal, Spain, Romania, and Hungary having universities in the top rankings. The distribution is extremely evenly spread among top institutions, with publication numbers ranging from 15-25, indicating an evenly spread global effort and not one institution dominating the activity.

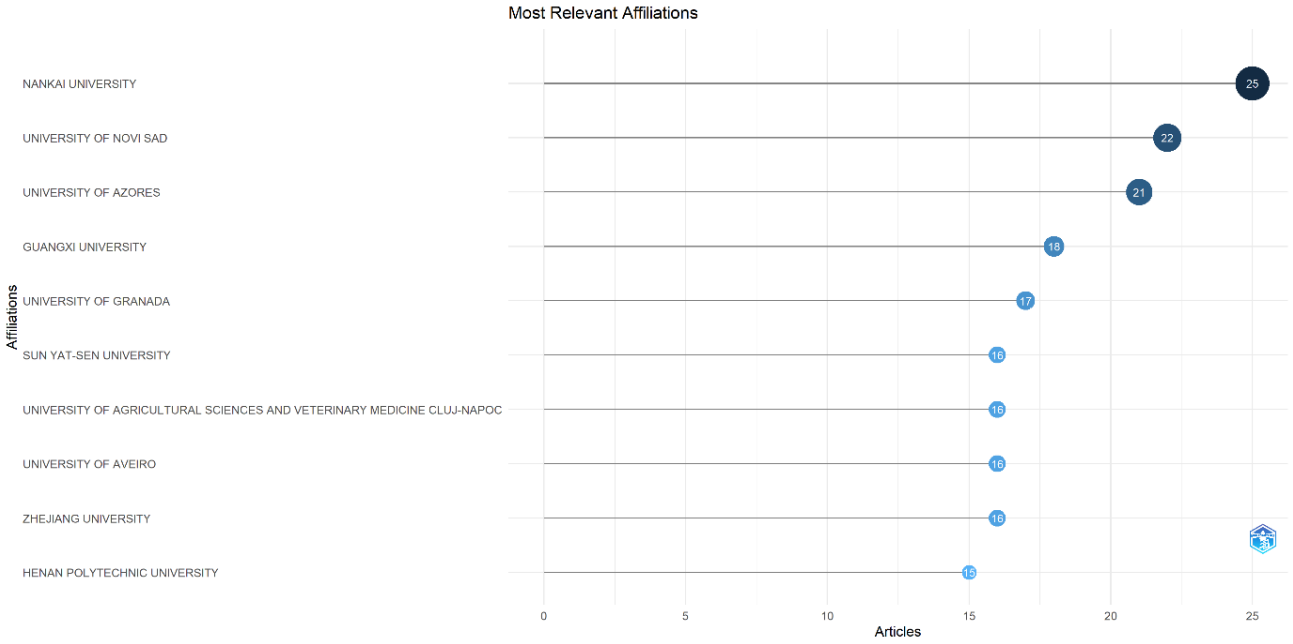

Figure 8. Top 10 Most Productive Institutions in Sustainable Mountain and Rural Tourism Research. Source: Author's fieldwork, 2025

Document by Country

China leads sustainable mountain and countryside tourism studies with 166 papers, the highest number of papers from any nation. European nations are also well represented with Spain (53), Italy (50), Romania (34), the UK (33), Portugal (23), Serbia (23), Poland (17), Austria (15), Sweden (10), and Turkey (10). Asian nations also contribute significantly with Malaysia (38), Indonesia (26), Korea (14), Thailand (13), Japan (11), and India (17). Other contributors include South Africa (20), Australia (18), and the USA (30). The distribution indicates China's dominance in research but also extensive international contributions from across Europe, Asia, and other parts of the world, an indicator of global intellectual interest in sustainable mountain and countryside tourism issues (Fig. 9).

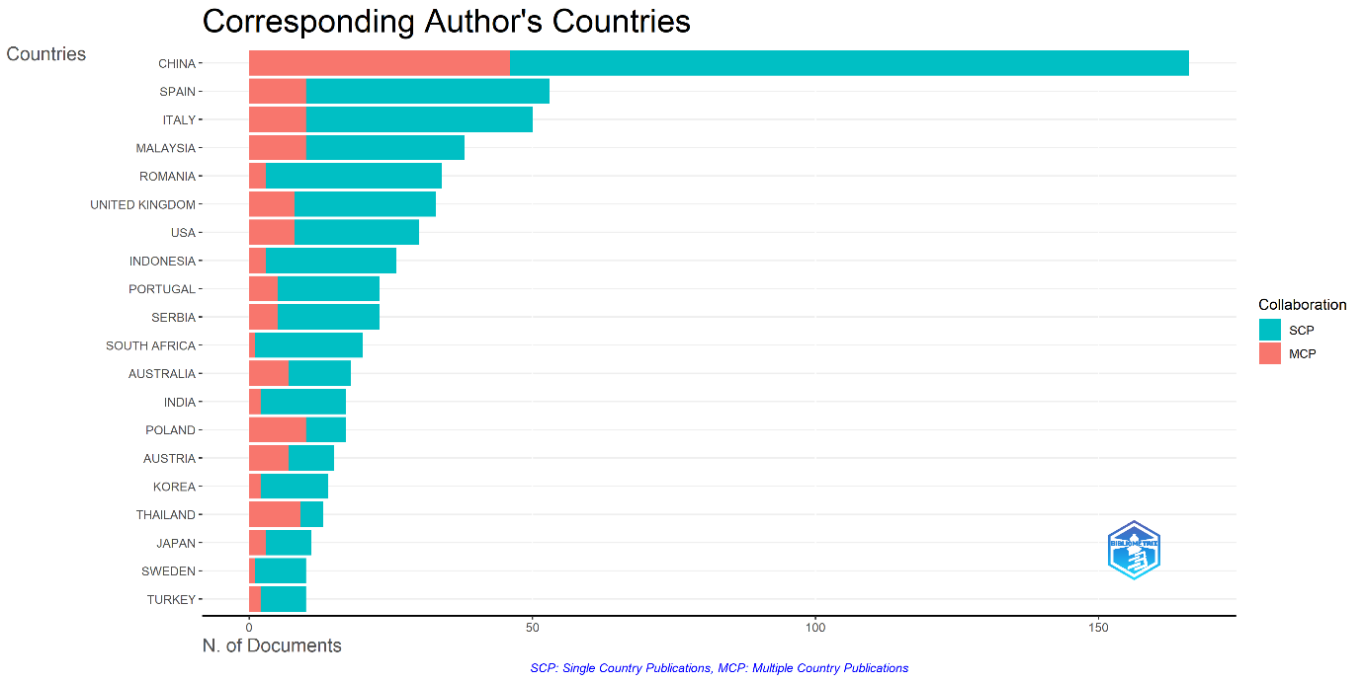

Figure 9. Distribution of Sustainable Mountain and Rural Tourism Research Publications Worldwide. Source: Author's fieldwork, 2025

