Sustainable Tourism and Innovation: Bibliometric Review and Future Research Agenda

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Abstract

The growing awareness of the need of protecting the environment is one factor propelling the development of new tourist attractions. Recycling and energy efficiency improvements are only two of the many strategies being used in tandem with the development of new environmentally friendly goods and services. Reasoning for creative behaviour in the tourism sector is survival and competitive advantage [1]. One study analysed 187 publications published between 1996 and 2022. Publications, authors, subjects, sources, keywords, and citations are all examined together with the other data gleaned from the literature review.

Keywords- Environmental Management, Bibliometric, Sustainability, Tourism, Innovation, Technology

Introduction

Cultural preservation, biological variety, ecological processes, social and economic equality, and personal enrichment are all aspects of tourism that contribute to its goal of being environmentally, socially, and economically sustainable[2]. Augmented Reality (AR) and Virtual Reality (VR) are two examples of how quickly digital technology has advanced in recent years. These innovations in technology are presently serving as a catalyst for change in the Cultural and Creative Industries (CCIs) by providing novel ways to disseminate knowledge, expand access to resources, and raise appreciation for and understanding of Cultural and Natural Heritage [3]. Information technology (IT) has been extensively utilized by the tourist and hospitality sectors to improve service quality and customer experience as well as lower costs and increase operational efficiency [4]. In this article, we will look at how hotel and tourist businesses have adapted new technologies to better serve their customers.

Literature Review:

The quality of the tourist experience is determined by how well the various providers involved in the industry work together and have a

common goal, so tourism planning must be an integrated process. [5]. Taking a long-term view is crucial to the growth of the tourism industry because it can facilitate the generation of economic value. Businesses and attractions in the tourism industry that adopt "greener" and more sustainable practices are better able to reflect the growing environmental concerns that influence tourist behavior and consumption patterns. [6].

Northern rural areas are primarily agricultural, but there is a growing awareness of the need to develop sustainable forms of tourism and promote economic growth. In any case, this is essential for the continued health of the regional economy and the establishment of a more stable foundation for territorial growth. Using tourism as a metaphor for the imbalanced and complicated relationship between the Majority World and the wealthy tourist-generating countries, [7]. Unless destinations adopt internationally accepted public health protocols that make visitors feel safe, international tourism will face ongoing challenges to fully recover in the wake of COVID-19. For LDCs like Nepal, whose economies are highly dependent on rural, environmental, and adventure tourism, this is an especially daunting challenge. Although experts predict that the pandemic will present opportunities for more sustainable tourism development in previously underserved rural areas, these areas must first recover from the effects of the disease. Although new products and technologies are often mentioned when discussing innovation, [9] the foundation of any innovative idea is to question and then improve upon previously held beliefs and practices. [10].

Recent years have seen remarkable development in digital technologies like Augmented Reality (AR) and Virtual Reality (VR). Innovative information sharing, easier access, and greater public appreciation and understanding of Cultural and Natural Heritage are all made possible by these technologies, which are presently functioning as a major force in the transformation of the Cultural and Creative Industries (CCIs). In the case of underwater ecosystems, this is particularly true since the most fascinating cultural and ecological sites are usually inaccessible to everyone except scuba divers owing to depth and/or environmental restrictions. [3] The average visitor now has higher standards when choosing a vacation spot. They now give serious consideration to the state of the local ecosystem when choosing a vacation spot. Sustainable tourism requires planners to take into account environmental protection and conservation problems [11].

Consumers are increasingly demanding that tourist destinations include mobility into their long-term plans. Policymakers may benefit from tourism mobility analysis in order to create sustainable tourist rules that account the demands of the business as a whole[12]. Sustainable tourism is "the practise of travel that minimises negative consequences on the environment, society, and economy via the responsible use of available resources to support cultural preservation, biological variety, ecological processes, social fairness, and economic prosperity" [2]. Increased environmental awareness is driving some exciting new trends in the travel sector. Increasingly, businesses are combining recycling and energy efficiency with innovative green products and services. Tourism professionals defend their innovative methods by arguing that they are necessary for the industry's success and growth [1].

Large quantities of garbage are produced, traffic is increased, noise and air pollution are increased, and local resources such as land, water, energy, and food are placed under pressure due to the influx of tourists. Recognizing the environment's important role, functions, and interactions with the economic system, the circular economy is provided as an alternate model to the linear model. The tourist and hotel industries have been criticized for not doing enough to combat climate change and other environmental problems. Implementing the shift to a CE requires ground breaking new approaches to business model creation [13].

