Mapping Research Trends in Sustainable Tourism Development

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Article Info

ABSTRACT

This study aims to map and analyze the research trends in sustainable tourism development using a bibliometric approach. Drawing on data from the Scopus database spanning from 2001 to 2025, the study explores publication growth, leading authors, institutions, countries, and evolving thematic structures in the field. Using VOSviewer for network visualization, the analysis reveals a significant increase in scholarly output, especially after 2017, indicating rising global interest in sustainable tourism as part of broader sustainability agendas. Thematic clustering identifies four major research areas: community-based development, environmental management, economic dimensions of tourism, and regional planning. Overlay and density visualizations show the emergence of recent themes such as climate change, empowerment, and quality of life, reflecting a shift toward more inclusive and resilience-focused perspectives. The co-authorship and country collaboration networks highlight a globally distributed and increasingly interconnected research community, with notable contributions from China, Indonesia, and the United States. This study contributes to a clearer understanding of the field's intellectual landscape and provides a strategic foundation for future interdisciplinary research and policy-making in sustainable tourism.

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1. INTRODUCTION

Over the past few decades, tourism has emerged as one of the most dynamic and fastest-growing sectors globally. Its capacity to generate income, create employment, and stimulate local economies has made it a strategic tool for development, particularly in developing countries [1]. However, this growth has not been without consequences. The expansion of tourism has also led to various environmental, social, and cultural issues, including resource depletion, habitat loss, carbon emissions, and the commodification of local traditions [2]. These impacts have catalyzed a global discourse on the need for more responsible, balanced, and future-oriented forms of tourism—thus giving rise to the concept of sustainable tourism development.

Sustainable tourism development aims to minimize negative externalities while maximizing the positive contributions of tourism to host communities, the

environment, and economies. It is grounded in the principles of sustainability, which advocate for the equitable distribution of benefits, intergenerational equity, cultural sensitivity, and ecological preservation [3]. The concept gained significant international traction following the Rio Earth Summit in 1992 and has since been incorporated into major global frameworks, including the United Nations' 2030 Agenda for Sustainable Development, particularly through Goal 8 (decent work and economic growth), Goal 12 (responsible consumption and production), and Goal 14 (life below water).

As the concept of sustainable tourism development continues to evolve, so does the body of research surrounding it. Scholars from various disciplines—including environmental science, economics, sociology, and management—have contributed to a growing and diverse literature base. This expanding knowledge corpus reflects a shift in tourism research from mass tourism models toward more sustainable paradigms that prioritize the well-being of host communities and ecosystems [4]. With the integration of new analytical tools such as Geographic Information Systems (GIS), big data analytics, and machine learning, sustainable tourism research is also becoming increasingly data-driven and multidisciplinary [5].

Despite its growth, the literature on sustainable tourism development remains complex, multifaceted, and, at times, fragmented. Different regions, stakeholder groups, and academic disciplines emphasize different sustainability priorities and methodologies. For example, studies in Southeast Asia may focus on ecotourism and biodiversity conservation, while those in Europe may concentrate on urban tourism management and carbon footprint reduction [6]. This diversity, while enriching, also poses challenges for understanding overarching research trends and identifying knowledge gaps. Mapping the intellectual structure and thematic evolution of the field is thus crucial for consolidating insights and guiding future research directions.

Bibliometric analysis has emerged as a powerful method to address this need. It provides a systematic, quantitative approach to analyzing large volumes of academic literature by evaluating publication patterns, citation networks, and thematic clusters [7]. Through techniques such as co-word analysis, co-citation mapping, and thematic evolution tracking, bibliometric studies can uncover hidden patterns, key contributors, and emerging trends in a given field. In the context of sustainable tourism development, such an analysis can provide valuable insights into how the discourse has evolved over time, which areas have been extensively studied, and which remain underexplored.

While the literature on sustainable tourism development is abundant, there is a lack of comprehensive studies that map its intellectual structure using systematic and replicable bibliometric methods. Most existing reviews are narrative or conceptual in nature and may be limited by subjective interpretation and narrow scope. Consequently, there is insufficient clarity on how the field has evolved in terms of research themes, methodological approaches, and geographic focus. Without such clarity, researchers and policymakers may struggle to navigate the extensive literature, identify gaps, or align research agendas with pressing sustainability challenges. Therefore, there is an urgent need to synthesize and visualize the trajectory of research in sustainable tourism development to better understand its dynamics and future directions. This study aims to map the research trends in sustainable tourism development through a bibliometric analysis of peer-reviewed academic publications.

