

Article

Trends in Sustainable Tourism Paradigm: Resilience and Adaptation

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Abstract: In recent decades, sustainable tourism has emerged as a central paradigm, attracting growing scholarly interest. External factors, such as the SDGs, climate change agendas, smart and digitalized tourism, cyber and astronaut travel, pandemics, and shifting trends in economic competitiveness, mass tourism, and overtourism, are shaping the 21st-century paradigmatic landscape, challenging both the theoretical “what” and practical “how” of the sustainable tourism paradigm. Using Kuhn’s paradigmatic framework and the Web of Science bibliometric database from 1991 to 2022, this analysis traces trends in sustainable tourism research, advances in academic communication through influential co-citation networks and interdisciplinarity, and the emergence of alternative and quasi-paradigms. The findings suggest, first, a positive trend in tourism scholarly research production; second, weak and diverse communication and interdisciplinarity, as scholars do not sufficiently collaborate in co-citations; and third, the coexistence of the sustainable tourism paradigm with numerous alternative, rival, and quasi-paradigms. The lack of influential knowledge communication highlights the need for the academic tourism community to reconsider its knowledge generation practices. Enhanced collaboration through co-citation and interdisciplinary cooperation is crucial for fostering a deeper and shared understanding of multiple tourism-related concepts. Further thematic and interactive research is needed on the resilience and adaptability of the sustainable tourism paradigm. This article contributes to advancing sustainable tourism scholarship by advocating for a more influential and adaptable paradigm to ensure its relevance amidst emerging challenges.

Keywords: sustainable development; sustainable tourism paradigm; resilience; competing paradigms; interdisciplinary integration



Citation: Mihalic, T. Trends in Sustainable Tourism Paradigm: Resilience and Adaptation. *Sustainability* **2024**, *16*, 7838. <https://doi.org/10.3390/su16177838>

Academic Editor: Harry Coccossis

Received: 24 July 2024

Revised: 28 August 2024

Accepted: 7 September 2024

Published: 9 September 2024



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1. Introduction

Sustainable development has become a fundamental philosophy underpinning economic, ecological, and socio-political interests in the public, private, and civic sectors. This interest was sparked by a societal response to the environmental consequences of neoliberal economic development in the 1960s. In 1987, the United Nations presented *Our Common Future* [1], a 20th century vision of sustainable development that has since become the dominant sustainability paradigm of our time [2].

The principles of sustainable development [1] have been applied to the field of tourism [3,4] and are reflected in global tourism-specific documents such as *Making Tourism More Sustainable* [5]. This application of sustainable tourism remains highly relevant today [6]. Its content is continually updated to reflect the evolving socio-political context of sustainability and its implementation, as seen in the solutions proposed by the UN Agenda 2030 [7]. In this context, sustainable tourism, synonymous with sustainable tourism development, has established itself as a dynamic paradigm that evolves over time, reflecting societal, political, and tourism knowledge progress. The primary aim of this study is to investigate how the sustainable tourism paradigm adapts and remains resilient in response to specific external factors, such as the SDGs, climate change agendas, and emerging tourism phenomena, like smart tourism, cyber and astronaut travel, pandemics, and overtourism. The study focuses on how these factors challenge the existing theoretical and practical dimensions of the sustainable tourism paradigm and examines whether the

current paradigm can accommodate these new challenges or if it requires expansion or modification. By doing so, the study seeks to provide insights into how the sustainable tourism paradigm can remain relevant and effective in the face of evolving global trends and issues. Thus, the paper explores trends within the sustainable tourism paradigm, with a focus on the growth of research, the expansion of disciplinary knowledge, and the rise of alternative paradigms. Firstly, it examines trends in the two foundational aspects of sustainable tourism: the theoretical (“what”) and the practical (“how”) dimensions [8,9]. Secondly, it investigates the influential content in tourism academic communication and knowledge. Finally, it assesses the position of the sustainable tourism paradigm and discusses its future resilience and relevance within a landscape of alternative and quasi-paradigms. To achieve these objectives, the study employs bibliometrics, a recognized empirical and qualitative methodology for describing the intellectual field and identifying paradigms within it [10].

This study is novel in two ways. First, it addresses both the theoretical “what” and practical “how to sustain” of the sustainable tourism paradigm, drawing on Kuhn’s dual paradigmatic framework. Second, it contributes beyond the current state of research by systematic categorization of the sustainable tourism paradigm in comparison to its alternatives and quasi alternatives.

Following the Introduction, this paper reviews the philosophical and theoretical foundations of the sustainable tourism paradigm, examines the current state of research and highlights the key dimensions of the sustainable tourism paradigm and its sources. The following sections deal with the Methodology, Findings and Discussion. Limitations and Conclusions sections conclude the paper. Considerations and recommendations for strengthening the future resilience of the sustainable tourism paradigm are proposed.

2. State of the Art

2.1. Philosophical and Conceptual Foundations

The tourism paradigm or worldview represents the collective perspective, school of thought, and shared beliefs that shape the way the tourism community of a given era perceives the world of tourism and the guiding principles of its behavior. In this context, the community is the tourism community or the relevant community united by shared tourism knowledge, professional interactions, communication, common interests in addressing tourism problems, and willingness to consider possible solutions to those problems [8,11].

Kuhn [8] defines a paradigm as a coherent framework of thought that guides the study of a particular scientific phenomenon. A scientific paradigm represents a dual model of universally recognized “scientific achievements” that provide “model problems and solutions” to a community of practitioners for a given period of time [8] (p. xiii). Thus, the paradigm is about the nature of reality and truth, “what” kinds of questions to explore, and “how” to go about doing so. Later, Kuhn expanded the concept of paradigm to its role as the philosophical and theoretical foundation of a scientific discipline, school of thought, or phenomenon.