As the tourist industry expands, so do its worries. All sectors of the tourist industry have worked together to identify ways to lessen the impact that their business has on the environment. Sustainable tourism encompasses a

variety of subsets that provide alternatives to conventional, mass tourism. However, it seems that tourists aren't keeping up with the pace of tourism development. [14]. Despite its importance to the world economy, the tourism sector has a number of problems in the areas of economics, society, and the environment. The distributed ledger technology known as blockchain may help address these concerns and pave the way for a more environmentally responsible and equitable tourist industry on a global scale. However, the challenges that prevent blockchain from being widely used in the travel sector have not been studied. [15]. Tourism that is managed, analysed, and makes better decisions with use of ICT is more likely to be long-lasting and environmentally friendly [16].

There hasn't been a lot of focus on tourism innovation from researchers or policymakers. However, rising consumer, resident, and governmental concern for the environment drives creative solutions within the tourist sector. [17]. There is often a correlation between the introduction and gradual application of novel ideas like integrated natural resources and the growth of ecologically sound communities in the vicinity. [18].

Innovation in the areas of society and the environment is on the rise. More and more businesses are investigating the potential benefits of social and environmental innovation for their operations [19]. Sustainable tourism issues have been dominated by climate change. The tourist industry is a large contributor to greenhouse gas emissions and thus must be addressed as part of any strategy to slow the consequences of global warming. The prevalent paradigm within the existing body of knowledge and key policy discourses has been to motivate action: changes in management practises and the widespread adoption of the most resource-efficient technology would lead to decreased emissions[20].

Sustainable tourism can't advance without a similarly creative shift away from "unsustainable" tourism, as well as novel approaches to researching and creating sustainable tourism theory and ideas. Many companies have taken on ad hoc projects, but few have documented their medium-term progression in a methodical way. [21].

Despite being categorised as a service industry that creates intangible services, tourism heavily reflects a take-make-dispose production model due to its reliance on massive quantities and flows of limited natural resources. [22]. Increasing tourism's popularity has a multiplier effect on the economy, and this growth is also tied to improvements in environmental standards and associated technology. Although several studies have looked at how tourism affects carbon emissions, not as much is known about how environmental contamination and technology advancements influence the expansion of the industry[23].

Destination resilience literature has been widely read and discussed in many different sectors throughout the years (strategic management; sociology; etc.). Thus, the tourist industry's potential for resilience has encouraged the creation and execution of strategies, regulations, and actions targeted at reducing risks and capitalising on possibilities in times of crisis via open innovation mindsets. [24]

Travel and tourism may be the fastest-growing sector globally, but it also has some of the least-developed systems for ensuring visitor safety and protecting the environment. However, only a fraction of the materials discuss how the use of new technology might influence the pursuit of more sustainable tourist growth. [25] Communities relying on tourism, coastal tourist facilities, and beaches are especially vulnerable to climate change, therefore it's important to take steps to lessen that risk as soon as possible while simultaneously ensuring the area's long-term viability[26].

Objectives of the Study:

The following questions are the basis for this study:

1. How many new books are published each year on green travel and new ideas?

2. To what extent have the works of these writers, issues of these publications, and nations as a whole advanced the cause of environmentally friendly and forward-thinking travel?

3. Thirdly, how do the authors and nations involved in the

subject topic interact and co orate in the realm of academic research?

4. What are the most common terms connected to the subject field, and have promise for future research?

Methodology:

For this descriptive bibliometric analysis, we employed the R programming language and the bibliometric codes, and we consulted the Scopus database for our citation data. The web-based interface of bibliometrics known as "bibliophily" was also used to build a network and a conceptual map of co-citations. On November 17th, 2022, we will do a Boolean search in relation to the scope of our research. After sorting by publication status, document type, source type, and language, a total of 306 articles were retrieved. Finally, 187 publications were included in the statistical evaluation. The plan for gathering and sanitizing data is laid forth in Table 1.

Table 1: Data extraction and cleaning process.

