

Sustainability in hospitality and tourism: a review of key research topics from 1994 to 2020

Hospitality
and tourism

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Abstract

Purpose – The purpose of this study is to examine the scientific research related to sustainability in hospitality and tourism from 1994 to 2020 by conducting bibliometric and science mapping analyses and to discuss the implications for prospective research opportunities.

Design/methodology/approach – Keyword co-occurrences with 2,980 published papers collected from the Web of Science (Social Science Citation Index and Emerging Sources Citation Index) were used for the bibliometric-based analysis. The authors use SciMAT software which offers relevant outputs, such as research themes and graphical outputs (strategic diagrams, cluster networks and science mapping representing the temporal evolution of the themes).

Findings – The findings show that biodiversity conservation, sustainable attitudes, climate change, protected areas, satisfaction and environmental management were the focal motor-themes in the studied periods. Additionally, four areas for future investigation are identified and discussed: sustainable behavior and environmental sustainability; consumption, demand and economic growth; tourism development and strategies; and rural tourism, poverty, ethics and education.

Research limitations/implications – This analysis shows insightful results processing a high number of published documents. However, the authors recommend further research focused on qualitative literature review for each critical topic.

Originality/value – The authors are unaware of analogous, completed and recent work about sustainability in hospitality and tourism. The authors believe this article is of great value to academics and practitioners because it synthesizes and disseminates the research topic while providing an outstanding basis for identifying research opportunities.

Keywords Bibliometric analysis, Science mapping analysis, Sustainability, Hospitality, Tourism, SciMAT

Paper type Research paper



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1. Introduction

Sustainability has become a popular concept in recent scientific literature and a key strategic guideline for public policies and the strategies of private business organizations. In the field of hospitality and tourism, sustainability has been one of the dominant discourses in academia, business, policy and government over the past three decades (Butler, 1999; Hopwood *et al.*, 2005; Prud'homme and Raymond, 2013; Sharpley, 2020), specially since 2015, when the United Nations members adopted the 2030 Agenda for Sustainable Development (Moyle *et al.*, 2020). Despite this progress, research on sustainability in tourism and hospitality continues to be underdeveloped (Ertuna *et al.*, 2019); hospitality and tourism companies are still far from implementing the results of academic research (Gössling and Higham, 2021; Sharpley, 2020). Moreover, although the benefits derived from addressing sustainable practices are clear in terms of costs reduction, enhanced customer satisfaction, trust and improved benefits (Batle *et al.*, 2018; Chan and Hsu, 2016), many hospitality and tourism managers still focus on maximizing profits and controlling costs while ignoring the potential of sustainability (Jones *et al.*, 2016). The COVID-19 pandemic has also opened new opportunities and challenges to develop sustainability activities and programs in the hospitality industry and tourism to respond to the new demands of society and stakeholders (Jones and Comfort, 2020).

This study addresses several literature gaps. First, sustainability is widely defined as “meeting the needs of the present without compromising the ability of future generations to meet their own needs” (United Nations, 1987, p. 16). Thus, the term sustainability is used to refer to multiple economic, environmental and socio-cultural policies and practices implemented by governments, businesses, or NGOs, such as environmental protection, containing climate change, favoring local economy, poverty elimination or social sustainability in terms of health, human rights and ethical issues, among others (Fischer *et al.*, 2020). As a result, there is an overuse of the term sustainability (Hopwood *et al.*, 2005) and the concept is often misinterpreted, which reinforces the need for a holistic understanding of sustainability. Second, there is a lack of a comprehensive view of research examining sustainability in hospitality and tourism, which is essential to develop a framework to position future research in the field because of the extent of the definitions and variables related to sustainability. Third, research on sustainability in tourism and hospitality is linked to environmental, economic, socio-cultural, political and ethical aspects of sustainable tourism (Mihalic, 2020; Moyle *et al.*, 2020), which is examined from different disciplines such as consumer behavior, marketing, finance and human resource management, leading to a variety of contexts and perspectives of analysis that may limit the generalizability of the results. Therefore, to address these limitations, and in an attempt to reduce the gap between theoretical sustainability and its practical implementation in tourism and hospitality (Sharpley, 2020), this study provides a bibliometric analysis and science mapping of this body of literature to synthesize the main research themes, guide future research agenda on sustainability in hospitality and tourism and offer practical implications for the industry.

Following Donthu *et al.* (2021), a bibliometric analysis was used instead of a meta-analysis or qualitative systematic literature review because the aim is to summarize extant literature, the scope is broad and there is a large amount of data to manually make the analysis. In addition, the bibliometric analysis is a quantitative method that allows descriptive statistical analyses and it is also useful to identify the topics that are gaining more importance and identify possible gaps in the literature. The aim of this analysis is to present the research structure of a domain (Paul and Rialp, 2020). Specifically, the following research questions (RQs) concerning sustainability in hospitality and tourism are examined:

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- RQ1.* What are the major research topics on sustainability in hospitality and tourism? How do they connect with each other?
- RQ2.* Which topics on sustainability in hospitality and tourism are most influential?
- RQ3.* How has the literature advanced? Which topics on sustainability in hospitality and tourism are emergent and beneficial for prospective research?
- RQ4.* What are the main implications so far for policymakers and tourism and hospitality businesses arising from the challenges involved in adopting sustainable practices?

The first research question refers to the need to generate a complete and accurate approach to the field of study by identifying the key issues, the size and the relationships between them. The second research question is related to the relative importance of each topic. In this respect, topics with a high number of citations are considered more influential (Huang *et al.*, 2021). The third question will help define the direction and interest in the research field where researchers are looking for influential topics. The last question seeks to draw out the main practical implications of this research and provide actionable recommendations to contribute to the development of sustainable practices in the hospitality and tourism industry.

Several disciplines, including tourism, hospitality, services and management, among others, have used the bibliometric analysis. Recent examples included Cunill *et al.* (2019), Nusair (2020) or Mody *et al.* (2021). Specifically, there are several studies in the areas of tourism and hospitality, even in sustainability within these areas, but they are limited to a specific journal or four-five top journals (see Table 1). Therefore, this paper also contributes to the literature by using a broader scope in investigating and exploring the progress of sustainability in hospitality and tourism, and identifying the more promising avenues for future research along with some key practical implications for tourism firms.

The paper is structured using the following sections: the methodology, data and tools for analyses are described in Section 2. The results, including the descriptive statistics, the highly cited articles within the two periods, a content analysis of the research and structural analysis of the progression of sustainability in hospitality and tourism comparing the two periods are presented in Section 3. Section 4 provides an agenda for future research. Section 5 offers conclusions, theoretical and practical implications and limitations.

2. Method

2.1 Literature review article guidelines

There are three types of systematic literature reviews (Paul and Rialp, 2020). First, the domain-based analysis, which synthesizes research into various themes. Second, the theory-based analysis, which focuses on how research from the same body of literature applies theories. Third, the method-based analysis, which focuses on methodologies used in a body of literature. In this research, the domain-based review is an excellent choice given the current research questions because it combines the methodologies of bibliometric and content analysis. Bibliometric analysis is helpful to investigate journal publications using statistical tools, whereas content analysis synthesizes the major themes of the literature (Donthu *et al.*, 2021).

Table 1.
Recent bibliometric
analyses on tourism
and hospitality

Author/year	Journal	Topic/analysis
Hocevar and Bartol (2021)	<i>International Journal of Tourism Cities</i>	Urban tourism (not sustainability)
Sigala <i>et al.</i> (2021)	<i>Journal of Hospitality and Tourism Management</i>	<i>Journal of Hospitality and Tourism Management</i> (analysis of one journal)
Senbeto <i>et al.</i> (2021)	<i>Journal of Hospitality and Tourism Research</i>	Hospitality and tourism in Africa (not sustainability)
Moyle <i>et al.</i> (2020)	<i>Journal of Sustainable Tourism</i>	Sustainability (analysis of four high-ranked journals)
Kumar <i>et al.</i> (2020)	<i>Journal of Heritage Tourism</i>	<i>Journal of Heritage Tourism</i> (analysis of one journal)
Nusair <i>et al.</i> (2019)	<i>International Journal of Contemporary Hospitality Management</i>	Social media in hospitality and tourism journals (not sustainability)
Avila-Robinson and Wakabayashi (2018)	<i>Journal of Destination Marketing and Management</i>	Destination management and marketing research (not sustainability)
Mauleon-Mendez <i>et al.</i> (2018)	<i>Advances in Hospitality and Tourism Research</i>	Sustainable tourism research (analysis of one journal)
Bramwell <i>et al.</i> (2017)	<i>Journal of Sustainable Tourism</i>	Sustainable tourism in <i>Journal of Sustainable Tourism</i> (analysis of one journal)
Ruhanen <i>et al.</i> (2015)	<i>Journal of Sustainable Tourism</i>	Sustainable tourism (analysis of four high-ranked journals)

The process of developing a review article requires an organizing framework (see [Figure 1](#)). The first critical phase is identifying a relevant topic[1] (Paul and Rialp, 2020). In this regard, the keywords used for the selection of the articles is an essential input for the bibliometric analysis, thus setting the breadth of the study. The literature presents two criteria to select keywords: using a high number of keywords could be an alternative ([Leung *et al.*, 2017](#)); or a more concentrated search on a very few words with direct relation to the exact research topic ([Leung *et al.*, 2013](#); [Zeng and Gerritsen, 2014](#)). Both alternatives were tested in this research. The first search included many words (e.g. environment*, greenhouse gas emissions, CO₂ emissions, climate change, biodiversity conservation, sustainable development, etc.). In the second search, following the work of [Leung *et al.* \(2013\)](#) and [Zeng and Gerritsen \(2014\)](#), the search list was narrowed down to “sustainability” in “hospitality” and “tourism” to cover exactly one of the topics of the special issue. Findings from both alternatives were compared, and the last search resulted in publications related to “climate change,” “biodiversity conservation,” etc. and also publications related to sustainability in tourism and hospitality in general (sustainable attitudes, green hotels, environmental behavior, etc.). Thus, the second search was used in this research. The second critical phase is establishing criteria to select journals or databases, scope and period (Paul and Rialp, 2020). The Web of Science was selected because it is the most widely used because of its reliability, the category “Hospitality, Leisure, Sport and Tourism” and all coverage years). Furthermore, this type of analysis produces tables and figures to identify research gaps and future research directions.