Most Cited Publications in Sustainable Mountain and Rural Tourism Research:

This Figure 10 displays the top 10 most cited research papers in sustainable rural and mountain tourism literature, illustrating the field's recent classic contributions. Sims (2009), Journal of Sustainable Tourism article tops the list with 973 citations, being the most cited paper in the field. Lane appears twice in the top list with papers published in 1994 (493 citations) and with (Lane & Kastenholz) in 2015 (316 citations), illustrating continued contribution to the field. Tourism Management and Journal of Sustainable Tourism are the two top journals with highly cited research, with several articles in each journal. The range of citations is between 250-973, illustrating high scholarly influence and impact. More recent papers, such as (Yang et al., 2021) and (Rosalina et al., 2021), illustrates the field's continued development with high early citation performance. The range of 1994-2021 illustrates the history of development in the field and consistent scholarly interest in sustainable tourism practices.

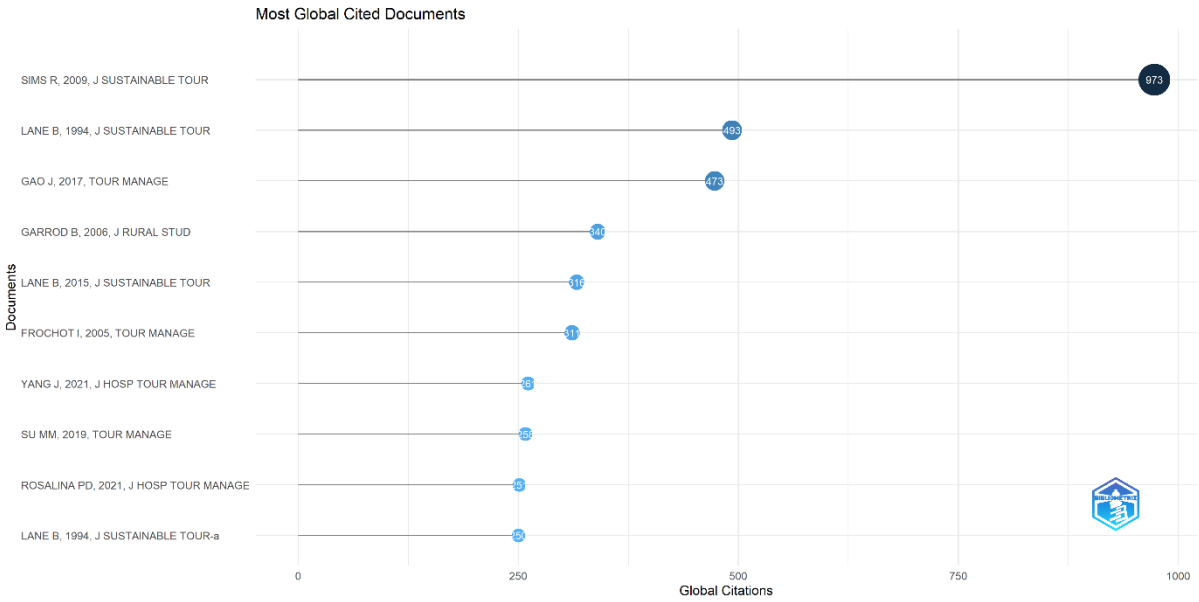

Figure 10. Most Cited Publications in Sustainable Mountain and Rural Tourism Research (Top 10 by Citation Count). Source: Author's fieldwork, 2025

Keywords Most Applicable to Sustainable Mountain and Rural Tourism Research

This keyword examination identifies the most prevalent themes in sustainable mountain and rural tourism studies in Figure 11. "Tourism development" tops at 244 references, followed by "sustainable development", 215, and "rural area", 195, indicating developmental orientation in the field. "Ecotourism", 194, and "sustainability", 175, indicate environmental orientation, while "China", 144, indicates research prominence in the country. Other top words are "tourism", 130, "rural development", 121, "tourist destination", 107, and "tourism management", 72, indicating the field's multidisciplinary orientation in development, management, and sustainability directions.

Figure 11. Most Frequent Keywords in Sustainable Mountain and Rural Tourism Research Literature. Source: Author's fieldwork, 2025

Utilising Zipf's Law to Determine the Distribution of Keyword Frequencies in Bibliographic Documents

With the use of Zipf's Law of Word Occurrence, the frequency distribution of the most common terms was examined. Zipf's Law states that if keywords are arranged in decreasing order of frequency, with "r" standing for rank and "f" for frequency, the result should stay the same. However, the original formulation of Zipf's Law ($r \times f = c$) does not apply to the current bibliographic information, as shown by the frequency data for Keywords Plus and the keywords of the top 15 authors in Table 2 and Figure 12 (World Clouds) (Bhatt et al., 2022).

Table 2. Authors' Keywords and Keywords Plus Frequency Distributions

Authors keywords				Keywords plus			
Keyword	**Rank (r)**	**Frequency (f)**	**Product (r*f)**	**Keyword**	**Rank (r)**	**Frequency (f)**	**Product (r*f)**
Rural Tourism	1	467	467	Tourism Development	1	244	244
Sustainable Development	2	140	280	Sustainable Development	2	215	430
Sustainability	3	89	267	Rural Area	3	195	585
Sustainable Tourism	4	89	356	Ecotourism	4	194	776
Tourism	5	68	340	Sustainability	5	175	875
Rural Development	6	55	312	China	6	144	864
Mountain Tourism	7	45	315	Tourism	7	130	910
Agritourism	8	28	224	Rural Development	8	121	968
China	9	27	243	Tourist Destination	9	107	963
Rural Areas	10	27	270	Tourism Management	10	72	720
Sustainable Rural Tourism	11	22	242	Perception	11	47	517
Agriculture	12	20	240	Rural Economy	12	44	528
Ecotourism	13	20	260	Tourism Economics	13	43	559
Community-Based Tourism	14	16	224	Stakeholder	14	42	588
Rural Revitalization	15	16	240	Tourism Market	15	39	585