According to the philosophy of science, tourism knowledge or a school of thought goes through alternating periods of normality, in which an established paradigm prevails and gradual changes may occur, and revolutionary periods, in which the paradigm undergoes a sudden and profound change, resulting in a paradigm shift. As inconsistencies and phenomena that contradict the established paradigm accumulate, alternative perspectives emerge. Once these become relevant to both academic theory and practical solutions, a new paradigm emerges. A transition period follows in which the original paradigm and the new paradigm compete, eventually leading to a paradigm shift. Paradigms evolve over time, and those of a well-integrated community can be so compelling and robust that possible alternative paradigms that might challenge them remain hidden. Paradigm shifts may result from the introduction of new knowledge supported by new

evidence, from new conceptualizations of problems, or from profound discoveries, societal or technological changes.

Recently, social scientists have become interested in communication among scientists, e.g., in paradigm semantic, conceptual, perceptual, and methodological commensurability in interdisciplinary research [12]. Scientific theories are commensurable and clearly understandable if they share common terminology, which facilitates comparisons necessary to assess their validity, utility, or effectiveness. In contrast, theories are considered incommensurable when they contradict each other, lack sufficient overlap for direct comparison, or rely on empirical evidence that evaluates one theory better than another. Kuhn describes incommensurability as untranslatability and measures how scientific theories communicated as sentences can be translated without residual loss. Incommensurability is not problematic when the theories are merely different or relate to different disciplines without conflict or competition and scientists from different disciplines understand each other. Different paradigmatic concepts and approaches can be commensurable or adversarial in interdisciplinary collaboration.

Numerous tourism researchers acknowledge the importance of the tourism paradigm [13–17]. Tribe and Liburd position tourism as a mature knowledge field in which Mode 1 knowledge is generated in academia (theory) and characterized by theoretical foundations and value-based considerations, while Mode 2 knowledge is grounded in real-world problem solving [11] (pp. 46–47). In addition, there are two other forms of knowledge: knowledge generated on websites and indigenous knowledge. Tribe and Liburd emphasize the overarching influence of neoliberal capitalist values on knowledge production. According to the philosophy of science, paradigms are associated with specific disciplines, which means that the tourism paradigm requires a mature disciplinary understanding of tourism. According to Jafari [18], the maturity is reached when tourism is placed in the global socio-political context and there are advances in academic communication.

2.2. Sustainable Tourism

Tourism's critique of the old paradigm of economic growth began [19] and gained momentum in the 1990s when the negative impacts of mass tourism became relevant to a broader tourism community. As a result, alternative concepts, such as alternative tourism, non-mass tourism, and enlightened mass tourism were explored [20,21]. Over time, numerous terms have emerged to describe environmentally friendly tourism, including sustainable, responsible, responsustable, responsustainable and green tourism, as well as triple bottom line and ecotourism. Some authors introduced the notion of corporate social responsibility [22,23], mostly in order that the corporate sector achieve certain social, economic and environmental goals [24]. Newer terms, such as resilient, regenerative, solidarity and transform, ative tourism, have yet to be fully conceptualized. These terms join a long list in the history of tourism discourse, including environmental, ecological, new, soft, smart, ethical, and peace tourism. In addition, there are established labels for unsustainable tourism practises, including mass tourism, hard tourism, unethical tourism, irresponsible tourism, overtourism and anti-tourism. New 21st century phenomena, such as overtourism, astronaut tourism or metaversal [cyber] tourism, may also have an impact on the tourism discourse and challenge the paradigm of sustainable tourism, which dates back to the previous century and is limited only to the physical environment of the planet. These various terms and their different interpretations make tourism communication difficult. Consequently, the concept of sustainability, with its various interpretations and designations, has made it intangible and has provoked criticism and disillusionment. This has even led to questioning the very existence of the sustainable tourism paradigm.

Although concepts corresponding to sustainability have been used for centuries [25], the modern understanding that emerged in the 20th century dates back to *Our Common Future* [1]. Sustainability is about environments, which encompass the places “where we live on this planet”, and development, which represents “what we do” to achieve humanity's goals and improve happiness (well-being, quality of life) in these places [1]

(p. 41). In this context, the quality of the economic, social, and natural environment represents the place we want to sustain (the “what”), and development represents the approach to achieving sustainability (the “how”) [9]. Sustainable development is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” [1] (p. 41). This vision from *Our Common Future* has attracted the interest and support of scholars and policy makers and aims to create a future world where economic and ecological aspects are balanced in the pursuit of greater prosperity (standard of living, well-being, quality of life). In this vision, social (managerial, business) and technological innovations bridge the gap between economy and ecology. Achieving true sustainability requires an integrative, transdisciplinary, and meta-scientific approach to effectively translate these concepts into practical, real-world applications [26].

The adoption of the WCED societal paradigm in the tourism sector began with the publication of the first such book on tourism *Sustainable Development Approach* by Inskeep [27], and subsequently the *Global Code* [28] was established to promote values of sustainability, responsibility and equity that benefit all sectors and involve all stakeholders. In 2002, the *Quebec Declaration on Ecotourism* [29] reaffirmed a firm commitment to sustainability in ecotourism by placing it in the broader context of sustainable tourism. The joint efforts of government officials, private sustainable development experts, tourism professionals and academics culminated in the publication of *Making Tourism More Sustainable* in 2005 [5]. This guide defines the sustainability principles (“what”) and management practices (“how”) for destinations and represents an important milestone on the road to sustainable tourism.

The discourse on sustainable tourism highlights the importance of responsibility in its implementation. As a result, the tourism community introduced the term responsible tourism as a concept with its own dimensions [30,31]. In 2012, the WTO expanded the *Global Code* title with *For Responsible Tourism* and, in 2019, UNWTO transformed this into the legally binding *Framework Convention* [32]. Article 6 was renamed from, *Obligations to Responsibilities of Stakeholders*, reflecting the evolution of terminology and understanding that responsibility drives sustainability. Through the convention’s ratification, the member states can now legally recognize their responsibility for sustainable tourism.

