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# **Relationship between Environmental Sustainable Development Goals and Sustainable Tourism: Current Status and Future Prospects**

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## **Abstract**

In this paper, we examine the current trend in tourism literature about a possible link between sustainable tourism and the targets of the environmental sustainable development goals (ESDG) proposed by the United Nations. We conduct a systematic literature review and bibliometric analysis on a sample of 160 papers published between 2015 until March 2023. The sample papers are organized in four clusters, namely, environmental sustainability, types of sustainable tourism, geographical location, and research method. The findings suggest that tourism literature strongly focuses on sustainable tourism and acknowledges the importance of environment in the discussion related to sustainability of the sector. However, there is lack of initiative to examine the relation between sustainable tourism and its contribution toward the achievement of targets of the ESDGs. In addition, we find that OECD member states are performing better compared to non-members in achieving the sustainable development goal 7 and 13, which are the proxy for environmental sustainability in this study. We also find that case study is the most popular research method in this field. The identified research gap in these clusters allowed us to make a list of the future research agenda in relation to the link between ESDG and sustainable tourism. The findings of the paper show how to extend the existing literature in future to enrich the knowledge about the topic. In addition, the findings will guide policymakers to make necessary changes in the regulatory framework of the tourism sector for enhancing the sector's contribution in achievement of the ESDG targets.

**Keywords:** Environmental Sustainability Development Goal; Climate action; Energy; Carbon emission; Net-Zero; Sustainable Tourism

## 1 | Introduction

The notion of ‘sustainable tourism’<sup>1</sup> has arguably emerged after the Brundtland Commission reports in 1987 and since then it has been widely embraced by academic researchers in tourism, practitioners and regulators associated with the industry (Hall, 2019; Moyle et al., 2021; Ruhanen et al., 2015). A Sustainable Development Goal<sup>2</sup> (hereafter SDG) is the core of any policy related to the sustainable future (Sneddon et al., 2006) and every industry and their stakeholders needs to play an important role in the achievement of the SDGs. In this paper, we focus on the tourism sector (Bramwell et al., 2017) and the contribution of the same on the environmental sustainable development goals<sup>3</sup> (hereafter ESDG). Similar to other studies, extensive contribution of travel and tourism activities on global economic growth motivated us to focus on this sector (Niñerola et al., 2019; Sokhanvar & Çiftçioğlu, 2022). In 2021, the contribution of the tourism sector to the global gross domestic product was 5.81 trillion U.S. dollars, an increase of almost one trillion U.S. dollars from the time of the pandemic (Statista, 2023<sup>4</sup>). According to the United Nations World Tourism Organization (UNWTO), we can observe a pre-pandemic growth in the sector in 2023 and the sector can fully recover by 2024. Over the last decades, because of the immense importance of the tourism in world economic development, we find discussion about how to ensure that there is a sustainable development of the sector (Berno et al., 2001). To develop sustainably, the tourism sector considers socioeconomic and environmental factors in the operational strategies of sustainable tourism (Mihalic, 2020). However, it is difficult to generalize the findings of these studies related to sustainable tourism, because of the existence of too many perspectives borrowed from different fields of study explaining the achievement of the sector (Sharpley,

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<sup>1</sup> According to the World Tourism Organization, Sustainable Tourism is defined as “tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities,” (Source: <https://sdgs.un.org/topics/sustainable-tourism>)

<sup>2</sup> In 2015, the United Nations adopted the Sustainable Development Goals (SDGs), also known as the Global Goals. This universal call by the UN is to action to end poverty and protect the planet so that, by 2030, all people in society can enjoy peace and prosperity. There are 17 SDGs and they are closely linked with each other and the development must balance social, economic and environmental sustainability (Source: <https://www.undp.org/sustainable-development-goals>) .

<sup>3</sup> Three pillars of SDGs are social, economic and environmental sustainability. Environmental sustainability was previously mentioned in Millennium Development Goals (MDG 7) but did not address properly the goal to combat climate change challenge. After 2015, environmental sustainability received higher attention alongside other sustainable developmental goals as it is an important pathway to ensure future generations have the natural resource available to live an equal, if not better, way of life as current generations (<http://www.unep.org/about-un-environment/sustainability>)

<sup>4</sup> <https://www.statista.com/statistics/233223/travel-and-tourism--total-economic-contribution-worldwide/>

2020). Thus, the widescale implementation of sustainable tourism remains limited in practice (Molina-Collado et al., 2022). Moreover, with the adoption of the SDGs by the United Nations (UN) in 2015, we find additional attention in the literature on sustainable tourism. For example, Ruhanen et al. (2015) have highlighted the theoretical approaches, contextual themes, and spatial patterns of the trends of sustainable tourism during the period of 1988-2012. Later, Moyle et al. (2021) developed a better understanding of sustainable tourism and highlighted the growing popularity of it from 1987-2017. In addition, Molina-Collado et al. (2022) find that, from 1994 until 2020, the number of papers establishing a link between different aspects of environment and tourism increased in the sustainable tourism literature. In these interdisciplinary studies, there are discussions about the possibility of attainment of SDG targets through sustainable tourism (Nunkoo et al., 2021) where application of sustainable development indicators acts as a competitive measurement of sustainability (Rosato et al., 2021). There is evidence where sustainable tourism considers collaborative innovation as a tool for the achievement of SDG (Leminen et al., 2021). However, in the literature, we find that, to be prominent in sustainable tourism, the business and their stakeholders can cause damage to environment by overusing nonrenewable natural resources (Yfantidou & Matarazzo, 2017). So, the literature is inconclusive about the relationship between sustainable tourism and achievement of ESDG targets. In other words, the discussion about sustainable tourism is mainly focused on overall discourses of sustainable goals rather than the impact of the same on the achievement of the ESDG (Higham et al., 2021). Thus, in this timely paper, we examine the following important questions. What is the existing trend of tourism literature in establishing the relationship between sustainable tourism and environmental sustainability development goals? What should be the future tourism research agenda to establish a link between sustainable tourism and the targets of the environmental sustainability development goals? Following the literature, we consider the UN definitions of SDG 7, which is defined as affordable and clean energy, and the SDG 13, climate action to proxy for ESDG<sup>5</sup> (Mustafa et al., 2021).

Given growing tension about changes in climate and environment changes and responsibility of business and their stakeholders in the rapid deterioration of environment, there

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<sup>5</sup> We follow <http://www.unstats.un.org> to define SDG 7 and SDG 13. The UN SDG 7 refers to affordable and clean energy, and the UN SDG 13 refers to climate action. In this paper, we use SDG 7 and SDG13 instead of repeating the definition of SDG 7 and SDG 13. Following Mustafa et al. (2021), we adopt SDG 7 and SDG 13 to proxy environmental sustainability.

is an urgent need to critically analyze SDG 7 and SDG 13 in detail, which is largely missing in tourism literature (Fischer et al., 2020; Gokmenoglu & Eren, 2020). Thus, the purpose of this study is to synthesize sustainable tourism literature and explore its possible link with the ESDG. To capture the growing literature on sustainability tourism and possible actions to achieve the targets of SDG 7 and SDG 13, especially by the tourism sector; following the literature, we conduct a systematic literature review and bibliometric analysis to find the recent trends in the above relationship, identify the gap in literature and recommend the future research agenda (Molina-Collado et al., 2022). From the analysis, we find that, mostly, the literature on sustainable tourism focuses 17 SDGs together and is silent about the contribution of each type on the achievement of targets in ESDG. Thus, we propose that the future research on sustainable tourism should focus on ESDG rather than considering all SDGs in the discussion. There is an urgent need for a detailed understanding about which activity of tourism can expedite the achievement of SDG 7 and SDG 13 and impose limited to no further risk for the environment. Future research on sustainable tourism and the impact of the same on ESDG will assist the environment sustainability champions in the tourism industry to support the government initiatives in achievement of the targets mentioned in SDG 7 and SDG 13. The regulators will be in a better position to identify the changes needed in governing framework of tourism industry and to guide them in linking their sustainable tourism strategies with the ESDG.

In Section 2 of the paper, we summarize the relevant literature. In Section 3, we explain the research methodology including the search criteria used in systematic literature review and bibliometric analysis followed by findings in Section 4. In Section 5, we summarize the implication of the study followed by a conclusion in Section 6.

## **2. Literature Review**

As an economic agent of the society, contribution of businesses from different sectors in achievement of SDG targets is still questionable (Garcia-Sanchez et al., 2020). Researchers and professional organizations claim a lack of proper understanding of the business about how to align their sustainable strategies with the targets of SDGs (PWC, 2019; Wicki & Hansen, 2019). Businesses in the tourism industry are not an exception to that. The tourism research community is concerned about the impact of the activities of tourism businesses on the achievement of SDGs. Although the business in the tourism sector keeps SDGs in the core of the sustainability strategies, there is lack of detailed study linking tourism literature with each of the SDGs, including ESDGs (Moyle et al., 2021). In the last decade, tourism research

focused on opportunities associated with SDGs. But there is limited evidence about the success of the sector in overcoming the challenges imposed on the society related to the achievement of targets of SDGs (Bramwell et al., 2017). Each of the 17 SDGs recommended by the UN is highly linked with each other to balance the economic, social, and environmental dimensions needed for sustainable development (UN, 2015). The interconnection between SDGs is a complex system which is very hard to analyze with statistical techniques. In a recent study, Wu et al. (2022) applied advanced network analysis and found that environmental SDGs are negatively connected throughout the SDG index progression, which is similar to other studies (Zhou et al., 2017). Moreover, the attainment of ESDG targets positively influences the achievement of most of the SDGs (Scharlemann et al., 2020). In addition, interactions between SDGs differ because of various factors, including differences in sector characteristics (Weitz et al., 2018). Because of the immense importance of ESDG in achievement of other SDGs, in this research we focus on the environmental sustainable development goal in tourism.