2.2 Data set and standardization

The data was extracted from the Web of Science (Social Science Citation Index and Emerging Sources Citation Index databases) for the period 1994–2020. The search is grounded on the occurrence of the study’s keywords, “sustainability,” “hospitality” and/or

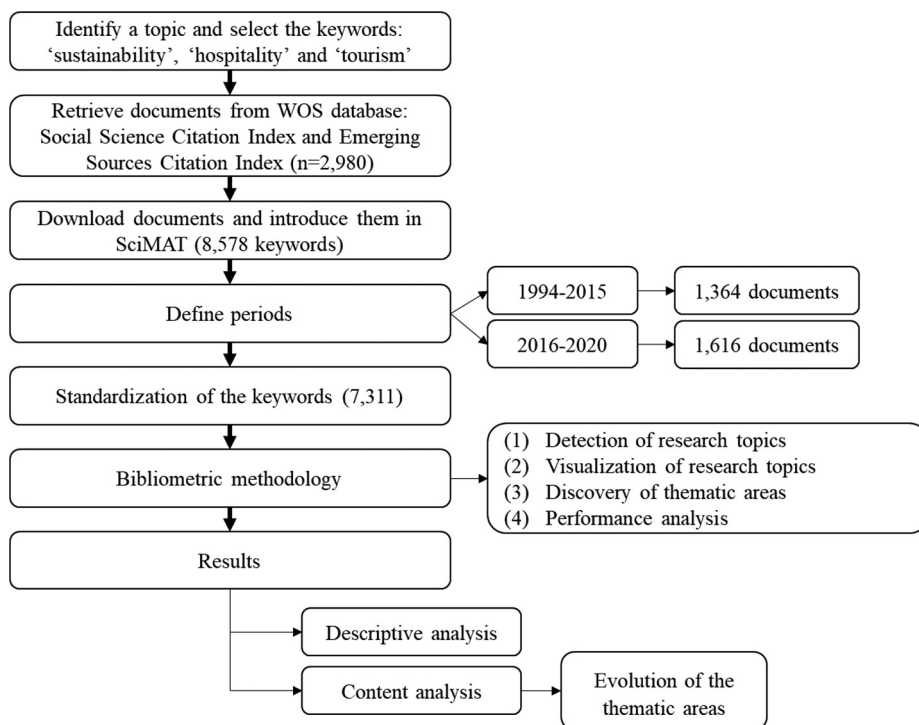


Figure 1.
Framework to
develop the
bibliometric analysis

“tourism,” in the title, abstract or keywords of each article. The query was $TI=(SUSTAINAB* \text{ AND } HOSPITALITY) \text{ OR } TI=(SUSTAINAB* \text{ AND } TOURISM) \text{ OR } AB=(SUSTAINAB* \text{ AND } HOSPITALITY) \text{ OR } AB=(SUSTAINAB* \text{ AND } TOURISM) \text{ OR } AK=(SUSTAINAB* \text{ AND } HOSPITALITY) \text{ OR } AK=(SUSTAINAB* \text{ AND } TOURISM)$. A total of 2,980 articles were obtained in the category “Hospitality, Leisure, Sport and Tourism.” These were then exported to SciMAT (Cobo *et al.*, 2011; <https://sci2s.ugr.es/scimat/>), an extensively used software in the literature (Leong *et al.*, 2021; Mulet-Forteza *et al.*, 2021), which generated 8,578 groups of words.

The first step included standardizing those words with the same or similar meaning. This involved an automatic term grouping based on distances. SciMAT detects terms that differ by a distance of X characters. The second step is a laborious process of manually grouping terms that can be analyzed in the same group based on words having similar meanings (e.g. environmental-attitudes and ecology-attitudes). After this process, 1,329-word groups were reduced and a total of 7,311 word groups were obtained for the analysis. The third step involved creating periods for the analysis to provide a longitudinal view. The starting point of the search (1994) was defined by the first article in the database, which included the keywords “sustainability” combined with “hospitality” and/or “tourism” in the title, abstract and/or keywords. Next, an appropriate cut-off point, which is usually defined by events that caused key changes and a balanced sample regarding the quantity of articles across the two periods, was established (Leong *et al.*, 2021; Mulet-Forteza *et al.*, 2021). For this purpose, the Paris

Agreement approved at the Paris Climate Conference in December 2015, and 2030 Agenda for Sustainable Development, along with the Sustainable Development Goals (SDGs), approved by governments in 2015, could be one of the most relevant milestones for sustainability in hospitality and tourism, which was considered to establish a cut-off point. In addition, using the year 2015 as the cut-off point also resulted in a balanced sample in the number of articles in each period (1,364 articles in 1994–2015 and 1,616 articles in 2016–2020).

2.3 Analytical tools and process

SciMAT generates two types of outputs (Cobo *et al.*, 2011):

- (1) performance analysis, which refers to the impact of a research theme through the quantity of publications (as a gauge of an author or theme's productivity) and citations (as a measure of an author or theme's influence within a body of literature) (Fetscherin and Heinrich, 2015; Merigó and Yang, 2017); and
- (2) science mapping analysis, which produces a depiction of the body of literature's structure and temporal progress (Cobo *et al.*, 2012).

In addition, the bibliometric methodology is discussed in four analysis processes: detection of research themes; visual depiction of research themes using strategic diagrams and networks of themes; the discovery of thematic areas and their evolutions; and performance analysis (see Figure 2).

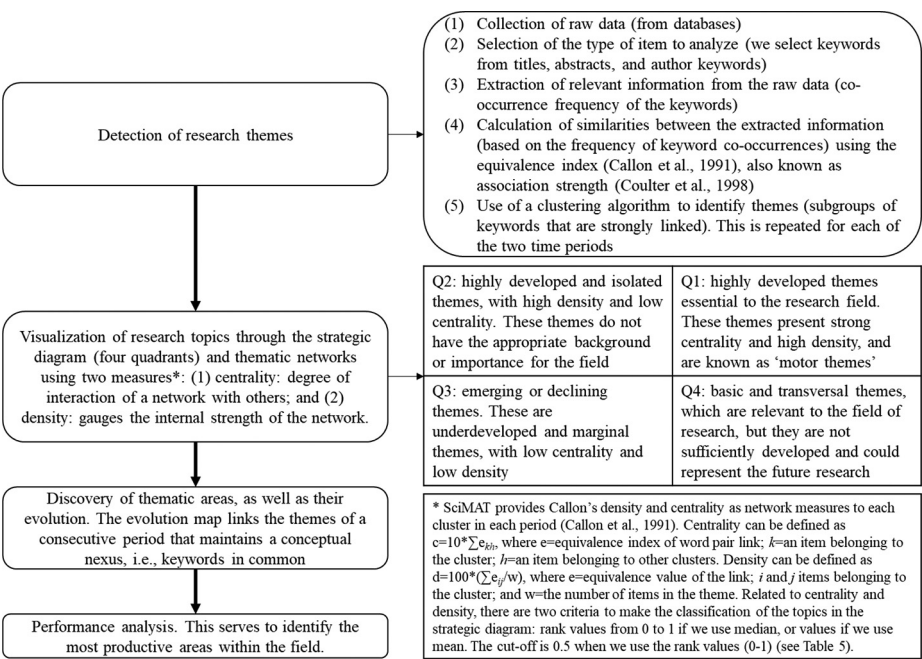


Figure 2.
Phases of
bibliometric method
and science mapping
analysis

Source: Cobo *et al.* (2011) and López-Robles *et al.* (2021)

3. Results

3.1 Descriptive statistics

The analyses found 2,980 publications that fit the selection criteria. As shown in [Figure 3](#), there is an ascendant trend in the quantity of publications over time. Analyzing the periods, the number of articles fluctuates from 5 in 1994 to 214 in 2015, and from 219 in 2016 to 481 in 2020. In relation to the number of citations, there is also consistent growth because of the rising trend in the quantity of publications. During the first 10 years, citations are low, from 5 in 1995 to 71 in 2004. However, it starts to grow until 13,436 citations in 2020. The total number of citations is 68,365, the average number of citations per article is 23.03 and the h-index is 109; that is, 109 articles are cited at least 109 times.

[Table 2](#) shows the top 30 journals classified by the number of articles. The *Journal of Sustainable Tourism* and *Tourism Management* are the most productive journals in the field of sustainability in hospitality and tourism, with 622 and 228 articles, respectively. Another essential question is which journals are most influential based on the number of citations in this domain. In this case, the top three journals taking into account the average of citations per publication are *Annals of Tourism Research* (76.96 citations per document), *Tourism Management* (66.89 citations per document) and *Journal of Travel Research* (35.06 citations per document).

3.2 Content and science mapping analyses

To respond RQ1, SciMAT was used to investigate the issues and themes of the analyzed articles. The research team manually assessed and standardized the initial extractions of the words or phrases by SciMAT. For instance, keywords/phrases like “CO₂ emissions” and “carbon dioxide emissions” are judged to be the same construct that have similar meanings. After this process, the themes located in the cluster networks and strategic diagrams were identified per period. The themes’ location among the quadrants depends on centrality, which reflects the number of connections among networks, and density, which reflects a network’s internal strength. The software provides the rank values from 0 to 1 based on the median (see [Table 3](#)). The cut-off is 0.5. In addition, the cluster network of themes signifies the connection a theme has with other research areas based on co-occurrences of the keywords. The utmost pertinent keyword is located centrally of the network. The sphere’s volume reflects the quantity of articles/h-index, and the association’s strength is reflected by the thickness of the connection between two keywords (see all the cluster networks in the [Appendix](#)).