2. THEORETICAL FOUNDATIONS OF SUSTAINABLE TOURISM

Sustainable tourism is grounded in the broader concept of sustainable development, as popularized by the Brundtland Report. The foundational idea is that development must meet the needs of the

present without compromising the ability of future generations to meet their own. In tourism, this translates into strategies that maintain environmental integrity, support local communities, and generate equitable economic returns [8]. Several theoretical frameworks have been used to interpret and guide sustainable tourism development. One of the most influential is the Triple Bottom Line (TBL) approach, which integrates three pillars: economic viability, environmental protection, and social equity [9]. Researchers have applied TBL to evaluate tourism policies and projects, highlighting the trade-offs and synergies between different sustainability dimensions [10], [11]. Additionally, stakeholder theory and systems thinking have been widely employed to emphasize the interconnectedness of tourism actors—governments, private sectors, tourists, and local communities—and the importance of collaborative governance [12], [13].

structure and thematic evolution of research in sustainable tourism development. Using the Scopus database as the primary source due to its comprehensive coverage of peer-reviewed literature, a search query was constructed using keywords such as "sustainable tourism," "sustainable tourism development," and related terms appearing in article titles, abstracts, or keywords. The data set includes publications from 1990 to 2024 to capture the historical and contemporary discourse. VOSviewer software was utilized to visualize co-authorship networks, keyword co-occurrences, and citation patterns, enabling the identification of influential authors, institutions, and journals, as well as emerging and declining research themes. The analysis followed established bibliometric procedures outlined by [7], including data cleaning, normalization of author names and keywords, and clustering based on relevance scores.

3. METHOD

This study employs a bibliometric analysis to systematically map the intellectual

4. RESULT AND DISCUSSION
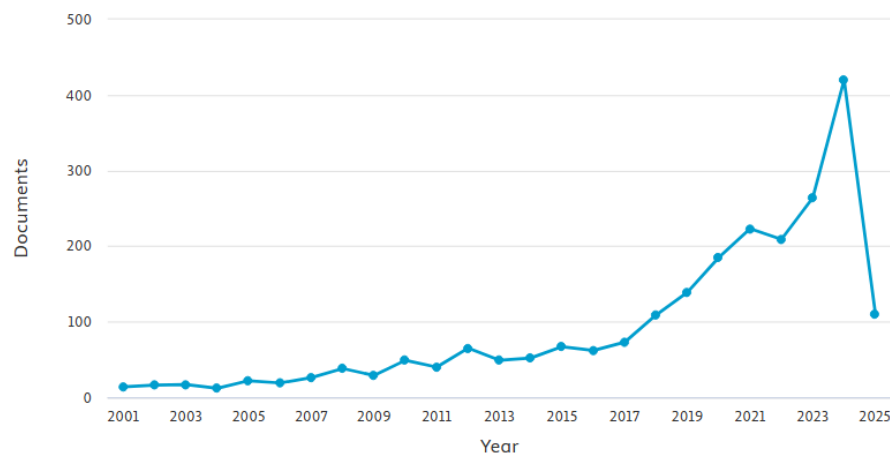### 4.1 Result
a. Yearly Publication

Figure 1. Documents by Year
Source: Scopus Database, 2025

The graph illustrates the annual publication trends related to sustainable tourism development from 2001 to 2025. For the first decade (2001–2011), the number of publications remained relatively low and stable, averaging under 50

documents per year. A modest increase is observed starting in 2012, followed by a significant surge beginning in 2017. This upward trend accelerates sharply from 2019 onward, peaking dramatically in 2023 with over 400 documents

published—a strong indication of heightened scholarly interest, possibly driven by global sustainability agendas and post-pandemic shifts in tourism paradigms. However, there is a steep decline in 2025, likely due to incomplete indexing for the current year.
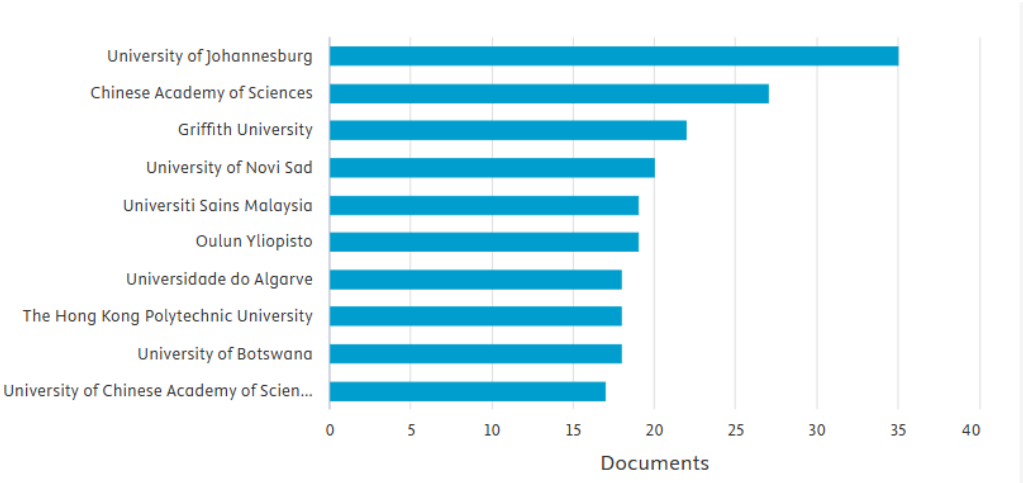