	Identification ↓	Literature identified in SCOPUS by topic = ("sustainable tourism") AND ("innovation") , (n = 306)
DATA SET (306)	Screening ↓	Literature refined by excluding document type - Article, Source type - Journal ,Language - English.
		Records screen (n= 119) → Records excluded by types of papers (n = 119)
	Eligibility ↓	Literature assessed for eligibility, (n= 187)
	Included	Highly relevant literature included, (n = 187)
	Search Details	(TITLE-ABS-KEY ("sustainable tourism") AND TITLE-ABS-KEY ("innovation")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (SRCTYPE , "j")) Search Date : 17/11/2022 Time Span : 1996 – 2022.

Table 2 shows the main information of literature on sustainable tourism and innovation. Altogether 187 articles related to the study area during 1996–2022 were considered for the study, and the references used are 12138. A total of 468 authors together published their documents in 93 sources. The table also reveals that the annual growth rate percentage of documents is 15.13, average age of document is 4.5 years, and the Average citation per document is 19.16.

The total keywords plus and author's keywords were 509 and 659, respectively. The table also reveals that international co- authorship percentage is 20.86.

Table 2 : Main information of literature on green technology and sustainability.

Description	Results
Timespan	1996:2022
Sources (Journals)	93
Documents	
Total Documents	187
Annual Growth Rate %	15.13
Document Average Age	4.5
Average citations per doc	19.16
References	12138
DOCUMENT CONTENTS	
Keywords Plus (ID)	509
Author's Keywords (DE)	659
AUTHORS	
Authors	468
Authors of single-authored docs	34
AUTHORS COLLABORATION	
Single-authored docs	39
Co-Authors per Doc	2.72
International co-authorships %	20.86
DOCUMENT TYPES	
Article	187

Results And Discussion:

Annual scientific production:

Figure 1 shows annual literature trends of articles based on sustainable tourism and innovation from 1996 to 2022. During the initial period (1997- 2004), the annual production of the literature was slow, and only 4 articles were successfully published, and indexed in Scopus database. After, 2012 exponential growth started, and 178 articles are published within a span of last 10 years, with an annual growth rate of 15.13 %. The highest number of publications is reported in year 2022 (37 publications).
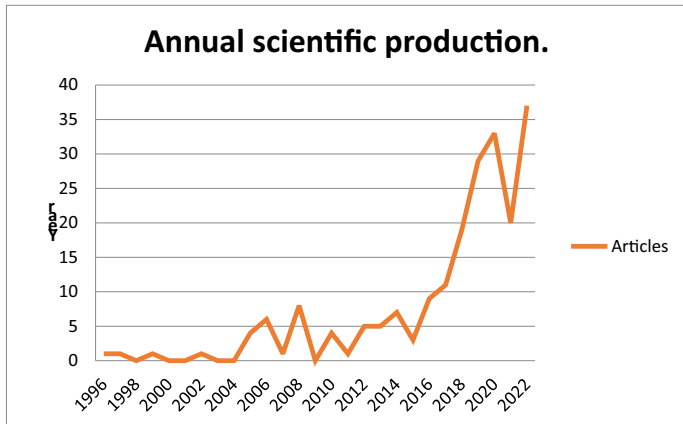
Annual scientific production.

Figure 1: Annual scientific production.

Table 3and Table 4 show the top 10 countries in terms of production and total citations respectively. China is the most productive country in terms of annual production (54), whereas USA hasthe largest receiver of total citations (Total citations: 404).

Table 3 : Top nations by production

Sr. No	Country	No. of Publication
1	CHINA	54
2	SPAIN	47
3	ITALY	33
4	AUSTRALIA	22
5	NETHERLANDS	20
6	UK	20
7	USA	19
8	PORTUGAL	17
9	INDONESIA	16
10	GREECE	10

Table 4. Top 10 countries by total citations

Sr. No	Country	TC	Average Article Citations
1	USA	404	36.73
2	UNITED KINGDOM	399	36.27
3	AUSTRALIA	327	27.25
4	SPAIN	318	17.67
5	ITALY	310	18.24
6	CHINA	267	14.83
7	NETHERLANDS	251	27.89
8	CANADA	237	118.50
9	INDIA	224	112.00
10	SWEDEN	219	54.75

Sources:

Table 5, shows the 10 most productive, and impactful journals in the field of sustainable tourism, and innovation from 1996 to 2022. Journal of sustainable tourism topped the list with 26 articles 916 total citations , and h index 17 followed bySustainability (Switzerland) (28 articles, 407 citations, h index = 11), and Worldwide Hospitality And Tourism Themes (12 articles, 77 citations, h index = 5).