While the societal debate and the evolution of semantics continue, numerous global events and documents have been adopted. In 2015, the United Nations [7] adopted *The 2030 Agenda for Sustainable Development Goals* (SDGs), which was translated into the tourism-specific *Tourism SDGs* [33]. In 2019, UNWTO launched *A Destination Management Guidelines* [34] emphasizing a destination specific model of efficient governance, strategic leadership and effective implementation of (sustainable) tourism development. In 2021, a *Glasgow Declaration* was adopted to promote carbon neutrality in tourism [35]. Many tourism stakeholders have committed.

Figure 1 presents the two-sided understanding of paradigmatic dimensions of sustainable tourism as a side-by-side model of the sustainability concept and responsibility for its implementation (development), committed to sustainability values. This research adapts a five-dimensional paradigm of sustainable tourism based on Kuhn’s theory and practice framework. Only academic social networks that encompass and align with both aspects of the paradigmatic framework—the “what” (theoretical) and the “how” (practical) dimensions of sustainability and development—can be considered true tourism paradigms. Networks that specialize in a single dimension or action, even if they gain socio-political relevance and urgency, cannot be classified as full paradigms but rather as quasi-paradigms.

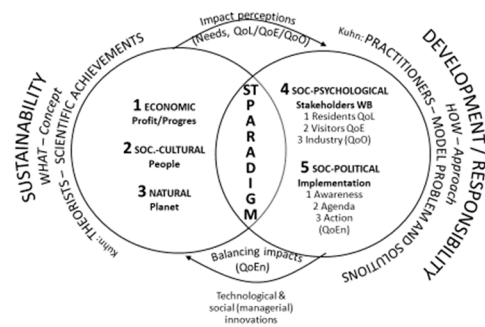


Figure 1. Sustainable Tourism Development within Kuhn's Dual Framework and Five Dimensions. Notes: STD—Sustainable Tourism Development; WB—well-being. Environments—in broad usage, the term ‘environments’ refers to the three dimensions of sustainability shown in the left circle of the figure. When used in a narrower sense, it specifically denotes the third dimension, ‘environmental sustainability’. Source: Adapted from Buhalis [ed.] 2022 [36]; Elkington 1997 [37]; Frey 1985 [38]; Inskeep 1991 [27]; Kuhn 1962 [8]; McCool et al. 2011 [9]; Mihalic 2020 [39]; RTP and WCP 2002 [31]; UNEP and WTO 2005 [5]; Munasinghe 2010 [26]; UNESCO 2012 [2]; WCED 1987 [1]; WTO 1999 [28].

In this model, socio-cultural and environmental (natural) dimensions are collectively classified as ecological sustainability. This grouping serves as a counterpoint to economic sustainability, emphasizing the often asymmetrical relationship among the dimensions concerning “what” to sustain, known as the economy–ecology nexus. This asymmetry is particularly evident when comparing the financial profit motives and shareholder interests with the broader objectives of progress, wealth, and well-being that affect all stakeholders.

Furthermore, stakeholders’ needs and perceptions of well-being, influenced by tourism development and presence, are encapsulated within the socio-psychological dimension, depicted in the right circle of our model. This dimension is crucial in guiding how policies are formulated to promote well-being-centered sustainable tourism development [40]. This plays a vital role in shaping the actionable agendas of the fifth socio-political dimension of the sustainable development paradigm, thereby significantly influencing the strategic agendas and policy implementations within the field.

The comprehensive dual framework model of sustainable tourism development, delineated by the above five dimensions, serves as the current state of the sustainable tourism paradigm under investigation [37–39]. Given the dynamic nature of paradigms and the necessity to adapt to external factors and react to competitors to remain relevant and resilient, our study addresses three critical research questions:

- What are the current trends in sustainable tourism paradigm research within the context of its dual theory–practice framework and its multiple dimensions?
- How does the academic communication network support and advance the body of knowledge in sustainable tourism, thereby fostering influential intellectual growth and activism for sustainable development within the tourism field?
- What alternatives could potentially weaken the resilience of the existing sustainable tourism paradigm?

2.3. Bibliometrics and Social Network Analysis in the Tourism Research Field

Many tourism researchers have applied literature evidence to study the state of play in research outputs on sustainable tourism. Moyle et al. [4] (p. 106) counted 17 such published documents. A few studies specifically examined the evolution in the field of sustainable tourism [36,41–45]. Some researchers [46] observed a trend away from theoretical papers to papers on applying theory through empirical research, which they have seen as an evolution towards a more mature tourism intellectual field. Bramwell et al. [41] advocated for different approaches to sustainability in tourism, focusing on sustainable tourism discourse as a set of different themes, relevant for different situations, stakeholders and levels. One paper explicitly addressed interdisciplinarity in sustainable tourism research [47]. By co-

citation analyses, authors found that tourism knowledge has become more interdisciplinary, but it is defined primarily by tourism studies and to an extent by studies from multiple social science disciplines. They suggested advancing sustainability tourism knowledge by research engagement with humanities. Other researchers pointed to the need to reduce the hypocrisy of commitments to sustainability and climate change policy [48]. Although the tourism research has examined the bibliographic themes of tourism, it has not conducted a comprehensive analysis of the sustainable tourism paradigm and its alternative paradigms.

3. Research Methodology

3.1. Sample

To explore and examine the structure of tourism academic knowledge, the Web of Science (WoS) bibliometric database was used. The WoS was selected for its functionality, scale, quality of data processing and depth of coverage [24,49].

The study period begins with the publication of the first tourism book on the *Sustainable Development Approach* [27]. In October 2021, with assistance from a WoS and a CiteSpace specialist, test databases were created and various search strings were tested for coverage of known papers on the tourism paradigm. By February 2022, the 1991–2021 files from the WoS Core Collection were downloaded. The data was then cleaned, duplicates were deleted, and synonyms were merged. The final search string included the terms “sustainable”, “responsible”, “ecological”, and “green” tourism. The words “paradigm”, “concept”, or “approach” were used to identify publications based on theory, while “practice”, “industry”, or “implementation” were used to identify those focusing on practice. In total, 4002 theory papers, 4512 practice papers, 6833 theory or practice papers, and 1679 theory and practice papers were captured. The search for academic papers and proceedings was limited to titles, abstracts, and specified keywords. The data files and corresponding search strings are freely accessible on ResearchGate [50].

