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Mapping the Changing Landscape of Risk and Crisis Research in Tourism Management: A Longitudinal Bibliometric Analysis

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Abstract

Research on risk and crisis in tourism management covers a wide range of disruptions, yet little is known about how its thematic structure has changed over time. This study examines 4,830 Scopus-indexed journal articles and reviews published between 1987 and 2026 using longitudinal science mapping in SciMAT. The findings suggest a broadening from disaster and crisis management toward risk assessment, vulnerability, preparedness, and resilience. Research temporarily concentrated around COVID-19 during 2020–2022, while the most recent period shows a more diversified, destination-centered configuration. Across the study period, established themes persisted and became connected with newer areas of research rather than being replaced. By tracing changes in thematic relationships and structural roles across successive periods, the study extends previous reviews that mainly identified major topics and crisis types and provides a

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longitudinal account of the conceptual development of risk and crisis research in tourism management.

Keywords: Tourism risk; tourism crisis; science mapping; bibliometric analysis; thematic evolution; co-word analysis; resilience

1. Introduction

Tourism activities are inherently exposed to uncertainty and disruption arising from diverse sources, including natural hazards, health emergencies, economic instability, political tensions, and environmental change. Due to the mobility of tourists, dependence on external conditions, and interactions among multiple tourism actors, disruptive events can generate consequences that affect tourism organizations and destinations (Ritchie, 2004; Ritchie et al., 2010). Consequently, understanding how tourism systems anticipate, respond to, and recover from disruptive events has become an important area of research in tourism management.

Risk and crisis research in tourism management has developed across a broad range of contexts and conceptual perspectives. Early studies laid the foundation for understanding tourism disasters and crises by emphasizing preparedness, response, recovery, and mitigation processes (Faulkner, 2001; Ritchie, 2004). Subsequent research extended this perspective by examining organizational aspects of tourism crisis management, including the role of knowledge management in destination management organizations (Blackman et al., 2011). Research also examined tourism risks associated with political instability, terrorism, and other external shocks that influence tourist flows and destination performance (Sönmez, 1998; Sönmez et al., 1999).

Beyond specific crisis events, tourism scholarship has examined broader issues related to uncertainty, vulnerability, and adaptation. Studies on tourism risk and uncertainty have explored how uncertainty influences tourism decisions, mobility, and destination development (Williams & Baláž, 2015). Research on resilience has emphasized the capacity of tourism systems and destinations to respond and adapt to disruptions through governance arrangements, institutional coordination, and learning processes (Becken & Hughey, 2013; Prayag, 2018).

Recent global disruptions have further increased scholarly attention to different forms of tourism risk. The COVID-19 pandemic generated substantial impacts on international mobility, tourism businesses, and destination economies, stimulating research on health risks, crisis responses, resilience, and recovery pathways (Gössling et al., 2020; Škare et al., 2021). Other studies have examined tourism-related uncertainty associated with economic policy uncertainty (Balli et al., 2018), geopolitical risks affecting tourism demand (Balli et al., 2019; Tiwari et al., 2019), and climate-related pressures affecting tourism systems (Scott et al., 2016; Scott et al., 2024). More recent conceptual discussions have also highlighted the growing relevance of multiple, interacting sources of uncertainty for tourism futures (Gössling & Scott, 2025). Together, these studies demonstrate the breadth of issues examined within contemporary risk and crisis research in tourism management.

Previous reviews have examined tourism crises from different perspectives, but their scope and analytical emphasis vary. Mair et al. (2016) focused on post-disaster and post-crisis recovery at the destination level. Ritchie and Jiang (2019), reviewing 142 studies published between 1960 and 2018, identified weak conceptual and theoretical foundations, limited empirical testing, and uneven coverage of research themes. Berbekova et al. (2021) identified eight recurring crisis-management themes and noted limited conceptual development, while Wut et al. (2021) classified established and emerging areas of crisis, risk, and disaster management and proposed a research agenda organized around theory, context, and method. These reviews clarify the main concerns in the field but largely organize the literature by topics, crisis stages, or conceptual categories.

Bibliometric studies provide a complementary perspective. Jiang et al. (2019) mapped the intellectual structure of tourism crisis and disaster management through citation and co-citation networks, identifying major clusters and structural gaps. Sampaio et al. (2022) combined bibliometric analysis with latent Dirichlet allocation to examine major topics and changes in their prominence, while Upadhyay et al. (2023) traced the intellectual and thematic development of crisis-communication research in tourism and hospitality. Their focus, however, has remained mainly on intellectual structures, topic distributions, broad trends, or specific subfields.

Less clear is how thematic relationships within risk and crisis research in tourism management change across successive periods. Existing studies provide limited evidence on how thematic networks persist, branch, converge, or change their structural roles over time. This study addresses that gap through longitudinal science mapping, combining period-specific strategic diagrams, overlapping maps, and thematic evolution analysis to examine changes in thematic composition, continuity, transformation, and structural position. To address this gap, this study examines the longitudinal evolution of tourism risk and crisis research through three research questions:

RQ1. What are the major themes characterizing risk and crisis research in tourism management across different periods?
RQ2. How has the thematic structure of risk and crisis research in tourism management evolved across successive periods?
RQ3. How have the relative positions and roles of major themes within the field changed over time?

This study extends existing reviews and bibliometric research by shifting attention from identifying major topics and intellectual structures to the longitudinal organization of thematic relationships in risk and crisis research in tourism management. Its principal contribution is to show how major research themes have persisted, transformed, and become connected across successive periods, and how their relative positions and roles within the field have changed over time. In this way, the study provides a more dynamic account of the field than approaches that primarily classify research themes, map citation structures, or examine changes in topic prominence. The analysis also brings together related but conceptually distinct areas of risk, crisis, disaster, uncertainty, disruption, and resilience within a common longitudinal framework, without treating them as equivalent constructs. This perspective helps clarify how the broader knowledge structure of risk and crisis research in tourism management has developed and where different research streams increasingly intersect.

The following section establishes the conceptual foundations of these research streams, after which the Methods describe the data collection and science-mapping procedures. The Results present the period-specific and longitudinal thematic patterns, followed by the Discussion and the study's implications, limitations, and future research directions.

2. Conceptual foundations of risk and crisis research in tourism management

Tourism research uses several related but distinct concepts to describe adverse conditions and responses to them. Risk, uncertainty, hazard, shock, disruption, crisis, disaster, and resilience are related but not interchangeable. Williams and Baláž (2015) distinguish risk from uncertainty by the degree of knowledge about possible outcomes. Under risk, outcomes and their probabilities can, in principle, be estimated; under uncertainty, such probabilities may be unknown or unreliable.

Hazard refers to a potential source of harm whose effects depend in part on the vulnerability of the exposed destination or organization (Alvarez et al., 2022; Williams & Baláž, 2013). Alvarez et al. (2022) distinguish shocks, which are events with relatively rapid onset, from slower and more persistent stressors. Disruption is used more broadly to refer to interruptions to normal tourism activity and is a descriptive rather than a separate theoretical construct.

Crisis and disaster refer to adverse conditions that have materialized and disrupted the functioning of tourism organizations or destinations. Tourism research commonly distinguishes them partly by origin and controllability. Crises are more often associated with organizational or managerial failures, whereas disasters are generally linked to external events over which organizations have limited control (Ritchie, 2004; Ritchie & Jiang, 2019). The distinction is not absolute, since an external disaster may also produce an organizational or destination crisis.

Resilience differs from these concepts because it concerns the capacity to respond to disturbance. It includes the ability of tourism systems to cope, recover, adapt, and reorganize. Prayag (2018) treats resilience and crisis management as closely related yet conceptually distinct, whereas Alvarez et al. (2022) link destination resilience to recovery, learning, adaptation, and self-organization following exposure to hazards.

Bringing these concepts into a common analytical domain does not imply equivalence. Risk, uncertainty, and hazards concern potential adverse conditions; shocks, disruptions, crises, and disasters describe realized disturbances; and resilience concerns the capacity to respond and adapt. Their boundaries may overlap, but tourism research has treated them as connected areas of inquiry (Prayag, 2018; Ritchie & Jiang, 2019). A common science-mapping framework therefore allows

their relationships and development over time to be examined without collapsing their conceptual differences.

3. Methods

3.1. Database selection and sample definition

This study adopted a bibliometric design combining performance analysis with longitudinal science mapping to examine the development and thematic evolution of risk and crisis research in tourism management. Bibliometric analysis is particularly suitable for examining large bodies of scientific literature and identifying the development, structure, and emerging directions of a research field (Donthu et al., 2021). While performance analysis evaluates publication output and scholarly impact, science mapping examines conceptual relationships among research topics and changes in a field's thematic structure over time (Cobo et al., 2011, 2012; Donthu et al., 2021).

Longitudinal science mapping was conducted using the Science Mapping Analysis Software Tool (SciMAT). SciMAT was selected because its longitudinal framework enables the emergence, continuity, transformation, and relationships among research themes to be traced across successive periods (Cobo et al., 2011, 2012).

Bibliographic records were retrieved from Scopus because of its broad multidisciplinary coverage and structured metadata suitable for bibliometric analyses (Baas et al., 2020). Records were exported on 17 August 2026 in RIS format and included publication year, title, abstract, author keywords, indexed keywords, source information, and citation data.

The search strategy was designed to capture risk- and crisis-related scholarship situated within a tourism management context. Accordingly, in addition to requiring the proximity of tourism and risk-, crisis-, uncertainty-, disruption-, shock-, disaster-, hazard-, or polycrisis-related terms, the search required at least one term related to management, governance, policy, strategy, or resilience. This additional condition was used to delimit the corpus to studies with an explicit management- or governance-related orientation rather than to represent the entirety of tourism risk research. The following search expression was applied to titles, abstracts, and keywords:

TITLE-ABS-KEY (((touris* W/15 risk*) OR (touris* W/15 cris*) OR (touris* W/15 uncertaint*) OR (touris* W/15 disrupt*) OR (touris*

W/15 shock*) OR (touris* W/15 disaster*) OR (touris* W/15 hazard*) OR (touris* W/15 polycrisis*)) AND (manag* OR govern* OR policy OR policies OR strateg* OR resilien*))

The W/15 operator required that the tourism term and its corresponding risk- or crisis-related term occur within 15 words, thereby reducing incidental co-mentions while preserving retrieval breadth. Results were limited to English-language journal articles and reviews indexed in Business, Management and Accounting; Social Sciences; Environmental Science; Economics, Econometrics and Finance; and Decision Sciences subject areas. These database limits were applied before relevance screening.