In tourism literature, sustainable tourism is prominent in finding ways of achievement of targets of SDGs (Higgins-Desbiolles, 2018). Discussion about the progression of sustainable tourism is mainly observation-based, where themes of research are considered important rather than detailed analysis of content of the research published by journals. However, to understand the contribution of research in advancing knowledge about emerging issues, it can be better analyzed if there is a periodic monitoring of the content of academic journals (Van Doren & Heit, 1973; Xiao & Smith, 2006). Thus, to gauge the progress in sustainability tourism literature and how it considers the challenges in achievement of targets of ESDG, we conduct a systematic literature review and bibliometric analysis for a comprehensive analysis of the topic. From the critical and systematic analysis of the literature we find, from the Paris agreement in 2015 to the recent Conference of Parties (COP27) in Egypt 2022, tourism remains a significant sector of discussion. This sector has set out a plan to achieve its climate action ambitions. COP27 brought “leading stakeholders from the sector together to share practical insights into accelerating the shift to greater sustainability and reaching net-zero.” COP27 also discussed the pathway to reduce carbon footprint of tourism, promote sustainable tourism practices and support the development of low-carbon tourism infrastructure (UNWTO, 2021). Making the tourism sector more sustainable is an ongoing challenge, which is discussed widely in social science journals (Göösling, 2019; Scott, 2021). Simultaneously, we find evidence about the adverse impact of the tourism on environment (Higham et al., 2022) and busyness of

the policymakers in integrating relevant policies to mitigate the climate change challenges. International organizations are measuring carbon emission to keep track of their carbon footprint in the sector (Demeter et al., 2022). Rapid tourism expansion and increasing tourism revenues have positive and significant effect on global carbon emission per capita, mainly in the upper-middle income countries (Ochoa-Moreno et al., 2022). New policies are introduced to strengthen the contribution of sustainable tourism to decarbonize the sector. Although environmental sustainability is linked with the tourism sector, there is limited evidence on the contribution of sustainable tourism in attainment of targets of SDG 7 and SDG13. Because of the globalized nature of tourism, sometimes it is hard to collect data from different sources and to analyze a large volume of complicated data with widely used analytical tools (Tussyadiah, 2020). Thus, which research method should be adopted to answer the complicated relationship between sustainable tourism and ESDG is yet to be examined. The tourism and hospitality sector has made a significant contribution to the world economy (Dube & Nahamo, 2018), but simultaneously this sector is responsible for, as well as victim of, environmental damage. In COP 26, countries have signed up to the declaration and committed to cut carbon emissions in half by 2030 and achieve net zero by 2050. Thus, this is a timely research paper that will help us to understand how sustainable tourism could contribute toward achieving targets proposed in SDG7 and SDG 13. In addition, the findings of this paper will guide future researchers to understand which country needs more attention and which research method they should follow to provide scientific evidence about this emerging topic.

### **3. Methodology**

To determine how the tourism sector is becoming sustainable and how sustainable tourism can create potential pathways in achievement of targets of ESDGs to build a carbon neutral future, we conducted a systematic literature review (SLR) and bibliometric analysis, explained as follows.

#### **3.1 Systematic literature review**

The SLR is based on the Scopus database starting from 2015 until 2023. SLR methodology is adopted to identify, elect, critically appraise, and collate findings in prior relevant studies and identify future research agenda related to the research topic. To eliminate the possibility of



selection bias (Mustafa et al., 2021), we used a possible combination of keywords related to “environmental sustainability,” “sustainable development goal,” “environmental sustainability development goal” and “sustainable tourism.” The search was limited to published open-access and peer reviewed journal articles written in English. The initial sample consisted of 171 documents. The sample was comparable with related literature. Following the literature, we carried out a filtering process by reading the abstracts and organized our search for analysis (Moyle et al., 2021; Pizzi et al., 2020). Three duplicate records were removed before screening. Further, eight records were removed prior to assessing eligibility because of lack of precise descriptions, non-availability of full journal article, not fully matched with the search criteria and published other than in English. The final sample consisted of 160 research papers. We considered the appearance of the keywords in the abstracts, title, indexed keywords and in the full text in our search. In the next step, we read each article to conduct the analysis. Figure 1 reports the PRISMA of the study.

(Figure 1 about here)

After adjusting the inconsistencies, we coded and tagged papers and included them in the relevant four clusters. For tagging, we used the relevant part of the text and mapped it with the keywords in the text of the papers. In the final sample, 49 papers are related to environmental sustainability (cluster 1), and 41 papers are on sustainable form of tourism (cluster 2). Moreover, 32 papers helped us to explain the geographical location cluster (cluster 3) and 38 papers are key in explaining the research methods (cluster 4). In Table 1, we report the thematic clusters and the relevant keywords.

(Table 1 about here)

### **3.2 Bibliometric analysis**

Bibliometric methodology is a quantitative technique to analyze bibliometric data (e.g., units of publication and citation) (Donthu et al., 2021) to uncover the emerging trends about the

discussion on any topic in journals, collaboration patterns among disciplines and it also allows researchers to systemize research evidence in a scientific field (Donthu et al., 2021; Pizzi et al., 2020; Rosato et al., 2021). Any sustainability goal is always interlinked with other SDGs (including environmental SDGs), which demands for validity check of any finding drawn from a particular methodology. Moreover, sustainable tourism is comprised of various components of tourism and involves large number of stakeholders and their interest associated with tourism. Because of the multidimensional aspect of our research question, we decided to conduct bibliometric analysis along with the SLR. We try to understand how scholars from different disciplines provide valuable insights to the discourses of impact of sustainable tourism on the achievement of ESDG targets.

## **4. Findings**

In this section, we give detailed findings after the analysis of the research data.

### **4.1 | Findings from the systematic literature review**

We examine the network of interconnected topics based on how the articles have been categorized in different clusters.

#### ***4.1.1 | Cluster 1: Environmental sustainability***

As tourism is recognized as one of the major economic activities in many countries (Scheyvens, 2018), a set of initiatives has been undertaken to encourage and support the new paradigm of tourism business, focused on SDGs (UN WTO 2019a, 2019b). Over the last three decades, we find a great shift in tourism research toward sustainable tourism where targets of SDGs are given priority by the sector (Moyle et al., 2021). Several researchers adapted a holistic approach and considered all SDGs or interaction among SDGs while answering their sustainable tourism research question (Yfantidou & Matarazzo, 2017). However, others find that environmental SDGs are negatively connected throughout the SDG index progression (Wu et al., 2022; Zhou et al., 2017). In addition, attainment of ESDGs could positively influence the success of other SDGs (Scharlemann et al., 2020). The clock is ticking too fast for the industries to modify their existing operational strategies in achievement of SDGs and, simultaneously, the recent development in the international environmental policy demands for urgent research focused on ESDGs.

In addition, we find that the tourism sector is not just the victim of global climate change but also produces a considerable amount of greenhouse gas (GHG), which, in turn, has a deleterious effect on the climate. To achieve the net zero target, the worldwide tourism sector will have to take care of carbon pricing, requiring a massive deployment of energy-efficient technologies and a shift of their operations based on renewable energy sources (Scott & Gössling, 2021). The International Energy Agency (IEA) has set a global pathway to net zero emissions by 2050 (IEA, 2021) and, thus, we find discussion in the literature about the contribution of the tourism sector toward the set target (Scott & Gössling, 2021). Higham et al. (2021) show that air travel produces the most carbon (321 metric tons in 2005 and 397 in 2016) followed by the cruise ship industry and hotel accommodation (Cooper et al., 2021). Thus, the UNWTO is committed to expediting the progress of the sector toward low-carbon tourism development and contributing to the international climate goals. Initiatives by the UNWTO are reflected in academic literature (Elkhwesky, 2022). However, the above discussion shows that the tourism literature is inconclusive about the possible relation between environmental sustainability and sustainable tourism, as presented in Table 2. In our research sample, keywords like sustainability, SDG and climate change have a higher percentage of documents (24.37% for sustainability, 20.62% for SDG and 18.12% climate change) with higher citations (25% for sustainability, 26.49% for SDG and 22.01% for climate change). This means that the targets of the ESDG play a significant role in tourism, but how it could increase the contribution of the sustainable tourism toward a resilient and sustainable environment is not yet known. Future academic research should find ways to encourage the tourism sector to adapt affordable clean energy (SDG 7) in their strategies toward zero carbon climate action (SDG 13). In line with the research findings, scholars should draw policy guidelines about how the regulators should encourage tourism businesses and their stakeholders in achieving the ESDGs.