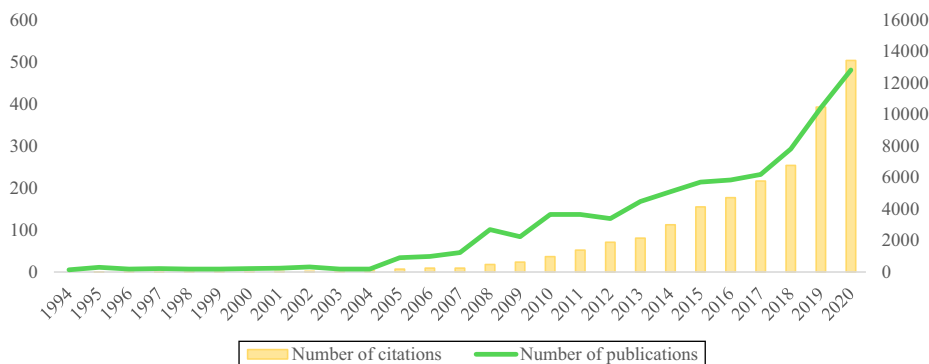


Figure 3.
Development of the
quantity of articles
and citations

Table 2.
Top 30 journals by
the number of
articles in the field of
sustainability in
hospitality and
tourism

Rank	Journal	No. of published documents	Citations	Average citations/publication
1	<i>Journal of Sustainable Tourism</i>	622	19,070	30.66
2	<i>Tourism Management</i>	228	15,250	66.89
3	<i>Worldwide Hospitality and Tourism Themes</i>	142	506	3.56
4	<i>Current Issues in Tourism</i>	125	2,055	16.44
5	<i>Tourism Planning Development</i>	114	1,335	11.71
6	<i>Annals of Tourism Research</i>	91	7,003	76.96
7	<i>Tourism Geographies</i>	88	2,587	29.40
8	<i>Tourism Management Perspectives</i>	77	1,615	20.97
9	<i>Tourism Recreation Research</i>	75	911	12.15
10	<i>Asia Pacific Journal of Tourism Research</i>	72	824	11.44
11	<i>International Journal of Tourism Research</i>	70	1,358	19.40
12	<i>Tourism and Hospitality Research</i>	66	1,160	17.58
13	<i>Tourism Analysis</i>	57	406	7.12
14	<i>International Journal of Contemporary Hospitality Management</i>	51	1,193	23.39
15	<i>Journal of Travel Research</i>	51	1,788	35.06
16	<i>Journal of Heritage Tourism</i>	48	380	7.92
17	<i>Tourism Economics</i>	46	529	11.50
18	<i>Tourism</i>	45	223	4.96
19	<i>Tourism Review International</i>	45	527	11.71
20	<i>Tourism Review</i>	42	714	17.00
21	<i>Journal of Destination Marketing & Management</i>	41	893	21.78
22	<i>Anatolia. International Journal of Tourism and Hospitality Research</i>	38	374	9.84
23	<i>European Journal of Tourism Research</i>	36	188	5.22
24	<i>International Journal of Tourism Cities</i>	35	188	5.37
25	<i>Journal of Tourism Culture and Territorial Development</i>	33	43	1.30
26	<i>Scandinavian Journal of Hospitality and Tourism</i>	32	671	20.97
27	<i>Journal of Tourism and Culture Change</i>	29	214	7.38
28	<i>International Journal of Culture, Tourism and Hospitality Research</i>	28	289	10.32
29	<i>International Journal of Hospitality Management</i>	27	699	25.89
30	<i>Journal of Hospitality and Tourism Management</i>	27	682	25.26

Table 3.
Performance
indicators in the
periods 1994–2015
and 2016–2020

Period	Theme	Quadrant	Centrality		Density rank	Themes		Cluster networks	
			Centrality	rank		No. of documents	h- index	No. of documents	h- index
1994– 2015	Satisfaction	Q1	26.79	0.84	14.20	0.95	2,079	133	5,734
	Sustainable-attitudes	Q1	54.93	1.00	10.21	0.79	4,004	216	9,654
	Climate-change	Q1	26.02	0.79	11.19	0.84	2,788	101	5,255
	Biodiversity-conservation	Q1	44.08	0.95	8.84	0.68	4,292	307	13,967
	Travel	Q1	20.87	0.53	16.69	1.00	849	98	4,396
	Resident-attitudes-toward- tourism	Q1	34.06	0.89	6.97	0.58	1,492	171	8,519
	Place-attachment	Q1	22.73	0.63	9.34	0.74	1,832	87	4,874
	Consumption	Q1	25.81	0.74	6.43	0.53	938	14	4,322
	Corporate-social- responsibility	Q2	17.33	0.37	7.86	0.63	1,279	110	4,006
	Ethics	Q2	2.64	0.05	12.36	0.89	410	45	2,273
2016– 2020	Networks	Q3	20.60	0.47	5.98	0.47	2,066	22	7,122
	Authenticity	Q3	15.65	0.26	5.39	0.42	1,282	15	5,627
	Demand	Q3	16.01	0.32	5.00	0.32	500	10	3,373
	Rural-tourism	Q3	13.82	0.16	5.21	0.37	1,444	16	6,376
	Experience	Q3	19.66	0.42	1.22	0.11	524	12	6,863
	Poverty	Q3	4.41	0.11	4.72	0.26	494	9	2,649
	Tourism-development	Q3	14.08	0.21	1.12	0.05	668	12	6,404
	Strategies	Q4	25.31	0.68	4.16	0.21	1,112	16	6,245
	Nature-based-tourism	Q4	21.30	0.58	2.16	0.16	540	14	4,058
	Economic-growth	Q1	58.30	0.94	34.85	1.00	438	10	1,063
	Satisfaction	Q1	71.81	1.00	18.34	0.92	1,626	21	3,843
	Sustainable-attitudes	Q1	68.48	0.97	15.39	0.89	1,840	23	4,629
	Norm-activation-theory	Q1	49.04	0.86	29.86	0.97	896	15	1,728
	Protected-areas	Q1	57.55	0.92	13.47	0.86	1,391	21	4,789
	Environmental-management	Q1	51.48	0.89	11.58	0.83	747	16	2,254
	Corporate-social- responsibility	Q1	35.14	0.75	6.35	0.67	556	13	1,690
	Rural-tourism	Q1	28.88	0.64	7.77	0.78	427	14	2,553
	Innovation	Q1	25.19	0.56	8.42	0.81	342	10	1,099

(continued)

Table 3.

Period	Theme	Quadrant	Centrality		Density rank	Themes		Cluster networks			
			Centrality	rank		No. of documents	No. of citations	No. of documents	No. of citations	h-index	
	Resident-attitudes-toward-tourism	Q1	35.98	0.78	5.43	51	769	17	250	2,859	26
	World-heritage-site	Q1	40.84	0.83	5.11	46	596	16	170	1,726	21
	Adaptation	Q2	23.57	0.42	22.03	33	614	14	145	1,954	21
	Agriculture	Q2	14.08	0.22	7.26	12	105	6	53	459	12
	Gender	Q2	16.19	0.31	5.26	13	217	7	65	860	17
	Geography	Q2	11.63	0.19	6.20	12	112	7	90	1,160	17
	Sustainable-tourism-indicators	Q2	15.74	0.28	5.00	21	332	10	113	1,242	20
	Education	Q2	3.79	0.03	7.25	8	50	5	37	350	11
	Inclusive-tourism	Q2	4.39	0.06	7.01	10	102	5	59	665	15
	Overtourism	Q2	8.59	0.08	5.94	15	367	7	75	954	14
	Sport-tourism	Q3	24.22	0.47	2.89	17	100	7	88	746	16
	Island	Q3	21.65	0.39	3.39	27	260	10	186	2,453	26
	Travel	Q3	21.60	0.36	3.43	18	223	7	95	998	15
	Identity	Q3	14.43	0.25	4.16	23	198	8	99	1,029	16
	Preferences	Q3	11.31	0.17	4.33	12	156	7	60	666	16
	Strategies	Q3	24.20	0.44	1.77	25	258	10	160	1,618	19
	Volunteer-tourism	Q3	11.05	0.14	4.13	15	124	7	86	746	15
	Stakeholders	Q3	18.81	0.33	1.31	24	321	11	119	1,081	17
	Social-media	Q3	8.79	0.11	2.49	9	58	5	69	698	15
	Poverty	Q4	30.88	0.69	3.61	21	242	9	83	800	15
	Consumption	Q4	24.50	0.53	4.33	23	450	10	120	1,897	24
	Destination-image	Q4	38.18	0.81	2.04	20	342	9	123	1,516	21
	Demand	Q4	28.68	0.61	3.04	19	168	8	111	1,083	18
	China	Q4	34.53	0.72	2.17	24	275	9	121	1,433	20
	Policy	Q4	25.63	0.58	2.31	30	461	13	165	1,733	21
	Behavior	Q4	30.47	0.67	1.50	0.08	23	298	10	124	1,432
Knowledge	Q4	24.23	0.50	1.24	0.03	20	239	8	136	1,326	19

3.2.1 Emerging period (1994–2015). The SciMAT analysis produced 19 themes. Biodiversity conservation has the largest number of documents (88), followed by sustainable attitudes (75) and climate change (44). These are the motor themes together with satisfaction, resident attitudes toward tourism, place attachment, travel and consumption (see Q1, top right quadrant of Figure 4). In response to RQ2, biodiversity conservation and sustainable attitudes were the most relevant motor themes, with 4,292 and 4,004 citations received, respectively (see Table 3), and they can be considered as the most influential in this analysis.