Source: Author's fieldwork, 2025

Emerging Research Themes and Temporal Trends in Sustainable Mountain and Rural Tourism

This trend analysis represents the temporal evolution of research themes in sustainable mountain and rural tourism between 2002 and 2024 (Fig. 13). Early research (2002-2010) responded to initial themes like "Europe," "Western Europe," and "farming systems," establishing spatial and sectoral benchmarks. Mid-term research (2010-2018) evolved into niche themes like "conservation management," "rural landscape," "environmental management," and "mountain environment," reflecting greater environmental issues. Recent years (2018-2024) mirror the intensification of such leading issues as "sustainable development," "tourism," "ecotourism," and "rural area," with increased bubble size indicating higher frequency of study. The temporal trend demonstrates the evolution of the field from simple geographical studies to complex models of sustainability. Contemporary studies feature demographic issues (such as "female," "male," "rural population") and analysis methods (such as "spatiotemporal analysis"), indicating methodological progress and social inclusivity of contemporary studies.

(a) (b)

Figure 12. World Clouds. (a) Authors' Keywords (b) Keywords Plus. Source: Author's fieldwork, 2025

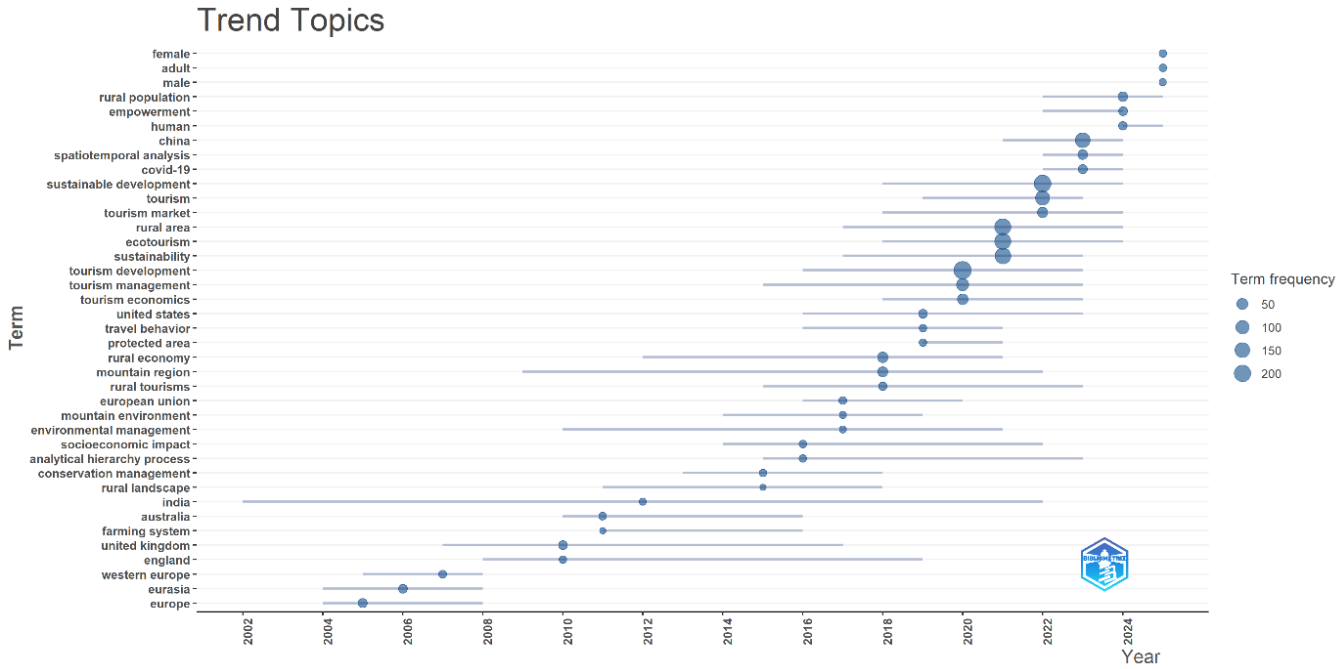

Figure 13. Evolution of Research Topics in Sustainable Mountain and Rural Tourism. Source: Author's fieldwork, 2025

Global Collaboration Patterns in Sustainable Mountain and Rural Tourism

This collaboration map portrays international research partnerships in sustainable mountain and rural tourism, revealing significant bilateral cooperation patterns (Fig. 14). China stands out as the leading collaborative hub, collaborating most often with the USA (15 collaborations), Australia (12), and several other nations, including Malaysia, the UK (9 each), Hong Kong, and Thailand (7 each). Spain illustrates high cross-border research activity, most notably with Ecuador (8 collaborations) and Portugal (7), signifying close Ibero-American academic connections. The evidence reveals China's wide-ranging international research network, working with varied countries on different continents, like Canada (6) and Japan (4). European collaboration is a case in point through the Spain-Portugal partnership, illustrating regional academic integration. These collaborations illustrate the truly global nature of the field, with research moving beyond geographical and cultural borders. The frequencies of collaboration indicate research networks that are well-established and enable comparative studies and exchange of knowledge in sustainable mountain and rural tourism across various geographical and cultural settings.