(Table 2 about here)

#### ***4.1.2 / Clusters 2: Types of sustainable tourism***

With the Brundtland Report (WECD, 1987), we observe a new trend in the tourism sector. Researchers, practitioners, and policymakers included sustainable tourism at the center of any discussion related to tourism (Ruhanen et al., 2015). In the last three decades, we observe rapid

progress in sustainable tourism (Bramwell et al., 2017). To mitigate the challenges and overcome the barriers in the achievement of targets of SDGs, new types and forms of sustainable tourism evolved in the literature. In Table 3, we summarize the key types of sustainable tourism in our sample. It is evident that sustainable tourism is always positive about their contribution toward the achievement of SDGs (Moyle et al., 2021). However, the literature is slim when it comes to a possible link between sustainable tourism and its contribution toward the achievement of ESDGs. Moreover, until now, the recent literature is divisive about the strength and weakness of the types of sustainable tourism and its connection with SDGs, including ESDGs (Sharpley et al., 2020). To address this gap, we assess the trend in the extant sustainable tourism literature around environmental sustainability. In addition, we draw a future research agenda about the topic.

(Table 3 about here)

From the critical analysis of our research sample, (see Table 4), we find Ecotourism is the most significant type of sustainable tourism. Twenty-five percent of papers of the research sample, with 160 papers, are focused on ecotourism. Ecotourism is the fastest growing type of global tourism, as it allows tourists to enjoy nature without creating any stress on natural resources (Cobbinah et al., 2017). In addition, we find that ecotourism becomes eligible as a sustainable tourism only when the focus of the tourism will be nature-based, tourists will gain knowledge from the interaction with nature and the tourism business alongside their visitors should follow principles and practices related to environmental sustainability (Weaver & Lawton, 2007). The second most important type of sustainable tourism in our sample is Cultural tourism (39 documents with 59 citations). Cultural tourism has recently been reaffirmed by the UNWTO as a significant component of international tourism, accounting for 39% of tourism arrivals (Richards, 2018). Cultural tourism is growing rapidly in relation to cultural consumption (Stylianou-Lambert, 2011), cultural motivation (Falk, 2011), anthropology and the creative economy (Richards, 2018). Agricultural tourism is another form of sustainable tourism which exclusively focuses on the revenues of the farms and farmers, development in consumer markets, off-farm marketing, and retailing (Cohen & Avieli, 2004; Smith, 2014; WFTA, 2013). Arrivals of tourists in heritage sites is considered as Heritage tourism (23 documents out of 160 papers), which creates employment opportunities for locals, increased stakeholder value and

helps to participate in heritage promotion programs (Chong & Balasingham, 2019). Food tourism is a unique type of sustainable tourism, where the preparation and consumption of food can be sustainable (El Archi et al., 2023; Taş Gürsoy, 2021).

(Table 4 about here)

The findings of our analysis are consistent with existing literature, which shows that sustainable tourism has high potential in achieving SDGs (Niñerola et al., 2019). Moreover, most of the activities of each type of sustainable tourism are focused on nature and highly sensitive to the environment (Moyle et al., 2021). But we cannot find any strong evidence about the capability of each type of sustainable tourism (Table 3) in attainment of the ESDGs. Thus, in this research, to enrich the knowledge base, we draw a future research agenda about the topic.

#### ***4.1.3 / Cluster 3: Geographical location***

Because of the immense economic value created by the tourism sector, we find that every country around the world engages in tourism (Sokhanvar & Çiftçioğlu, 2022). Large-scale engagement of the economic agents (like tourism businesses, tourists, and their stakeholders) in tourism activities, created the need for the practice of sustainable tourism (Chong & Balasingham, 2019). In the literature, we find that the sustainable tourism strategies adopted by the developed countries mostly failed in the developing countries, mainly because of the differences in the institutional and infrastructural set-ups (Göösling, 2000). However, some countries progressed quickly in linking sustainable tourism activities with environmental sustainability, like the use of renewable energy or clean energy in tourism (Kaygusuz, 2012). But when it comes to mitigation of climate change, the global tourism leaders possess diverse opinions (Göösling & Scott, 2019). The current sustainable tourism literature already started discussing the implication of the roadmap proposed by the international energy agency on the sector (Scott & Göösling, 2022). From our analysis, it is evident that the existing literature has no clear indication about how the existing infrastructure, economic development, institutional set-ups, regulatory framework, and resource constraints at country level could allow their sustainable tourism opportunities to achieve the targets of the ESDGs. In Figure 2, we show

the countries in our sample which are actively engaged in sustainable tourism and taking an initiative to link the same in achieving the SDGs.

(Figure 2 about here)

In addition, in Figure 3, we show on a global map how many papers we find in our sample related to each country. A better way to understand the geographical segmentation of research is to analyze it by country. By using the choropleth map (shades of color), we show the distribution of particular entity (documents) across the world. It is evident from the map that the United States of America is the leading nation with 29 documents. A comprehensive analysis of the clusters confirms that OECD countries are mostly advanced in the subject matter with countries like China (24), the United Kingdom (23), Australia (16), and Italy (13) leading the way ahead than their other continental counterparts. In Asia-Pacific, China is the leader, followed by Malaysia (9) and India (7). Countries with grey color and yellow color have very low documents (Canada, 9; Spain, 6; Portugal, 5) in our sample.

(Figure 3 about here)

In the Sustainable Development Report, 2021, the United Nations shows a detailed ranking hierarchy of 193 UN member states according to the scores, which measure countries' total progress toward achieving 17 SDGs. The SDG achievement scores of the top 15 countries are higher than 80 out of 100. Finland scored the highest (85.90), followed by Sweden (85.61), and Denmark (84.86). In summary, the report shows that OECD member states are performing better than non-member states in achieving SDG targets, including SDG 7. However, progress toward climate mitigation (SDG 13) is limited. The last 15 countries in the list with a score of less than 50 out of 100, belong to the African continent. Thus, it is evident that certain clusters of countries are performing better in achieving ESDGs. Keeping the differences in performance of cluster of countries in mind, we examine the trend in sustainable tourism for these clusters. For example, we find that OECD countries are the world's top tourism destinations and account for 56.9% of global arrival. The tourism sector directly contributes 4.4% of GDP, 6.9% of employment and 21.5% of service export in OECD countries<sup>6</sup>.

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<sup>6</sup> Available at: [www.oecd-library.org](http://www.oecd-library.org), accessed 16<sup>th</sup> April 2022

However, with the rise of globalization and technological advances, long-distance travel has become easier and cheaper in OECD countries, which generates economic development in these countries through tourism (OECD, 2022). Simultaneously, rapid and unplanned tourism growth has increased the negative environmental impact on tourism destinations, including congestion, overcrowding and pollution (OECD, 2011). Hence, the literature is inconclusive about the contribution of sustainable tourism in ESDGs. Moreover, the European countries in this cluster are guided by the clause of the European Commission on the SDGs (Wong, 2019) and make a significant contribution in the achievement of SDGs (Pizzi et al., 2020). For example, in the UK, environmental protection is top in the priority list of sustainable tourism followed by business profitability (Kharouf et al., 2020). Similarly, in the USA protection of nature, biodiversity and climate is the key to sustainable tourism (Clark & Nyaupana, 2020). In Central Asia, China is serious about climate-resilient policies (Cai et al., 2019; Zhu et al., 2021). In addition, we find that Sub-Saharan Africa countries from the CEMAC cluster are taking aggressive steps in achieving the 2030 agenda of environmentally sustainable tourism (Carius & Job, 2019). Thus, our analysis shows there is a need of country-specific study alongside the country cluster to understand the link between sustainable tourism and ESDGs. In Table 5, we report the country cluster level findings of our sample.

(Table 5 about here)

#### ***4.1.4 / Clusters 4: Research methods***

In the research method cluster, we summarize the techniques used by the researchers to collect and analyze data in our sample. Because of the interdisciplinary nature of tourism literature, we find that, to evaluate the findings, researchers have used both qualitative and quantitative research methods which are heterogeneous in nature (Okumus et al., 2018). In Table 6, we report the types of research methods and distribution of papers under each method from our sample.

(Table 6 about here)

Our analysis shows that the case study is the most dominant research method in our sample. 38.75% of the documents used this method followed by survey (31.25%), focus group discussion (16.87%) and analytic hierarchical method (13.12%). Case study is identified as a qualitative form of research design. It is comparative, retrospective and a snapshot (e.g., analysis of state and process at the time of the research), or a longitudinal study (Flick et al., 2004). It can be designed through both inductive and deductive logics (Dooley, 2002). According to Brunt et al. (2017), the data obtained by a case study cannot be generalized to the broader population. Case study method in hospitality and tourism research is used to identify the areas that need attention in future research, to study the main stakeholders in the destination context and to understand consumer demand (Caker & Aykol, 2020). In focus group discussion, researchers assemble a group of individuals to discuss a specific topic aiming to draw from the complex personal experiences, beliefs, perceptions, and attitudes of the participants through an interaction (Nyumba et al., 2017). In addition, a Likert scale tool is highly popular in the sustainable tourism research focused on survey and is used to measure the degree of agreement and disagreement from a diverse range of statements about some attitude, person, object, or event (Blancas et al., 2010; Taherdoost, 2019). The AHP method, on the other hand, is used to determine “the weights of criteria and priorities of alternatives in a hierarchical structure based on the pairwise comparisons” (Ngo & Creutz, 2022). However, the above-mentioned research methods are mostly popular in assessing qualitative data and cannot be applied in big data analysis. The findings of such data analysis cannot be generalized. Thus, after analyzing the research method used in recent sustainable tourism and its relationship with SDGs, we find a doubt about the suitability of these methods in explaining the complex relationship between sustainable tourism and ESDGs. In the future research agenda about the topic, we added the possible application of other research methods.