The cluster network of *biodiversity* conservation shows that it has been analyzed from different perspectives such as management, ecotourism, environmental behavior or visitor experience (see the Appendix). Hall (2010) suggests the importance of avoiding the potential effect of tourism in the continuing deterioration of biodiversity and the role of governments

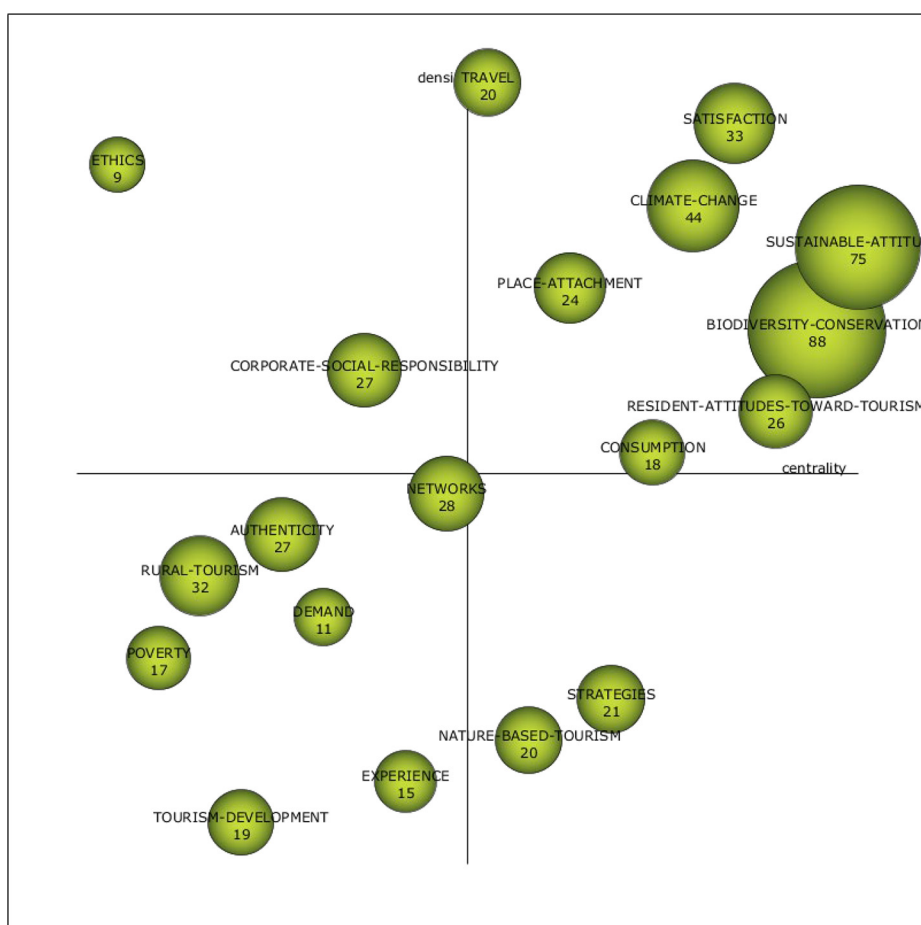


Figure 4.
Strategic diagram of
the 1994–2015 period
(quantity of articles)

Note: Centrality reflects the number of connections among networks, and a network's internal strength is reflected by density

in this respect. [Weaver \(2005\)](#) discusses two ways to achieve sustainable performance in ecotourism: one based on the learning opportunities in the destination and the other based on how to transform environmental behavior to enhance the tourist experience.

Sustainable attitudes and resident attitudes toward tourism emerge in the first quadrant connected because they are based on the residents' perceptions and consider community participation (see the [Appendix](#)). [Choi and Murray \(2010\)](#) used the social exchange theory to define the residents' attitudes toward tourism and their impact on sustainable tourism. [Duerden and Witt \(2010\)](#) pointed out that several socio-demographic and external factors such as legislation or the media contribute to forming attitudes in this context.

Climate change, satisfaction, place attachment, travel and consumption are also motor themes in the first period. *Climate change* refers to adaptation, vulnerability, resilience or CO₂ emissions. The theory of resilience has been applied to link environment, society and economy to achieve sustainable development ([Lambert et al., 2010](#)). *Satisfaction* highlights service quality, customer value or loyalty in the cluster network, and it is analyzed from the customer or visitor perspective in different contexts: satisfaction in hospitality ([Prud'homme and Raymond, 2013](#)), protected areas ([Okello and Yerian, 2009](#)) or ecotourism ([Torres-Sovero et al., 2012](#)), and residents' perspective ([Cottrell et al., 2013](#)). *Place attachment* presents links with identity, social construction and involvement. Creating a brand is useful for enhancing place identity and achieving tourism involvement, for which stakeholders are also responsible, although sociological barriers can limit the effects of identity development to place-attachment ([Cohen et al., 2013](#); [Wheeler et al., 2011](#)). *Travel* refers to accessible tourism and sustainable mobility. [Darcy \(2010\)](#) explored important criteria for tourists with a disability in selecting accommodation. *Consumption*, as the last motor theme, presents links with energy consumption, greenhouse emissions, or footprint. *Consumption* implies thinking about the environmental impact derived from visitors in a destination, and about the consumption of energy needed from the combustion of fossil fuels, which is a threat because of the emission of greenhouse gases ([Dickinson and Peeters, 2014](#); [Nepal, 2008](#)). A balanced approach requires collaboration between stakeholders, sectors and local governance ([Currie and Falconer, 2014](#)).

In the second quadrant, themes with well-developed internal and weak external links emerged, which lack the appropriate background or importance for the field (see [Figure 4](#)): *corporate social responsibility* (CSR) and *ethics*. The cluster network of CSR shows that it connects mainly to financial performance and sustainable practices in hospitality ([Wang, 2014](#)). *Ethics* has been studied in the context of environmental ethics, host–guest interaction and education, and it has been applied in pilgrimage destinations, among others ([Isaac, 2010](#)) (see the figures of the cluster networks in the [Appendix](#)).

The third quadrant at the bottom left in [Figure 4](#) includes the following themes: *rural tourism, networks, authenticity, tourism development, poverty, experience* and *demand*. These themes are less developed, and some of them could emerge in the second period. *Rural tourism* has been studied from local food or farm tourism perspectives to achieve sustainable development and economic sustainability. *Networks* present links with innovation, local government, policymaking or collaboration theory ([Currie and Falconer, 2014](#)). *Authenticity* has been investigated in the context of heritage, cultural and food tourism ([Sims, 2009](#)). *Tourism development* research has focused on countries such as China, Portugal or Iceland. *Poverty* illustrates how governments and non-governmental organizations (NGOs) have tried to develop tourism in several countries to reduce *poverty* ([Spenceley and Meyer, 2012](#)). The links in the cluster network include developing countries, Africa, NGOs or community-based tourism, among others. *Experience* includes several topics such as emotions and information in volunteer tourism ([Weaver, 2015](#)). *Demand*

shows links with seasonality, arrivals or economic development, water management and food.

Finally, the fourth quadrant (see [Figure 4](#)) also presents central themes like in the first quadrant (many connections) but internally underdeveloped, so they could be considered as potential themes for the future. There are only two themes with a similar number of publications: *strategies* (21) and *nature-based tourism* (20). *Strategies* presents links with stakeholders, human resource management, technology, competitive advantage, competitiveness, sustainable tourism strategy and dynamic capabilities, among others. Specifically, human resources oriented to technology allow firms in the hospitality industry to obtain a sustainable competitive advantage ([Norman et al., 2014](#)). The second theme, *nature-based tourism*, is mainly related to entrepreneurship, environmental responsibility or resources, among others. In the nature tourism sector, the most common business is small businesses located in rural areas that have a high environmental responsibility for the use of natural resources ([Lundberg and Fredman, 2012](#)).

3.2.2 Expansion period (2016–2020). Research in the second period is exemplified by a diversity in themes (36 themes), with *protected areas*, *sustainable attitudes* and *satisfaction* standing out as foremost research areas ([Figure 5](#)). *Protected areas* has the highest number of publications (127 vs 126), although *sustainable attitudes* has a higher number of citations (1,840 vs 1,391) ([Table 3](#)). Both themes are the most influential considering their number of citations and their cluster networks. *Protected areas* is linked to biodiversity conservation, ecotourism, wildlife tourism, nature-based tourism or national park ([Spenceley, 2017](#); [Weaver and Lawton, 2017](#)), and they are based on optimal use of natural resources, protection of biodiversity and natural heritage and obtaining of social and economic benefits. *Attitudes* continues to be one of the motor themes as in the emerging period (see Q1, top right quadrant of [Figure 5](#)). This theme is linked to residents, environmentally responsible behavior or quality of life. [Passafaro \(2020, p. 583\)](#) affirms that “attitudes represent one of the first psychological factors taken into account by researchers interested in identifying the determinants of environmentally significant behaviors.” In this second period, *satisfaction* also continues as a motor theme, and continues related to service quality, loyalty, experience and place attachment, among others. It has been mainly analyzed from a customer perspective with its antecedents (e.g. service quality) and consequences (e.g. loyalty) because it is a key performance indicator in the hospitality industry ([Koch et al., 2020](#)).

Other motor themes ordered by the number of publications are the following: *environmental management* (54), *rural tourism* (51), *resident attitudes toward tourism* (51), *world heritage site* (46), *CSR* (40), *norm activation theory* (39), *economic growth* (30) and *innovation* (27) (see [Figure 5](#)). The cluster networks (see the [Appendix](#)) display the subsequent findings. Related to *environmental management*, the relevance of hotel industry and specifically green practices hotels and eco-innovation are widely examined ([Batle et al., 2018](#); [Chan and Hsu, 2016](#); [Tritto, 2020](#)). *Rural tourism* presents links to entrepreneurship and family business ([Cunha et al., 2020](#)), and focuses on culinary and farm tourism ([Chen and Huang, 2019](#)). Resident attitudes toward tourism are analyzed from perspectives such as tourism impacts, sustainable tourism indicators or community participation ([Uysal and Sirgy, 2019](#)). *World heritage site* is approached from the visitor perspective and considering the importance of cultural management for heritage tourism ([Bec et al., 2019](#)). *CSR* in the hospitality industry focuses on SDGs, SMEs, green restaurants and employees, among others ([Ahn and Kwon, 2020](#); [Tuan, 2018](#)). *Norm activation theory* presents links with the theory of planned behavior because they are simultaneously used in empirical studies to analyze pro-environmental behavior ([Cvelbar et al., 2017](#); [Esfandiar et al., 2019](#)). *Economic*