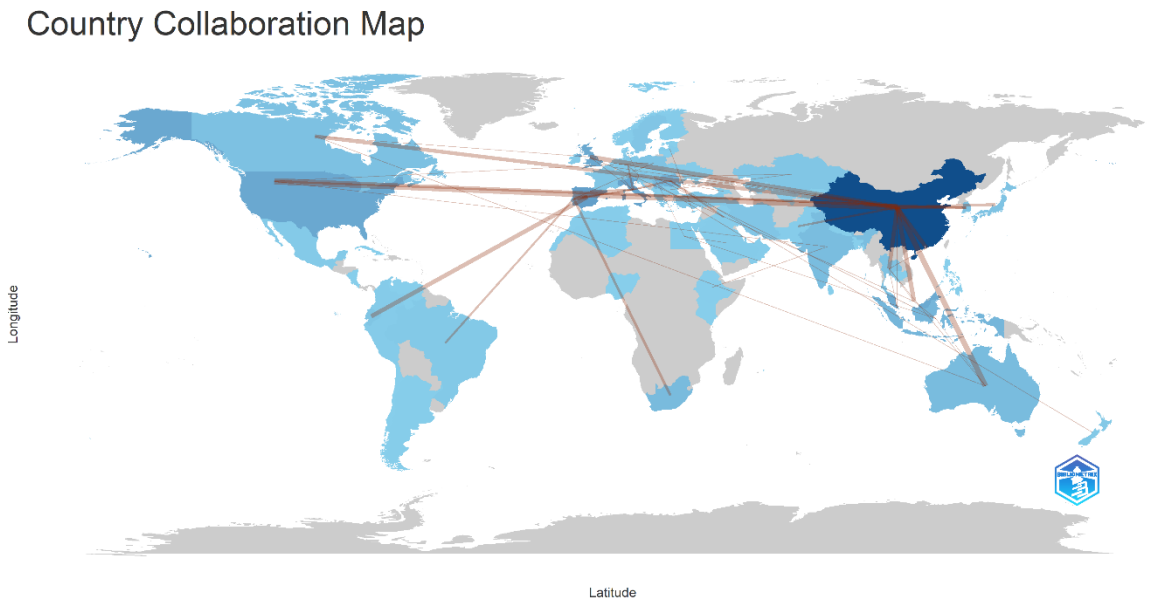

Figure 14. International Research Collaboration Network in Sustainable Mountain and Rural Tourism. Source: Author's fieldwork, 2025

Top Citation and Co-Citation Network Analysis Authors

Applying the full counting method, we performed an analysis with co-citation as the type and cited authors as the unit. 652 authors among 58,971, each of whom had at least 20 citations, met the condition. With 137,543 links and a total link strength of 682,134, these 652 authors were placed in five clusters to generate a fully connected set. The authors' total co-citation link strength was the criterion for selection. Cluster 1, coloured red, is the biggest with 203 items. Cluster 2, coloured green, consists of 183 items and has a link strength of 7298. Cluster 3, coloured blue, consists of 145 items, and Cluster 4, coloured yellow, consists of 102 items. Cluster 5, coloured purple, is the smallest with 19 items.

Figure 15 illustrates the co-authorship network of authors in bibliographic citations, grouped into five different clusters. In Cluster 3 (Blue), the most cited author is Kastenholz, E., with 645 links, 372 citations, and a total link strength of 19,123. In Cluster 1 (Red), the most cited one is Lane, B., with 396 citations, 646 links, and a total link strength of 17,909. Wang, Y., at the head of Cluster 2 (Green), has 319 citations, 640 links, and a total link strength of 16,775. The most prominent author in Cluster 4 (Yellow) is Uysal, M., with 153 citations, 612 links, and a total link strength of 8,780. Lastly, in Cluster 5 (Purple), Castanho, R.A. is the most prominent, with 92 citations, 219 links, and a total link strength of 4,195.

Co-Occurrence Analysis of the Keywords Used by the Authors

Co-occurrence refers to how often items, like keywords, happen together in a document, forming a network around their common frequency (Fig. 16). By looking at these co-occurrences, it helps identify similar phrases and theme clusters (Ali & Gölgeci, 2019; Choudhary et al., 2024). The factors considered in the analysis employed the full counting method, imposing a minimum requirement of five keyword occurrences. 103 keywords among. 2,629 met this requirement. The collective. The strength of the 103 keywords' co-occurrence linkages with other keywords was found. 103 keywords and 9 clusters made it to the final study after selecting the keywords with the strongest overall link strengths. Cluster 1 (Red) contains the highest number of 20 items, with "Social Capital" having the highest connectivity (15 links), total link strength (24), and 11 occurrences within the group. Cluster 2 (Green) comprises 15 items, with "Sustainable Development" exhibiting the highest connectivity (69 links), total link strength (258), and 140 occurrences in the group, ranking second among all 103 keywords. "Tourism" has the most connectedness (51 links), total link strength (145), and occurrences in the group, ranking 5 out of all 103 keywords. Cluster 3 (Blue) also has 15 items. Out of all 103 keywords, "Rural Tourism" ranks first in terms of connectedness (98 links), total link strength (656), and occurrences (467). There are an additional 12 items in Cluster 4 (Yellow).