3.2. Methodology and Research Tools

WoS filters were used to assess the annual frequency of documents related to both theory (“what”) and practice (“how”). Excel was used for data analysis and trend visualization.

Central to this study is social network analysis, i.e., of the communication among the social entities that reveals the paradigms. Conducted through CiteSpace cluster analysis using the log-likelihood ratio (LLR) algorithm, the list of potential paradigms based on the most strongly identified keyword in each cluster was generated. The clusters, e.g., potential paradigms, were ordered by the number of documents in each cluster, with the largest and most dominant cluster designated as cluster #0. The cohesion and separation between clusters were assessed by calculating the silhouette coefficient. A high coefficient value indicates that the terminology is closely related to the cluster and has a weaker connection to neighbouring clusters, while values close to zero suggest overlapping clusters with minimal differences in the terminology used in sustainable tourism discourse. To identify the most influential source document in each cluster, Betweenness Centrality (BC) coefficient analysis was utilized. BC measures the strength of information flow and the influence a source document has on communication. A higher BC value indicates a stronger and more influential source. A BC value of ≥ 0.10 indicates significant turning points or influential communication bridges in academic discourse [51].

4. Findings

4.1. Research Trend

The research on sustainable tourism and the associated paradigm is growing significantly and is expected to reach 6000 publications by 2030, as shown in Figure 2. The dual aspects of the sustainable tourism paradigm presented in Figure 1 are integral to the discourse, as evidenced by the practice-to-theory ratio of 108% in 2021, derived from the data shown in Figure 2. Critical texts, including books and encyclopaedia entries, are

highlighted to link the trend line to the key milestones identified by the narrative review in the State of the Art section of this paper.

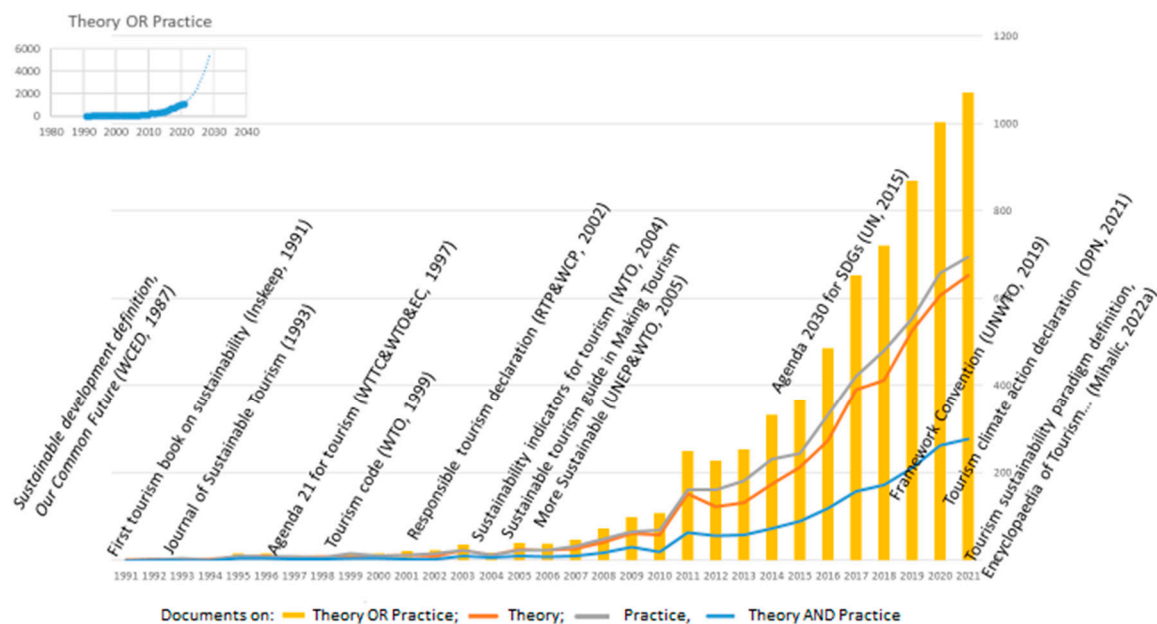


Figure 2. Number of publications per year and key societal and tourism-specific milestones 1992–2022. Note: WoS data on sustainable tourism theory [n = 4002], practice [n = 4512], theory or practice [n = 6833], and theory and practice [n = 1679], processed with WoS filters and Excel. Source: Own research.

4.2. Advances in Academic Communication

Academic communication networks within the sustainable tourism paradigm play a crucial role in generating knowledge, sharing ideas and creating influential information nodes on what needs to be sustained and how to be sustainable in tourism. These networks contribute significantly to the maturity of tourism as an intellectual field. However, our survey of WoS publications shows that research on sustainable tourism is scattered across numerous subject categories. It is particularly striking that a large proportion, namely 31% of the total documents, fall under the WoS subject category ‘Hospitality, leisure, sport and tourism’ (Table 1). Although this category comprises 2149 documents, it has not managed to form an influential node in the communication network (BC = 0.03).

Table 1. Sustainable tourism paradigm disciplinary.

Rank	Subject	Count	BC	Year	Rank	Subject	Count	BC	Year
1	Hospitality, leisure, sport, and tourism	2149	0.03	1992	6	Economics	468	0.06	1995
2	Environmental sciences	1433	0.25	1991	7	Business	421	0.02	1997
3	Green and sustain. science and technology	1322	0.09	1999	8	Social scien., interdiscipl.	309	0.10	2001
4	Environmental studies	1230	0.27	1991	9	Geography	258	0.04	1991
5	Management	667	0.09	1994	10	Ecology	218	0.04	1991

Notes: BC, Betweenness centrality. Calculated from WoS data on sustainable tourism theory or practice [n = 6.833], processed with Citespace. Source: Own research.

Strong communication bridges or turning points were built in environmental sciences, environmental studies, and social sciences, interdisciplinarily. Interdisciplinary social science communication in sociology, anthropology, economics, management science, political science, human geography, psychology, and history produced 309 documents on sustain-

able tourism paradigm, which created an influential communication network through co-citations (BC = 0.10).