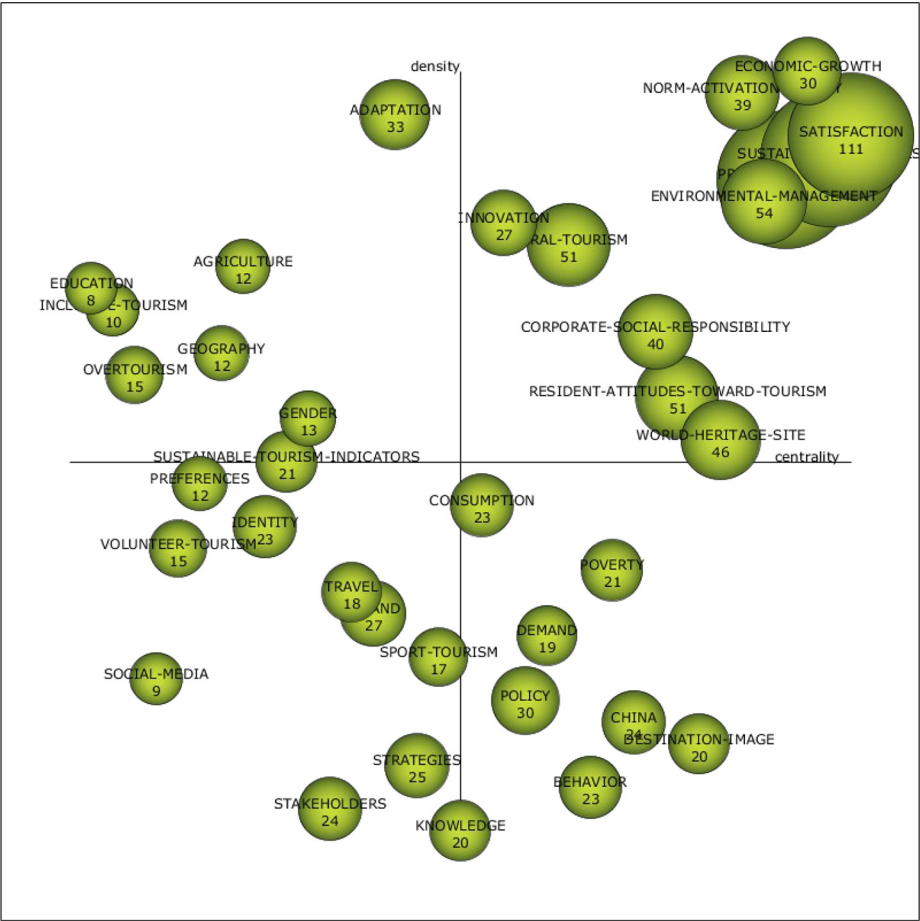


Figure 5.
Strategic diagram of
the 2016–2020 period
(quantity of
documents)

Note: Centrality reflects the number of connections among networks, and a network’s internal strength is reflected by density

growth has been analyzed using panel data from an international perspective and also considering topics such as energy consumption or CO₂ emissions (Pan and Dossou, 2020; Pegkas, 2020). *Innovation* presents links with information technology, transformational leadership and dynamic capabilities to achieve sustainable competitive advantage in the hospitality industry (Batle et al., 2018; Heslinga et al., 2019; Horng et al., 2018).

In the second quadrant (see Figure 5), eight themes emerged, ordered by the number of documents: *adaptation* (33), *sustainable tourism indicators* (21), *over-tourism* (15), *gender* (13), *agriculture* (12), *geography* (12), *inclusive-tourism* (10) and *education* (8). The themes in this quadrant are highly developed, isolated and they include highly focused areas with high internal associations but weak external associations with other topics. In relation to *adaptation*, several studies have analyzed the behavioral tourist adaptation to climate change or disaster derived from the weather (Cocolas et al., 2016; Wu et al., 2017);

and *over-tourism* focuses mainly on destinations such as Venice or platforms such as Airbnb (Cheng *et al.*, 2020).

The third quadrant (see Figure 5) reveals nine underdeveloped themes: *island* (27), *strategies* (25), *stakeholders* (24), *identity* (23), *travel* (18), *sport tourism* (17), *volunteer tourism* (15), *preferences* (12) and *social media* (9). These themes are potentially emerging or disappearing themes. *Identity* draws attention because the role of environmental identity is helpful to explain behaviors in hospitality and tourism (Teeroovengadum, 2019). The role of *stakeholders* is also essential in the governance of the destination; thus:

[...] destination managers and marketers should encourage investment in promoting green meetings, and tourism establishments and travel agencies must adopt an environmentally friendly certification scheme in order to reduce the negative impacts of tourism on the environment (Cakar and Uzut, 2020, p. 927).

Finally, the fourth quadrant (see Figure 5) shows the central themes in the research field that are weakly developed. They include *policy* (30), *China* (24), *behavior* (23), *consumption* (23), *poverty* (21), *destination image* (20), *knowledge* (20) and *demand* (19). These themes share links with other topics in sustainability in hospitality and tourism. The cluster network for *China* (see Appendix) presents topics such as environmental impacts, rural impacts or themes related to energy (Sharif *et al.*, 2020). The cluster network of consumption presents connections to environmental concern, water management, pollution and so on (Gokmenoglu and Eren, 2020).

3.2.3 Structural analysis of the evolution of “sustainability in hospitality and tourism” research with SciMAT. Relating to the longitudinal results, SciMAT offers two maps. First, the overlapping map shows the number of keywords analyzed in each period. The number of keywords in the first period was 3,513 and 4,858 in the second one. In addition, this map indicates the inclusion rate (number of keywords from the first period that maintains in the second one). In this case, this rate was 38% (1,326 words maintained and moved to the second period), and 3,532 new words were incorporated in the second period. The second map is the evolution map, which provides the temporal progression of the themes, obtaining a dynamic perspective of the conceptual structure of published research on sustainability in hospitality and tourism. The column represents a period; the lines establish the relationships between the different topics over time. A thematic nexus is represented by continuous lines displaying when topics share a matching focal item, while the broken lines indicate those topics related because they share specific keywords. In addition, the thickness of the lines is an indicator of the inclusion rate, and the size of the spheres is proportional to the number of publications achieved by each theme (Murgado-Armenteros *et al.*, 2015). This map was manually transformed to achieve a more synthesized arrangement of the topics, allowing for their grouping by large thematic areas (see Figure 6). The thematic areas were as follows:

- sustainable behavior and environmental sustainability;
- consumption, demand and economic growth;
- tourism development and strategies; and
- rural tourism, poverty, ethics and education.

The map displays the existence of some themes that remain constant over time (e.g. satisfaction, attitudes, CSR, consumption, demand, travel, strategies, poverty and rural tourism) and themes that develop in the subsequent period (e.g. destination image, over-tourism, inclusive tourism). Next, responding to RQ3, the four areas were analyzed to identify topics emerging and promising beneficial for further prospective research.

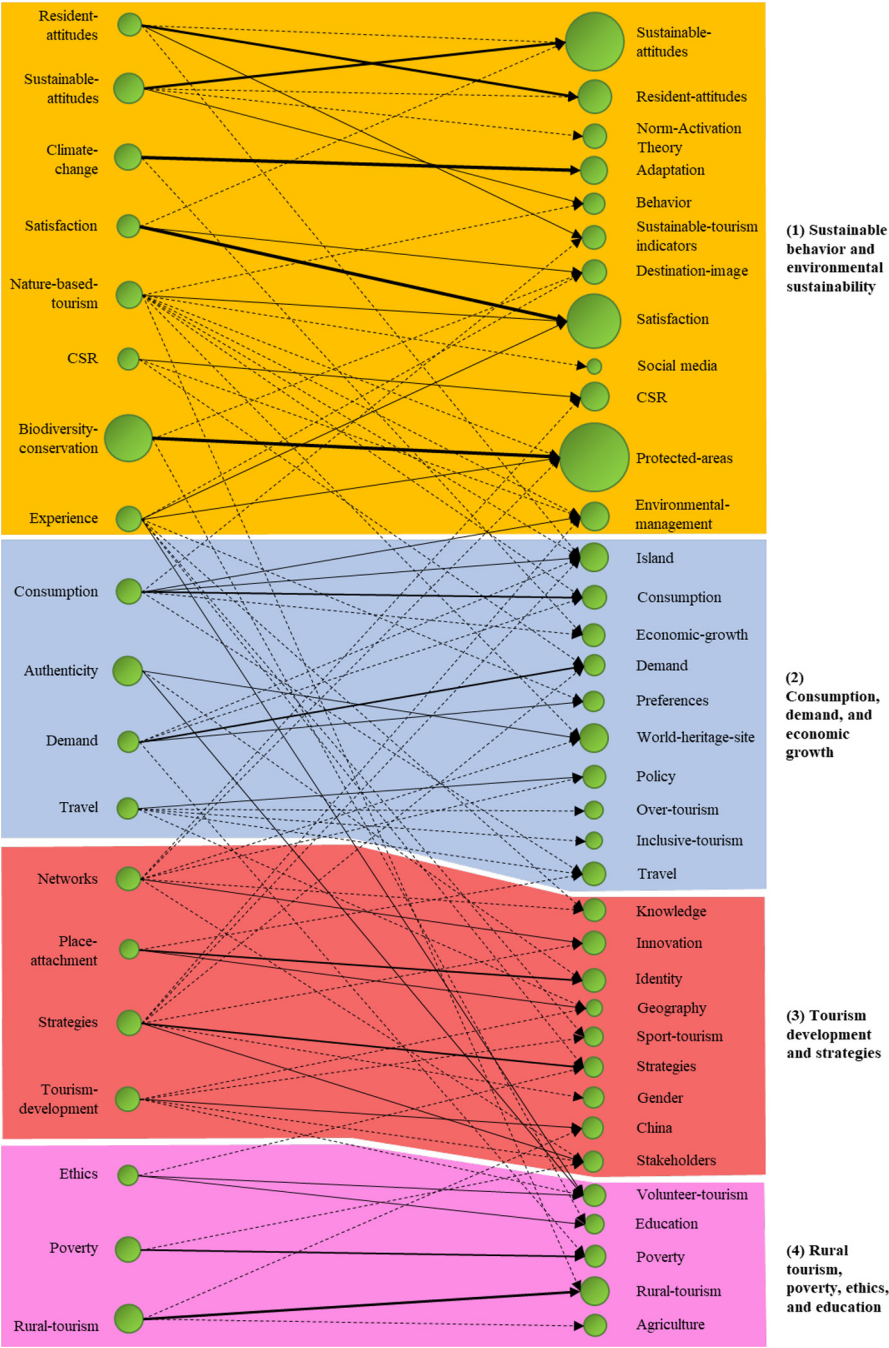


Figure 6.
Longitudinal
evolution map about
research trend on
sustainability in
hospitality and
tourism

3.2.3.1 Sustainable behavior and environmental sustainability. Attitudes, satisfaction and biodiversity conservation are exceedingly researched themes from the first period covering topics such as responsible environmental behavior, protected areas, perceptions and behavioral intentions. The theory of planned behavior is used to explain the sustainable behavior intentions in the context of hospitality and tourism. Sustainable attitudes, resident attitudes and satisfaction are motor themes in both periods. The importance of sustainable attitudes increases in the second period with links to social exchange theory, involvement, residents' perceptions and quality of life. In the case of satisfaction, it presents links to service quality and experience in the hospitality industry. In the second period, the norm activation theory emerges, and it analyzes social norms to explain pro-environmental behavior. In addition, CSR is a highly developed and isolated theme (second quadrant) in the first period, but a motor theme (first quadrant) in the second period, where it presents connections with SDGs, employees and green restaurants. Other new themes that emerge in the second period are the following: destination image, social media, protected areas and environmental management.