#### **4.2 | Findings of bibliometric analysis**

Following relevant literature, in this section we add the detailed findings of the bibliometric analysis conducted on our research sample (Niñerola et al., 2019). In Figure 4, we find that, from 2015 until March 2023, the overall number of papers published about sustainable tourism and environmental sustainability are increasing, which supports the relevance of the research question proposed in this paper.

(Figure 4 about here)



Following Farrukh et al. (2020), we use ‘co-citation,’ ‘bibliographic coupling,’ and ‘co-word’ analysis to conduct the bibliometric analysis to validate the trend in the literature observed in SLR related to the topic. To conduct the bibliometric analysis, we represent different component (authors, institutions, countries) by network diagram where the web shows the interconnected linkage among these different components. On the other hand, different sizes of bubbles in the network represent a single data point. These nodes represent the actor in the network system (e.g., article, author, country, keyword, journal). A bigger bubble represents higher occurrences of a particular component. Each color represents a thematic cluster. Wherein the nodes and links in that cluster can be used to explain the theme’s (cluster’s) coverage of topics (nodes) and the relationships (links) between the topics (nodes) manifesting under that theme (cluster) (Donthu et al., 2021).

#### ***4.2.1 / Co-citation analysis***

Co-citation analysis occurs when two or more publications cite a particular or a pair of publications and then that pair of publications is considered as co-cited. The connectedness of the topic among co-cited publications forms a cluster of literature network and, thus, we conduct a co-citation check among articles, journals, and associated authors (Mustafa et al., 2021; Pizzi et al., 2020). Following Pizzi et al. (2020), we use VOS Viewer software to calculate the indicators of interest in the paper. The output graph shows an element with a circle, and the connected circles represent a network. Because of the different importance of various factors, the size of a circle will also vary. The spatial position and colors of the circles indicate the relevance of the clusters mentioned in this research.

#### ***References***

The network analysis related to the relevant articles associated with the research question is represented in Figure 5. In this graph, we show the papers with the highest number of coupling strengths. When the reference lists of two articles are cited by each of the article, then they are considered as cited documents. If the intersection of these two reference lists is non-empty, then both articles are bibliographically coupled. The number of items in this intersection is called the bibliographical coupling strength. The bibliographical coupling strength divided by the number of items in the union of the two reference lists is called the relative bibliographic coupling strength (Sen & Gan, 1983; Shen et al., 2019) However, in the future research agenda, the importance of connectedness among each type of sustainable tourism and the relative coupling strength can be useful in assessing the link between sustainable tourism and ESGs.

(Figure 5 about here)

Out of 160 articles in our dataset, a minimum threshold of four citations is considered and the obtained set contains 23 cited references. The high coupling strength of the sample shows the importance of sustainable tourism and environmental sustainability in the tourism literature. Our analysis shows that, since 1990, sustainable tourism has progressed rapidly. Moreover, sustainable tourism started becoming mature when it became successful in setting up links with the attainment of SDGs (Bramwell et al., 2017). As a result, the future of the tourism sector becomes sustainable. There exists higher coupling strength for papers by Boluk et al. (2019) who addressed a few core SDG themes (e.g., gender issue, challenges in circular economy, governance, and ethical consumption, etc.) and criticized the contribution of the sustainable tourism in its achievement. The concept of sustainable tourism is redefined in terms of an overarching paradigm which incorporates a range of approaches to the tourism/environment system within the destination areas (Hunter, 1997). Jamal and Camargo (2014) discussed the key philosophical traditions and social-political perspectives on justice to tackle sustainable tourism for the socioeconomic and environmental benefit. From our sample, Hunter (1997) has highest number of citations (1451) followed by Bramwell et al. (2017), (386 citations), Jamal and Camargo (2014), (311 citations) and Boluk et al. (2019) (200 citations).

### *Sources*

In Table 7, we provide a list of leading journals related to the topic. The journals are selected where there are at least 20 articles published related to the research topic during the sample period and have total citations more than 35.

(Table 7 about here)

The density analysis (Figure 6) reveals that *Journal of Sustainable Tourism*, *Tourism Management* and *Annals of Tourism Research* are placed in the core of the discussion due to their high degree of specialization. In future, the density analysis should consider other research journals on sustainable tourism.

(Figure 6 about here)

### *Authors*

Figure 7 depicts how the authors cite each other's work and remain connected.

(Figure 7 about here)

Three high density clusters show high degree of bibliographic coupling, and one large moderate density cluster shows middle degree of bibliographic coupling. High density clusters include prolific authors like Hall, Gössling, Scott, and Higgins-Desbiolles as their works are related to sustainable tourism, tourism management and environment sustainability goals and they are from a management and geography discipline.

#### ***4.2.2 / Bibliographic coupling***

The bibliographic coupling technique operates on the assumption that two publications sharing common references are also similar in their content and this method helps to divide the articles into thematic clusters based on shared references and best used in a specific timeframe (Donthu et al., 2021).

##### *Article*

The bibliographic coupling of the 160 articles in the dataset can be helpful to better understand the theoretical foundations of these publications. The network of articles with at least ten citations is analyzed, and this analysis shows that the most extensive set of connected documents contains around 117 publications. The five researchers with the highest indices of bibliographic coupling are Dube (2021a, 2021b), Bianchi (2021), Liburd (2022), and Nunkoo (2023).

(Figure 8 about here)

In Figure 8, we find the works of Lew et al. (2016), Scheyens (2018) Hall (2019), and Scott (2019) are widely valued within the current literature.

Based on these documents, we have categorized major themes of the sample and presented them in Figure 9. Here, sustainable tourism research based on environmental

challenges is highly cited in the literature following involvement of local community and other stakeholders in the tourism development business.

(Figure 9 about here)

### *Journals*

For bibliographic coupling of journals, we follow the existing literature (Ferreira, 2018) and keep a minimum threshold of three articles per journal. The three journals with the highest bibliographic coupling index are *Journal of Sustainable Tourism, Sustainability* (Switzerland) and *Worldwide Hospitality and Tourism*.

(Figure 10 about here)

### *Organization*

Figure 11 represents the bibliographic coupling of organizations. This figure establishes a strong relationship between the organizations that produced the documents, as they are drawing on similar sources and possibly working in related fields. In the context of different organizations, bibliographic coupling can be used to analyze and understand the relationship and collaboration between them. From our dataset, six organizations have published at least two documents on the basis of the impact of tourism achieving SDGs (Figure.11): School of Business and Economics (Linnaeus university, Kalmar, Sweden; 317 citations); Department of Geography (University of Oulu, Oulu, Finland; 271 citations); Department of Management (marketing and entrepreneurship, University of Canterbury, Christchurch, New Zealand; 271 citations); African Institute of Corporate Citizenship and Department of Ecotourism Management (Vaal university, South Africa; 54 citations); School of Tourism and Hospitality (Johannesburg, South Africa; 7 citations); and Faculty of Applied Science (WSB University, Poland; 8 citations) have the highest degree of bibliographic coupling index. These organizations mainly focus on tourism research, regional development and policies, sustainable development goals and environmental challenges across developed and developing countries. By examining the overlap in the references cited by publications from different organizations, researchers can identify areas of common interest.

(Figure 11 about here)

### **4.2.3 / Co-word analysis**

Co-occurrences of keywords have been used to evaluate more specifics of the discourse, understanding of particular associations that have been established between its keywords and also highlights the emergence of the recent works in this field. Our result shows that, out of 1247 keywords, 59 of them appear at least four times within the list. Ten keywords with stronger link strength are as follows (Table 8).

(Table 8 about here)

In Figure 12, the cluster of the keywords denotes the major themes of the study. Each bubble in the network represents an entity (keywords) and the size of the bubble indicates the occurrences of the keywords (i.e., number of times that the keywords occur). The link between the bubble represents the co-occurrence between keywords (i.e., keywords that co-occur or occur together), the bigger the bubble, the greater the occurrence of the keyword, and the thicker the link between bubble, the greater the occurrence of the co-occurrences between keywords. Each color represents a thematic cluster, whereas the bubble and links in that cluster can be used to explain the theme's (cluster's) coverage of topics (bubble) and the relationships (links) between the topics (bubble) manifested under that theme (cluster).

(Figure 12 about here)

## **5 Discussion and Implication**

In this paper, we conduct a critical analysis of literature to examine the trend in the sustainable tourism research about its possible link with the environmental sustainability. The findings of our analysis indicate that academic literature is mainly concerned about the challenges faced by the tourism sector in achievement of SDGs, which is similar to other research in tourism (Niñerola et al., 2019). There is no in-depth discussion on the contribution of sustainability tourism in achievement of environmental sustainability (Farmaki et al., 2015). Thus, our

research question is original and unique in nature. In addition, we find countries in the OECD cluster are progressing better in linking sustainable tourism with SDGs in general and with some targets of ESDGs. Application of case study method is popular in such research. We identified three significant theories widely used by papers in our sample. The most encompassing theoretical development of the last decade is the introduction of the mobility theory. According to Urry (2000, p.186), it focuses on the “diverse mobilities of peoples, objects, images, information, and wastes.” Sustainable tourism is seen as part of a sub-set of a vast, heterogeneous, and complex global mobilities, which also includes migration, return migration, diasporas, transnationalism and other obligatory as well as voluntary forms of travel (Cohen & Cohen, 2012). In addition, we find gradual adoption of the Actor Network-Theory (ANT) since 2000 (Van Der Duim et al., 2013, 2017). This theory enables radical new ways of examining and describing tourism by critically investigating its ontological conditions and making use of three notions central to ANT: ordering, materiality, and multiplicity (Cohen & Cohen, 2012; Van Der Duim et al., 2013). The relevance of practice theories for tourism policies extends into the realms of policy and governance. Shove and Walker (2010) convincingly argued that practice theories can provide an “alternative to the dominant psychology and economics driven rational-actor perspectives in policy designs. It highlights more desirable social practices which might emerge and can be fostered by policy.” Adopting a practice-based perspective challenges the dominant paradigms that inform and legitimize policies of both state and non-state actors (Dredge, 2014).