4.3. Trends in Sustainable Tourism Paradigm Alternatives

The analysis revealed semantically significant clusters and keywords, which are interpreted as social networks or potential paradigms in the field of tourism. The largest cluster (#0, size = 240) emphasizes the predominant influence of the sustainable tourism paradigm and its relevant keywords of sustainable tourism, sustainability and development, amidst a multitude of smaller potential paradigms that focus on semantically close or distant keywords and content. These are categorized on the basis of their coherence with the sustainable tourism paradigm (Table 2, silhouette coefficients): a set of close paradigms united by values and keywords of sustainability, and distant and possibly rival paradigms that diverge from the principles of sustainable tourism and are oriented towards economically oriented values of the old paradigm of economic development and keywords such as competitiveness and growth. In addition, a category of quasi-paradigms is suggested, including climate change, smart tourism and COVID-19, which are characterized by different semantics than the close and distant rival paradigms and whose values have not yet been captured by the CiteSpace social network co-citation analysis. The table lists the first eleven clusters by size. The much smaller cluster #16—SDGs (Sustainable Development Goals) (size = 13) has been added to the table. The SDGs as a potential future network have already been identified in the review presented in the State of the Art section of this paper and are highlighted as a possible emerging quasi-paradigm in Table 2.

Table 2. Co-citation potential paradigms and categories.

Cluster Label	Size	Silhouette	Keywords (LLR)
1	2	3	4
Category 1			
Sustainable tourism paradigm (possessing all features of Kuhn’s dual framework)			
#0 Sustainable Tourism	240	0.67	sustainable tourism; indicators; sustainable tourism indicators; sustainable development; sustainability
Category 2			
Close to sustainable tourism paradigm (sustainability values based dimensions)			
#2 Ecotourism	113	0.83	ecotourism; conservation; sustainable; enclave tourism; protected area tourism
#1 CSR	158	0.85	corporate social responsibility (CSR); hotel; theory of planned behaviour; hotel industry; sustainable practices
#4 SET/QoL	86	0.87	social exchange theory (SET); quality of life (QoL); sustainable livelihood; tourism development; tourism impact
#5 CBT	77	0.89	community-based tourism (CBT); Ecuador; nature conservation; CBT, project; sustainable livelihoods
Category 3			
Rival and distant to sustainable tourism paradigm (economic values based dimensions)			
#6 Destination competitiveness	68	0.90	destination competitiveness; competitiveness; creative tourism; destination image; tourism competitiveness
#7 Overtourism	66	0.92	overtourism; urban planning; urban tourism; undertourism; overcrowding
#9 Economic growth	43	0.98	economic growth; causality; energy consumption; carbon emissions; CO _s emissions

Table 2. Cont.

Cluster Label	Size	Silhouette	Keywords (LLR)
Category 4			
Quasi-paradigms (possessing some but not all features of Kuhn’s dual framework)			
#3 Climate change	103	0.92	climate change; behaviour change; life cycle assessment; air travel; carbon footprint
#8 Smart tourism	63	0.96	smart tourism; cultural heritage; smart cities; technology; local food
#10 COVID-19	40	0.99	COVID-19 (Coronavirus Disease); well-being; community impact; recovery strategies; transformation
Category 5			
Emerging quasi-paradigm (possessing some but not all features of Kuhn’s dual framework)			
#16 SDG	13	0.99	sustainable development goals; income distribution; Nepal; input–output model; precarity

Notes: CSR—corporate social responsibility, SET—social exchange theory; QoL—quality of life; CBT—community-based tourism, SDG—Sustainable Development Goals. Sustainable tourism means sustainable tourism development. Column 1 clusters are labelled using the CiteSpace LLR algorithm. Row categories are defined according to the paradigmatic dual framework (Figure 1). Coefficients calculated from WoS data, processed using CiteSpace, and categorized by the author. Source: Own research.

The analysis revealed limited evidence that tourism discourse relies predominantly on the key academic research by journal papers, breakthrough institutional documents and books, some shown in our research growth trend illustration (Figure 1). Only two such sources were frequently cited by tourism researchers in their co-citation network on sustainable tourism [Table 3]. *Our Common Future* [1] influenced the communication around the CSR partner paradigm for sustainability in the hotel industry. Butler’s [52] work on the evolution of tourist destinations, published in *Canadian Geographer*, became relevant to the tourism paradigmatic discourse on COVID-19. The communication inside the cluster of sustainable tourism paradigm failed to coherently connect through co-citation, and no strong communication node or bridge has been created. Surprisingly, there was insufficient evidence that *Making Tourism More Sustainable* [5], a document written and agreed upon by tourism experts and still touted as the main source for understanding the WTO-led sustainable development paradigm in tourism, was relevant as a key source. No academic paper has been identified as influential for tourism social networks, e.g., drawing attention and mutual communication [and agreement] among the tourism academic community of theorists and practitioners.

Table 3. Academic Communication: Key sources by cluster, centrality, and occurrence.

Cluster	BC	Occurrence	Key Source by Author, Year and Title
#0 ST	0.04	115	Jamal, Getz, 1995: <i>Collaboration theory and community tourism planning</i> [53]
#0 ST	0.03	153	Choi, Sirakaya, 2006: <i>Sustainability indicators for managing community tourism</i> [54]
#0 ST	0.03	137	Hunter, 1997: <i>Sustainable tourism as an adaptive paradigm</i> [14]
223#0 ST	0.02	205	Butler, 1999: <i>Sustainable tourism: A state-of-the-art review</i> [55]
#0 ST	0.01	172	Buckley, 2012: <i>Sustainable tourism: Research and reality</i> [42]
#0 ST	0.02	172	Liu, 2003: <i>Sustainable tourism development: A critique</i> [56]
#0 ST	0.02	140	Saarinen, 2006: <i>Traditions of sustainability in tourism studies</i> [57]
#0 ST	0.00	118	UNEP and WTO, 2015: <i>Making tourism more sustainable</i> [5]
#1 CSR	0.16	215	WCED, 1987: <i>Our common future</i> [1]
#2 Ecotourism	0.03	79	Scheyvens, 1999: <i>Ecotourism and the empowerment of local communities</i> [58]
#3 Climate Change	0.03	85	Gössling, 2002: <i>Global environmental consequences of tourism</i> [59]
#7 Overtourism	0.11	214	Butler, 1980: <i>The concept of a tourist area cycle of evolution</i> [52]

Notes: BC, between centrality; ST, sustainable tourism; CSR, corporate social responsibility. Calculated from WoS data on sustainable tourism theory or practice (n = 6.833), processed with Citespace. Source: Own research.