Figure 2. Documents by Affiliation
Source: Scopus Database, 2025

The bar displays the top contributing institutions in the field of sustainable tourism development based on the number of published documents. The University of Johannesburg leads the list with 35 documents, indicating its prominent role in advancing research in this area. It is followed by the Chinese Academy of Sciences with just over 30 publications, showcasing strong research engagement from China. Other notable contributors include Griffith University, University of Novi Sad, and Universiti Sains Malaysia, each with around 20–23 publications, highlighting the global distribution of research efforts across continents such as Africa, Asia, Europe, and Oceania. Institutions like Oulun Yliopisto, Universidade do Algarve, and The Hong Kong Polytechnic University also appear as key players, reinforcing the interdisciplinary and international nature of sustainable tourism research.
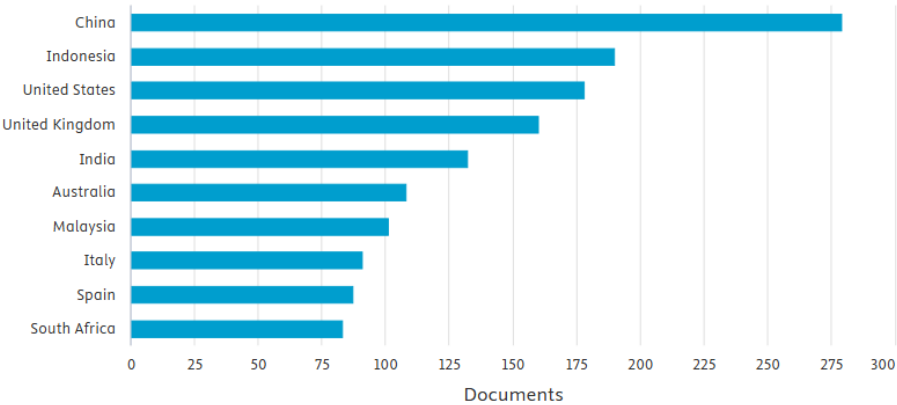

Figure 3. Documents by Country
Source: Scopus Database, 2025

The bar presents the leading countries in terms of the number of publications related to sustainable tourism development. China emerges as the most prolific contributor, with nearly 300 documents, underscoring its dominant academic presence in this research area. Indonesia follows as the second-highest contributor, reflecting its increasing scholarly engagement and the critical importance of tourism to its economy and environment. The United States and United Kingdom also feature prominently, highlighting their ongoing contributions to global sustainability research. Countries such as India, Australia, and Malaysia demonstrate notable participation, further emphasizing the significance of sustainable tourism across the Asia-Pacific region. Meanwhile, European countries like Italy and Spain, along with South Africa, round out the top ten, indicating a geographically diverse research landscape.

Table 1. Most Cited Article

Citations	Author and Year	Title
1978	[14]	Tourism: Principles, Practices, Philosophies
1313	[15]	Tourism and Sustainability: New Tourism in the Third World
1163	[16]	Food, place and authenticity: local food and the sustainable tourism experience
1137	[17]	The Competitive Destination: A Sustainable Tourism Perspective
1092	[1]	Sustainable Tourism Development: A Critique
1091	[18]	Sustainable tourism: A state-of-the-art review
1076	[19]	Book Review: Ecotourism and Sustainable Development: Who Owns Paradise?
1049	[20]	Systems integration for global sustainability
967	[21]	A review of the global climate change impacts, adaptation, and sustainable mitigation measures