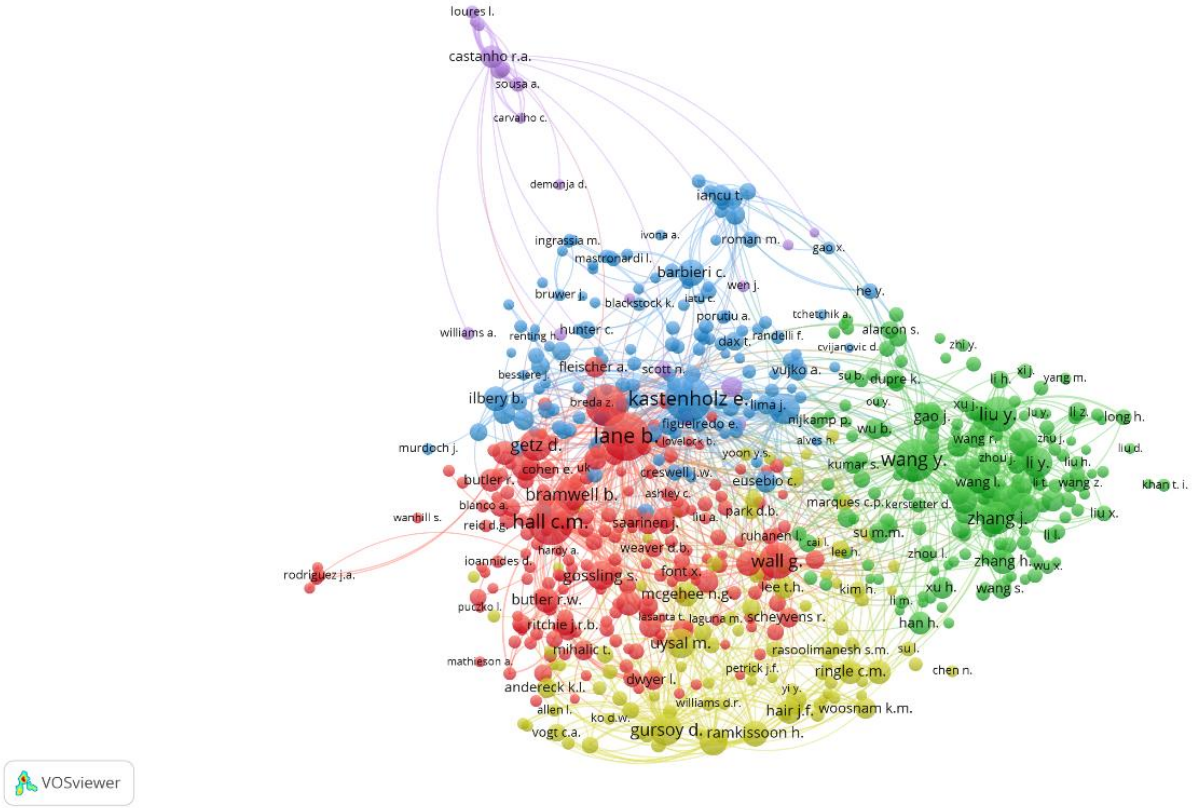

Figure 15. Co-citation network of authors. Source: Own elaboration, 2025

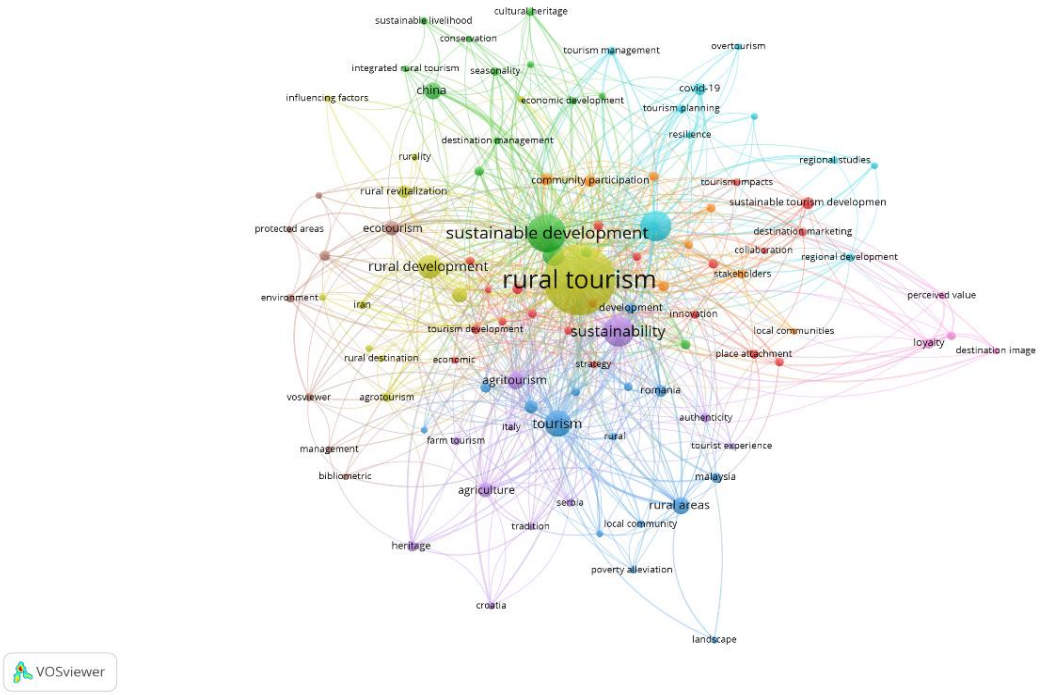

Figure 16. Co-occurrence of authors' keywords. Source: Source: Author's fieldwork, 2025

Out of the 11 items in Cluster 5 (Purple), "Sustainability" has the maximum connectivity (56 links), total link strength (175), and 89 occurrences. "Sustainable tourism" has the highest connectivity (54 links), total link strength (149), and 89 occurrences among the ten items in Cluster 6 (Teal). Out of the eight elements in Cluster 7 (Amber), "community participation" has the maximum connectedness (16 links), total link strength (28),

and 14 occurrences. Out of the eight items in Cluster 8 (Mauve), "Ecotourism" has the highest connectivity (26 links), total link strength (43), and 20 occurrences. Out of the four items in Cluster 9 (Violet), "Loyalty" has the maximum connectivity (11 links), total link strength (26), and 10 occurrences.

Country Clusters and Key Collaborators in the Global Co-Authorship Network

The co-authorship analysis was based on countries as the unit of analysis and involved complete counting. 55 out of 95 countries had more than the inclusion threshold, but only 53 of them formed one connected network. Once the choice was made to display the largest connected set, the analysis showed 53 countries grouped into 7 distinct clusters. Total co-authorship link strength to other nations was computed for all 53 countries.

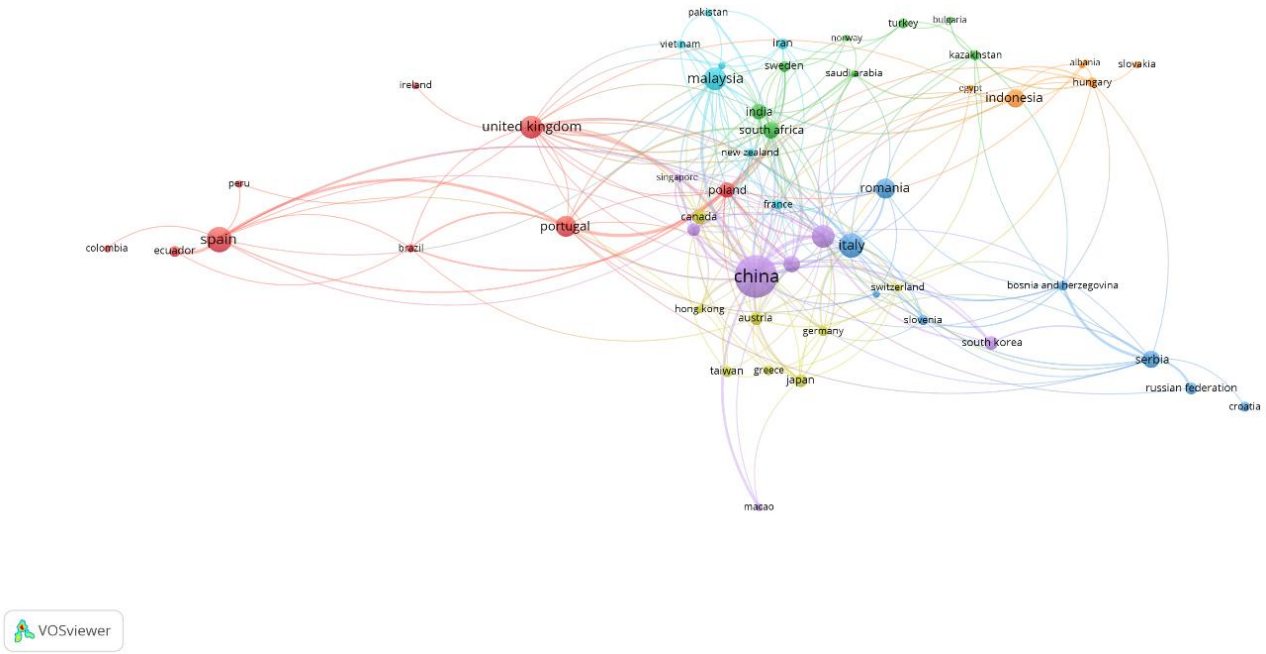

Figure 17. International co-authorship network. Source: self-explanation. Source: Author's fieldwork, 2025