The academic implication of this study is far reaching. From the cluster analysis and the bibliometric findings, we identified the key gaps in the sustainability tourism literature in relation to environmental sustainability. The future research agenda summarized below will enrich relevant academic and theoretical literature. In addition, this research evidence will indicate the necessary policy changes required for the tourism sector and possible initiatives by the industry stakeholders for achievement of environmental sustainability. Regulators working on climate issues will get a guidance from the research findings about how to enhance inclusivity by engaging the tourism sector in achieving the worldwide targets related to SDG 7 and SDG 13. We find that importance of environment SDGs in tourism literature started getting attention since 2015 and became popular after the release of the seminal work by Scott et al. (2016). Thus, the tourism sector is aware of the significant environmental challenges and the industry is keen in identifying ways to be ‘carbon neutral’ in the near future. Introducing responsible tourism activities and practices could reduce the tourism industry carbon footprint

and has the potentiality in introducing positive changes in operation for an environmentally friendly sustainable future (Ali et al., 2021). The tourism sector can introduce eco-friendly travel, use renewable energies (e.g., solar or wind energy), limit use of water for heating, washing and create eco-friendly awareness among guests to achieve environmental sustainability. So, our findings indicate that tourism businesses and their stakeholders could play the leading role in the global response to SDG 7 and SDG 13 and extend literature in green tourism (Wei et al., 2022). However, because of limited academic evidence, we propose that future researchers in sustainable tourism should pay greater attention to environmental sustainability.

Large scale adaptation of sustainable tourism is only possible when the efficiency of the operation of the industry is discussed in an interdisciplinary space. The types of sustainable tourism already identified in the literature are summarized in the second cluster in Table 2. For example, in a recent study, Vespestad and Gressnes (2021) found that tourists who are aware about environment and climate change possess a willingness to pay for a nature-based touristic experience. Similar experience could increase positive engagement of human beings with the environment. However, these studies mostly concentrate on certain types of sustainable tourism instead of exploring the possible link of the type with environmental sustainability. Thus, in future research agenda, we call for research evidence on types of sustainable tourism and their contribution in achieving environmental sustainability. Positive stories about the strong link between sustainable tourism and environmental sustainability will guide tourism businesses in finding ways to practice sustainable tourism in connection with SDG 7 and SDG 13. Moreover, we find that there is lack of empirical evidence in sustainable tourism mainly because of lack of data availability (Tölkes, 2018). From 160 papers in our data source, very few documents are based on quantitative analysis. Thus, the future research agenda should focus on application of advanced technology and big data analytics to collect and analyze numerical data for a better understanding about the influence of sustainable tourism on environmental sustainability (Nuenen & Scarles, 2021). In addition, communicating sustainability concerns of the tourism industry to their stakeholders is not mature enough (Kristjánsdóttir et al., 2017). There is an urgent need for the adoption of innovative approaches by the industry to communicate implications of sustainable tourism in environmental sustainability (Line et al., 2016). Researchers provide empirical evidence of adoption of intelligent automation in tourism (Tussyadiah, 2020) but there is almost no evidence about the relation between climate change and clean energy and the types of sustainable tourism. In future research, we propose better

attention toward behavioral intention of the tourists (Huang et al., 2021). For such research, we need a better theoretical understanding of the motivation of the tourists and advanced analytical skills to link the same with post-trip experience. We find OECD countries like Austria, Spain, France, Greece, Hungary, and Portugal are progressing well in capturing environmental challenges in sustainable tourism (OECD, 2022). However, there is lack of evidence for other countries, like, Sweden, Slovak Republic, Denmark, and Finland (OECD, 2022) Future research should focus on these countries.

## **6. Conclusion**

This paper examines the relation between sustainable tourism and achievement of ESDGs. Beside the immense importance of study, similar to other studies, there are certain limitations. The systematic literature is based on selected keywords widely used in sustainable tourism. However, there is a possibility of other keywords having indirect effect on the topic. Sample article classification is also subjective in nature and is based on individual judgment. However, this paper gives a heads-up to the research community to start thinking about the interconnectedness between sustainable tourism and environment sustainable goals in their future research. Beside the far-reaching academic contribution of this study, the findings will give indication to the tourism industry about which approach and process to follow in their business to introduce sustainable tourism and to contribute toward environmental SDGs. In future, we aim to explore the financial advantages that could be generated through sustainable tourism. Research on environment SDGs has universal applicability, promotes a long-term approach to address global challenges and requires joint action of policymakers, businesses, and their stakeholders to alleviate global economic, environment and social crises. This research has strong emphasis on global, national, and local collaboration and building understanding among government, private enterprises, and civil society. Because of the interdisciplinary nature of the question raised in this study, the policymakers involved in debating the ways of expediting the achievement of environment sustainable goals will be benefited from our findings.



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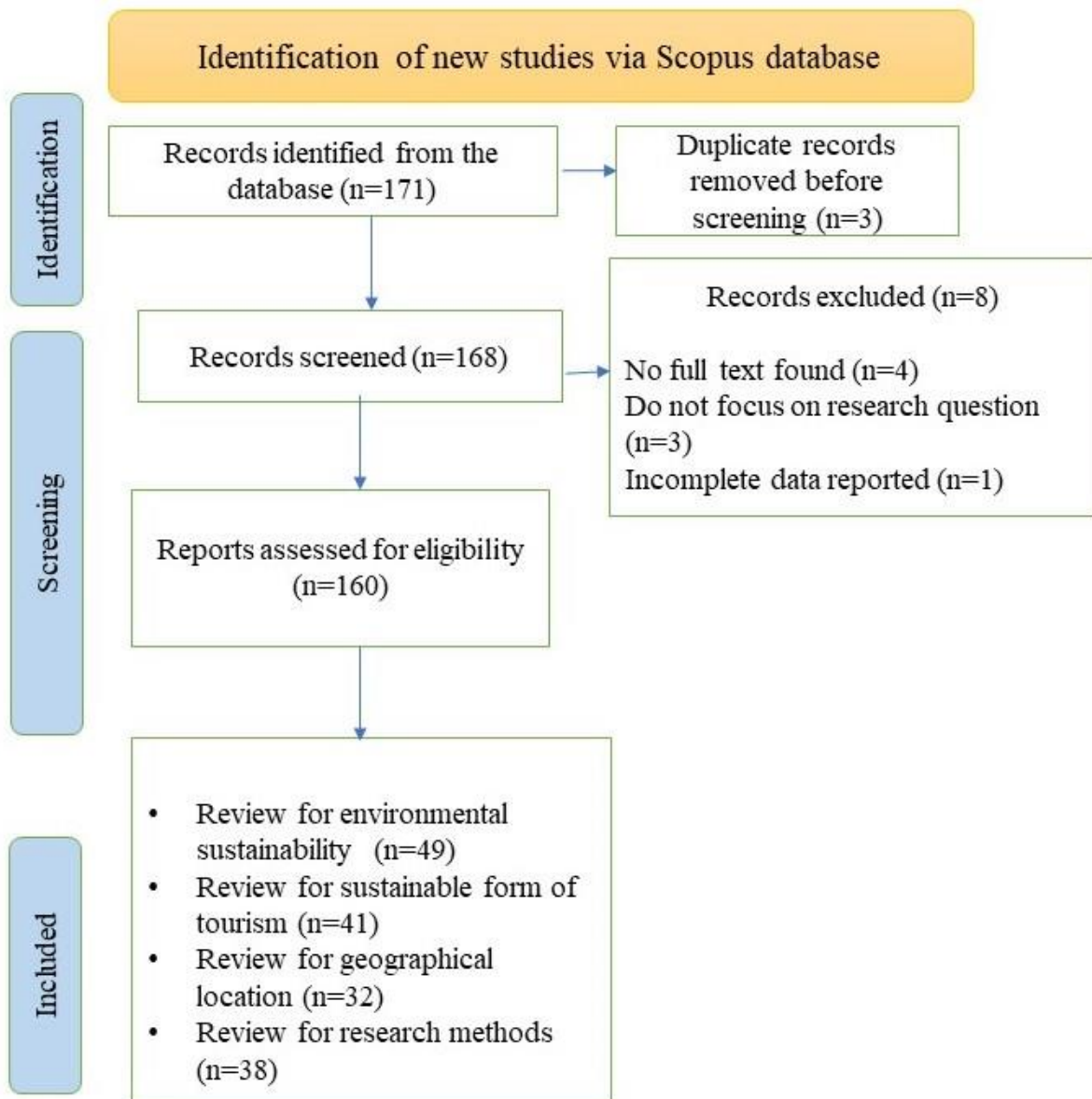
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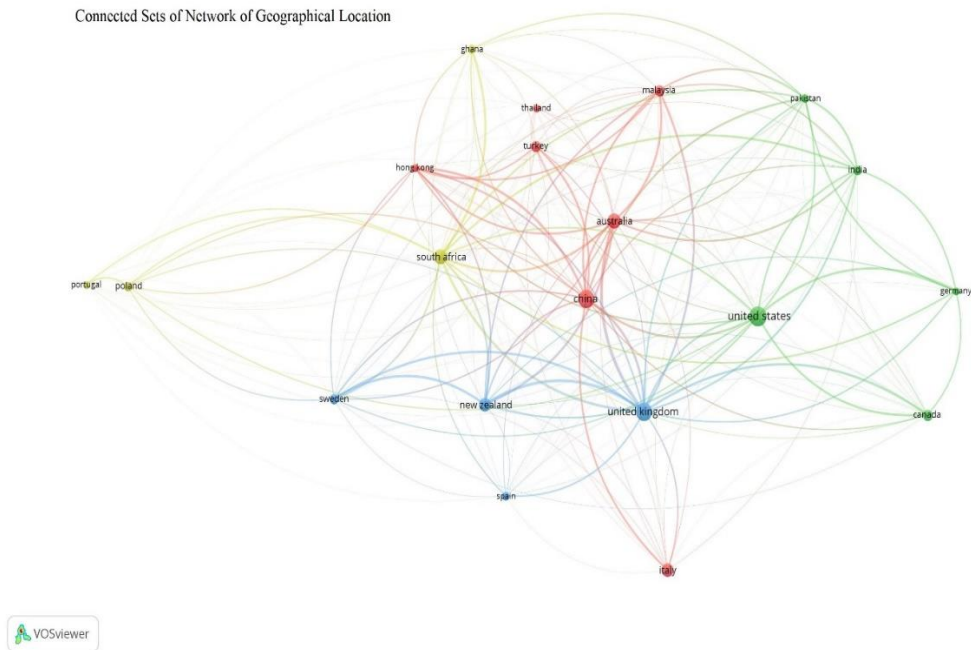
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**FIGURE 1** PRISMA flow diagram