Corpus construction was reported using an adapted PRISMA 2020 flow diagram (Page et al., 2021). The Scopus search yielded 5,310 records after application of the predefined database limits. A single-reviewer screening procedure was used to assess record relevance at the bibliographic-record level based on titles, abstracts, and keywords. Records were retained when tourism constituted a substantive study context and when risk, crisis, uncertainty, disruption, shock, disaster, or hazard represented a meaningful research concern related to tourism management or associated responses. Records were excluded when tourism was peripheral to the main research problem, when tourism appeared only as an incidental application context, or when risk- or crisis-related terminology was not substantively connected to tourism.

For potentially borderline records, titles, abstracts, and keywords were considered jointly before a final inclusion or exclusion decision was made. Particular attention was given to whether the risk- or crisis-related issue had substantive implications for tourism management, governance, policy, strategy, resilience, tourism activity, or destination-related outcomes. No formal inter-reviewer consistency assessment was undertaken because the screening was conducted using a single-reviewer procedure. The relevance screening excluded 480 records, resulting in a final analytical corpus of 4,830 documents published between 1987 and 2026.

Because the purpose of the screening process was to establish a thematically relevant bibliographic corpus for bibliometric and science-mapping analyses rather than to conduct a systematic evidence synthesis, relevance assessment was conducted at the bibliographic-record level rather than through full-text content coding. The selection process is summarized in Fig. 1.

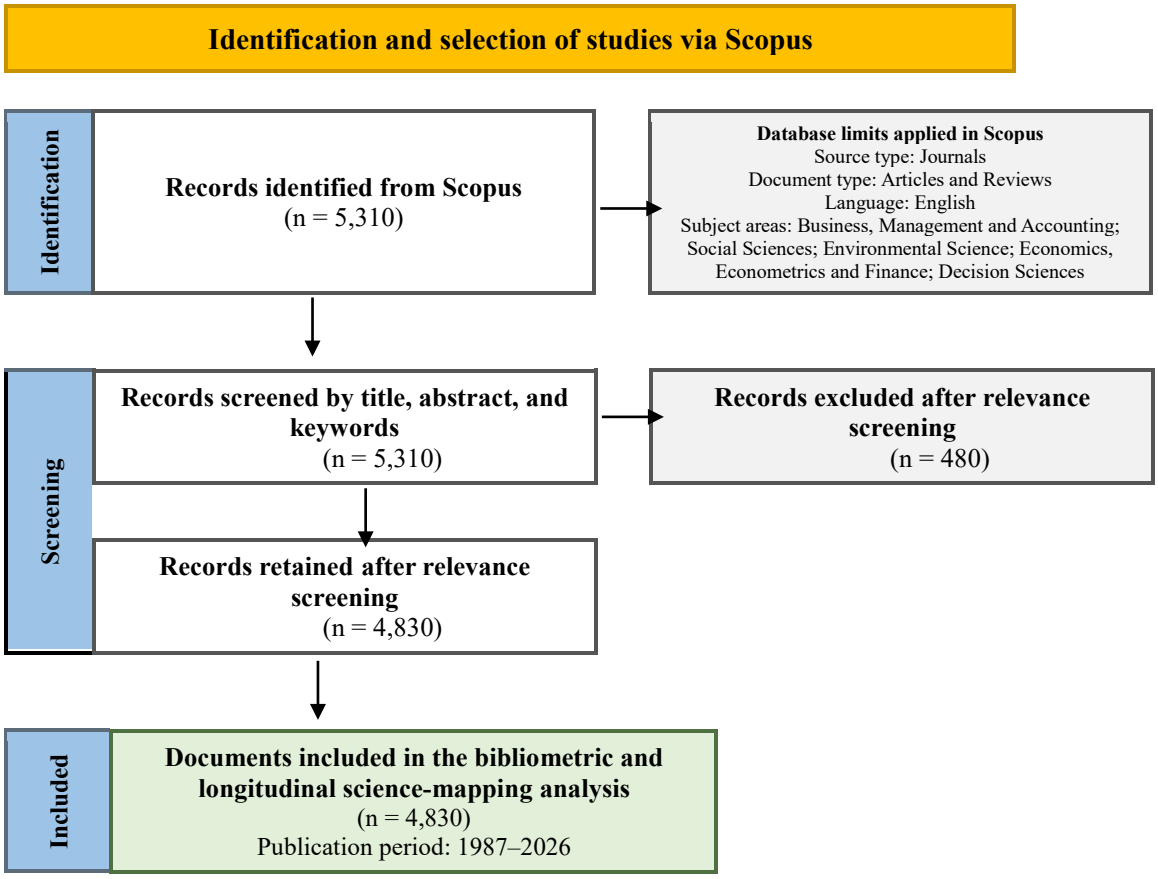


Fig. 1. Adapted PRISMA 2020-based flow diagram for the identification and screening of bibliographic records

3.2. Performance analysis

Performance analysis was conducted to provide an overview of publication growth, source distribution, and citation visibility in risk and crisis research in tourism management. Annual publication output was examined based on publication-year metadata. Publication sources were ranked by the number of documents in the final corpus. Selected highly cited documents were identified based on Scopus citation counts

and their substantive relevance to tourism risk, crisis, and disaster research. Citation data reflect Scopus records retrieved on 17 August 2026.

3.3. Science mapping and thematic evolution analysis using SciMAT

The final dataset was analyzed using SciMAT to examine the conceptual structure and thematic evolution of risk and crisis research in tourism management over time. SciMAT integrates co-word analysis, thematic clustering, strategic diagrams, and thematic evolution maps within a longitudinal science-mapping framework (Cobo et al., 2011, 2012). Co-word analysis was used to identify conceptual relationships based on keyword co-occurrence, assuming that frequently co-occurring terms represent conceptual associations within a research domain (Callon et al., 1991).

Before analysis, the keyword dataset was manually cleaned and normalized to reduce lexical and semantic fragmentation while preserving conceptually meaningful distinctions. Both author keywords and indexed keywords were included. The cleaning procedure followed four main principles. First, spelling, grammatical, and singular–plural variants referring to the same concept were standardized (e.g., TOURIST-BEHAVIOR/TOURIST-BEHAVIOUR and CARBON-EMISSION/CARBON-EMISSIONS). Second, clearly equivalent expressions were merged under a common preferred term; for example, CRISES-MANAGEMENT was standardized as CRISIS-MANAGEMENT, while DESTINATION, DESTINATIONS, TOURIST-DESTINATION, and TOURIST-DESTINATIONS were consolidated as TOURIST-DESTINATION. Third, generic, methodological, or indexing terms with limited substantive value were removed, including ANIMALS, BUILDING, NUMERICAL-MODEL, COST-BENEFIT-ANALYSIS, and DELPHI-ANALYSIS. Fourth, conceptually related but analytically distinct terms were retained separately to avoid excessive aggregation. Thus, RISK, RISK-ASSESSMENT, RISK-PERCEPTION, and HEALTH-RISK were treated as distinct concepts, as were DISASTER, NATURAL-DISASTER, NATURAL-HAZARD, COVID-19, and PANDEMIC. These procedures were intended to reduce terminological variation without obscuring substantive differences among research themes (López-Robles et al., 2020).

The analytical period covered 1987–2026 and was divided into five intervals: 1987–2009, 2010–2014, 2015–2019, 2020–2022, and 2023–2026. The unequal periodization was adopted to accommodate the substantial growth in publication volume while retaining meaningful phases in the field's development. The first interval spans a longer period because publication activity was relatively limited during the formative years; despite covering 23 years, it contains 361 documents, a volume comparable to the 353 documents published during 2010–2014. The 2015–2019 interval captures the subsequent expansion of the field before COVID-19. The 2020–2022 period was treated separately because it represents a distinct phase of rapid growth in crisis-related tourism research associated with the pandemic, whereas 2023–2026 captures the most recent phase following the peak of pandemic-related publication activity. Because 2026 data were incomplete at the time of retrieval, findings for the final year were interpreted with caution.

Because the periods differ substantially in duration and publication volume, cross-period comparisons were interpreted cautiously. Absolute quantities such as the number of identified terms, theme size, and number of core documents may partly reflect differences in corpus size and were therefore not treated as directly comparable indicators of thematic importance. Similarly, centrality and density were interpreted relative to the configuration of each period-specific network rather than as absolute longitudinal measures. Cross-period interpretation therefore focused primarily on thematic configuration, structural position, quadrant membership, persistence, branching, and evolutionary linkages.

The unit of analysis consisted of keyword terms derived from both author and indexed keywords. To account for differences in corpus size, the minimum keyword-frequency thresholds were set at 3, 3, 4, 6, and 8 for 1987–2009, 2010–2014, 2015–2019, 2020–2022, and 2023–2026, respectively. Co-word networks were normalized using the Equivalence Index, and thematic clusters were identified using the Simple Centers Algorithm (Callon et al., 1991; Cobo et al., 2012). The thematic network size was restricted to a minimum of 4 and a maximum of 12 terms, with an edge-reduction value of 1. Theme-level performance was evaluated using the number of core documents and the h-index. Because citation-exposure windows differ substantially across periods, theme-level h-index values were treated only as descriptive within-period

indicators of citation visibility and were not interpreted as directly comparable measures of thematic performance across periods.

Strategic diagrams positioned themes according to centrality, reflecting their interaction with other themes, and density, reflecting their internal development and cohesion. Themes were classified as motor themes (high centrality; high density), basic and transversal themes (high centrality; low density), highly developed but isolated themes (low centrality; high density), and low-centrality/low-density themes. Because themes in the latter category may be emerging or declining, their interpretation was informed by the longitudinal results (Cobo et al., 2011, 2012; Herrera-Viedma et al., 2020).

Longitudinal development was examined using two complementary SciMAT outputs—the overlapping map assessed continuity in the conceptual vocabulary between consecutive periods using the Jaccard similarity index. The thematic evolution map was constructed using the Inclusion Index, which measures the strength of conceptual links between thematic networks across consecutive periods. No additional minimum Inclusion Index cutoff was imposed; links were retained when thematic networks in consecutive periods shared at least one keyword (i.e., Inclusion Index > 0). Solid links indicate that the name of one thematic network appears in the name or keywords of another network, whereas dashed links indicate that the networks share keywords other than their names. Line thickness represents link strength as measured by the Inclusion Index. These patterns were interpreted to identify continuity, transformation, branching, and convergence across periods (Cobo et al., 2011, 2012).

Trajectories were selected for detailed discussion when they could be traced across all five periods through linked thematic networks at each consecutive transition and showed a coherent thematic progression. The Inclusion Index was used to assess the strength of cross-period links, whereas document volume, centrality, density, and h-index were not used as independent criteria for selecting trajectories.