Table 5: Top 10 journals with the highest production ofarticles.

Sr. No	Source	h_ index	g_ index	m_ index	TC	NP	PY_start
1	Journal Of Sustainable Tourism	17	26	0.63	916	26	1996
2	Sustainability (Switzerland)	11	19	1.833	407	28	2017
3	Worldwide Hospitality And Tourism Themes	5	8	0.385	77	12	2010
4	Journal Of Cleaner Production	4	4	0.222	287	4	2005
5	Tourism And Hospitality Research	4	4	0.267	166	4	2008
6	Tourism Management	4	5	0.154	303	5	1997
7	Tourism	3	3	0.333	22	3	2014
8	Anatolia	2	2	0.111	9	2	2005
9	Annals Of Tourism Research	2	2	0.118	172	2	2006
10	Current Issues In Tourism	2	2	0.095	7	3	2002
TC: total citations; NP: number of publications; PY: year of first publication.							

Documents:

Table 5, summarizes the top 10 most cited papersin the field of sustainable tourism and innovation. The article "Reviving tourism industry post-COVID-19: A resilience-based framework" has drawn the most attention with 232citations. Articles titled "Entrepreneurship and innovation at the base of the Pyramid: A recipe for inclusive growth or social exclusion?" (Total citations: 232), and "The entrepreneurship factor in sustainable tourism development" (Total citations:169),ranked second and third in terms of most cited paper in the dataset.

Table 5 : Top 10 most global cited documents

Sr. No	Authors	Title	Year	Source title	Cited by
1	Sharma G.D., Thomas A., Paul J.	Reviving tourism industry post-COVID-19: A resilience-based framework	2021	Tourism Management Perspectives	232
2	Hall J., Matos S., Sheehan L., Silvestre B.	Entrepreneurship and innovation at the base of the Pyramid: A recipe for inclusive growth or social exclusion?	2012	Journal of Management Studies	230
3	Lordkipanidze M., Brezet H., Backman M.	The entrepreneurship factor in sustainable tourism development	2005	Journal of Cleaner Production	169
4	Hjalager A.-M.	Innovation patterns in sustainable tourism: An analytical typology	1997	Tourism Management	132
5	Smerecnik K.R., Andersen P.A.	The diffusion of environmental sustainability innovations in North American hotels and ski resorts	2011	Journal of Sustainable Tourism	121
6	Torres-Delgado A., Saarinen J.	Using indicators to assess sustainable tourism development: a review	2014	Tourism Geographies	120
7	Moscardo G.	Sustainable Tourism Innovation: Challenging Basic Assumptions	2008	Tourism and Hospitality Research	103
8	Le Y., Hollenhorst S., Harris C., McLaughlin W., Shook S.	Environmental management: A study of Vietnamese hotels	2006	Annals of Tourism Research	102
9	Coghlan A.	Facilitating reef tourism management through an innovative importance-performance analysis method	2012	Tourism Management	87
10	Verbeek D., Mommaas H.	Transitions to sustainable tourism mobility: The social practices approach	2008	Journal of Sustainable Tourism	85

Author's Keywords:

There are 685 keywords provided by the authors, and 10 keywords meet the threshold of 10 occurrences. Most relevant keywords meeting the threshold of 10 occurrences in the field of Green technology and sustainability is exhibited in Table 6. Table 7, exhibit author's keywords which has a occurrence frequency of 1 % .These keywords shows the area which is less explored and has potential for future research.

Table 6 : Most relevant keywords meeting the threshold of 10 occurrences.

Author's Keywords	Occurrences
Sustainable tourism	78
Innovation	33
Tourism	25
Sustainability	21
Sustainable development	18
Sustainable tourism development	11
Climate change	8
Social innovation	8
Covid-19	7
Entrepreneurship	6