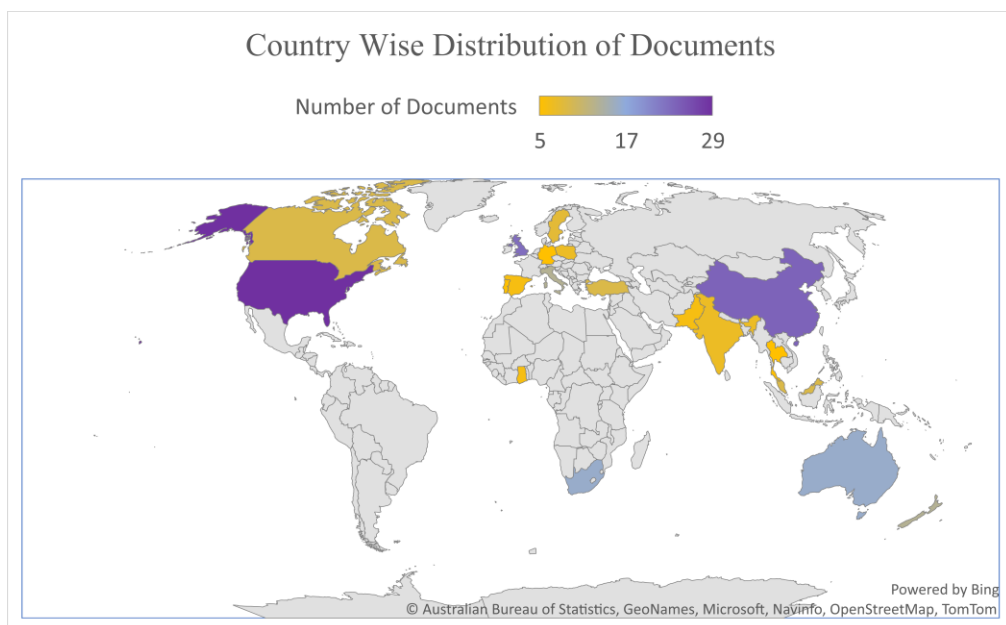


**FIGURE 2** Geographical location clusters



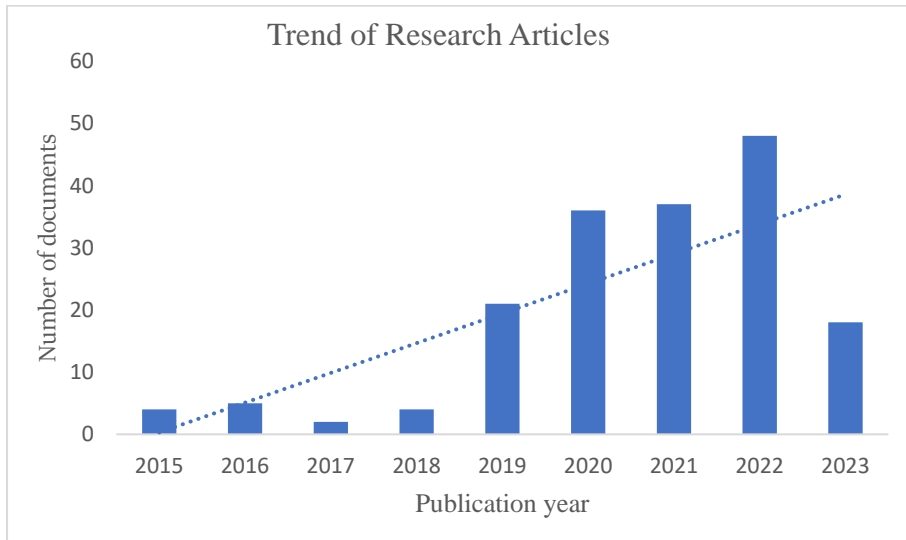
Note: Figure 2 shows the network of countries in the sample. Circle of different colors indicate the main countries engaged in sustainable tourism and have initiatives in achievement of overall targets of SDGs. Higher importance of the country in sustainable tourism is indicated by bigger circles.

**FIGURE 3.** Distribution of documents across the globe



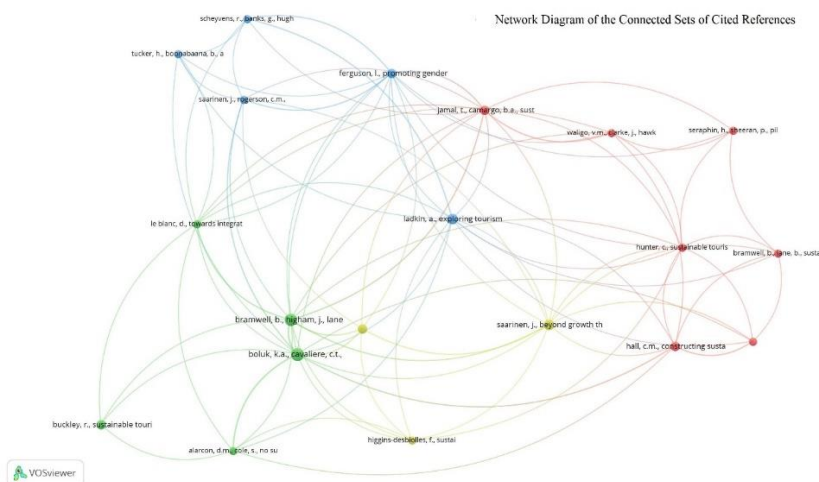
Note: On the global map in Figure 3, we show how many papers we find in our sample for each country

**FIGURE 4** Trend of research articles published per year of the sample on sustainable tourism and environmental sustainability.



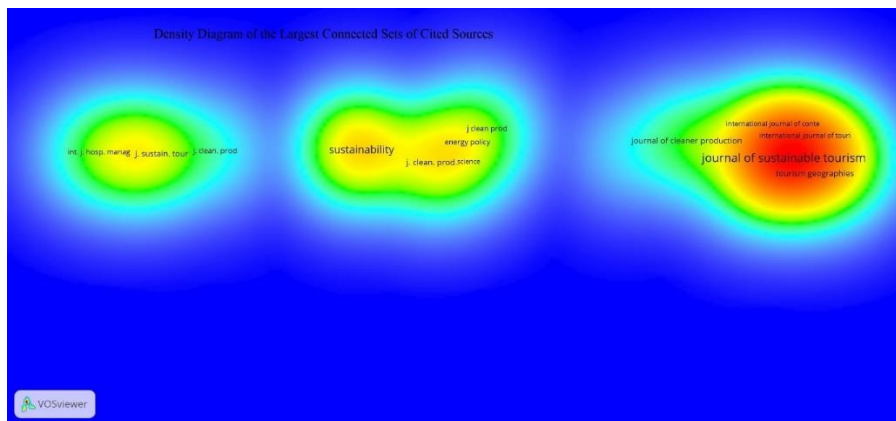
Note: In Figure 4, we show the growing number of papers published per year from 2015 until March 2023 on sustainable tourism and environmental sustainability in the Scopus database.