The analytical framework was aligned with the three research questions. Strategic diagrams and thematic networks were used to identify the major themes and their structural positions within each period (RQ1). The overlapping and thematic evolution maps were used to examine changes in thematic structure across successive periods, including continuity, transformation, branching, and convergence (RQ2). For RQ3, changes in the relative positions and roles of major

themes were examined using period-specific centrality and density measures together with their thematic network connections.

4. Results

4.1. Performance analysis

The publication output, leading sources, and highly cited documents of risk and crisis research in tourism management are presented in the following sections.

4.1.1. Publication output over time

Fig. 2 presents the annual distribution of the 4,830 documents published between 1987 and 2026. Publication activity remained limited in the early years and gradually increased during the 2000s and 2010s. A clear increase occurred after 2020, with annual output rising from 191 documents in 2019 to 298 in 2020 and 489 in 2021, coinciding with the expansion of tourism research addressing COVID-19-related disruptions. Publication activity remained high after the pandemic period, reaching 467 documents in 2023, 571 in 2024, and 647 in 2025. Documents published during 2023–2026 accounted for 45.40% of the corpus, compared with 26.21% during 2020–2022. The lower number recorded for 2026 (508 documents) indicates that data collection was conducted before the end of the publication year and should therefore be interpreted with caution.

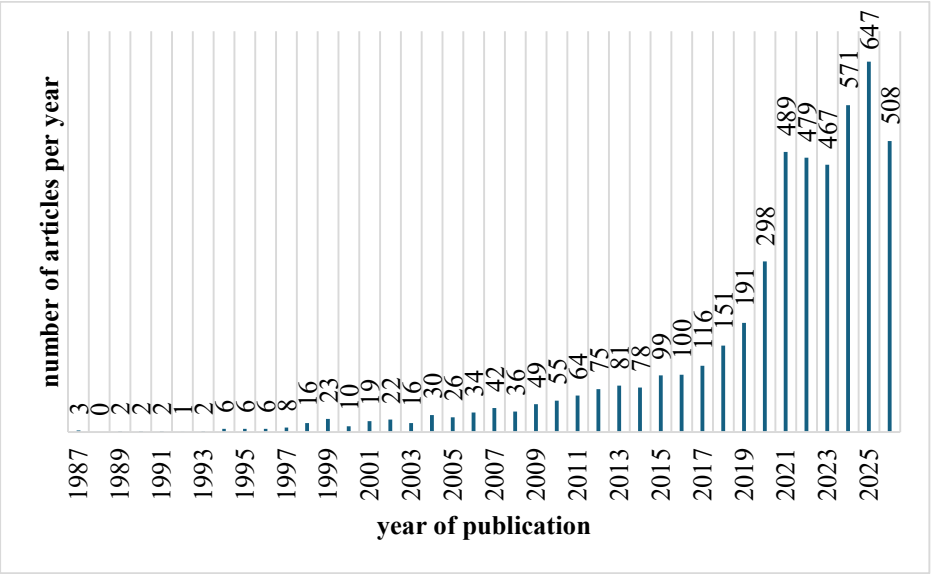


Fig 2. Annual publication output in tourism risk and crisis research in tourism management, 1987–2026
Source: Authors' elaboration based on Scopus data

4.1.2. Main publication sources

The 4,830 documents were distributed across a wide range of publication outlets, including specialized tourism journals and multidisciplinary sources. Table 1 presents the ten leading publication sources ranked by the number of documents in the final corpus. These sources accounted for 1,206 documents, representing 24.97% of the total corpus.

Table 1. Main publication sources contributing to the research field

Rank	Publication source	Documents	Share of total (%)
1	Sustainability (Switzerland)	252	5.22
2	Current Issues in Tourism	191	3.95
3	Tourism Management	169	3.50

4	Journal of Sustainable Tourism	131	2.71
5	Tourism Economics	102	2.11
6	Annals of Tourism Research	89	1.84
7	Journal of Travel Research	82	1.70
8	GeoJournal of Tourism and Geosites	70	1.45
9	Tourism Management Perspectives	60	1.24
10	Worldwide Hospitality and Tourism Themes	60	1.24
Total, top 10 sources		**1,206**	**24.97**

Sustainability (Switzerland) was the leading source with 252 documents, followed by Current Issues in Tourism (191) and Tourism Management (169). The distribution of leading sources indicates that research on tourism risk and crisis has been published across tourism management, sustainability, and economics-oriented outlets rather than concentrated in a single journal.

4.1.3. Highly cited documents

Table 2 presents the ten most highly cited documents in the final corpus based on Scopus citation counts. Together, these publications received 9,947 citations as of 17 August 2026. The most cited document was Gössling et al.'s (2020) assessment of COVID-19 and global tourism change, followed by Faulkner's (2001) framework for tourism disaster management and Ritchie's (2004) strategic approach to tourism crisis management. The remaining highly cited studies address terrorism, political instability, health crises, and broader tourism disruptions.

Table 2. Selected highly cited documents in tourism risk and crisis research in tourism management

Rank	Authors	Title	Journal	Year	Citations
1	Gössling, S., Scott, D., & Hall, C.M.	*Pandemics, tourism and global change: A rapid assessment of COVID-19*	Journal of Sustainable Tourism	2020	3,764
2	Faulkner, B.	*Towards a framework for tourism disaster management*	Tourism Management	2001	1,160

3	Ritchie, B.W.	*Chaos, crises and disasters: A strategic approach to crisis management in the tourism industry*	Tourism Management	2004	965
4	Ritchie, B.W., & Jiang, Y.	*A review of research on tourism risk, crisis and disaster management: Launching the Annals of Tourism Research curated collection on tourism risk, crisis and disaster management*	Annals of Tourism Research	2019	707
5	Škare, M., Soriano, D.R., & Porada-Rochoń, M.	*Impact of COVID-19 on the travel and tourism industry*	Technological Forecasting and Social Change	2021	674
6	Sönmez, S.F.	*Tourism, terrorism, and political instability*	Annals of Tourism Research	1998	584
7	Novelli, M., Gussing Burgess, L., Jones, A., & Ritchie, B.W.	*'No Ebola…still doomed' – The Ebola-induced tourism crisis*	Annals of Tourism Research	2018	573
8	Sönmez, S.F., Apostolopoulos, Y., & Tarlow, P.	*Tourism in crisis: Managing the effects of terrorism*	Journal of Travel Research	1999	520
9	Hall, C.M.	*Crisis events in tourism: Subjects of crisis in tourism*	Current Issues in Tourism	2010	500

10	Ioannides, D., & Gyimóthy, S.	*The COVID-19 crisis as an opportunity for escaping the unsustainable global tourism path*	Tourism Geographies	2020	500

Note: Citation counts were retrieved from Scopus on 17 August 2026.

4.2 Analysis by period

Complementing the longitudinal thematic evolution analysis, the thematic structure of each period was examined across all four categories of the strategic diagrams. Table 3 provides a systematic overview of the motor themes, basic and transversal themes, highly developed but isolated themes, and low-centrality/low-density themes identified in each period. For more detailed visualization, the cluster network of the largest motor theme, based on the number of core documents, was selected for examination in each period. However, document volume was not used as the sole basis for interpretation; smaller themes were also considered according to their structural position and longitudinal relationships, particularly when their continuity or evolutionary linkages suggested an emerging, declining, or specialized role.

Table 3. Thematic structure across the five study periods

Period	Motor themes	Basic and transversal themes	Highly developed but isolated themes	Low-centrality/low-density themes
1987–2009	DISASTER-MANAGEMENT; NATURE-SOCIETY-RELATIONS	TOURISM-DEVELOPMENT; ECONOMIC-IMPACT	PERCEPTION; PROTECTED-AREA	CRISIS-MANAGEMENT
2010–2014	ECONOMIC-IMPACT; VULNERABILITY; REGIONAL-PLANNING;	TOURIST-MARKETS	CONSUMER-BEHAVIOUR	NATURE-BASED-TOURISM; CRISIS-MANAGEME

	ENVIRONMENTAL-RISK			NT; HUMAN-ACTIVITY
2015–2019	RISK-ASSESSMENT; NATURAL-HAZARD; WORLD-HERITAGE-SITE; HUMAN-ACTIVITY; GROUNDWATER	ENVIRONMENTAL-IMPACT	TOURISM-ECONOMICS	NATURAL-DISASTER; TOURIST-BEHAVIOUR; POLICY-IMPLEMENTATION; SMALL-AND-MEDIUM-SIZED-ENTERPRISE
2020–2022	COVID-19; RISK-ASSESSMENT; CARBON-EMISSION	TOURISM-DEVELOPMENT; RISK; RISK-PERCEPTION	ECONOMIC-POLICY; RESIDENTS; INNOVATION	CULTURAL-HERITAGE; ISLAND-TOURISM
2023–2026	TOURIST-DESTINATION; INTERNATIONAL-TOURISM; ECOSYSTEMS; HEALTH-RISK; HAZARDS	CLIMATE-CHANGE; RISK-PERCEPTION	INCOME; CULTURAL-HERITAGE	DISASTER; INNOVATION; STRATEGIC-APPROACH; INVESTMENT

4.2.1. Period 1987–2009

Fig. 3(a) presents the strategic diagram for the first period. Two motor themes were identified: DISASTER-MANAGEMENT and NATURE-SOCIETY-RELATIONS, indicating that early tourism risk research was mainly organized around disaster management and environmental concerns. TOURISM-DEVELOPMENT and ECONOMIC-IMPACT appeared as basic and transversal themes, while PERCEPTION and PROTECTED-AREA were highly developed but relatively isolated. CRISIS-MANAGEMENT was located in the low-centrality and low-density quadrant but continued into the following period, suggesting an emerging theme. Among the motor themes, DISASTER-MANAGEMENT had the largest document base (21 documents) and was selected for further examination through its thematic network (Fig.

3(b)). The theme was connected with NATURAL-DISASTER, NATURAL-HAZARD, RISK, and policy-related concepts, reflecting early attention to hazardous events and their management. Studies developed tourism disaster and crisis management frameworks and expanded the focus from response and recovery toward preparedness, risk reduction, and readiness (Faulkner, 2001; Hystad & Keller, 2008; Ritchie, 2008; Ritchie, 2004).

The second motor theme, NATURE-SOCIETY-RELATIONS, linked environmental risk, climate change, ecosystems, and environmental management, implying that environmental vulnerability was already an established component of the field. The first period, therefore, shows a concentrated thematic structure in which disaster management and environmental concerns formed the main research foundations. At the same time, tourism development and economic impacts provided broader transversal foundations for subsequent research.