3.2.3.2 Consumption, demand and economic growth. In the first period, consumption is a motor theme (first quadrant), and demand is configured as an emerging or declining theme (third quadrant). However, in the second period, both themes are considered applicable to the literature, but lack sufficient development (fourth quadrant), suggesting future lines of research. Specifically, consumption presents links to environmental management and energy, and in the second period, the connections move to sharing-economy and peer-to-peer-accommodation. Demand connects with economic development in the first period and with competitiveness in the second one. In addition, during the first period, travel is a motor-theme, which moves to the third quadrant in the second period. The links are with public transport or greenhouse gas emissions, among others. Moreover, it is worth noting that economic growth and world heritage sites emerge as motor themes. Economic growth is a theme related to consumption, and world heritage site is related to authenticity, which is the first period. The development of themes such as preferences, over-tourism, island, policy and inclusive tourism also emerged during the second period.

3.2.3.3 Tourism development and strategies. Tourism development, strategies and networks are considered as emerging or declining themes (third quadrant) in the first period because they are underdeveloped and marginal themes with low centrality and density. However, the theme strategies evolve to other themes, such as innovation, which is a motor theme in the second period. The theme networks in the first period also evolve to innovation in the second one. Thus, innovation relates to strategy, and the cluster network presents links with several topics studied in the hospitality industry such as transformational leadership, information technology, dynamic capabilities, sustainable competitive advantage and some topics such as smart cities related to tourism. Place attachment is a motor theme in the first period and evolves into identity, connecting to place branding, place identity, reputation and creative tourism. Geography, sport tourism, gender and China are themes that emerge in the second period, and they connect with the area of tourism development and strategies in topics such as globalization, economic crisis or environmental impacts. Finally, knowledge is configured as potential future research because it is in the fourth quadrant and its connections are with environmental sustainability and evolutionary game theory, which examines the generation of green behaviors by the hospitality industry.

3.2.3.4 Rural tourism, poverty, ethics and education. Rural tourism begins as an underdeveloped theme in the first period (third quadrant), where it is linked to diversification, local food, farm tourism, economic sustainability and sustainable development, among others. Rural tourism evolves to rural tourism and agriculture. In the

second period, rural tourism is a motor theme and adds new topics such as socioemotional wealth, family business and culinary tourism. Poverty is also an underdeveloped theme in the first period, and it evolves to a basic and relevant theme in the second period but is not sufficiently developed. The links with Africa, SDGs and economic development make it an interesting theme for future research. Ethics is a highly and isolated theme (second quadrant), and it evolves to education and volunteer tourism. Education is related to environmental education, and volunteer tourism connects to transformational learning, ethics and authenticity.

4. Future research agenda

The bibliometric and science mapping analyses offer the foundation for identifying future research gaps on sustainability in hospitality and tourism. Thus, the evolution of the research themes in the two periods under consideration is organized around the four broad areas mentioned above, which are also used to develop and discuss the future research agenda:

- (1) *Regarding sustainable behavior and environmental sustainability*, issues related to behavior and the environment require more research. Recently, a consumer behavior perspective has focused attention on analyzing drivers of environmentally responsible behavior, such as environmental knowledge, green product attachment, descriptive social norm, anticipated pride and guilt, environmental CSR, perceived effectiveness, connectedness to nature, green value and green image. However, these concepts have been examined from a general perspective in a broad range of the environmental literature often not directly related to hospitality or tourism (Farmaki, 2019; Han, 2021). In other cases, “sustainable tourism investigations have focused primarily on tourists’ in-destination perceptions and behaviors, without taking consideration of the environmental influence from the source market” (Han, 2021, p.1033). Thus, we propose further research focused on facilitators and inhibitors that promote changes in consumers’ environmentally responsible behavior in different settings, such as a destination, hotel or restaurant. In addition, further research that builds on the knowledge of the tourist behavior phenomena to promote a change is useful for destination and businesses managers.
- (2) *From the consumption, demand and economic growth perspectives*, more attention must be paid to consumption, preferences and policies. Specifically, more research about what policies help destinations and the hospitality industry to develop more interest in effective sustainable consumption is needed. It is essential to analyze the customers’ sustainable consumption behavior and know who are the consumers that have more preference toward sustainable consumption (Chen et al., 2021). Academia should develop future studies to suggest how governments should cultivate consumers’ environmental consciousness to encourage sustainable consumption practices. Additionally, it is relevant to analyze the barriers that do not favor sustainable consumption and the existence of different groups of consumers with different levels of concern and/or preference for sustainable consumption in the tourism and hospitality industry.
- (3) *From tourism development and strategies perspectives*, more research is needed to analyze the relationship between the design of sustainability-focused strategies and tourism development. Future studies should explore if sustainability is a driver of tourism development. Literature has shown the complex connection

between tourism development and sustainability, which can be contradictory. Thus, when strategies are designed to protect cultural and natural heritage, the attractiveness and image of a destination can be reduced; but policies that support sustainability in destinations usually generate positive perceptions in residents and visitors, and they can improve the image of the destination (Buckley, 2018; Guizzardi *et al.*, 2021). Accordingly, future research should consider different aspects when finding how these relationships manifest in hospitality and tourism, including types of tourism, geographical areas, destinations, hotels or stakeholders. Destination competitiveness or travel expenditure could be indicators to reflect the outcomes of those relationships. The future research agenda should also consider the principles of circular economy in the sustainability strategies and explore if service providers are considering them to establish relationships with stakeholders to achieve more sustainable tourism development (Jones and Wynn, 2019).

- (4) *Rural tourism, poverty, ethics and education in future research.* Based on the analysis of their cluster networks, SDGs could be a promising topic for further research. However, although tourism is a powerful tool for reducing inequalities in rural areas and achieving economic development (UNWTO, 2015), and the adoption of the 2030 Agenda for Sustainable Development by United Nations members to end poverty, protect the planet and ensure prosperity for all, there is a paucity of studies referred to the SDGs industry (Raub and Martin-Rios, 2019), and poverty (Rasoolimanesh *et al.*, 2021; Scheyvens and Hughes, 2019) in the tourism and hospitality. Future research should examine sustainable tourism indicators related to Goal 1 (Poverty) for tourism planning and management in rural areas and in poor locations. It is essential to overcome “sustainability myopia” and conduct research on sustainability initiatives beyond the economic focus, analyzing tourism and hospitality industry as a tool to reduce poverty and provide economic and social benefits. Another intrinsically related issue refers to studying ethical commitment when defining actions that generate wealth and employment in poor areas to alleviate poverty.

5. Discussion and conclusions

5.1 Conclusion

This paper offers a bibliometric analysis and science mapping of sustainability trends in hospitality and tourism from 1994 to 2020, directions for further research and practical implications. This article contributes to the literature revealing the evolution of research themes in sustainability in hospitality and tourism. Our findings suggest four critical topics for future research, such as examining facilitators and inhibitors that promote changes in consumer behavior; what policies help destinations and the hotel industry to develop more interest in effective sustainable consumption; the effects of the principles of the circular economy on the sustainability of the hospitality and tourism industry; or the relationships between SDGs and hospitality and tourism industry in poor areas. This study also offers implications for managers and policymakers.

5.2 Theoretical and practical implications

In 2019, the tourism sector accounted for 10.3% of global GDP, employed one out of ten workers and generated one out of four new jobs; furthermore, more than 50% of the global tourism workforce are women. Thus, tourism represents an economic sector that has

undeniable social, cultural, political and economic value and should play a crucial role in contributing to the achievement of the SDGs (World Travel and Tourism Council, 2021). However, the COVID-19 pandemic is posing a major challenge to the tourism sector in terms of growth and employment, and the sector must prepare to return to the market stronger and more resilient than ever (Jones and Comfort, 2020). The hospitality and tourism sector has to focus on the generation of value and abandon business models dominated by a pattern of low technological intensity and poorly trained human capital. In this scenario, sustainability, together with the tourism industry's steady shift towards the circular economy (Jones and Wynn, 2019), emerges as an important avenue for progress, as these practices enable the activation of efficiency and innovation levers that are key to reshaping the underpinnings of hospitality and tourism firms' competitiveness (Heslinga *et al.*, 2019; Horng *et al.*, 2018). Sustainability, therefore, must be understood as a key way forward for the differentiation of tourism businesses and the improvement of competitiveness towards more intelligent and responsible tourism.

Academic research to date reveals a number of practical implications for developing sustainability in the tourism sector. From a *tourism development and strategy perspective*, it is necessary to understand that sustainability cannot be implemented unilaterally. Transforming the production model and value chains of the tourism sector to achieve the SDGs by 2030 requires public-private and citizen collaboration. Thus, administrations and public authorities are responsible for developing the necessary infrastructures and public services, together with the legal framework, that allow the advancement of tourism and hospitality firms towards sustainability and future development. Specifically, public administrations can contribute to sustainability in the hospitality and tourism sector by encouraging:

- tourism and hospitality firms digitalization, because of its implications for overall efficiency in the management and consumption of resources (Filipiak *et al.*, 2020);
- the improvement of infrastructures in destinations, paying special attention to sustainable mobility;
- the diversification of the offer, including the design of new flagship tourism products and experiences with high sustainability standards (e.g. rural tourism), which contribute to the generation of new employment opportunities and territorial cohesion (i.e. balanced development and cooperation between regions) (Llorca-Rodríguez *et al.*, 2021);
- the natural capital of the tourism system, guaranteeing its sustainability by reducing emissions, an adequate waste and water management and the introduction of actions to prevent and adapt to the effects of climate change (Wu *et al.*, 2017); and
- the efficiency of the tourism system by revealing and eliminating negative externalities, including the excessive concentration of visitors at the destination, causing increasing tension between residents and visitors (Mihalic, 2020).