5. Discussion

Despite the growing maturation of the tourism knowledge subject in terms of growing research trends in the theory and practice of tourism (Figure 1), disciplinary communication nodes failed to follow (Table 1). Tourism research communication has developed joint communication nodes in environmental science/studies and social science, disciplinarily. In our study of the sustainable tourism paradigm, the expected main document *Making Tourism Sustainable* failed to impact research communication as a co-citation node. Terminological and perceptual confusion often stems from the diverse use and interpretation of the key terms, based on the absence of joint sources on field specific theories and approaches. Diverse, inaccurate and conflicting interpretations of sustainable tourism and development, as well as differing perspectives on the physical and human environment [52,60,61] (p. 7), lead to communication breakdown and unfounded criticism of sustainable tourism. For example, such criticisms are directed at the supposed static nature of sustainable tourism. Such a critique overlooks the dynamic process of development, referring to agendas and actions as integral parts of sustainable tourism (Figure 1, socio-political dimension). Many researchers overlook the importance of stakeholders and their perception of well-being due to tourism presence and development (Figure 1, stakeholders' soc-psychological well-being dimension). These debates, based on different understandings drawn from a variety of sources and disciplines, hinder progress and created ambiguity. *Making Tourism More sustainable* explicitly states that sustainable tourism is based on the "principles of sustainable development" from *Our Common Future* [1] (p. x) and aims to make all tourism more sustainable. This clarification underscores the tourism-specific understanding of sustainable tourism as an evident synonym for dynamic sustainable tourism development. Tourism researchers should adhere to tourism-specific documents and communication terms developed and agreed upon by the tourism community to promote mutually understandable communication and create nodes of research in tourism research networks.

Sustainable tourism formed a particularly strong cluster and dominant or main paradigm, whose keywords captured the values, concepts and approaches of sustainable tourism development. However, close alternatives include CSR, ecotourism, SET (QoL) and CBT. These can be viewed as non-rivals or partners of sustainable tourism, and they may also be considered partial or sub-paradigms. They all support the sustainability concept of "what to sustain" but emphasize their own, narrower implementation of "how to sustain" and focus on sub-goals such as the tourism industry, nature conservation, quality of life and community perspective. They partially complement sustainable tourism values and approaches and agree on the conceptual sustainability of the three pillars, often "... cited as an approach for tourism to become more sustainable" [62] (p. 1547). Connecting these paradigms under the common umbrella of sustainability results in a stronger and more resilient paradigm of sustainable tourism.

The next category of distant paradigms or rival competitors to the sustainable tourism paradigm incorporate semantics distant from those of sustainable tourism's keywords. The term 'rival' is used here to mean "one of two or more striving to reach or obtain something that only one can possess" [63]. Rival paradigms tend to outcompete others and compete to force paradigm shift [8]. Here, the economic growth paradigm, destination competitiveness and overtourism stand out, possibly relating to the values of the old economic development and growth paradigm. Although many documents demonstrate that *Our Common Future* initiated a paradigm shift from economic towards sustainable development, the neoliberal values of tourism growth, profit, and competitiveness are constantly present in the tourism discourse and determine tourism behavior [17]. Here the economy–ecology nexus, based on the economic "growth fetish", is killing tourism sustainability [64], as much as its sustainable tourism paradigm. Evidence thereof are the clusters that capture the interests and motives of the tourism industry and its financial growth motives, but not those of the ecological environment. These old–new paradigms are a potential rival to sustainability and a constant pressure towards a paradigm shift. In the category of economic-value-based paradigms, they are complementary and may merge in future and become stronger.

Another category of quasi-paradigm (Table 2) joins the climate change, smart tourism and COVID-19 CiteSpace-suggested academic network. The increasing trend and importance of academic communication on climate change is indisputable. If all resources, events, research, and policies focused on the problem of climate change and its solutions, future studies could consider climate change as an overarching paradigm for the next decade. Scott et al. [65] noted the increasing portrayal of climate change as an existential threat to increase its urgency in becoming a dominant global concern. Weaver [21] warned against excessive climate change rhetoric and focus. A holistic approach is advocated to understand the tourism paradigm through the lens of paradigmatic framework theory, ensuring that no single aspect, stakeholder, or value dominates at the expense of others, and considering the context of intra- and intergenerational rights. Although it is expected that the next few decades will require constant engagement with the goal of achieving net zero by 2050, it should not be forgotten that “how” to achieve this goal (solving the climate problem) can only be a part of the whole, and not an independent tourism paradigm. The disciplinary paradigm framework encompasses an overarching philosophy of “what” and “how” (Figure 1), excluding possible forced or quasi and partial paradigms that might gain socio-political support for a partial “how” and fail to meet the full principles of “what” to balance and sustain. Furthermore, the climate change model may have competing, complementary, or rival models that are currently hidden, unknown, or outvoted by global warming advocates. One example is opposition to man-made climate change or policy discrepancies related to global warming versus the global dimming theory already addressed by new technologies and solar geo-engineering [66], which is opening new questions that might put the dominant paradigm and commitment to it to the test.