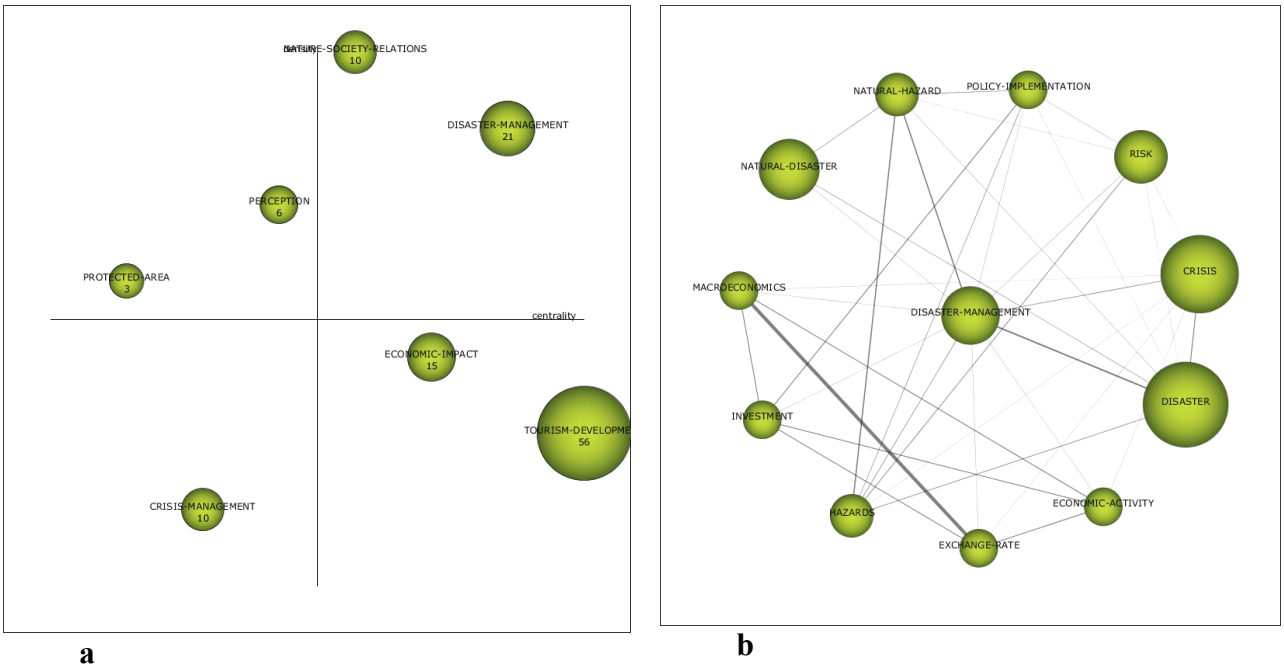


Fig 3. (a) Strategic diagram and (b) cluster network of the main motor theme for the period 1987–2009

4.2.2. Period 2010–2014

Fig. 4(a) presents the strategic diagram for the second period. Compared with the previous period, the thematic structure became more diversified. Four motor themes were identified: ECONOMIC-IMPACT, VULNERABILITY, REGIONAL-PLANNING, and ENVIRONMENTAL-RISK, reflecting the expansion of tourism risk research into economic, vulnerability, planning, and environmental dimensions. TOURIST-MARKETS occupied a basic and transversal position, whereas CONSUMER-BEHAVIOUR appeared as a highly developed but isolated theme. ECONOMIC-IMPACT was the largest motor theme (61 documents) and was connected with TOURISM-DEVELOPMENT, TOURISM-ECONOMICS, FINANCIAL-CRISIS, ECONOMIC-CRISIS, DISASTER-MANAGEMENT, and GLOBAL-ECONOMY (Fig. 4(b)). Research examined the effects of financial crises on tourism activity and expenditure (Eugenio-Martin & Campos-Soria, 2014; Li et al., 2010; Ritchie et al., 2010) and the economic consequences of natural disasters for tourism destinations (Liu, 2014).

The other motor themes indicate the field's widening scope. VULNERABILITY was associated with natural hazards, resilience, and tourism policy; REGIONAL-PLANNING connected risk assessment with climate change, natural resources, and socioeconomic conditions; and ENVIRONMENTAL-RISK linked environmental impacts with risk perception and environmental management. Overall, the 2010–2014 period represents a diversification of tourism risk research beyond disaster management toward economic impacts, vulnerability, planning, and environmental risk.

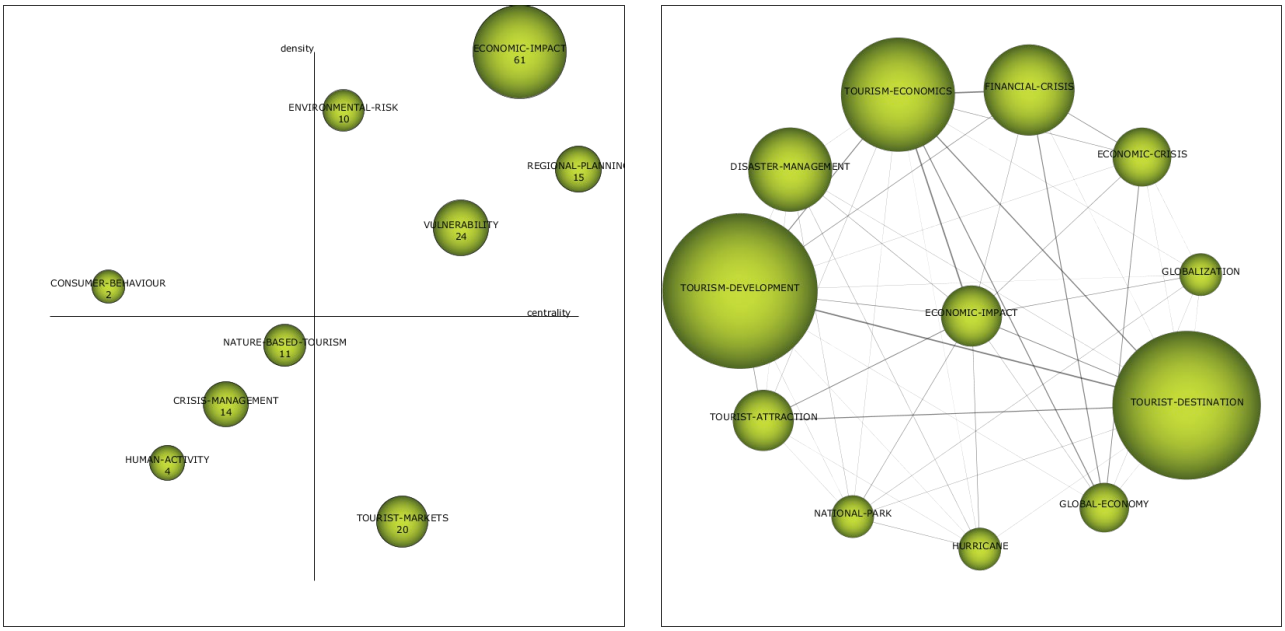


Fig 4. (a) Strategic diagram and (b) cluster network of the main motor theme for the period 2010–2014

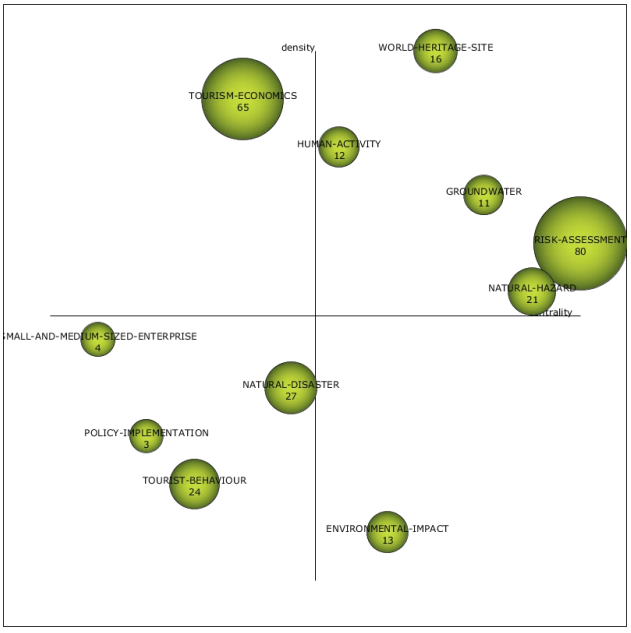
4.2.3. Period 2015–2019

Fig. 5(a) presents the strategic diagram for 2015–2019. Five motor themes were identified: RISK-ASSESSMENT, NATURAL-HAZARD, WORLD-HERITAGE-SITE, HUMAN-ACTIVITY, and GROUNDWATER, indicating further expansion toward risk evaluation, environmental hazards, and place-specific vulnerability. TOURISM-ECONOMICS emerged as a highly developed yet isolated theme, whereas ENVIRONMENTAL-IMPACT occupied a basic and transversal position.

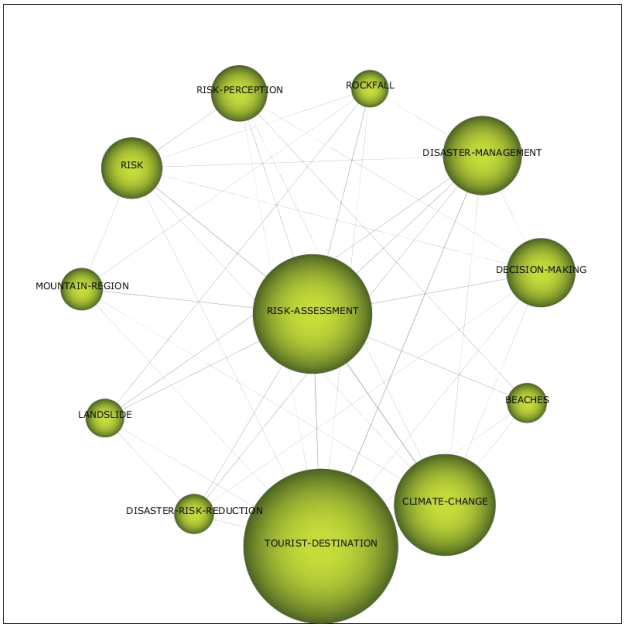
Among the motor themes, RISK-ASSESSMENT was clearly the most prominent in terms of the number of documents (80). The theme was closely connected to RISK, RISK-PERCEPTION, DISASTER-MANAGEMENT, DISASTER-RISK-REDUCTION, CLIMATE-CHANGE, and several specific hazards, including landslides and rockfalls (Fig. 5(b)). This configuration reflects the consolidation of

risk assessment from individual disaster events to vulnerability, climate-related hazards, risk perception, and disaster risk reduction (Williams & Baláž, 2015).