A co-authorship network of 53 countries is presented in Figure 17 and Table 3. There are seven clusters of countries' collaboration: the red (cluster 1) has 9 countries, the green (cluster 2), blue (cluster 3), and yellow (cluster 4) each has 8 countries, the purple (cluster 5) and teal clusters (cluster 6) has equal 7 countries, and the Amber (cluster 7) has only 6 countries. The leading countries in cluster 5 (green)—Australia, China, Macao, Singapore, South Korea, Thailand, and the United States —stand out in the co-authorship network due to their exceptional scholarly output, linkages, and overall collaborative strength. These countries exhibit the highest values, with 346 documents, 103 co-authorship links, and a cumulative link strength of 252, underscoring their central role in international scientific collaboration. Brazil, Colombia, Ecuador, Ireland, Peru, Poland, Portugal, Spain, and the United Kingdom are the most significant nations in the red cluster (1); Bulgaria, India, Kazakhstan, Norway, Saudi Arabia, South Africa, Sweden, and Turkey are in the green cluster (2). Bosnia and Herzegovina, Croatia, Italy, the Netherlands, Romania, the Russian Federation, Serbia, and Slovenia are in the blue cluster (3); Austria, Canada, Germany, Greece, Hong Kong, Japan, Switzerland, and Taiwan are in the yellow cluster (4); Finland, France, Iran, Malaysia, New Zealand, Pakistan, Vietnam are in the teal cluster (6); Albania, Egypt, Hungary, Indonesia, Slovakia, Ukraine are in the Amber cluster (7).

Figure 18 shows that the strongest cooperative ties in the network are grouped around China, Spain, the United Kingdom, Malaysia, Romania, Hungary, India, Thailand, Serbia, Kazakhstan, Saudi Arabia, South Koria, Bosnia and Herzegovina, Switzerland, Japan, Taiwan, Macao, Hong Kong, Austria, Canada, France, Poland, Singapore, New Zealand, South Africa, Pakistan, Vietnam marks these nations as central hubs of international scientific cooperation in Sustainable Mountain and Rural Tourism.

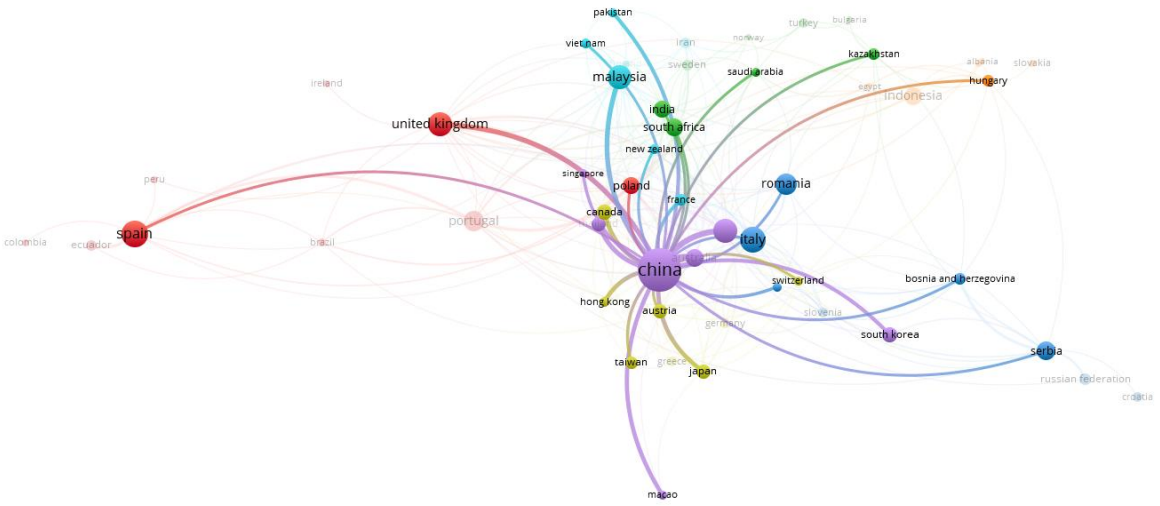

Figure 18. The strongest collaboration between countries. Source: Author's fieldwork, 2025

Table 3. 53 countries are shown in the table, arranged according to clusters, along with the Documents, Links, and Total Link Strength figures that go with each.

Cluster	Country (Documents, Links, Total link Strength)	Cluster total documents	Cluster total link	Cluster total link strength
1	Brazil (9,6,10), Colombia (6,1,1), Ecuador (15,2,10), Ireland (6,1,1), Peru (6,2,2), Poland (28,20,39), Portugal (52,11,33), Spain (75,12,28), United Kingdom (61,21,37)	258	76	161
2	Bulgaria (5,2,3), India (28,18,20), Kazakhstan (13,9,11), Norway (5,5,5), Saudi Arabia (6,9,11), South Africa (32,13,20), Sweden (14,9,9), Turkey (12,5,5)	115	70	84
3	Bosnia and Herzegovina (11,9,18), Croatia (11,1,1), Italy (66,17,34), Netherlands (6,6,7), Romania (45, 9, 13), Russian Federation (17,2,6), Serbia (35,3,27), Slovenia (13,9,10)	204	66	116
4	Austria (19,593,18), Canada (22,965,27), Germany (12,779,14), Greece (12,231,6), Hong Kong (9,231,13), Japan (19,428,17), Switzerland (7,224,19), Taiwan (14,521,6)	114	85	118
5	Australia (30,16,33), China (202,30,112), Macao (6,3,8), Singapore (6,9,11), South Korea (22,5,11), Thailand (20,15,29), United States (61,25,48)	346	103	252
6	Finland (7,9,10), France (13,12,16), Iran (15,8,8), Malaysia (58,16,33), New Zealand (9,15,16), Pakistan (6,4,7), Vietnam (9,8,10)	117	72	100
7	Albania (5,2,2), Egypt (5,6,9), Hungary (12,10,13), Indonesia (39,9,14), Slovakia (7,1,1), Ukraine (5,4,4)	73	32	43