Source: Scopus Database, 2025

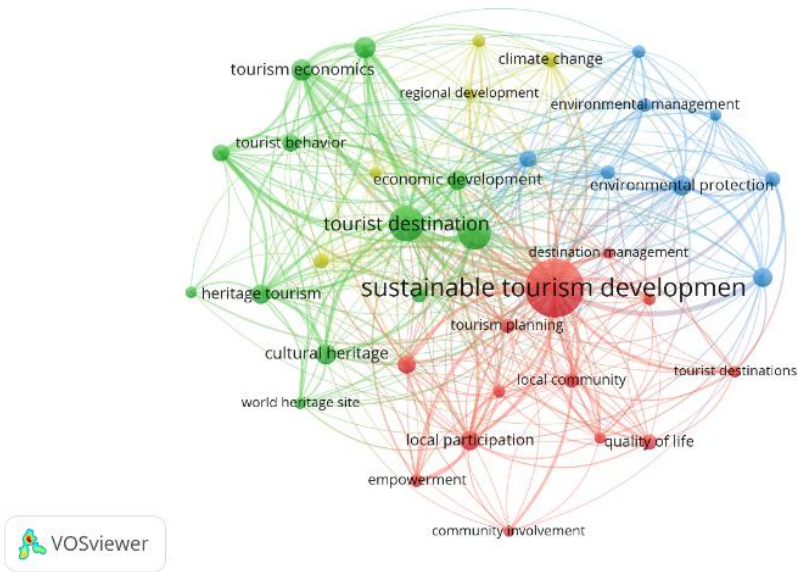b. **Keyword Co-Occurrence Network Visualization**

Figure 4. Network Visualization
Source: Data Analysis, 2025

The keyword co-occurrence network visualization highlights the intellectual structure and thematic clusters within the field of sustainable tourism development. The central term, "sustainable tourism development," is the largest node, reflecting its pivotal role in unifying diverse subtopics across the literature. Keywords are grouped into color-coded clusters, each representing a distinct thematic area. The proximity and thickness of the lines connecting terms indicate the frequency and strength of co-occurrence relationships, suggesting interconnected research interests and interdisciplinary approaches in this domain.

The red cluster primarily emphasizes community-centered and participatory development themes. Keywords such as local community, local participation, empowerment, quality of life, and community involvement illustrate a strong focus on inclusive development strategies. This cluster underscores the importance of bottom-up approaches in tourism planning, where the active involvement of local stakeholders is considered essential for achieving long-term sustainability and social equity in tourism initiatives. The inclusion of "tourism planning" in this cluster further highlights the linkage between participatory governance and strategic development frameworks. In contrast, the green cluster revolves around economic and destination-related aspects of tourism. Terms like tourism economics, tourist behavior, economic development, tourist destination, cultural heritage, and heritage tourism suggest a focus on tourism as a driver of economic growth, destination competitiveness, and cultural preservation. This cluster represents a more market-driven perspective of sustainable tourism, emphasizing how economic viability and cultural assets can be leveraged to promote both development and sustainability. The strong links between tourist behavior and economics also point to a growing body of research analyzing visitor impacts and motivations.

The blue cluster is anchored in environmental and ecological sustainability. Keywords such as climate change, environmental protection, environmental management, and destination management reflect scholarly attention to the ecological dimensions of tourism. These studies often address the carrying capacity of destinations, conservation strategies, and adaptive management practices in response to environmental threats, including those posed by global climate change. The inclusion of regional development suggests an interest in how broader spatial planning can support more environmentally sustainable tourism models. The yellow cluster appears to serve as a bridge across the other major themes, connecting environmental, economic, and regional considerations. Keywords like economic development and regional development indicate an integrative concern with how sustainable tourism fits within larger frameworks of territorial planning and development. These connector terms suggest that sustainable tourism is increasingly being conceptualized not in isolation but as part of a complex socio-economic and ecological system requiring cross-sectoral coordination.

The visualization reveals that research in sustainable tourism development is both thematically diverse and highly interconnected. The strong interlinkages between clusters highlight a maturing field that integrates community

empowerment, environmental responsibility, and economic viability. As sustainable tourism continues to evolve, the balance and interaction between these dimensions will likely remain at the core of scholarly and policy discourse. This map thus offers valuable insight into the dominant research trajectories, collaborative intersections, and emerging areas that warrant further investigation.
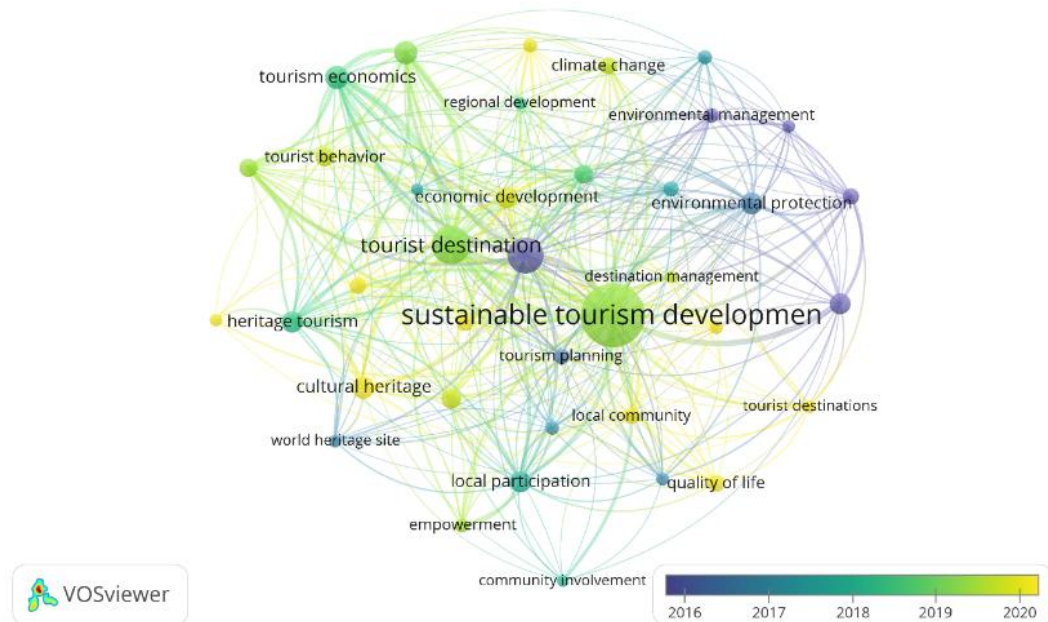