Smart tourism focuses on information and communication technology. It is premature to expect insights into how the intense focus on technology will affect sustainable tourism, and CiteSpace did not identify common influential and consensual communication points and values. In this context, viewing digital technology as a trigger for balancing economy and ecology is limited because, to date, the smart tourism cluster has mainly provided solutions for urban tourism and technology-based tourism activities. Although smart tourism is often communicated as a model for sustainable smart tourism destinations [67], no similarity was found between the smart tourism network and the sustainable tourism cluster communication network. Further research and co-citations are needed to capture the appropriate keywords in order to position smart tourism as a group of complementary competitors or partners to the sustainable tourism paradigm, which rely heavily on communication technology to balance tourism impacts on sustainability, e.g., environmental well-being, or the well-being of all tourism stakeholders.

Further, no evidence was found as to “how” the identified COVID-19 recovery strategies affect the balance between economy and ecology or whether they prioritize the interests of economic growth motives over those of ecology. Butler [68], whose early work on the evolution of destination growth is central to the COVID-19 alternative research network, recently observed: “Tourist destinations are looking back to the overtourism. . . and longing for a return to having too many visitors rather than too few or none” (paragraph 3). One can only warn that the pandemic-induced economic recovery should not become a new paradigm close to the values of the old neoliberal paradigm that advocates (over)growth of tourism.

CiteSpace captured the SDG cluster, which was too small (size = 13) and distant from all the other clusters, using a valuable semantics related to sustainable development goals. Thus, the cluster does not yet provide content that would enable it to be classified as a strong social network or potential paradigm or quasi-paradigm with confidence. It is suspected that this is an emerging cluster, as the SDGs become more prominent in socio-political discussions and academic journals show a growing interest in publishing more articles on the subject [69]. This anticipated increased research production will certainly change the future tourism academic networks in favour of the SDGs. The question of which key sources, concepts, and paradigms the research will link to remains open. More time and

more documents and co-citations are needed to formulate an SDG co-citation cluster and content and to reveal its true nature. That is not to say that the SDGs should be supported to become a new main paradigm. On the contrary, the same argument applies as in the case of the potential climate change paradigm: the SDGs of the *2030 Agenda* can only be part of the dominant tourism paradigm, one part of “how” to behave sustainably or implement sustainable development. Specifically, SDGs may relate to tourism policies, measures and actions, e.g., to paradigmatic dimension of socio-political agendas (see Figure 1).

Consequently, this study does not yet see the potential of climate change, or smart tourism, or SDGs, to become a new comprehensive paradigm for tourism development. However, there might be an emerging discourse on recovery and transformative tourism, as seen in the more frequent use of the terms in the keyword column in Table 2. In time, these terms might emerge as a network or cluster of their own. Based on the observations in the State of the Art section of this paper, future tourism communication networks on regenerative tourism [70], astronaut tourism, digital tourism, or metaversal tourism [71] may be anticipated. These were not identified through our CiteSpace cluster analysis because they have not yet achieved the critical mass, or understanding and relevance of the “what” and “how”, to be classified as a relevant alternative paradigmatic theory or approach, and thus as a relevant paradigm, or maybe as a complementary one that the main paradigm will have to integrate.

Technological innovations are driving recent breakthroughs in tourism in the form of commercial astronaut or space travel [72], digital products and cyber travel (metaverse) [73]. The question thus arises regarding whether the Profit (Progress/Wealth/Well-being)–People–Planet (Figure 1) understanding of sustainability in spaces on Earth is appropriate for tourism developments in new spaces, such as the metaverse and universe. Futurists, encouraged by technological progress, might argue for a paradigm shift to extend the three-sustainability pillars model to the universe and the metaverse, seen as spaces of unlimited resources and possibilities, so that the economic and ecological systems on Earth and their corresponding asymmetries become irrelevant or unimportant to future development and goals to meet human needs. Such paradigms, not limited to the physical space of the planet Earth, might overturn any Progress–Society–Planet earthly paradigm, rooted in the 20th century ideology of sustainable development [1]. These new outer and metaverse spaces [environments] of the 21st century do not fit into the prevailing framework of sustainable tourism, but new knowledge has yet to be accumulated, the assumptions of the thought framework (Figure 1, “what”) need to be questioned, and an alternative understanding of the environment humans live in and explore has yet to emerge. After the critical mass of alternative theories, and social and political awareness of tourism’s impacts in space and the metaverse is achieved, discussion and agendas can be activated to make tourism in space and metaverse sustainable without waiving responsibility for the terrestrial environment. The interests, motives or actors of these two additional spaces are still unknown. Therefore, it is too early to speculate which of the future tourism academic networks—complementary or rival to sustainable tourism—might represent a new possible paradigm and whether a paradigm shift or just a change in sustainability environments and corresponding development approaches will be required.

6. Limitations

This study has several limitations. In line with the philosophy of science, paradigms are typically associated with particular scientific disciplines, and there remains an ongoing debate about the disciplinary classification of tourism [17,18]. Nonetheless, the undeniable presence of tourism as a school of thought and as a socio-political phenomenon, its established recognition within the subject categories of research in the Web of Science (WoS), and the existence of an engaged academic community, warrant an investigation into the existence of the tourism paradigm and its possible future. Stronger sustainable tourism social science disciplines communication networks, where the research community seeks consensus on what and how to sustain in tourism and responsibly implement tourism

sustainability into action, must develop. It is important to recognize that the sustainable tourism paradigm is rooted in the broader sustainable development paradigm and draws on the multidisciplinary knowledge available in the wider society and its scientific disciplines, relevant for still emerging knowledge on the “what and how” of sustainable development.

The research methodology used in this article relies heavily on conventional academic knowledge, but falls short when it comes to incorporating non-academic, web-generated and indigenous knowledge, as well as metadata and generative artificial intelligence. Although this study claims to offer a globally consistent perspective on tourism sustainability, its approach and interpretations are more aligned with Western knowledge, captured in WoS research and global institutional documents on sustainable tourism, as approved by academia, as well as practitioners and civil society. These considerations underline the importance of including these different aspects in future research on the tourism paradigm and associated inter- and intragenerational justice.