The emergence of WORLD-HERITAGE-SITE, HUMAN-ACTIVITY, and GROUNDWATER during 2015–2019 indicates growing links between tourism risk research and environmental, heritage, and resource-related issues. To check whether tourism was only peripheral in these themes, their core documents were reviewed. In all cases, tourism was the primary focus of study, with environmental or resource concerns examined in relation to tourism activities, destinations, or management. These themes therefore reflect stronger connections with adjacent fields such as environmental management, heritage studies, and resource management rather than the inclusion of largely unrelated environmental-risk research. The period thus combines the consolidation of RISK-ASSESSMENT with broader diversification across environmental, hazard, and vulnerability-related contexts.



a



b

Fig. 5. (a) Strategic diagram and (b) cluster network of the main motor theme for the period 2015–2019

4.2.4. Period 2020–2022

Fig. 6(a) presents the strategic diagram for 2020–2022. COVID-19 strongly shaped the thematic structure. Three motor themes were identified: COVID-19, RISK-ASSESSMENT, and CARBON-EMISSION. TOURISM-DEVELOPMENT, RISK, and RISK-PERCEPTION occupied basic and transversal positions, whereas ECONOMIC-POLICY, RESIDENTS, and INNOVATION were highly developed but relatively isolated themes.

COVID-19 was the largest motor theme (297 documents). It was connected to PANDEMIC, HEALTH-RISK, CRISIS-MANAGEMENT, RESILIENCE, TRAVEL-BEHAVIOR, ECONOMIC-IMPACT, and TOURIST-DESTINATION (Fig. 6(b)), suggesting that these previously distinct concerns became more closely represented within the same thematic network during the pandemic period. Studies examined the global effects of COVID-19 on tourism (Gössling et al., 2020), crisis management and resilience responses in tourism systems and organizations (Filimonau & De Coteau, 2020; Wut et al., 2021), and the relationship between health risk perception and travel behavior (Chua et al., 2021). The simultaneous presence of RISK-ASSESSMENT as a motor theme indicates the continued importance of systematic risk evaluation. At the same time, CARBON-EMISSION shows that environmental and climate-related concerns remained well developed despite the strong focus on the pandemic. Overall, the 2020–2022 period can be characterized by the centrality of COVID-19 and the convergence of health, economic, behavioral, crisis management, and resilience-related concerns in tourism risk research.

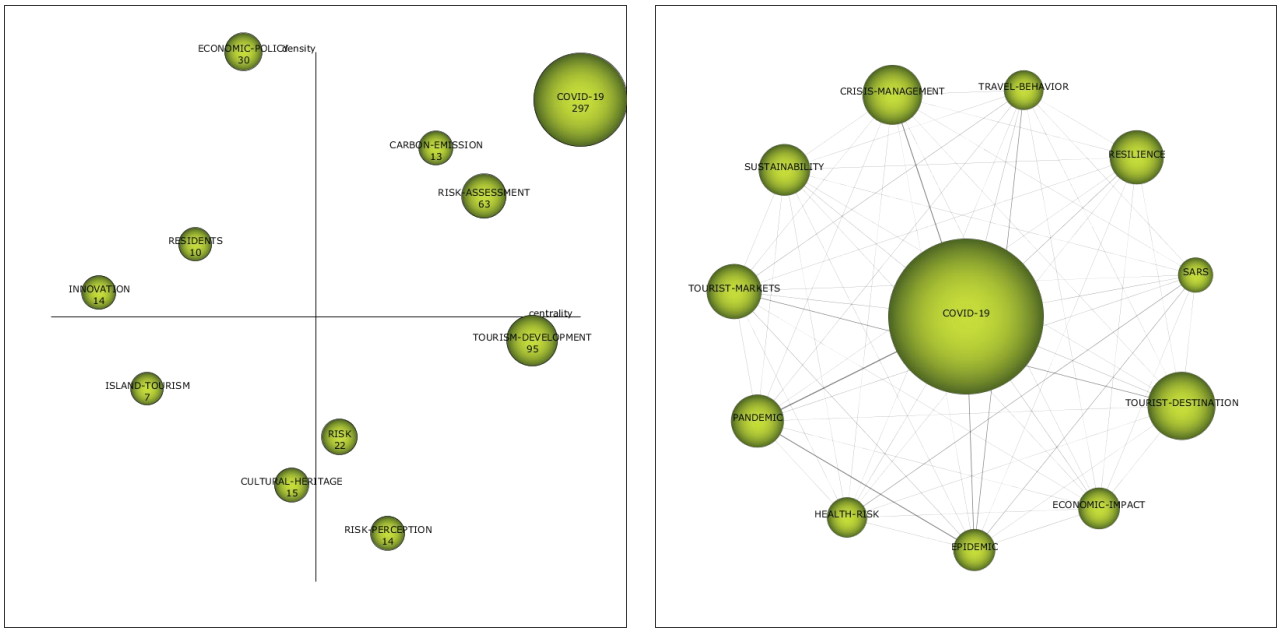


Fig 6. (a) Strategic diagram and (b) cluster network of the main motor theme for the period 2020-2022

4.2.5. Period 2023–2026

Fig. 7(a) presents the strategic diagram for the most recent period. Five motor themes were identified: TOURIST-DESTINATION, INTERNATIONAL-TOURISM, ECOSYSTEMS, HEALTH-RISK, and HAZARDS. CLIMATE-CHANGE and RISK-PERCEPTION occupied basic and transversal positions, whereas INCOME and CULTURAL-HERITAGE appeared as highly developed but relatively isolated themes. TOURIST-DESTINATION was the largest motor theme (420 documents) and connected destination-related research with TOURISM-DEVELOPMENT, TOURIST-BEHAVIOUR, STAKEHOLDER, DISASTER-MANAGEMENT, CRISIS-MANAGEMENT, COVID-19, TOURISM-ECONOMICS, and POLICY-MAKING (Fig. 7(b)), suggesting that destination-related research functioned as an important point of thematic convergence for multiple risk- and crisis-related concerns. Representative Studies examined destination responses to crises (Su et al., 2023), organizational capabilities for disaster management (Jiang et al., 2023),

destination resilience after disruptive events (Hall et al., 2024), and climate-change risk management at the destination level (Loehr & Becken, 2023). The remaining motor themes show the field's diversification across international tourism, ecosystems, health risks, and hazards. The positions of CLIMATE-CHANGE and RISK-PERCEPTION indicate their broad connections within the contemporary thematic structure. Overall, the 2023–2026 period can be characterized by a more diversified and destination-centered structure in which multiple dimensions of tourism risk and crisis research coexist and increasingly intersect.

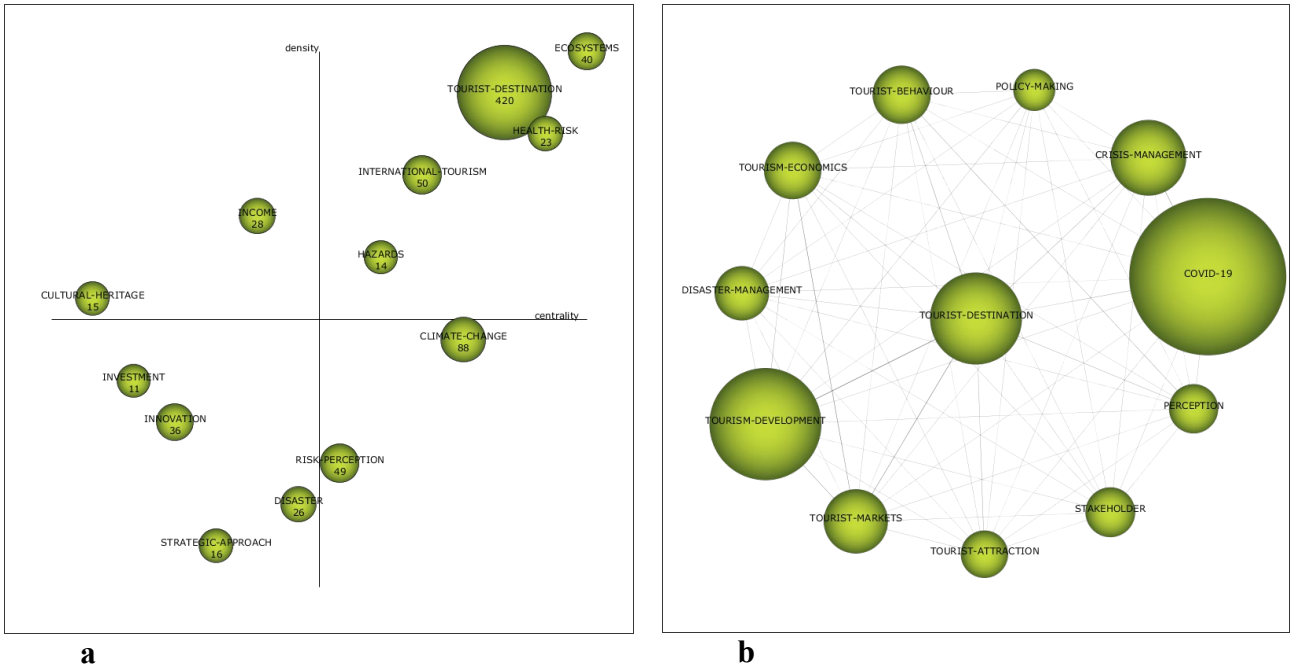


Fig 7. (a) Strategic diagram and (b) cluster network of the main motor theme for the period 2023–2026

4.3. Longitudinal thematic analysis

4.3.1. Overlapping map

The overlapping map was used to examine changes in the conceptual vocabulary of risk and crisis research in tourism management across the five periods. Fig. 8 reports the number of identified terms in each period, the number of shared terms between consecutive periods, and the corresponding Jaccard similarity index. Diagonal arrows represent newly introduced terms and terms that did not continue into the following period (Cobo et al., 2012; Gibbin et al., 2023). The number of identified terms increased from 288 in 1987–2009 to 364, 536, 701, and 906 in the subsequent periods. This absolute growth should be interpreted with caution because the later periods contain substantially larger publication volumes, which increase the opportunity for a broader vocabulary to be represented.

In contrast, the Jaccard similarity index provides a relative measure of vocabulary overlap between consecutive periods. Shared terms increased from 190 between the first two periods to 267, 401, and 599 in later transitions, while the Jaccard similarity index rose from 0.41 to 0.42, 0.48, and 0.59. Thus, despite the expansion in the number of identified terms, the proportionate overlap in vocabulary between consecutive periods also increased. At the same time, new terms continued to enter the field, with 174, 269, 300, and 307 new terms appearing across successive transitions. The most recent transition retained 599 terms from 2020–2022 while adding 307 new terms. These results indicate increasing lexical continuity alongside vocabulary expansion; however, they should not by themselves be interpreted as evidence of theoretical stabilization, coherence, or maturity. Such interpretations require consideration of the thematic evolution and network structure presented in the subsequent analyses.