**FIGURE 5** Network diagram of the connected sets of cited references



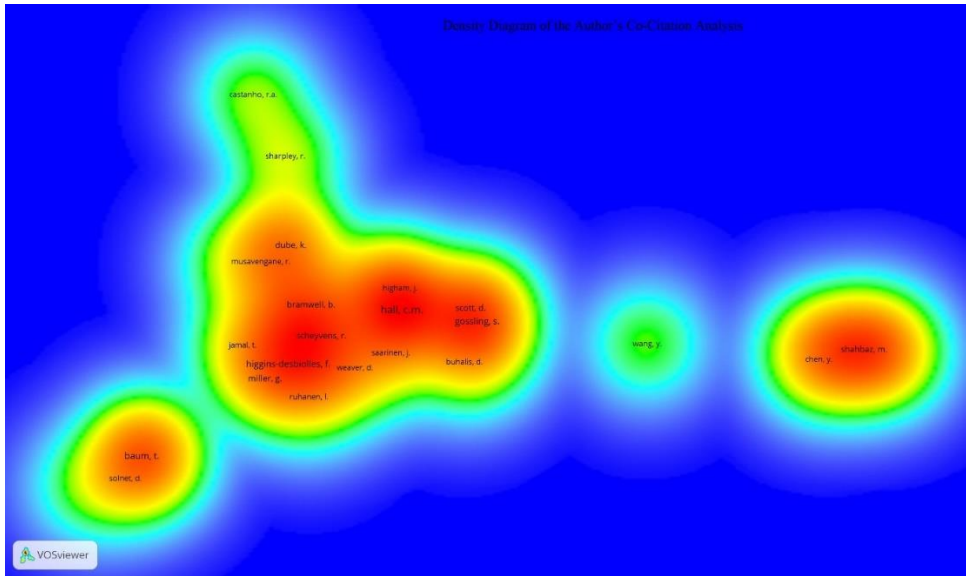
Note: Figure 5 is the network diagram of the connected sets of cited references. The key pair of articles cited by each other are shown in the diagram.

**FIGURE 6** Density diagram of the largest connected sets of cited sources



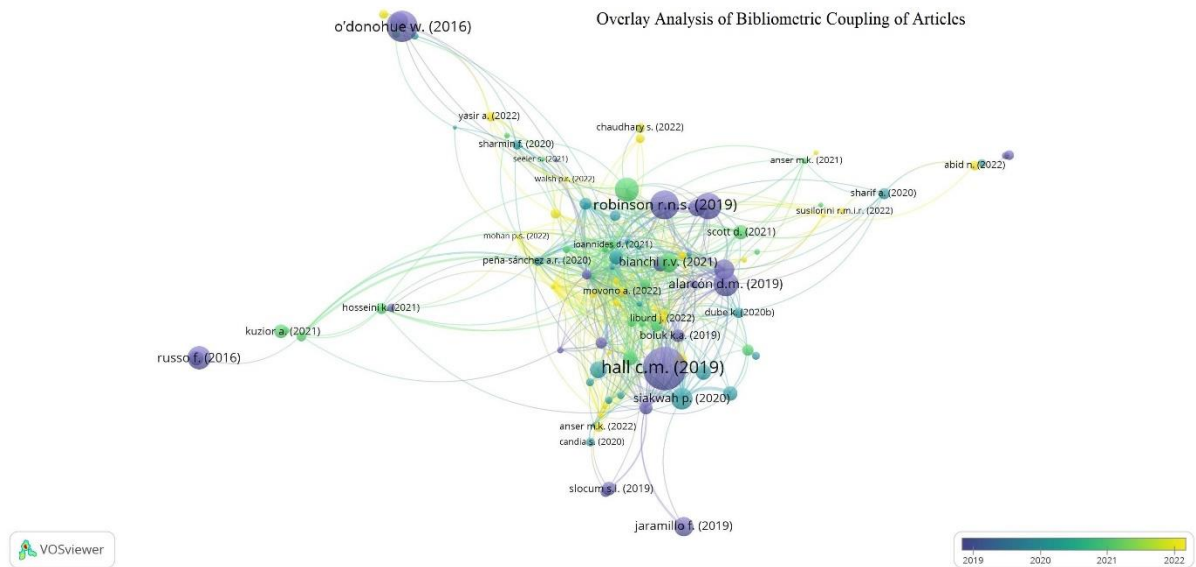
Note: In Figure 6, our findings show three large, connected sets of cited sources. Some journals appear in more than one set.

**FIGURE 7** Density diagram of the author's co-citation analysis



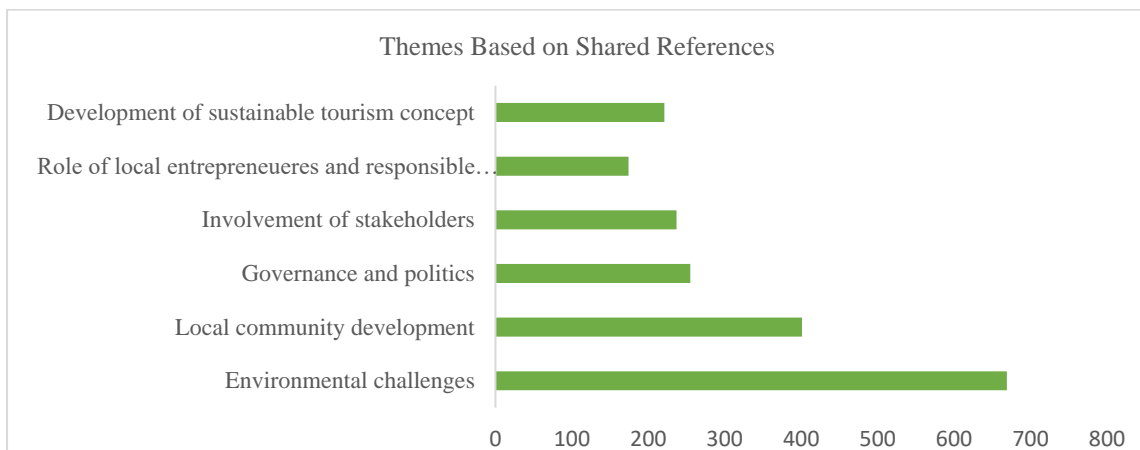
Note: Figure 7 represents the density diagram of the author's co-citation analysis. Bigger size

**FIGURE 8** Overlay analysis of bibliographic coupling of articles (weights and scores are based on citation)



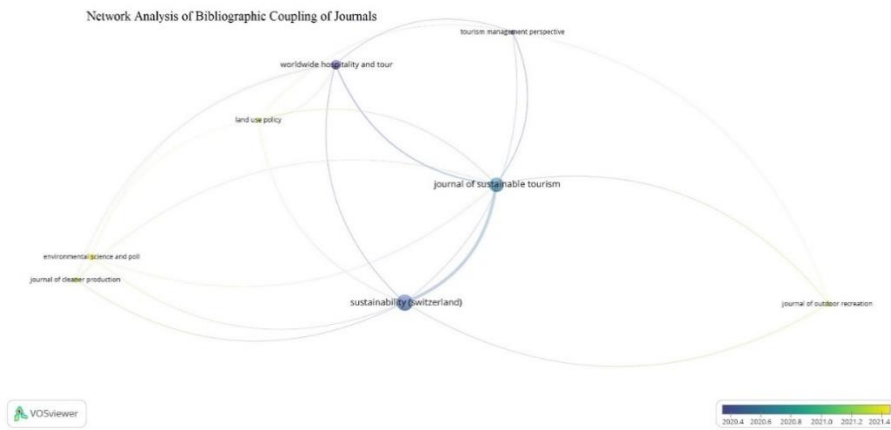
Note: In Figure 8, we show the bibliographic coupling of articles. The weights and scores are based on citation. Different colors indicate different periods. The size of the circles indicate the authors with different weights and scores.

**FIGURE 9** Major themes based on shared references.



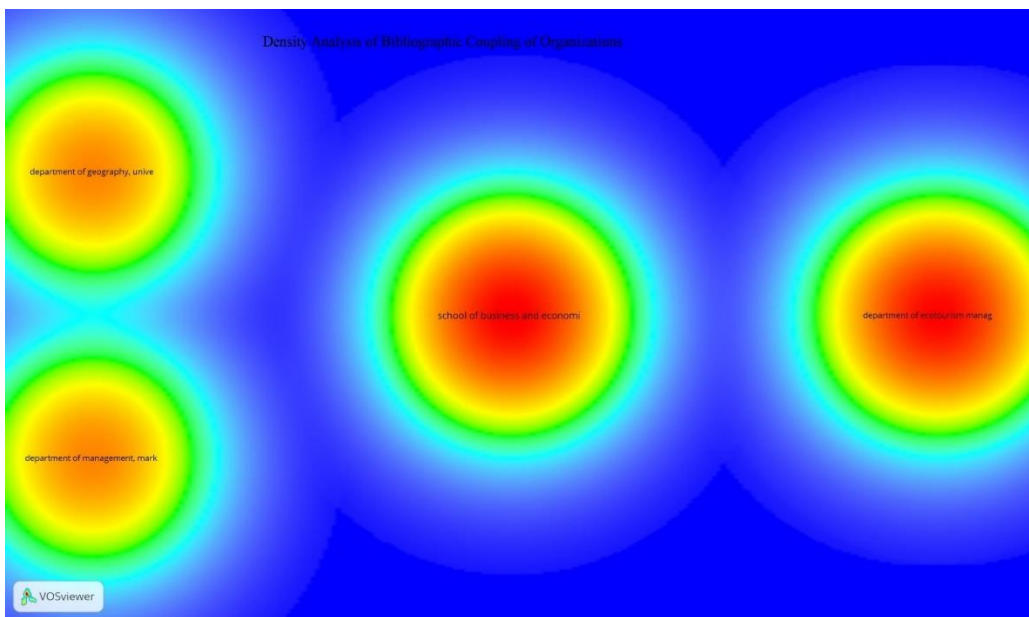
Note: In Figure 9, the authors calculate the major themes based on shared references from the total sample.