Figure 5. Overlay Visualization
Source: Data Analysis, 2025

The overlay visualization presents the temporal evolution of key themes in sustainable tourism development research from 2016 to 2020. The color gradient—ranging from dark blue (older keywords) to yellow (newer keywords)—indicates the average publication year associated with each term. Core concepts such as "sustainable tourism development" and "tourist destination" appear in darker shades of blue to purple, signifying their longstanding presence and foundational status in the literature. These terms represent the central focus around which related themes have emerged over time. Emerging topics can be identified by their yellow to green coloration, signaling more recent scholarly attention. Terms such as "heritage tourism," "quality of life," "climate change,"

and "community involvement" are highlighted in lighter colors, suggesting that these areas have gained prominence in the literature closer to 2019–2020. This shift indicates an increasing focus on tourism's role in cultural preservation, well-being, and adaptation to environmental challenges—key concerns in the post-pandemic and climate-aware era. The presence of "empowerment" and "local participation" as newer themes also reflects a trend toward more inclusive and community-driven models of sustainable tourism. In contrast, topics such as "environmental protection," "destination management," and "economic development" are visualized in darker shades, suggesting they were explored earlier but remain integral to the broader

discourse. Their continued connection to newer terms indicates enduring relevance, even as the thematic emphasis of the field evolves.
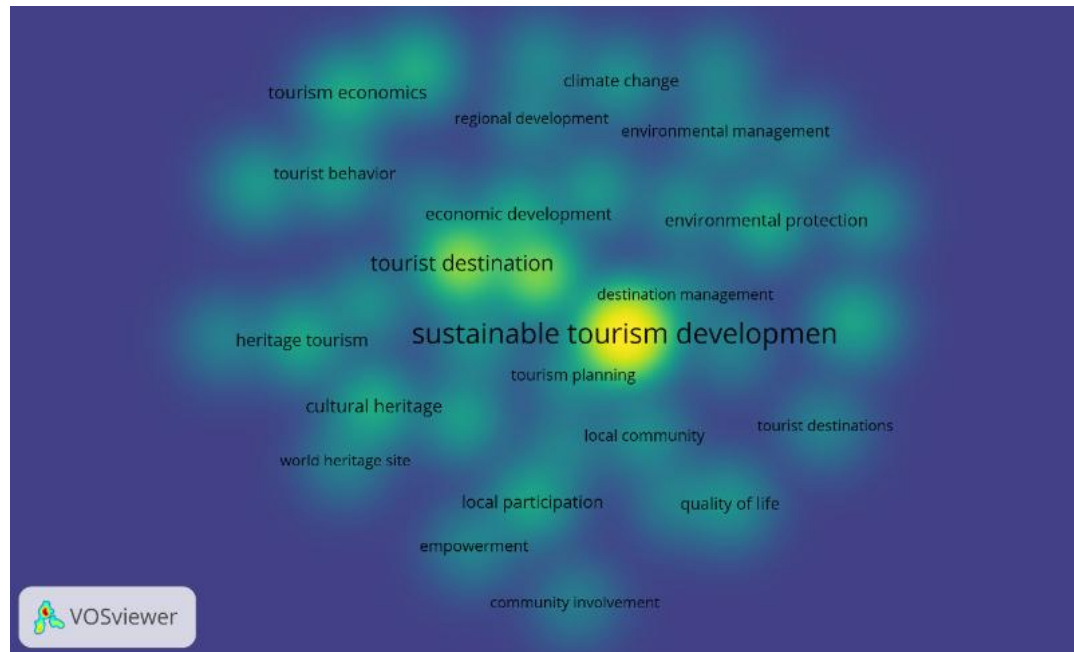