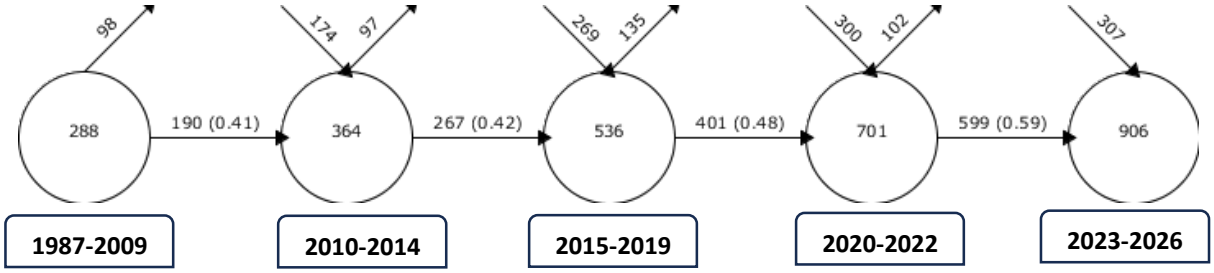


Fig 8. An overlapping map across the five study periods generated using SciMAT
Source: Authors' elaboration based on SciMAT analysis

4.3.2. Thematic evolution map

The thematic evolution map was examined to trace changes in the thematic structure across successive periods and to identify continuity and connections among thematic networks. Each node represents a thematic network in a specific period. Solid lines indicate links based on shared thematic names, whereas dashed lines represent connections based on shared keywords other than theme names. Line thickness reflects the Inclusion Index, which indicates the strength of conceptual relationships across periods (Cobo et al., 2011, 2012; Díaz-López et al., 2019). For detailed longitudinal interpretation, three focal evolutionary trajectories were selected because each could be traced continuously across all five analytical periods through linked thematic networks in each of the four consecutive period transitions and exhibited a substantively coherent thematic progression. These trajectories represent disaster/crisis/risk management, economic and policy-related uncertainty, and environmental/climate-related risk (Fig. 9).

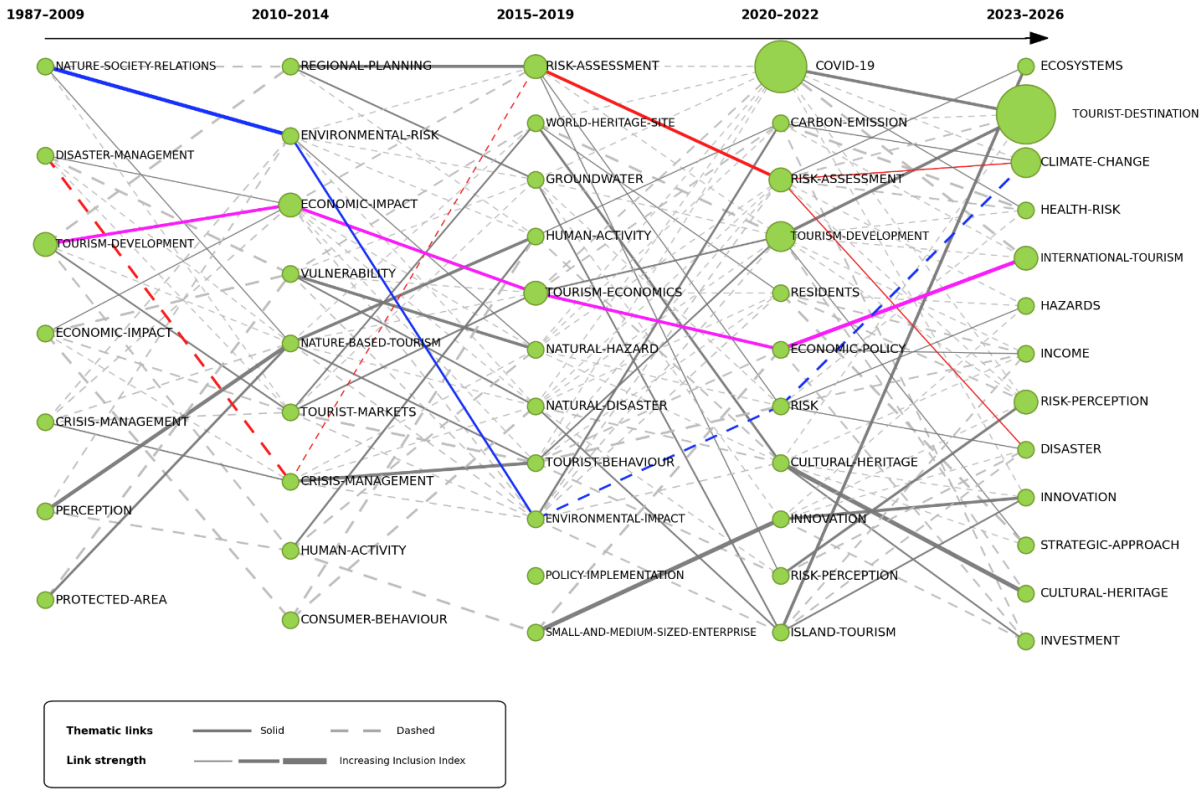


Fig 9. Thematic evolution map of risk and crisis research in tourism management across five study periods
Note: Colored links highlight the three focal evolutionary pathways
Source: Authors' elaboration based on SciMAT analysis

Pathway 1: From Disaster Management to Risk Assessment and Climate Change Adaptation

The first pathway represents the development of research from disaster and crisis management toward broader risk assessment and climate-related adaptation. During the formative period (1987–2009), the DISASTER-MANAGEMENT theme focused on developing tourism disaster-management frameworks. Research gradually expanded from response and recovery toward preparedness, risk reduction, and readiness (Faulkner, 2001; Ritchie, 2008). During 2010–2014, this

pathway evolved into CRISIS-MANAGEMENT, with greater attention to organizational and destination-level responses. Studies have examined crisis management practices in tourism organizations and destinations, including stakeholder perceptions, knowledge management, and crisis and disaster management in hospitality businesses (Blackman et al., 2011; Hanna Salman Sawalha et al., 2013; Rittichainuwat, 2013). Research also considered economic crises and their implications for tourism policy and recovery (Boukas & Ziakas, 2013).

In 2015–2019, the pathway became increasingly associated with RISK-ASSESSMENT, suggesting greater thematic attention to uncertainty and vulnerability. Research increasingly connected tourism risk, crisis, and disaster management with adaptation and resilience perspectives (Ritchie & Jiang, 2019; Scott et al., 2016; Williams & Baláž, 2015).

The RISK-ASSESSMENT theme continued during 2020–2022 and incorporated multiple crisis contexts following the COVID-19 pandemic. Studies examined resilience as an adaptive process (Jiang et al., 2021), destination resilience amid multiple crises (Pyke et al., 2021), and broader risk implications of the pandemic (Cook & Jóhannsdóttir, 2021). During 2023–2026, this pathway became more differentiated through the emergence of CLIMATE-CHANGE and DISASTER themes. The CLIMATE-CHANGE theme addressed tourism vulnerability, adaptation, resilience, and sectoral responses to climate change (León et al., 2023; Scott et al., 2024; Steiger et al., 2024). The DISASTER theme continued to focus on resilience, recovery, collaborative disaster management planning, and exposure to extreme weather within disaster risk reduction contexts (Camatti et al., 2024; Kausar et al., 2023; Liu et al., 2024).

Pathway 2: From Tourism Development and Economic Impacts to Economic Policy and International Tourism under Uncertainty

The second pathway captures the economic and policy dimensions of tourism risk research. During 1987–2009, the TOURISM-DEVELOPMENT theme examined how tourism development was affected by external disruptions, including terrorism, political instability, health crises, financial downturns, and other shocks. Studies have investigated the effects of SARS and avian influenza on

international tourism demand (Kuo et al., 2008), tourism uncertainty and economic growth (Chen & Chiou-Wei, 2009), and economic crises affecting the tourism industry (Okumus et al., 2005). During 2010–2014, the pathway developed into ECONOMIC-IMPACT, with greater emphasis on measuring the economic consequences of crises and disruptive events. Research has examined the effects of financial crises and recessions on tourism activity and expenditure (Eugenio-Martin & Campos-Soria, 2014; Li et al., 2010; Ritchie et al., 2010), as well as the economic effects of natural hazards on tourism-dependent destinations (Liu, 2014).

In 2015–2019, the pathway evolved into TOURISM-ECONOMICS. Research increasingly addressed economic and political uncertainty and its relationship with tourism demand, flows, competitiveness, and sectoral performance. Economic policy uncertainty and geopolitical risk have become increasingly prominent in explaining changes in tourism activity (Balli et al., 2018; Demir & Gozgor, 2018; Tiwari et al., 2019). During 2020–2022, the pathway moved toward ECONOMIC-POLICY, with studies examining economic policy uncertainty as a factor influencing tourism demand and international tourist arrivals (Işık et al., 2020; Nguyen et al., 2020). Research also considered its interaction with geopolitical risk and other sources of uncertainty (Lee et al., 2021; Zhang et al., 2022), particularly in relation to COVID-19-related disruptions.

In 2023–2026, the pathway developed into INTERNATIONAL-TOURISM. Research continued to examine uncertainty and international tourism demand (Kuok et al., 2023; Payne et al., 2023), while also incorporating climate-policy uncertainty, tourism investment, pandemic-related uncertainty, geopolitical instability, and tourism recovery under external shocks (Gao & Zhang, 2024; Qu et al., 2026; Zhao et al., 2023). Overall, this trajectory is consistent with a gradual broadening of thematic attention from tourism development and the economic impacts of individual disruptive events toward research addressing multiple forms of uncertainty and external shocks in relation to international tourism activity.

Pathway 3: From Environmental Risk to Climate Change Vulnerability and Resilience

The third pathway represents the environmental dimension of tourism risk research. During 1987–2009, NATURE-SOCIETY-RELATIONS focused on interactions between environmental systems, resource use, and tourism activities. Studies examined environmental pressures associated with tourism activities (Baker & Genty, 1998), tourists' preferences for environmental features under climate change conditions (Uyarra et al., 2005), and environmental risk assessment in tourism-related coastal development (El Sherbiny et al., 2006). During 2010–2014, the pathway developed into ENVIRONMENTAL-RISK, reflecting greater attention to environmental hazards affecting tourism. Research examined environmental impacts in tourism ecosystems (Gladstone et al., 2013), stakeholder perceptions of climate change (Trawöger, 2014), and environmental risk assessment in tourism settings (Böhm & Pfister, 2011; Irene et al., 2010). The thematic configuration of this period is consistent with a movement from broad nature–society concerns toward more explicit attention to environmental risk.