The analysis in the WoS was limited by the period and scope of the publications covered in the database. Certain publications, such as relevant institutional documents, may not have been captured in this study’s search, because they were not included in the WoS database. Certain important tourism declarations and journals were not initially included in the WoS; therefore, our databases could not fully capture all relevant documents. Nonetheless, the important publication nodes and turning points were captured by the co-citation analysis when the collected documents co-cited other documents, including journal articles or documents not in the WoS primary database.

Another limitation associated with WoS-based co-citation analysis is its dependence on citation and co-citation volume, which evolves over time. Nevertheless, cluster co-citation analysis managed to capture seminal topics in more recent clusters, such as COVID-19, which emerged in 2020, but the research network of which was linked to Butler’s seminal 1980 work. Conversely, the analysis could not yet confirm an alternative SDG quasi-paradigm, and recent new phenomena such as metaversal, astronaut or regenerative tourism has not yet been captured.

This research used a tested and predefined search string to cover WoS documents on the theory and practice of the sustainable tourism paradigm. A comprehensive search of the entirety of the tourism documents in WoS or any other academic database could yield a different landscape and reveal different alternative and quasi-paradigms. Therefore, it is important to interpret the results of this study in the specific context of research on the sustainable tourism paradigm, focusing on WoS documents and their temporal co-citation context of 1991–2022. Furthermore, the mapping of the sustainable tourism paradigm falls within the scope of CiteSpace and the algorithms used there.

7. Conclusions

This article examines the structure and evolving paradigms of sustainable tourism by analyzing its academic communication networks. It focuses on three main areas: research trends in sustainable tourism, the dynamics of knowledge generation through academic communication, and emerging alternatives in sustainable tourism. This exploration addresses the complexity, evolution, and resilience of the sustainable tourism paradigm. Integrating Kuhn’s dual theory–practice framework, the article presents the current paradigm in two aspects and five dimensions: the three pillars of sustainability form one side, while the socio-psychological and socio-political dimensions related to sustainability implementation form the other (refer to Figure 1).

Firstly, there is a growing interest in both theoretical and practical research on sustainable tourism. Despite the quantitative progress in tourism research, sustainable tourism knowledge remains fragmented. The failure to establish influential knowledge communication nodes indicates that the academic tourism community must revise its knowledge generation practices. Scholars should collaborate more effectively by co-citing each other’s work, building a conceptually, terminologically, and perceptually coherent multidisciplinary and cross-disciplinary knowledge base for their primary subject category. The

failure to build a shared, coherent, knowledge-based communication network and its semantics not only hinders the growth of knowledge in the field of tourism and weakens the paradigm but also impairs its ability to serve as a comprehensive guide for the tourism community. This weakness affects the understanding of the “what” and “how” of the tourism intellectual field and diminishes the effectiveness of academic activism towards more sustainable tourism.

Social network analysis confirms sustainable tourism as the dominant paradigm but also reveals the landscape of tourism paradigms and quasi-paradigms. In addition to close paradigms committed to sustainability values, rival paradigms advocate for neoliberal economic values of growth and competitiveness. These rival paradigms pose a direct challenge to sustainability as they often promote agendas that undermine the fundamental principles of sustainable tourism.

Quasi-paradigms, which resemble paradigms but do not possess all the features of Kuhn’s dual framework, also emerge. Specifically, academic networks on climate change, smart tourism, and COVID-19 have not passed the dual paradigmatic test to be recognized as specific and separate paradigms, focusing instead on partial dimensions of sustainable tourism. Nevertheless, the emergence of these quasi-paradigms underscores the need for sustainable tourism to adapt and incorporate these different dimensions when they are relevant to tourism sustainability.

Furthermore, the emerging academic network of SDGs must find its place in the discourse on sustainable tourism, likely as an actionable agenda and approach to sustainable development. Additionally, possible hidden paradigms triggered by new kinds of tourism, enabled by technologies such as astronaut and cyber-tourism, pose new challenges to the sustainability discourse. These phenomena push the boundaries of the traditional dimensions of the sustainable tourism framework and present a future challenge for researchers on how to incorporate them to keep sustainable tourism dimensions relevant and resilient for the 21st century.

The sustainable tourism paradigm [1,5] has reached a critical juncture that requires the integration of different dimensions and adaptation to the new realities of the 21st century. The existence of academic networks for economic development-centred paradigms indicates the fragility of sustainable tourism values and the complexity of balancing financial, profit-driven motives with sustainability goals. Challenges, such as pandemics, overtourism, technological advances, and the emergence of space and cyber-tourism, require a comprehensive adaptation strategy to balance economic and ecological well-being. Future research will need to address the revolving economic development paradigm and the ecology–economy nexus, integrated into sustainability dimensions, in the context of sustainability values and stronger focus on progress measurement through well-being.

Future research must address the evolving economic development paradigm and the ecology–economy nexus within the broader context of sustainability, with a stronger emphasis on measuring progress through well-being indicators. Additionally, understanding how competing paradigms interact, coexist, and evolve over time in response to external changes will be crucial. By integrating Kuhn’s framework with game theory, re-searchers could gain deeper insights into the conditions that lead to paradigm dominance, coexistence, or shifts, offering a more dynamic and quantitative perspective on the evolution of tourism paradigms.

The future resilience and effectiveness of the sustainable tourism paradigm depend on its ability to evolve in response to the totality of natural, man-made, and artificial worlds increasingly relevant to tourism. As the intellectual field continues to navigate an ever-changing landscape, it is essential for its paradigm to maintain its dynamism and openness to evolution to ensure its continued relevance and effectiveness in addressing the complex challenges of the new century. Further research is essential to clarify these issues and to design a robust, adaptive tourism paradigm that can support sustainable development in the future.

Funding: This work was supported by the Slovenian Research Agency under Grant P5-0117.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data that support the findings of this study are openly available in depositary at ResearchGate DOI: <https://doi.org/10.13140/RG.2.2.17800.08967/1> (accessed on 19 July 2024).

Acknowledgments: The author would like to thank Iana Bilynets, for technical assistance in creating the WoS databases and analytical input in CiteSpace.

Conflicts of Interest: The author declare no conflicts of interest.

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