Source: Author's fieldwork, 2025

Conclusion

The bibliometric analysis of Sustainable Mountain and Rural Tourism (SMRT) shows a significant rise in publication output after 2014. It also indicates a steady increase in academic interest from 1990 to 2025. Sustainability (Switzerland) is one of the key academic journals identified by Bradford's Law as important to the field. Lotka's Law reveals a common authorship pattern where a small group of prolific authors produces most of the knowledge, while the majority of contributors publish only one piece. Reputable universities and research centres from countries such as China, Serbia, Portugal, Spain, and Romania emerge as major

contributors. Strong regional and international partnerships are evident in the global co-authorship network, which features several clusters that reflect shared research interests and worldwide sustainability goals. With 973 citations, the Sims (2009) article from the Journal of Sustainable Tourism is the most referenced work in the field. Tourism development is one of the most frequently used terms in research on sustainable mountain and rural tourism. The most cited works have laid the groundwork for policy-driven rural development, community-based tourism, and sustainable development theory. Keyword co-occurrence and Zipf's Law analyses reveal a focused vocabulary centred on themes like "Rural Tourism," "Tourism Development," "Sustainable Development," and "Sustainability." Today, emerging trends involve empowerment, women, men, and rural communities. Keyword and citation analysis reveal both established and new thematic trends. This points to a changing landscape in research priorities and methods within the field. The field's intellectual structure is further mapped through citation and co-citation networks, which highlight leading academics and their thematic influence. Global collaboration networks highlight important regional clusters and international partnerships. This is especially true for countries with strong research cooperation, such as China, Spain, the United Kingdom, Japan, and Malaysia. The keyword co-occurrence analysis shows the importance of terms like "rural tourism," "sustainable development," and "rural development" in shaping the SMRT research landscape. Several obstacles and research gaps still exist despite progress. There is a need for better research methods, broader stakeholder involvement, and a stronger connection between ecological, economic, and sociocultural factors. In the future, focusing on collaboration across different fields, thorough policy studies, and ways to balance environmental protection with local development should be a top priority. These findings will be very useful for scholars, professionals, and lawmakers who want to support sustainable mountain and rural tourism around the world.

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Declaration

Ethics approval and consent to participate
Not applicable.

Consent for publication
Not applicable.

Availability of data and materials
The data supporting the findings of this study are available upon request.

Competing interests
The authors declare that there is no conflict of interest regarding this work.

Declaration of generative AI and AI-assisted technologies
During the preparation of this work the author used Grammarly in order to correct spelling mistakes and help me make better sentences. After using this tool/service, the author reviewed and edited the content as needed and takes full responsibility for the content of the published article.

Author contributions
VK, AN, SS, RT, and AB contributed to Conceptualization and Methodology. VK and AN contributed to Data Curation and Formal Analysis. SS and RT contributed to Investigation and Visualization. VK contributed to Writing – Original Draft. AN, SS, RT, and AB contributed to Writing – Review & Editing. AB contributed to Supervision and Project Administration. All authors have read and approved the final manuscript.

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References

Ali, I., & Gölgeci, I. (2019). Where is supply chain resilience research heading? A systematic and co-occurrence analysis. *International Journal of Physical Distribution and Logistics Management, 49*(8), 793–815. https://doi.org/10.1108/IJPDLM-02-2019-0038

Almasov, N., & Orujov, E. (2025). Organizational and economic aspects of mountain tourism management. *BIO Web of Conferences, 151*, 03015. https://doi.org/10.1051/bioconf/202515103015

Aria, M., & Cuccurullo, C. (2017). Bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics, 11*(4), 959–975. https://doi.org/10.1016/j.joi.2017.08.007

Bhatt, K., Seabra, C., Kabia, S. K., Ashutosh, K., & Gangotia, A. (2022). COVID crisis and tourism sustainability: An insightful bibliometric analysis. *Sustainability, 14*(19), 12151. https://doi.org/10.3390/su141912151

Bisht, A., Kumar, V., Thakur, V., & Rana, R. (2025). Sustainable tourism management: Challenges and strategic solutions for a resilient industry. *International Journal of Tourism and Hotel Management, 7*(1), 48–55. https://doi.org/10.22271/27069583.2025.v7.i1a.124

Bozok, D., Kılıç, S. N., & Özdemir, S. S. (2017). Bibliometric analysis of rural tourism on tourism literature. *Journal of Human Sciences, 14*(1), 187. https://doi.org/10.14687/jhs.v14i1.4274

Choudhary, V., Nag, A., Kumar, A., & Kumar, V. (2024). Wetland tourism: A bibliometric analysis (1985–2022). *Journal of Tourismology*. https://doi.org/10.26650/jot.2024.10.2.1444196

Cronjé, D. F., & du Plessis, E. (2020). A review on tourism destination competitiveness. *Journal of Hospitality and Tourism Management, 45*, 256–265. https://doi.org/10.1016/j.jhtm.2020.06.012

Dax, T., & Tamme, O. (2023). Attractive landscape features as drivers for sustainable mountain tourism experiences. *Tourism and Hospitality, 4*(3), 374–389. https://doi.org/10.3390/tourhosp4030023

Dhungana, B. R. (2024). Impact of sustainable mountain tourism on economic development: A systematic review. *Journal of Tourism and Himalayan Adventures, 7*, 1–13.