Table 7 : Author's keywords meeting the frequency of 1 %

Author's Keywords	Frequency	Percentage
Climate change	5	1%
Policy making	5	1%
Rural area	5	1%
Biodiversity	4	1%
Carbon dioxide	4	1%
Carbon emission	4	1%
China	4	1%
Competitiveness	4	1%
Cultural heritage	4	1%
Economic development	4	1%
Education	4	1%
Environmental impact	4	1%
Environmental management	4	1%
Liguria	4	1%
Mobility	4	1%
Questionnaire survey	4	1%
Action plan	3	1%
Business	3	1%
Coral reef	3	1%
Economic and social effects	3	1%
Economic growth	3	1%
Energy resource	3	1%
Environmental impact assessment	3	1%
Eurasia	3	1%
Governance approach	3	1%
International tourism	3	1%
Knowledge	3	1%
Local participation	3	1%
Modeling	3	1%
Natural resource	3	1%
Numerical model	3	1%
Perception	3	1%
Planning	3	1%
Resource management	3	1%

Author's Keywords = 50 , Total No. of Occurrence of Author's Keywords = 538

Figure 3, shows the evolution of author's keywords in the field of sustainable tourism and innovation. Between 2012 to 2017, keywords like policy making, tourism management, and sustainable tourism were mostly used by the authors. From 2018 to 2020, keywords like tourism market, stakeholder, tourism destination, sustainable development, ecotourism, tourism economics, tourist behaviour, conceptual framework were dominated the study area.
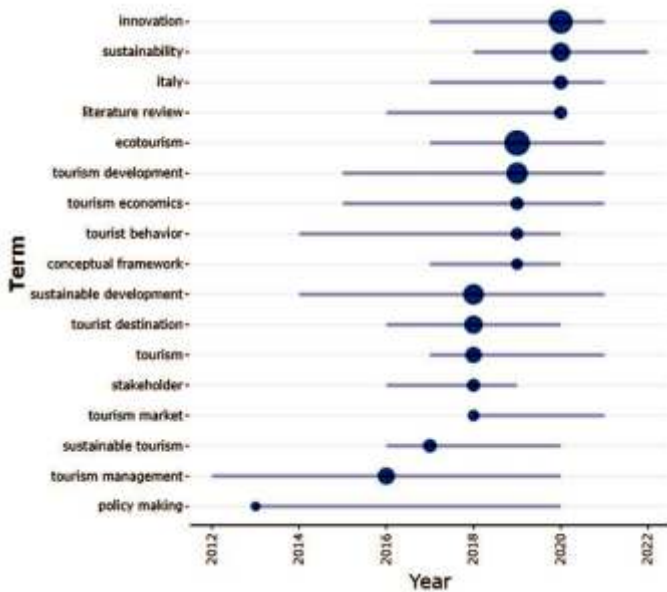

Figure 3: Trending topics in the field of Green technology and sustainability research. Parameters: Word minimum frequency = 5 , Number of words per year = 5.

Collaboration Network Analysis:

Collaboration network analysis shows how countries, institutions and authors are associated to each other. This analysis provides information regarding social structure of research field. Figure 4 shows the collaboration network diagram between top 50 most productive authors in the field of Green technology and sustainability. Overall, the collaboration network is discrete as there is no connection between many clusters. Some influential authors like Pirlone F , Xu F ,and Becken S do not have a stable community to work.
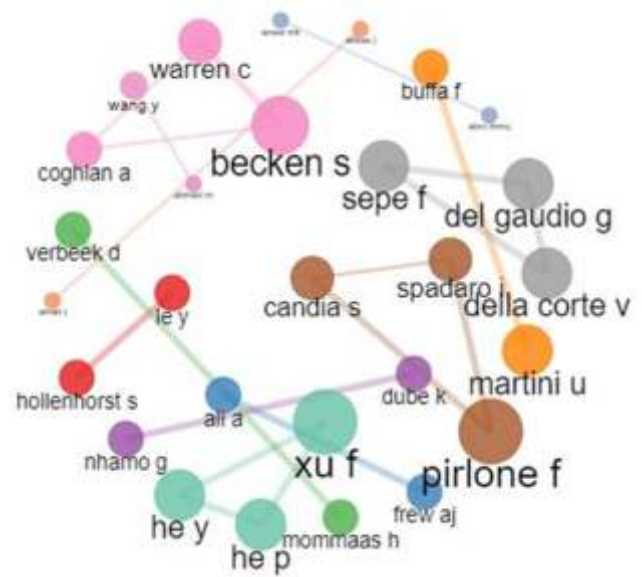

Figure 4: Collaboration networks of authors. Network Layout: Kamada & Kawai , Clustering Algorithm: Walktrap, Normalization : Association ,No. of Nodes: 50, Min. Edges: 1, Repulsion force : 0.1, No of labels: 50.