Figure 6. Density Visualization
Source: Data Analysis, 2025

The heatmap visualization presents the density of research activity based on keyword occurrences within the field of sustainable tourism development. The central term "sustainable tourism development" is the most intense (bright yellow), indicating it is the most frequently occurring and co-occurring keyword, thus forming the thematic core of the literature. Other high-density terms appearing in yellow to light green include "tourist destination," "economic development," and "tourism planning," suggesting these concepts are also central focal points of research and often discussed in relation to the core theme. Surrounding this core are several medium-to-low density clusters represented by green and teal shades, such as "environmental protection," "tourism economics," "local community," and "cultural heritage." These indicate moderately high interest but slightly less centrality in the current scholarly discourse. Terms with darker blue surroundings—such as "empowerment," "community involvement," and "quality of life"—appear less frequently and suggest either emerging themes or underexplored areas.
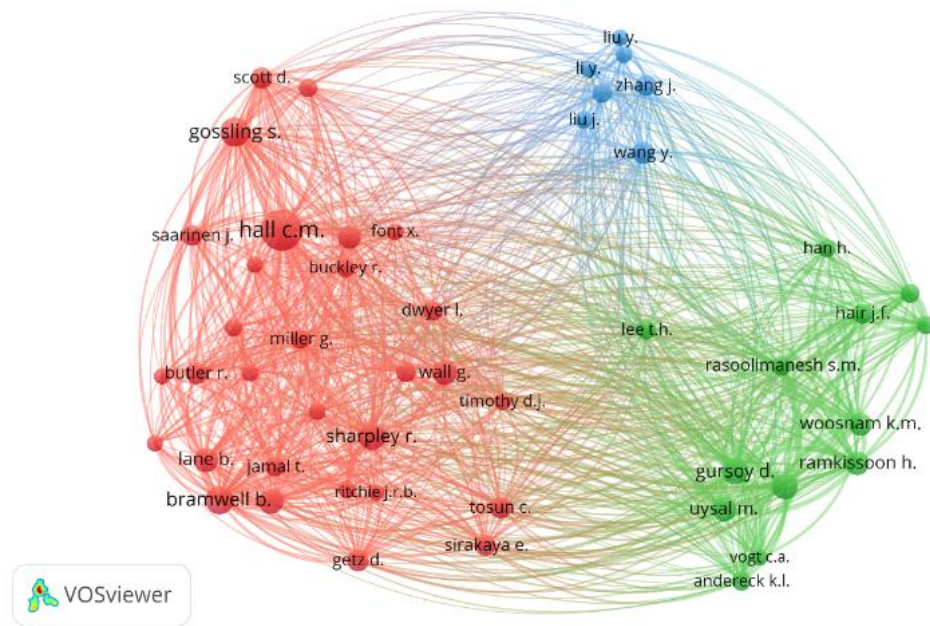
c. **Co-Authorship Network Visualization**

Figure 7. Author Visualization
Source: Data Analysis, 2025

The co-authorship network visualization illustrates the collaborative structure among leading scholars in sustainable tourism development. The network is divided into three main clusters, each color-coded to signify distinct research communities. The red cluster, prominently centered around Hall C.M., Gössling S., and Bramwell B., represents a well-established group of foundational scholars who have contributed extensively to the conceptual and governance aspects of sustainable tourism. This cluster exhibits dense interconnections, reflecting frequent collaboration and shared thematic focus on sustainability policy, tourism impacts, and systems thinking. The green cluster, led by authors such as Rasoolimanesh S.M., Han H., Hair J.F., and Uysal M., is indicative of a more recent and empirically driven research group, often focused on quantitative methods, tourist behavior, community perceptions, and structural modeling approaches. Meanwhile, the blue cluster, including Liu Y., Zhang J., and Wang Y., reflects a distinct network of scholars, often affiliated with Chinese institutions, contributing significantly to destination management, planning, and sustainable development within the Asian context.
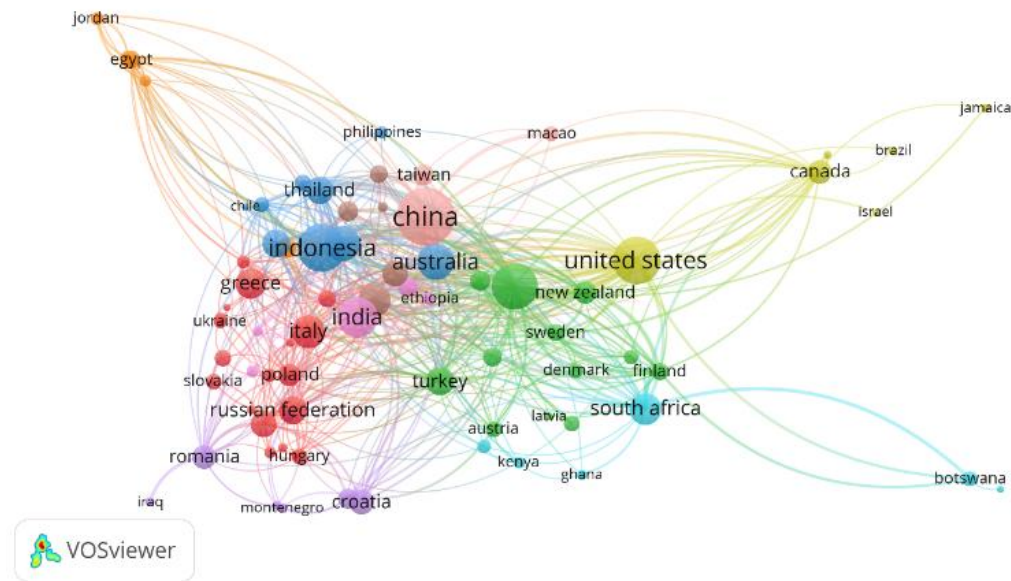
Figure 8. Country Visualization
Source: Data Analysis, 2025