In 2015–2019, the pathway shifted toward ENVIRONMENTAL-IMPACT, with research focusing on tourism–environment interactions and destination vulnerability. Studies examined linkages among tourism, energy, health, and environmental sustainability (Qureshi et al., 2017), integrated coastal vulnerability (Lins-de-Barros, 2017), environmental decline and support for tourism development (Robinson et al., 2019), and the environmental and economic implications of tourism activities in sensitive coastal settings (Lester et al., 2016). In 2020–2022, this trajectory was represented by the broader RISK theme. Rather than being confined to environmental impacts alone, research increasingly addressed multiple forms of vulnerability and uncertainty affecting tourism systems, including organizational resilience under uncertainty (Melián-Alzola et al., 2020), tourism vulnerability during the COVID-19 crisis (Arbulú et al., 2021), travel risk in nature-based tourism (Samdin et al., 2022), and climate-related vulnerability of tourism and heritage sites (Chikodzi et al., 2022). The emergence of the RISK theme suggests that the environmental trajectory became linked to a broader range of risk-related concerns during a period marked by health, environmental, and destination-level vulnerabilities.

In 2023–2026, the pathway became more concentrated around CLIMATE-CHANGE. Research increasingly examined climate

vulnerability, adaptation, resilience, extreme-weather exposure, and climate-policy responses across a wide range of tourism contexts. This development is evident in studies of climate change impacts on mountain tourism (Steiger et al., 2024), climate resilience and adaptation in coastal destinations (León et al., 2023), the implications of recent climate science for tourism development and sectoral action (Scott et al., 2024), and the exposure of tourism to weather extremes and climate-related hazards (Camatti et al., 2024). Overall, this trajectory is consistent with a gradual broadening of thematic attention from nature–society and environmental concerns toward more explicit risk-related themes and, most recently, stronger thematic connections with climate change, adaptation, and resilience.

Taken together, the three focal trajectories suggest a gradual broadening in the thematic organization of risk and crisis research in tourism management from relatively distinct concerns with disaster management, economic disruption, and environmental pressures toward more differentiated themes involving risk assessment, policy uncertainty, resilience, and climate change. The evolution map also reveals several more specialized trajectories, including the increasing prominence of RISK-PERCEPTION and the continuity of heritage-related themes across recent periods. These secondary trajectories suggest further diversification of the field, although they are less continuous than the three focal evolutionary pathways highlighted above. Overall, the thematic evolution indicates both continuity in established research concerns and increasing differentiation in the types of risks and responses examined over time.

4.4. Integrated analysis of thematic positions and network measures

Table 4 reports the motor themes and their network and performance measures across the five periods. Centrality and density are interpreted relative to other themes within each period-specific network rather than as directly comparable absolute values across periods. Similarly, h-index values are reported only as descriptive within-period indicators of citation visibility and are not interpreted as directly comparable measures across periods because of unequal citation-exposure windows. The formative period (1987–2009) showed a concentrated structure with two motor themes: DISASTER-MANAGEMENT and NATURE-SOCIETY-RELATIONS. DISASTER-MANAGEMENT

had the larger document base (21 documents) and higher centrality (31.82), whereas NATURE-SOCIETY-RELATIONS showed greater density (38.95), indicating a more internally cohesive environmental theme.

During 2010–2014, the motor-theme structure expanded to include ECONOMIC-IMPACT, VULNERABILITY, REGIONAL-PLANNING, and ENVIRONMENTAL-RISK. ECONOMIC-IMPACT was the largest theme (61 documents), while REGIONAL-PLANNING had the highest centrality (68.55). This configuration reflects a widening of the field across economic, planning, vulnerability, and environmental dimensions. In 2015–2019, RISK-ASSESSMENT became the dominant motor theme with 80 documents and the highest centrality (52.90). WORLD-HERITAGE-SITE had the highest density (24.45), indicating stronger internal development. This combination points to the consolidation of risk assessment alongside increasing specialization in hazard-, environmental-, and place-specific research.

A concentration around COVID-19 occurred during 2020–2022. COVID-19 was the largest motor theme (297 documents) and showed the highest centrality (48.38) and density (12.03). However, RISK-ASSESSMENT remained a motor theme, and CARBON-EMISSION represented a separate environmental dimension. Thus, although pandemic-related research strongly shaped the thematic structure of this period, previously established risk-assessment and environmental concerns remained structurally visible. The most recent period (2023–2026) shows a more diversified motor-theme structure. TOURIST-DESTINATION became the largest theme (420 documents), whereas ECOSYSTEMS showed the highest centrality (48.10) and density (21.07). The coexistence of destination, ecosystem, health, international tourism, and hazard-related themes indicates a broader thematic configuration compared with the COVID-19-focused period.

Overall, the integrated analysis reveals a sequence of structural change from a relatively concentrated formative configuration, through increasing thematic diversification and the consolidation of risk assessment, to the exceptional concentration of research around COVID-19, followed by a more diversified and destination-centered configuration in the most recent period. The coexistence of destination, ecosystem, health, international tourism, and hazard-related motor themes in 2023–2026 indicates increasing thematic complexity in the field. However, these network measures describe thematic prominence

and relationships within co-word networks and should not be interpreted as evidence of causal relationships among risks.

Table 4. Motor themes and network measures across the five periods

Period	Motor theme	Documents	Centrality	Density	h-index
1987–2009	DISASTER-MANAGEMENT	21	31.82	22.98	17
	NATURE-SOCIETY-RELATIONS	10	27.13	38.95	9
	ECONOMIC-IMPACT	61	65.33	22.42	34
2010–2014	VULNERABILITY	24	55.89	11.33	20
	REGIONAL-PLANNING	15	68.55	15.77	12
	ENVIRONMENTAL-RISK	10	55.60	16.74	8
2015–2019	RISK-ASSESSMENT	80	52.90	7.54	37
	NATURAL-HAZARD	21	43.77	6.46	14
	WORLD-HERITAGE-SITE	16	34.84	24.45	12
	HUMAN-ACTIVITY	12	34.35	10.62	10
	GROUNDWATER	11	41.76	10.26	10
2020–2022	COVID-19	297	48.38	12.03	63
	RISK-ASSESSMENT	63	30.12	5.86	28
	CARBON-EMISSION	13	25.72	9.32	9
2023–2026	TOURIST-DESTINATION	420	34.96	9.75	31
	INTERNATIONAL-TOURISM	50	21.98	6.25	14
	ECOSYSTEMS	40	48.10	21.07	13
	HEALTH-RISK	23	41.82	8.79	9
	HAZARDS	14	21.02	3.33	4

Note: Documents refer to the number of core documents associated with each theme.

5. Discussion

The findings indicate gradual changes in the thematic organization of risk and crisis research in tourism management over nearly four decades. Rather than showing a simple replacement of earlier concerns by new topics, the results suggest that established themes persisted while becoming connected to broader, more differentiated thematic configurations. Taken together, this pattern is consistent with a process of cumulative thematic differentiation rather than wholesale thematic replacement.

Regarding the first research question, the results indicate that the thematic structure broadened from an early emphasis on disaster

management and environmental concerns toward a more diverse configuration encompassing risk assessment, vulnerability, economic and policy issues, health, climate, ecosystems, and destination-level concerns. This broadening suggests that risk and crisis research in tourism management has progressively moved beyond the treatment of discrete crisis categories toward a more differentiated knowledge structure in which multiple forms of uncertainty, vulnerability, and response are examined within a shared management-oriented domain. This finding extends previous reviews by showing not only that the field has diversified, but also that this diversification has involved changes in the structural organization and relative roles of its themes over time. The pattern is nevertheless consistent with earlier reviews showing that tourism crisis research spans multiple crisis types, management stages, and contextual settings. Ritchie and Jiang (2019) highlighted the historical emphasis on response and recovery, as well as the need for greater attention to preparedness, risk reduction, and resilience. Similarly, Berbekova et al. (2021) identified increasing thematic diversity and continuing fragmentation within tourism crisis research.

The environmental themes identified in the analysis also highlight the corpus's interdisciplinary scope. Because the search included Environmental Science and both author and indexed keywords, some overlap with environmental, heritage, and resource-management research was expected. To check whether tourism was only a secondary concern in these themes, all core documents related to GROUNDWATER, HUMAN-ACTIVITY, and WORLD-HERITAGE-SITE were reviewed. In every case, tourism was central to the study. These themes therefore reflect links between the study corpus and adjacent fields rather than the inclusion of a separate environmental-risk literature in which tourism is peripheral. They should nevertheless be interpreted as interdisciplinary themes, since some of their concepts and keyword patterns may originate from related fields.

Regarding the second research question, the longitudinal analysis suggests that the thematic structure evolved mainly through continuity and extension rather than simple replacement. The trajectory from DISASTER-MANAGEMENT to CRISIS-MANAGEMENT and subsequently to RISK-ASSESSMENT is consistent with increasing attention to vulnerability, preparedness, risk assessment, and resilience alongside the management of identifiable disruptive events. This development corresponds with calls for tourism research to move

beyond reactive crisis responses toward preparedness and risk reduction (Ritchie & Jiang, 2019) and with the distinction proposed by Gössling and Scott (2025) between risks that can be anticipated and assessed and crises or disasters that have already materialized. The economic and environmental trajectories show that this evolution was not confined to disaster management. They indicate expanding connections between the mapped literature and economic and policy uncertainty, environmental change, vulnerability, adaptation, and resilience.

The overlapping-map results complement this interpretation by showing continued vocabulary expansion alongside increasing relative lexical overlap across successive periods. Because the absolute number of terms is partly influenced by corpus size, this pattern is interpreted as lexical continuity rather than evidence of theoretical stabilization. Thus, the development of risk and crisis research in tourism management appears to involve the addition of new areas of inquiry while retaining substantial lexical connections with established areas.

Regarding the third research question, the results show that the relative positions and roles of major themes changed across periods. The COVID-19 period provides the clearest example of a temporary concentration of thematic prominence around a shared global disruption. Health, crisis management, resilience, economic, behavioral, and destination-related concerns became more closely represented within the same thematic structure, while established risk-assessment and environmental themes remained visible. In the most recent period, the prominence of TOURIST-DESTINATION suggests greater thematic convergence toward destination-level research. This pattern is consistent with destination-resilience research that emphasizes interactions among businesses, communities, institutions, and policy actors across multiple scales (Hall et al., 2024) and with systems-oriented perspectives that view tourism as shaped by interactions among social, economic, and environmental dimensions (Farrell & Twining-Ward, 2004).