Figures 5, provides visualization of the top 50 most co authorship countries in the field of sustainable tourism and innovation. These countries are grouped into eight clusters which are shown by different color nodes. The larger nodes depict most productive countries in terms of co authorships and the thickness of links between nodes represent the cooperative relationship between countries. Two main clusters appear in the network, dominated by Spain, China and Italy represented by purple, green and blue nodes.
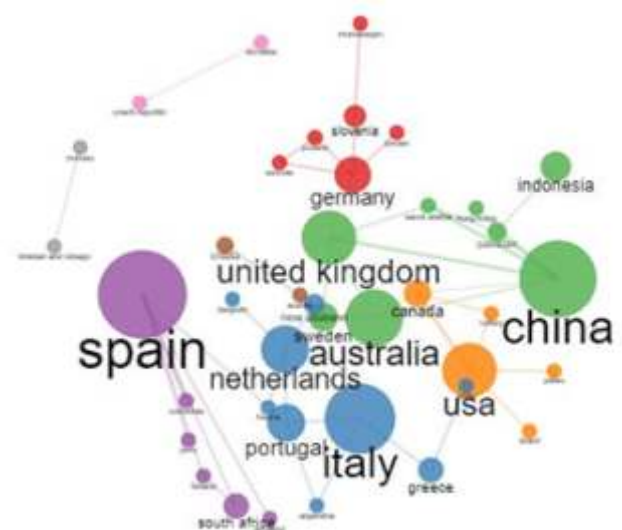
Figure 5: Collaboration networks of Countries. Network Layout: Kamada & Kawai , Clustering Algorithm: Walktrap, Normalization : Association ,No. of Nodes: 50, Min. Edges: 1, Repulsion force : 0.1, No of labels: 50.

Conclusion and Direction of Future Research:

The study conducted a comprehensive literature review on sustainability and innovation research work. From Scopus database, 187research articles related to the study area, and are published in between 1996 to 2022 were extracted. 468authors together published their documents related to the study area in 93 different sources, and in total 12138 references were used.

The main findings are summarised as follows:

1. Starting about 2012, there was a discernible uptick in the number of papers published each year that focused on the intersection between sustainable tourism and innovation. Between 1997 and 2004, just four papers were published and included in Scopus, and yearly output of the literature was modest. There has been rapid expansion since 2012; 78 articles have appeared during the last decade, representing an annual growth rate of 15.13 percent. In 2022, there will reportedly be the most books released. In terms of yearly output, China is well ahead of the pack, yet the United States is first in overall citations received.

2. After Sustainability (Switzerland) and the Publication of Sustainable Tourism, Worldwide Hospitality & Tourism Themes is the second most important journal in the field. The most prominent writers in the field of sustainability and innovation include (in no particular order) Becken, Xu, Pirlonr, Martini, Sepe, and Del Gaudio. However, the author's network of collaborators is still immature and fragmented.

3. The article "Reviving the tourist sector post-COVID-19: A resilience-based approach" has received the greatest attention and is considered to be the most influential publication. While "The Entrepreneurial Factor in Sustainable Tourism Development" and "Entrepreneurship and Innovation at the Base of the Pyramid: A Recipe for Inclusive Growth or Social Exclusion?" were the second and third most referenced positions, respectively.

4. Some of the most often used author keywords in sustainability and tourism studies include: sustainable tourism, innovation, tourism, sustainability, sustainable development, sustainable tourist development, climate change, Covid - 29, and entrepreneurship. Key terms such as "tourism market," "stakeholder," "tourism destination," "sustainable development," "ecotourism," "tourism economics," "tourist behaviour," and "conceptual framework" have dominated the field of research since at least 2018.

5. There are many under-explored areas that could be fruitful for future studies, such as climate change, rural areas, biodiversity, policy making, carbon dioxide, carbon emissions, cultural heritage, economic development, education, environmental impact, environment management, governance approach, local participation, international tourism, energy resources, growth, and economic and social effects.

In this analysis, we've covered where sustainability and innovation studies are now and where they may go in the future. Because not all secondary sources pertaining to the subject field are indexed in the Scopus database, our reliance on the Scopus database is a key restriction of our research activity. This means that cutting-edge methods will be employed to undertake in-depth analyses and measurements.

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