The country collaboration network visualization reveals the global landscape of academic cooperation in sustainable tourism development research. The United States, China, and Indonesia appear as central nodes with large circles, indicating their high volume of publications and extensive collaborative linkages. These countries act as major hubs, connecting with both developed and developing nations. India, Italy, and Australia also play key bridging roles, linking regional research efforts in Asia and Europe. The strong connections between South Africa, Botswana, and Kenya highlight active regional partnerships in Africa, while countries like Canada, Brazil, and Jordan form distinct but less densely connected clusters. Notably, European countries such as Turkey, Poland, Greece, and the Russian Federation exhibit strong intra-regional collaboration.

4.2 *Discussion*

a. Temporal Growth and Publication Trends

The annual publication trend from 2001 to 2025 shows a dramatic increase in research output, especially after 2017, with a sharp peak in 2023. This trajectory underscores a growing scholarly and policy interest in sustainable tourism as sustainability concerns become more central in global development agendas. The decline in 2025 is likely due to incomplete indexing at the time of data collection rather than an actual drop in academic output. This growth aligns with the adoption of the United Nations' Sustainable Development Goals (SDGs) in 2015, particularly Goals 8, 12, and 14, which directly pertain to responsible tourism, sustainable consumption, and conservation efforts. The increasing number of publications signifies the maturity of the field and its recognition as a multidisciplinary area of research that intersects with environmental science, economics, sociology, and cultural studies.

b. Institutional and Geographic Contributions

The analysis of top institutions reveals a notable global spread of research efforts. The University of Johannesburg leads in publication count, followed by the

Chinese Academy of Sciences, Griffith University, and Universiti Sains Malaysia. These institutions highlight the diverse geographic engagement with sustainable tourism issues, from Africa and Asia to Oceania. Their contributions reflect both the relevance of sustainable tourism to their national economies and their active involvement in scholarly debates around conservation, development, and cultural preservation. The country-level analysis reinforces this diversity. China emerges as the most prolific contributor, followed closely by Indonesia, the United States, and the United Kingdom. China's leadership is likely due to its policy commitment to sustainable development and increasing investment in tourism infrastructure and research. Indonesia's high contribution is particularly noteworthy, reflecting its rich natural and cultural assets, heavy reliance on tourism, and growing academic output from Southeast Asia. Meanwhile, traditional research powerhouses such as the US and UK maintain strong positions due to their long-standing academic infrastructure and international collaborations. African nations such as South Africa and Botswana also appear prominently, suggesting growing recognition of the importance of sustainable tourism for development in the Global South.

c. **Thematic Structures and Research Hotspots**

The keyword co-occurrence network reveals four major thematic clusters in the literature. The red cluster focuses on community-centered themes, including local participation, empowerment, and quality of life. These concepts underscore the centrality of inclusive development and participatory governance in achieving sustainable

tourism goals. This cluster reflects a critical shift in the field from top-down planning models toward grassroots empowerment, where local communities are seen not merely as beneficiaries but as active agents in tourism development. The green cluster highlights market-driven aspects such as tourism economics, tourist behavior, and cultural heritage. It emphasizes the role of destinations and economic sustainability in shaping tourism policies. This stream of literature tends to explore the balancing act between maximizing economic returns and preserving local culture and ecosystems. It is particularly relevant for countries that heavily depend on tourism as a source of GDP and employment. The blue cluster focuses on environmental sustainability, with keywords such as climate change, environmental protection, and environmental management. This theme reflects the increasing urgency to align tourism practices with ecological preservation, particularly in the face of climate change and environmental degradation. It also suggests a strong intersection between tourism and environmental policy, with scholars advocating for more responsible destination management practices. The yellow cluster, although smaller, acts as a bridge among the major themes, incorporating regional development and economic development. This suggests that sustainable tourism is increasingly being situated within broader frameworks of territorial planning and national development strategies. It illustrates the multidimensional nature of tourism, which simultaneously impacts economic systems, ecosystems, and social structures.