To reinforce the achievement of all these objectives, public administrations must also identify the most relevant tourism sustainable tourism indicators and link economic aid and taxes to sustainable business performance in a time-bound transition plan (Rasoolimanesh *et al.*, 2021), as well as to improve the skills, knowledge and competences of tourism stakeholders on how to create, develop and implement sustainable business initiatives (Raub and Martin-Rios, 2019). The tourism sector is largely made up of micro-SMEs; the great challenge is to bring sustainable practices to these businesses to reinforce their competitiveness, for which it is necessary to invest in training policies. These training

policies must be extended to tourists themselves to encourage their sustainable behavior and preferences for sustainable destinations.

The hospitality and tourism industry, in turn, needs to take an active role in the community and lead the change towards economic, social and environmental sustainability, to favor the SDGs *implementation, reduce poverty and impulse ethic behaviors*. Thus, it is important that tourism companies focus on social innovation through new sectoral practices that promote: (1) stable employment and adequate remuneration, which contribute to the redistribution of wealth and the reduction of poverty in local communities (Scheyvens and Hughes, 2019); (2) the inclusion of vulnerable groups in the different jobs associated with the sector, which also reinforces the stability of the social network (Hon and Gamor, 2021); (3) respect for local culture, food and products, which generates proximity wealth (Chen and Huang, 2019; Ertuna *et al.*, 2019); and (4) gender equality policies that enhance the achievement of the SDGs. Similarly, establishments can take actions to ensure environmental sustainability, such as (5) eradicating plastics; (6) taking concrete measures against food waste or the adequate use of energy and water (Camilleri, 2021); (7) reusing and repairing as many material goods as possible (Cvelbar *et al.*, 2017; Tritto, 2020); or (7) promoting the self-generation of energy from clean sources (Sharif *et al.*, 2020). All these aspects cannot be carried out without involving the firm's workforce, i.e. it is necessary (5) to foster awareness and internal communication to achieve the transmission of the sustainability culture to employees and managers (Pham *et al.*, 2019), and (6) provide incentives linked to the human resources participation in the establishment of sustainable practices. In this respect, employees can play a critical role in capturing the drivers of tourists' sustainable behavior and their preferences to adopt sustainable consumption, thus providing a valuable input to design strategies oriented to promote changes in behavior and favor economic growth.

All these actions will not have the desired effects without the necessary collaboration of tourists. It is essential to better communicate and inform tourists about responsible and sustainable tourism, to increase their satisfaction and improve the establishment's image and attractiveness (Koch *et al.*, 2020). There is a growing number of tourists who choose establishments for their sustainable policies and who are looking for enjoying authentic experiences and resources (Kiatkawsin and Han, 2017; Han, 2021). However, as it has been pointed out, we still need to achieve a *deeper understanding of the sustainable behavior of tourists*, and both administrations and the tourism sector have responsibilities in terms of training and awareness-raising in this area. Nevertheless, post-Covid tourists are also more aware of the impact of their stay on the territory and the resident population, which can reinforce the virtuous circle towards sustainability (Hall *et al.*, 2020; Jiang and Wen, 2020).

5.3 Limitations and future research

This research presents some limitations that should be considered for future research. This analysis, based on bibliometric and science mapping, sets a challenge for further research. First, data collection was limited to the WOS category "Hospitality, Leisure, Sport and Tourism." Second, the keywords were grouped mainly following the authors' criteria based on the meaning of the words, in addition to the SciMAT function "find similar words by distances." Third, the number of citations was considered as a performance indicator to define the most influential research. However, citations or impact factors may be highly related with "fashion" or "popularity" and thus inhibit considering breakthrough and innovative research. Fourth, bibliometric analysis lacks the insights of qualitative literature review. Donthu *et al.* (2021) recommend the use of a systematic qualitative review when the

number of papers to review is in the low hundreds, and the topic is specific. In this research, there are more than 2,000 papers focusing on a broad topic. For this reason, the current research used a quantitative analysis through graphic representation of the research field. However, future research could address a qualitative method to analyze some specific topics related to sustainability in hospitality and tourism with a lower number of articles. Lastly, future research should also include the analysis of other mainstreams fields where sustainability is also analyzed.

Note

1. One of the topics proposed in the special issue was selected: "sustainability in hospitality and tourism".

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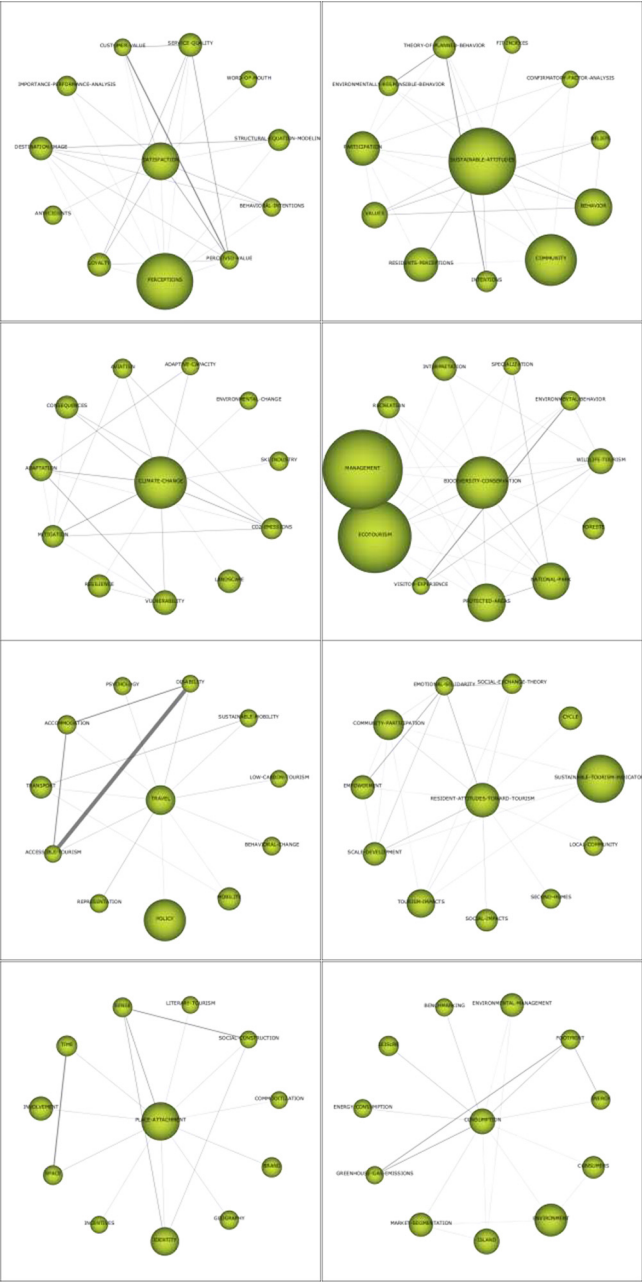


Figure A1.
Cluster networks of
the first quadrant
(1994–2015)

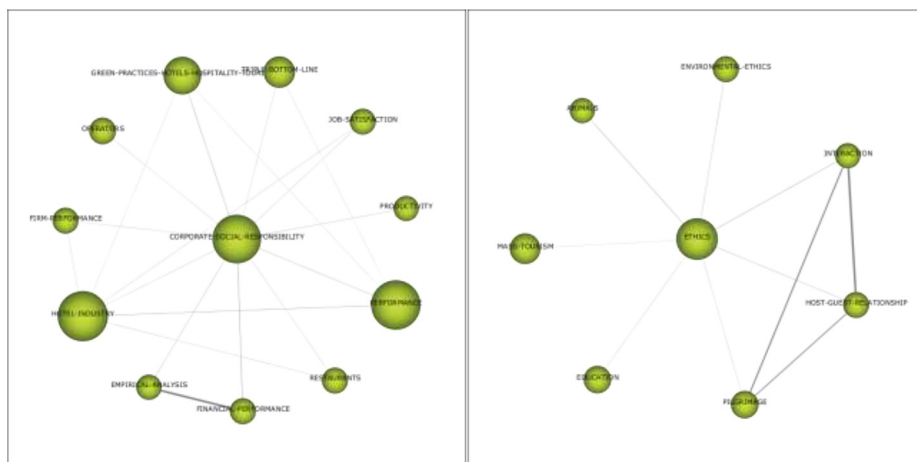
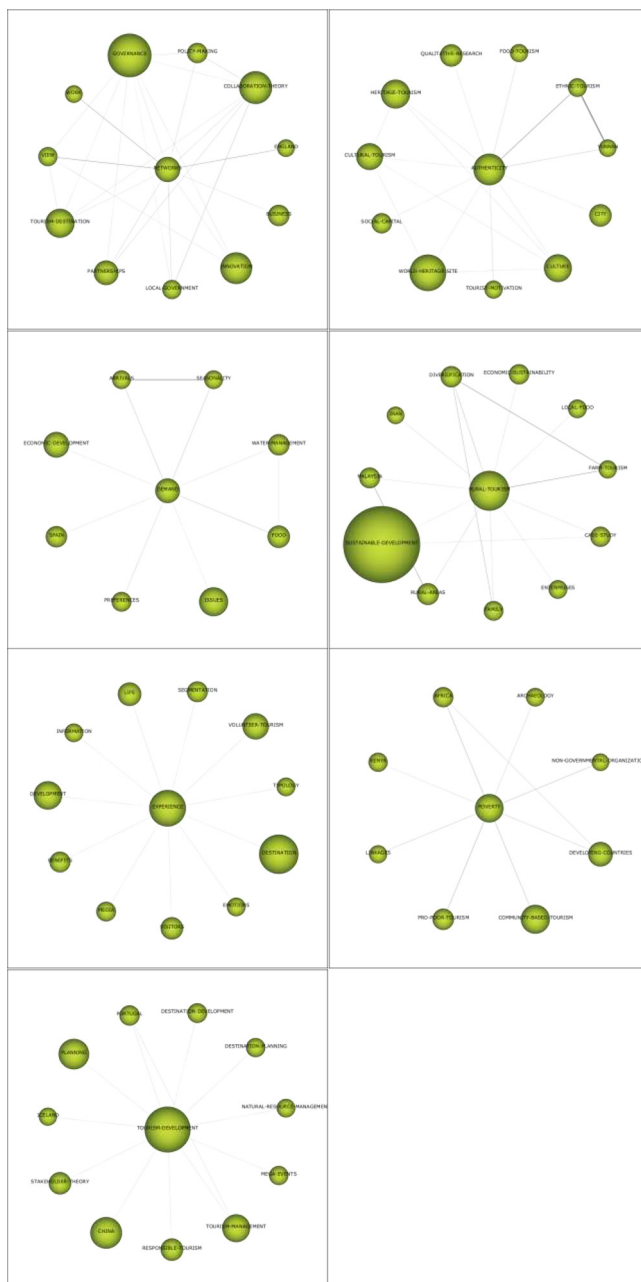