The transversal position of CLIMATE-CHANGE in the most recent period requires careful interpretation. Rather than appearing solely as a specialized environmental concern, climate-related research is increasingly connected with hazards, destination development, ecosystems, policy, resilience, and economic concerns within the mapped literature. This pattern is consistent with Loehr and Becken

(2023) conceptualization of climate risk as a multi-level system challenge in which vulnerability drivers and response options operate across wider spatial and institutional scales. When considered alongside previous resilience research, the findings are also consistent with greater attention to longer-term preparedness, adaptation, and systemic vulnerability rather than to recovery from individual disruptive events alone.

The coexistence of multiple risk domains raises the question of whether research on tourism risk is moving toward a polycrisis perspective. Recent studies have questioned approaches that treat crises as isolated events. Bianchi and Milano (2024) argue that tourism is embedded within intersecting crises whose structural conditions and connections require greater attention, while Gössling and Scott (2025) identify interactions among environmental, economic, geopolitical, societal, and technological risks as an important direction for future research.

However, the present findings should not be interpreted as evidence that tourism research has already adopted a fully developed polycrisis paradigm. Thematic convergence indicates conceptual association but does not establish systemic interdependence, cascading effects, or amplification mechanisms among risks. Co-word and thematic-evolution analyses cannot demonstrate causal relationships or how risks interact in practice. Establishing such relationships would require evidence of the mechanisms through which risks interact and propagate across sectors and scales. The findings therefore point to an increasingly interconnected research agenda rather than confirming the emergence of a polycrisis paradigm.

6. Conclusions

This study provides a longitudinal account of how the intellectual structure of risk and crisis research in tourism management has developed over nearly four decades. Rather than showing a simple succession of topics, the findings indicate that the field has evolved through continuity, transformation, and increasing connections among previously more distinct research streams. Disaster and crisis management, economic and policy concerns, and environmental and climate-related research have increasingly become part of a broader, more interconnected thematic structure.

The study's main contribution lies in demonstrating how these relationships and structural roles changed over time, extending prior reviews and bibliometric studies that have primarily identified major topics, intellectual structures, or shifts in topic prominence. The observed shift from disaster and crisis management toward greater attention to risk assessment, preparedness, vulnerability, adaptation, and resilience is consistent with a broader anticipatory orientation in the field, while crisis- and disaster-focused research remains important. The increasing prominence of destination-level research further suggests that the destination has become an important point of connection among multiple forms of tourism risk and uncertainty.

The most recent configuration should, however, be interpreted cautiously. Because the database search was conducted on 17 August 2026, coverage of 2026 publications was incomplete. Conclusions concerning the 2023–2026 period, therefore, reflect the thematic structure visible at the time of data collection rather than a definitive account of the completed period.

6.1. Theoretical implications

This study makes several theoretical contributions to understanding risk and crisis research in tourism management. First, it conceptualizes the field as an evolving knowledge structure rather than a set of discrete crisis categories. Previous reviews have mainly organized the literature by risk type, crisis stage, or theoretical perspective. The present analysis instead shows how themes persist, transform, and change their structural roles over time. The findings suggest that the field has developed through cumulative expansion: established concerns such as disaster management, environmental vulnerability, and economic disruption remain visible but are increasingly connected with risk assessment, resilience, climate change, policy uncertainty, health risks, and destination governance. This pattern is more consistent with the recombination and extension of established themes than with their simple replacement.

Second, the trajectory from DISASTER-MANAGEMENT through CRISIS-MANAGEMENT to RISK-ASSESSMENT suggests a gradual broadening toward preparedness, vulnerability, uncertainty, adaptation, and resilience. Risk-oriented concerns became more prominent over time, while crisis- and disaster-focused research remained important. This pattern is consistent with calls to extend tourism disaster planning

beyond response and recovery toward reduction and readiness (Ritchie, 2008) and with the view of risk and uncertainty as pervasive features of tourism activity (Williams & Baláž, 2015). The findings therefore point to a more anticipatory orientation in risk and crisis research in tourism management without implying the displacement of event-focused perspectives.

Third, the prominence of TOURIST-DESTINATION in the most recent period suggests that the destination has become an increasingly important level at which to examine multiple forms of risk. In 2023–2026, this theme connected crisis and disaster management with tourist behavior, stakeholders, tourism economics, policymaking, and health-related concerns. This convergence is consistent with a more place-based and multi-actor view of tourism risk, in which interactions among institutions, businesses, communities, infrastructure, ecosystems, and visitors shape destinations. Such a perspective also aligns with systems-oriented interpretations of resilience, where vulnerability and adaptive capacity are understood through relationships among actors and across scales rather than solely as properties of individual organizations.

Fourth, the transversal position of CLIMATE-CHANGE in the most recent period suggests that climate-related research is increasingly connected with hazards, destination development, ecosystems, policy, resilience, and economic concerns. This supports viewing climate change as a cross-cutting issue within risk and crisis research in tourism management rather than as an isolated risk category. It also highlights the value of examining how climate pressures shape the broader institutional, economic, social, and spatial conditions of tourism.

Finally, the study provides a more cautious theoretical basis for emerging discussions of polycrisis in tourism. The growing thematic diversity and convergence across environmental, economic, health, geopolitical, and destination-related domains suggest movement toward a more interconnected risk agenda. However, the results do not demonstrate that tourism scholarship has yet to develop a coherent polycrisis paradigm. Co-word relationships reveal conceptual proximity, not causal interdependence, cascading effects, or amplification mechanisms among risks. The theoretical implication is therefore twofold: risk and crisis research in tourism management is becoming more structurally interconnected, yet future theorization must move beyond thematic co-occurrence to specify the mechanisms through which risks interact across sectors, scales, and temporal

horizons. In this sense, the study provides a conceptual bridge between established crisis-management research and a future systems-based theory of tourism under multiple and interacting uncertainties.

6.2. Practical implications

The findings suggest several practical implications for tourism governance and destination management. First, the longitudinal shift from DISASTER-MANAGEMENT and CRISIS-MANAGEMENT toward RISK-ASSESSMENT suggests that destination management organizations should complement reactive crisis procedures with more systematic risk identification and preparedness. This could include destination-level risk registers, periodic assessment of major risks, and clear responsibility for monitoring and updating priority risks.

Second, the economic trajectory from TOURISM-DEVELOPMENT and ECONOMIC-IMPACT toward ECONOMIC-POLICY and INTERNATIONAL-TOURISM suggests that preparedness should also address economic and policy uncertainty. Destination organizations could use scenario and contingency planning to anticipate changes in travel demand, regulations, international mobility, and other external conditions that affect tourism activity.

Third, the environmental trajectory and the transversal position of CLIMATE-CHANGE suggest that climate-related risks should be integrated into routine destination planning. This includes identifying climate vulnerabilities, linking adaptation measures to tourism infrastructure and development decisions, and assigning clear responsibility for climate-risk monitoring and response.

Finally, the prominence of TOURIST-DESTINATION suggests a greater need for coordination across risk areas at the destination level. Formal arrangements among destination management organizations, tourism businesses, local authorities, health and environmental agencies, and community stakeholders could support shared risk assessment, information exchange, preparedness, and coordinated response. Such coordination is especially relevant where health, environmental, economic, and social risks intersect within the same destination.

6.3. Limitations

This study has several limitations. First, the analysis was limited to English-language publications indexed in Scopus. Relevant studies in

other languages, non-indexed sources, policy reports, or disciplinary categories outside the selected Scopus subject areas may therefore be underrepresented. The findings should be interpreted within these database and subject-area boundaries.

Second, relevance screening was conducted by a single reviewer using titles, abstracts, and keywords rather than full texts. Although explicit inclusion and exclusion criteria were applied, some judgment was unavoidable, and studies whose relevance became clear only from the full text may have been missed.

Third, the search was conducted on 17 August 2026, so coverage of 2026 was incomplete. Findings for the 2023–2026 period should therefore be interpreted cautiously. Citation-based indicators are also affected by citation-window bias because older publications have had more time to accumulate citations. The h-index is therefore treated as a descriptive indicator rather than as a directly comparable measure of thematic importance across periods.

Fourth, the analysis combined author and indexed keywords. This broadens thematic coverage but also introduces variation from differences in author terminology and database indexing practices. Keyword selection and indexing practices may also have changed over the study period, potentially affecting the representation and comparability of terms across periods. Although keyword cleaning and normalization reduced lexical variation, the thematic structure remains sensitive to preprocessing choices, frequency thresholds, and clustering parameters.

Fifth, the analytical periods were unequal in length. Longer periods provide more opportunities for publications and keyword co-occurrences to accumulate. Cross-period comparisons, therefore, focus mainly on thematic configurations, structural roles, and evolutionary patterns rather than on raw counts or absolute network values.

Sixth, the corpus has an interdisciplinary scope. Although a targeted review confirmed that tourism was central to the environmentally oriented themes examined, the inclusion of Environmental Science and the use of indexed keywords may have increased the visibility of concepts from adjacent fields such as environmental science, heritage studies, and resource management.

Finally, science mapping and co-word analysis identify thematic associations and patterns of conceptual development but cannot establish causal relationships among risks or show how disruptions

interact in practice. Broad longitudinal patterns can therefore be interpreted with greater confidence than the prominence or position of individual themes, which may remain sensitive to corpus construction, preprocessing, periodization, and analytical settings.

6.4. Future research agenda

The longitudinal patterns suggest several directions for future research. Recently prominent themes such as HEALTH-RISK, HAZARDS, ECOSYSTEMS, and INTERNATIONAL-TOURISM warrant closer examination, particularly with respect to destination governance, preparedness, and resilience.

The temporary concentration around COVID-19 during 2020–2022 also raises questions about which pandemic-related changes have persisted. Longitudinal studies could examine whether developments in preparedness, health risk management, traveler behavior, and organizational resilience have become embedded within tourism systems.

The transversal position of CLIMATE-CHANGE points to the need for research on its connections with economic, health, social, and governance risks. Similarly, the prominence of TOURIST-DESTINATION in the most recent period points to increasing convergence among previously more distinct research streams. This creates an opportunity to examine destinations as settings in which environmental, economic, health, stakeholder, and crisis-related risks interact. Empirical work could test whether the thematic convergence observed in the bibliometric record is also reflected in destination planning and governance practices.

Finally, the three longitudinal trajectories remain only partly connected. Future research could investigate the links among disaster and risk management, economic and policy uncertainty, and environmental and climate-related vulnerability to better understand how multiple risks interact within tourism systems.

Declaration of Using Generative AI

This manuscript benefited from the use of an AI-based tool, namely ChatGPT 5.6 (OpenAI, 2026), for improving English phrasing and clarity. The tool was not used for idea generation or data analysis. The final content remains the sole responsibility of the authors.

Declaration of Competing Interests

The authors declare no competing interests.

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