d. **Thematic Evolution and Emerging Issues**

The overlay visualization further refines our understanding by showing the temporal progression of research topics. Older foundational themes such as sustainable tourism development and environmental protection are shown in darker colors, indicating long-standing academic engagement. Meanwhile, more recent interest is seen in keywords such as climate change, empowerment, heritage tourism, and quality of life, which are colored yellow and green. This shift indicates that the field is evolving to address contemporary global concerns. For instance, the emergence of climate change and quality of life reflects a growing awareness of the socio-environmental implications of tourism and the need for strategies that enhance well-being while preserving ecological integrity. Similarly, increased attention to heritage tourism and cultural preservation suggests a renewed interest in leveraging local identities and traditions as tourism assets, particularly in the post-pandemic context where authenticity and resilience have gained importance. The heatmap visualization confirms that central topics like tourist destination, economic development, and tourism planning remain research hotspots, while concepts like community involvement and empowerment are less dense but gradually gaining attention. These findings point to promising areas for future research, especially studies that can integrate these emergent themes into broader sustainability frameworks.

e. **Intellectual Structure and Influential Authors**

The co-authorship network reveals three distinct clusters of influential scholars. The red cluster, led by prominent figures such as Hall C.M., Gössling S., and Bramwell B., represents foundational contributors who have shaped much of the theoretical and governance-oriented discourse. Their work is widely cited and highly interconnected, indicating cohesive and influential research networks. The green cluster, including scholars like Han H., Hair J.F., and Rasoolimanesh S.M., is characterized by more recent empirical research with a focus on behavioral modeling, structural equation modeling, and the measurement of sustainability indicators. This suggests a methodological diversification in the field, with increased use of quantitative techniques to evaluate tourism impacts and effectiveness. The blue cluster, which includes authors like Liu Y., Zhang J., and Wang Y., reflects a strong Chinese research network, contributing extensively to destination management and sustainable policy frameworks within Asia. This network illustrates the growing contribution of non-Western scholars in shaping global sustainability discourse and highlights regional academic autonomy in addressing context-specific tourism challenges.

f. **International Collaboration Patterns**

The country collaboration map further illustrates the global nature of sustainable tourism research. The United States and China serve as key international hubs, collaborating widely with both developed and developing countries. Indonesia, India, and South Africa also appear as central actors within their respective regional clusters, forming strong academic ties with neighbors and global partners alike. Interestingly, African countries like Botswana, Kenya, and Ghana are closely linked to South Africa, reflecting regional integration and shared tourism development goals.

Meanwhile, European countries such as Italy, Poland, and the Russian Federation form tight regional clusters with extensive intra-European collaboration. The map demonstrates a healthy and expanding network of scholarly cooperation, which is essential for addressing the transboundary nature of sustainability challenges in tourism.

g. **Implications and Future Directions**

The findings of this study offer several implications for researchers, policymakers, and practitioners. First, the growing volume and diversity of research suggest that sustainable tourism is no longer a niche area but a core component of the global sustainability agenda. As such, future research should aim to bridge thematic clusters—particularly integrating community participation with environmental sustainability—to develop holistic and actionable strategies. Second, the emergence of new themes such as climate change, resilience, and quality of life calls for interdisciplinary approaches that go beyond traditional tourism studies. Collaborative work involving environmental scientists, urban planners, economists, and social scientists is crucial for capturing the full complexity of sustainable tourism systems. Lastly, there is a clear need to further support and amplify research from the Global South. While countries like Indonesia, South Africa, and India are becoming increasingly influential, structural barriers such as funding inequality and limited access to high-impact journals still constrain broader participation. Strengthening global academic networks and promoting equitable knowledge exchange will be vital for ensuring that sustainable tourism development is truly inclusive and responsive to local realities.

5. CONCLUSION

This bibliometric study provides a comprehensive overview of the intellectual landscape, thematic evolution, and global collaboration patterns in sustainable tourism development research. The findings reveal a significant growth in scholarly output, particularly in the last decade, driven by increasing global attention to sustainability challenges. Core themes such as environmental protection, community participation, economic development, and destination management have remained central, while newer topics like climate change, heritage tourism, and quality of life have emerged as important research frontiers. Influential authors and institutions are spread across diverse regions, with notable contributions from China, Indonesia, and the United States, highlighting the global relevance of the field. The study also underscores the importance of interdisciplinary collaboration and the need to amplify voices from the Global South to ensure inclusive and context-sensitive approaches.

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