Dhungana, B. R. (2024). Tourism policy for sustainable mountain tourism: A systematic literature review. *Journal of Tourism and Himalayan Adventures, 6*(1), 45–57. https://doi.org/10.3126/jtha.v6i1.67390

Dobre, C., Linca, A. C., Toma, E., & Iorga, A. (2024). Sustainable development of rural mountain tourism: Insights from consumer behavior and profiles. *Sustainability, 16*(21), 9449. https://doi.org/10.3390/su16219449

Ferreira, J., Silvério, A. C., Vaz, M., & Fernandes, P. O. (2023). The relationship between rural tourism, sustainable tourism and outdoor activities: A systematic literature review. In *Perspectives and trends in education and technology* (pp. 597–608). https://doi.org/10.1007/978-981-19-6585-2_53

Higham, J., & Miller, G. (2018). Transforming societies and transforming tourism: Sustainable tourism in times of change. *Journal of Sustainable Tourism, 26*(1), 1–8. https://doi.org/10.1080/09669582.2018.1407519

Kalipçi, M. B. (2024). Exploring the nexus of tourism and technology acceptance: A bibliometric analysis. *Journal of Tourism and Gastronomy Studies, 12*(1), 29–41. https://doi.org/10.21325/jotags.2024.1367

Kumar, A., Nag, A., Kumar, V., & Sharma, P. (2025). Gastronomy tourism in Himachal Pradesh: A sustainable approach to community empowerment and cultural preservation. In *Global sustainable practices in gastronomic tourism* (pp. xx–xx). IGI Global. https://doi.org/10.4018/979-8-3693-7096-4.ch020

Lane, B. (1994). Sustainable rural tourism strategies: A tool for development and conservation. *Journal of Sustainable Tourism, 2*(1–2), 102–111. https://doi.org/10.1080/09669589409510687

Lane, B. (1994). What is rural tourism? *Journal of Sustainable Tourism, 2*(1–2), 7–21. https://doi.org/10.1080/09669589409510680

Lane, B., & Kastenholz, E. (2015). Rural tourism: The evolution of practice and research approaches—Towards a new generation concept? *Journal of Sustainable Tourism, 23*(8–9), 1133–1156. https://doi.org/10.1080/09669582.2015.1083997

Lun, L. M., Pechlaner, H., & Volgger, M. (2016). Rural tourism development in mountain regions: Identifying success factors, challenges and potentials. *Journal of Quality Assurance in Hospitality and Tourism, 17*(4), 389–411. https://doi.org/10.1080/1528008X.2015.1096754

Mitra, A., & Paul, S. (2025). Balancing mountain tourism, cultural heritage, and environmental stability. In *Balancing mountain tourism, cultural heritage, and environmental stability* (pp. 31–54). https://doi.org/10.4018/979-8-3693-8764-1.ch003

Mohamed Al Matris, A. (2023). The challenges of rural tourism development. *International Journal of Eco-Cultural Tourism, Hospitality Planning and Development, 6*(2), 29–45.

Nag, A., Kumar, V., Choudhary, V., Bhanu, U., Sharma, A., & Kapoor, N. (2025). Sustainable tourism in Ladakh: Balancing culture, economic growth, and environmental preservation through homestays. In *Global practices and innovations in sustainable homestay tourism* (pp. xx–xx). IGI Global. https://doi.org/10.4018/979-8-3373-0427-4.ch014

Nag, A., Kumar, V., Choudhary, V., Kumar, A., & Sharma, R. (2024). Nurturing nature and local well-being in the hills of Himachal Pradesh: Transformation through eco and sustainable tourism practices. In *Managing tourism and hospitality sectors for sustainable global transformation* (pp. xx–xx). IGI Global. https://doi.org/10.4018/979-8-3693-6260-0.ch011

Ng, S. L. (2022). Bibliometric analysis of literature on mountain tourism in Scopus. *Journal of Outdoor Recreation and Tourism, 40*, 100587. https://doi.org/10.1016/j.jort.2022.100587

Okazaki, E. (2008). A community-based tourism model: Its conception and use. *Journal of Sustainable Tourism, 16*(5), 511–529. https://doi.org/10.1080/09669580802159594

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., … Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *Systematic Reviews, 10*(1), 89. https://doi.org/10.1186/s13643-021-01626-4

Pahlevan-Sharif, S., Mura, P., & Wijesinghe, S. N. R. (2019). A systematic review of systematic reviews in tourism. *Journal of Hospitality and Tourism Management, 39*, 158–165. https://doi.org/10.1016/j.jhtm.2019.04.001

Passas, I. (2024). Bibliometric analysis: The main steps. *Encyclopedia, 4*(2), 1014–1025. https://doi.org/10.3390/encyclopedia4020065

Rosalina, P. D., Dupre, K., & Wang, Y. (2021). Rural tourism: A systematic literature review on definitions and challenges. *Journal of Hospitality and Tourism Management, 47*, 134–149. https://doi.org/10.1016/j.jhtm.2021.03.001

Sanagustín Fons, M. V., Fierro, J. A. M., & Patiño, M. G. (2011). Rural tourism: A sustainable alternative. *Applied Energy, 88*(2), 551–557. https://doi.org/10.1016/j.apenergy.2010.08.031

Sharma, V., Nag, P. A., & Kumar, V. (2025). Assessing the role of government support in promoting cultural entrepreneurship in Himachal Pradesh. *International Journal of Advance Research in Computer Science and Management Studies, 13*(1), 1–12. https://doi.org/10.61161/ijarcsms.v13i1.1

Sims, R. (2009). Food, place and authenticity: Local food and the sustainable tourism experience. *Journal of Sustainable Tourism, 17*(3), 321–336. https://doi.org/10.1080/09669580802359293

Suherlan, A., & Cheer, J. M. (2024). Stakeholders' perception, determinant factors, and impacts of sustainable rural tourism: A literature review. *IOP Conference Series: Earth and Environmental Science, 1366*(1), 012042. https://doi.org/10.1088/1755-1315/1366/1/012042

Tang, M., & Xu, H. (2023). Cultural integration and rural tourism development: A scoping literature review. *Tourism and Hospitality, 4*(1), 75–90. https://doi.org/10.3390/tourhosp4010006

Tsilika, K. (2023). Exploring the Contributions to Mathematical Economics: A Bibliometric Analysis Using Bibliometrix and VOSviewer. *Mathematics*, 11(22), 4703. https://doi.org/10.3390/math11224703

Uhai, S., Rizani, A., Parwati, K. S. M., Syaiful, M., & Amir, F. L. (2024). Rural tourism development and its impact on community economic welfare: A bibliometric analysis. *Sciences du Nord Humanities and Social Sciences, 1*(2), 44–52. https://doi.org/10.58812/snhss.v1i2.24

Wijijayanti, T., Salleh, N. H. M., Hashim, N. A., Mohd Saukani, M. N., & Abu Bakar, N. (2023). The feasibility of rural tourism in fostering real sustainable development in host communities. *GeoJournal of Tourism and Geosites, 46*(1), 336–345. https://doi.org/10.30892/gtg.46137-1031

Yang, J., Yang, R., Chen, M. H., Su, C. H., Zhi, Y., & Xi, J. (2021). Effects of rural revitalization on rural tourism. *Journal of Hospitality and Tourism Management, 47*, 35–45. https://doi.org/10.1016/j.jhtm.2021.02.008

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