**FIGURE 10** Network analysis of bibliographic coupling of journals



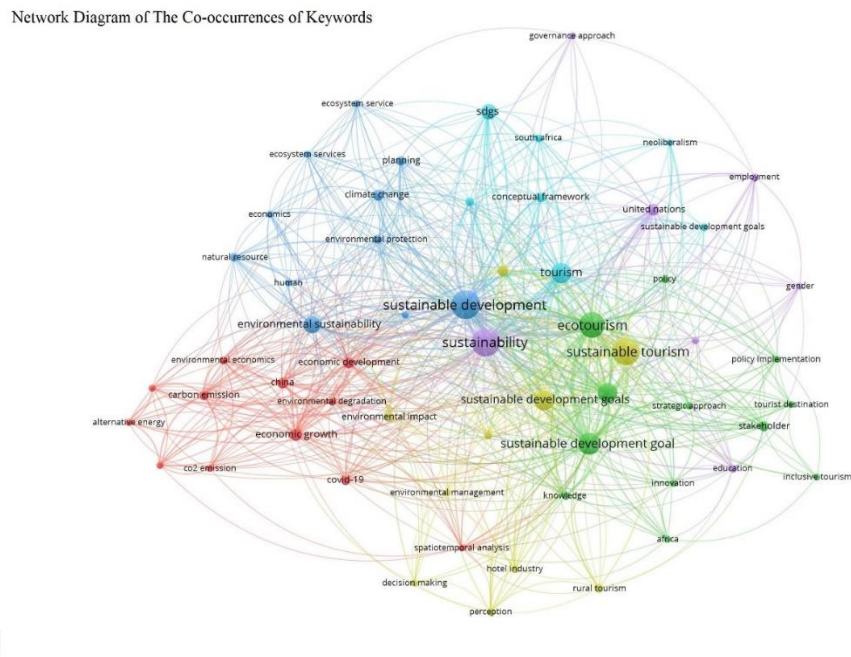
Note: Figure 10 shows the network analysis of bibliographic coupling of journals.

**FIGURE 11** Density analysis of bibliographic coupling of organizations



Note: In Figure 11, we show our findings related to the bibliographic coupling of organizations. The density and size of the circle denotes the importance of the organization in the context of the topic.

**FIGURE 12** Network diagram of the co-occurrences of keywords



Note: Figure 12 is a network diagram of the co-occurrence of keywords. Here, Red Clusters are for mitigation of climate change challenges and adoption of environment friendly sustainable tourism practices; Green Clusters denote prospects of achieving sustainable development goals in tourism and stakeholder's collaboration in the development of rural tourism; Yellow Clusters indicate the process of development moving toward balanced and sustainable future; Purple Clusters are associated with local community involvement and development of eco-tourism as a model of sustainable tourism; Sky Blue Clusters denote challenges of shifting to renewable energy and environmental protection

**TABLE 1** Thematic Clusters and Related Keywords

Clusters	Thematic markers	Main Keywords
Environmental sustainability	Tackling climate change challenge, shifting to renewable energy source, transport and environment, clean environmental energy and carbon neutrality	sustainability, SDGs, climate change, renewable energy, carbon emission, environmental sustainability, environmental protection. Environmental economics
Types of Sustainable tourism	Responsible travel to natural areas, explore tangible and intangible culture, experience agriculture in a personal and exclusive way	Ecotourism; cultural tourism; agro /agricultural tourism; heritage tourism; Food/culinary tourism; Smart tourism, tourism management, stakeholders, tourism market
Geographical location	OECD countries, MINT countries, CEMAC countries	Europe, China, Africa, Saudi Arabia, Portugal, Mexico, Indonesia, Latin America, Italy, India,
Research methods	Case study, survey, focus group discussion, Likert scale, content analysis, analytic hierarchical method (AHP),	Fuzzy scale, exploratory factor analysis, sustainability score, descriptive model, mapping

Note: In Table 1, we organized the research sample in four thematic clusters, namely, environmental sustainability, types of sustainable tourism, geographical location and research method. We used interconnected keywords to prepare the clusters.

**TABLE 2** Major Keywords in Environmental Sustainability Cluster

Keywords	Documents	Citation	% Documents	% Citation
Sustainability	39	506	24.37	21.55
SDG	33	494	20.62	21.03
Climate change	29	392	18.12	16.48
Renewable energy	23	247	14.37	10.51
Carbon emission	15	206	9.37	8.77
Environmental degradation	12	278	7.5	12.11
Environmental protection	9	225	5.62	9.58



Note: In Table 2, we show the appearance of the prominent keywords related to the Environmental Sustainability Cluster in our research sample. To capture the popularity of the keywords in the relevant research, we added the percentage of citations of the papers.

**TABLE 3.** Types of Sustainable tourism

Types of sustainable tourism	Definition	Source
Ecotourism	Form of tourism where travel should be in undisturbed areas with the specific objective of studying, admiring, and enjoying the nature and culture. This concept enhances the ethic of how to explore the natural environment ensuring a minimum impact on its resource base.	Ceballos-Lascurain (1991); Cater, E. (1998) Diamantis (1999)
Cultural tourism	It is a type of tourism activity in which the visitor's essential motivation is to learn, discover, experience and consume the tangible and intangible cultural attraction or products in a tourism destination.	UNWTO (2018); Richards (2018)
Agri/ Agricultural tourism	It is a farm tourism activity which includes recreational based activities, hospitality services, agriculture education and a variety of rural-based outdoor recreational activities. Some of these tourism activities are offshoots of active farms.	Barbieri et al. (2008); Fleischer et al. (2018)
Heritage tourism	When tourism business is based upon the utilization of the historic resource.	Poria et al. (2003); Timothy (2018)
Food/culinary tourism	Visit to primary and secondary food producers, food festivals, restaurants and specific location for which food testing/experiencing the attribute of specialist food production region are the primary motivating factor for travel.	Hall and Sharples (2003); Ellis et al. (2018)
Smart tourism	Smart tourism uses fifth generation mobile communication technology which has made tourism destination "smart". Smart tourism uses the aggregated data from social connections, infrastructure, government organizations and people at a destination.	Chen et al. (2021)

Note: In Table 3, we define the key types of sustainable tourism identified in the research sample. We added the sources followed to define the types of sustainable tourism.

**TABLE 4** Distribution of research sample across types of sustainable tourism

Keywords	Documents	Citation	% Documents	% Citation
Ecotourism	40	631	25	26.53
Cultural tourism	34	572	21.25	24.47
Agricultural tourism	28	118	17.5	5.02
Heritage tourism	23	415	14.37	17.67
Food tourism	20	399	12.5	16.99
Smart tourism	15	213	9.37	9.07

Note: In Table 4, we present the distribution of the sample papers under different types of sustainable tourism identified from the literature in Table 3. We add the total percentage of citation of each type of sustainable tourism to show the growing trend of each type in existing literature.

**TABLE 5** Country cluster distribution of sample

Countries	Documents	Citation	% Document	% Citation
OECD countries (Australia, Denmark, Sweden, India, Italy, China, United Kingdom, United States of America)	66	835	41.25	35.56
MINT country (Mexico, Indonesia, Nigeria, Turkey)	52	729	32.5	31.04
CEMAC countries (Cameroon, Central Africa, Chad, Congo, Guinea, Gabon)	42	784	26.25	33.39

Note: In Table 5, we focus on three country clusters, namely OECD, MINT and CEMAC. In our sample, Australia, Denmark, Sweden, India, Italy, China, United Kingdom, and the United States of America represents OECD cluster with 66 documents; Mexico, Indonesia, Nigeria, and Turkey belong to MINT country cluster with 52 documents and Cameroon, Central Africa, Chad, Congo, Guinea, and Gabon represent the CEMAC country cluster with a total of 42 documents from the total sample.

**TABLE 6** Research methods

Research methods	Documents	Citation	% Documents	% Citation
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Case study	62	741	38.75	31.55
Survey	50	588	31.25	25.04
Focus group discussion	27	534	16.87	22.74
Analytic hierarchical method (AHP)	21	485	13.12	20.65

Note: In Table 6, we identify the key research methods used by researchers. We find number of documents and total citations related to each research method.

**TABLE 7** Top five prominent journals related to research

Sources	ABS ranking	ABDC ranking	citations	documents	Impact factor
Journal of Sustainable Tourism	3	A*	406	23	7.968
Sustainability (Switzerland)			256	42	3.281
Tourism Management	4	A*	205	13	10.967
Annals of Tourism Research	4*	A*	194	9	9.011
Tourism Geographies	2	A	93	6	7.430

Note: In Table 7, we report the leading five journals, the journal ranking by ABS and ABDC, and impact factor. We picked up the journals where there are at least 20 papers published related to the topic during the sample period and the total citation of these 20 papers is more than 35. In addition, in Figure 6, we draw a density diagram to show beyond the above five key sources, which are the other journals that are highly connected with each other.

**Table 8 Keywords with stronger link strength**

Keywords	Occurrences	Total link strength
Sustainable development	64	276
Sustainability	59	229
Sustainable tourism	57	226
Ecotourism	50	253
Sustainable development goal	37	192
Tourism	31	142

Note: Table 8 show the six main keywords in our sample, number of occurrence and the total link strength