Figure A2.
Cluster networks of
the second quadrant
(1994–2015)



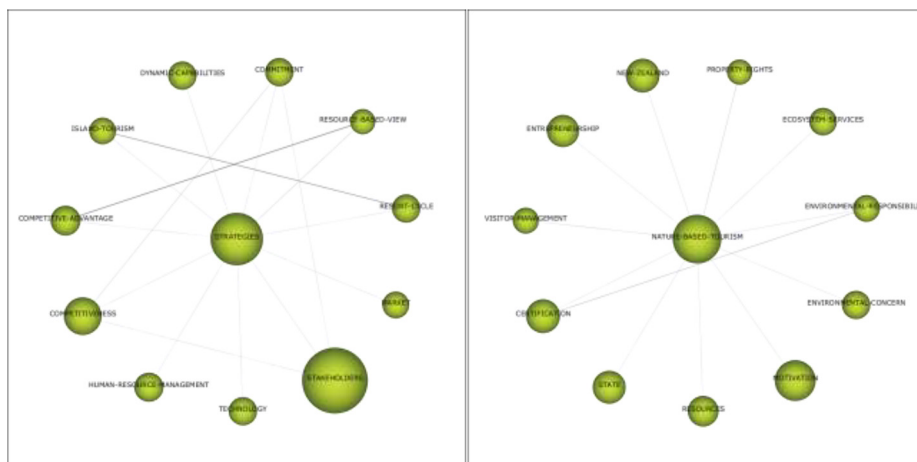


Figure A4.
Cluster networks of
the fourth quadrant
(1994–2015)

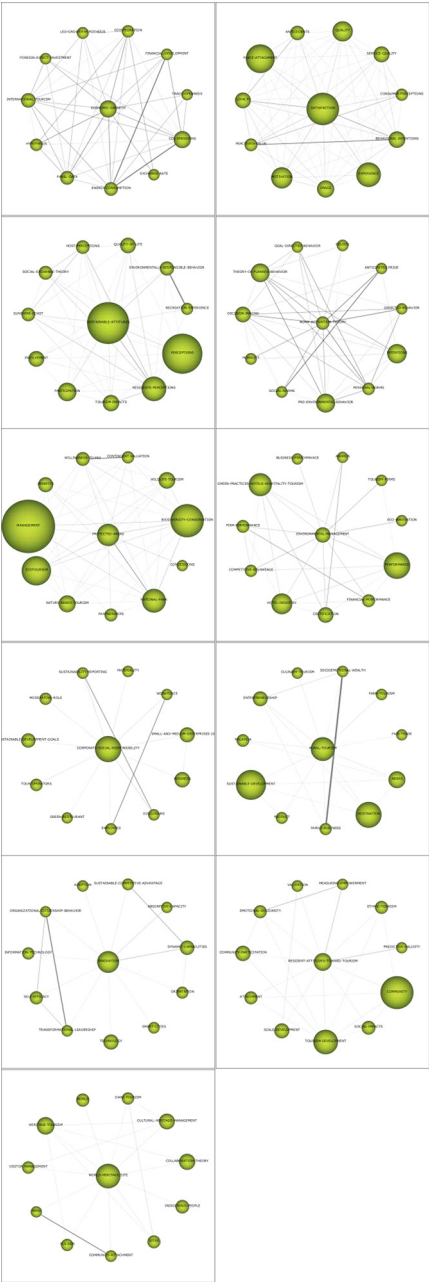
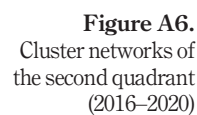


Figure A5.
Cluster networks of
the first quadrant
(2016–2020)



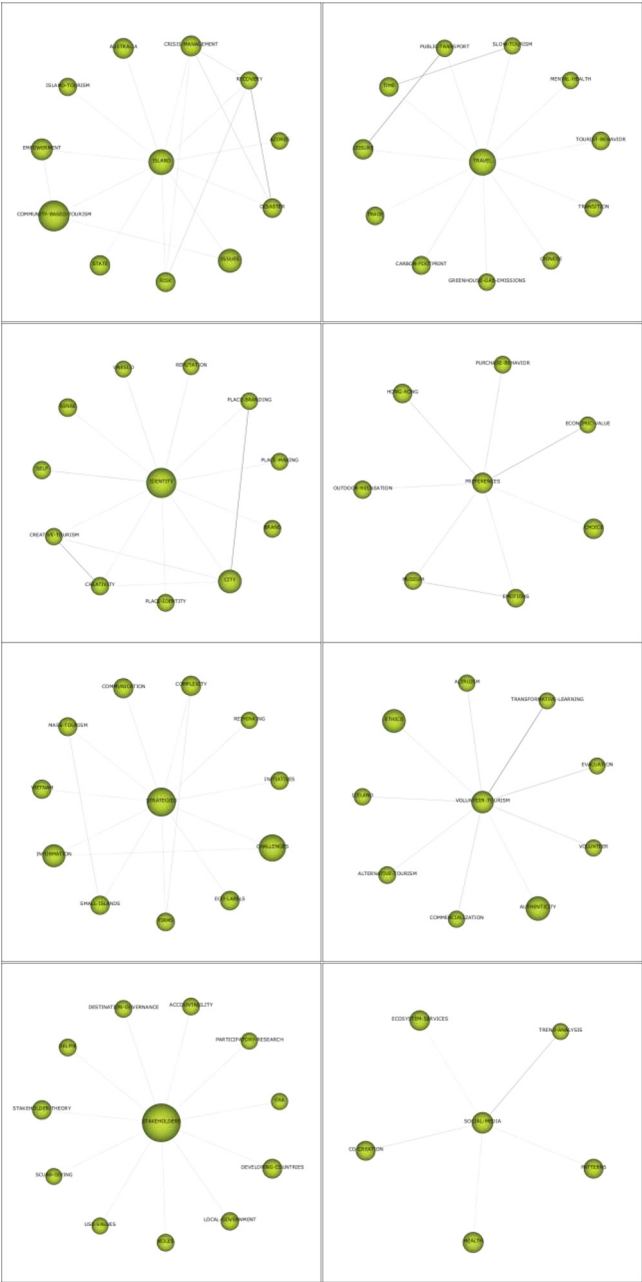


Figure A7.
Cluster networks of
the third quadrant
(2016–2020)

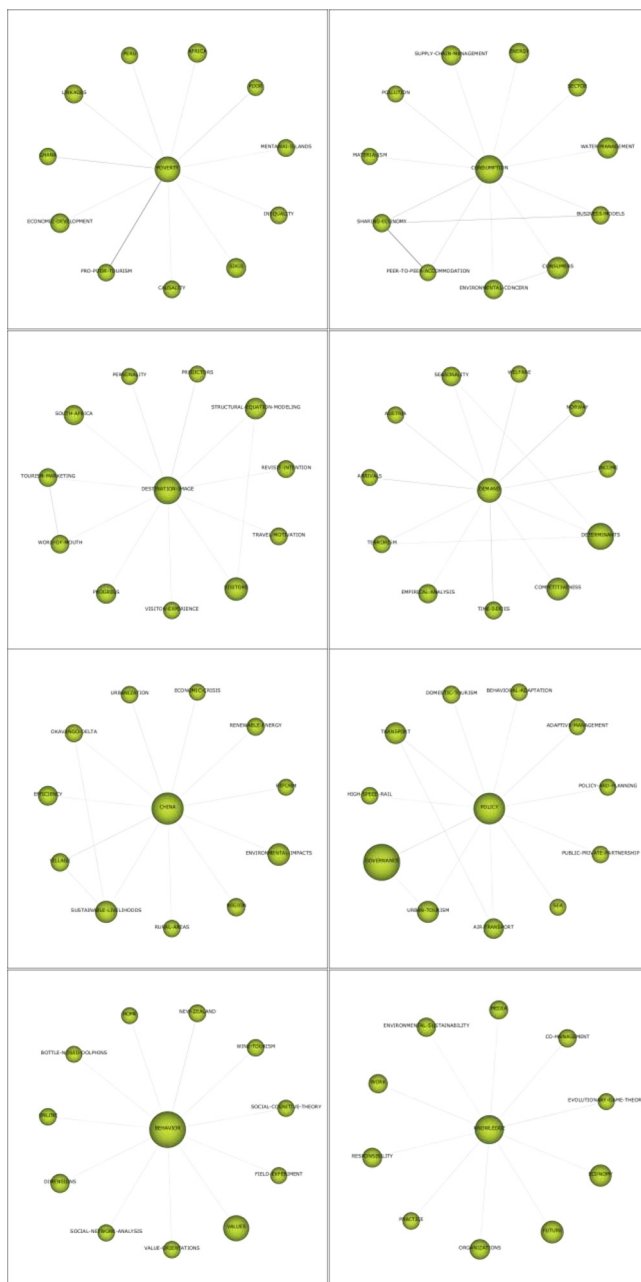


Figure A8.
Cluster networks of
the fourth quadrant
(2016–2020)

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