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Role of AI and GAI in Sustainable Tourism Behavior: Major Insights and Recommendations

Abstract

Sustainable tourism has taken over the tourism industry in the last few years. However, the rise of new technologies and platforms has significantly influenced the segment. Artificial intelligence (AI) and Generative AI (GAI) tools have added immense value to the domain. Sustainable tourism and the role of AI and GAI are the focus of the current study. Many studies have examined the impact of AI and GAI on sustainable tourism; however, most were either empirical, meta-analyses, or systematic reviews. Hence, this study aims to address the gap by employing a bibliometric and science-mapping approach to collate and analyse studies published between 2016 and 2024. Thirty-eight articles are included, and the chosen database was the Web of Science. A general performance analysis is conducted first, followed by a keyword analysis. After a detailed analysis of the articles, valuable insights were generated and thoroughly discussed. The findings focused on the role of technology, AI, and GAI on sustainable tourism dimensions. Specific implications are provided that are universally applicable.

Keywords: bibliometric, AI, GAI, sustainable tourism, review

1. Introduction

The recent COVID-19 pandemic and its aftermath have profoundly changed many aspects of life, including tourism and its various dimensions. The impact of tourism on the environment has become a key concern for both tour organisers and tourists. Hence, sustainable tourism has become the key to success in the modern travel and tourism industry (Rahmadian et al., 2022; Loaiza et al., 2019; Richard & Hall, 2000). "Tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities is called sustainable tourism" (UN Tourism, 2025). It can be defined as the protection of the social, cultural, and economic needs of the communities inhabiting the destination while minimizing environmental harm. It must evaluate various tourism aspects to address issues related to the three impacts: environmental, social, and economic (Rahmadian et al., 2022; Loaiza et al., 2019; Richard & Hall, 2000). It is strongly linked to the United Nations (UN) Sustainable Development Goals (SDGs) of "Goal 12: Ensure sustainable consumption and production patterns" and "Goal 13: Take urgent action to combat climate change and its impacts" (United Nations [UN], 2025; Rahmadian et al., 2022).

The role of technology is crucial for sustainability due to its power to transform resource management and to reduce environmental impact, aligning with long-term ecological balance. Technology drives sustainability, delivering numerous benefits: improved energy efficiency, optimised supply chains, enhanced circular economy, and better environmental monitoring (Afaq et al., 2024). When the world returned from almost zero physical tourism after the pandemic, the sector has seen advancements in the application of

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various technologies. The use of technology in tourism, especially sustainable tourism, has added immense value over the last few years (Gallego Gomez & Vaquero Frias, 2022; Loureiro & Nascimento, 2021). Among the various technologies, Artificial Intelligence (AI) and Generative AI (GAI)-based tools have significantly altered the concept of sustainable tourism. From planning to execution, it has revolutionised the industry (Afaq et al., 2024; Del Vasto & Castro, 2024; Sigala et al., 2024; Chiwaridzo & Chiwaridzo, 2024). For example, AI-based technologies can be used to monitor, predict, and reduce Greenhouse Gas (GHG) emissions, helping create a cleaner, healthier environment (Arya et al., 2024). Specifically, reducing the carbon footprint through optimised travel routes is one of the best real-world solutions enabled by AI-based technologies.

In sustainable tourism, AI has added value through the development of technical systems (Blockchain and IoT), improved customer relationship management (highly interactive), and the use of Augmented Reality (AR), Virtual Reality (VR), and Mixed Reality (MR) (Del Vasto & Castro, 2024). The allocation of resources, customised experiences, and data-enabled decision-making related to sustainable tourism are the benefits of AI. Similarly, GAI tools (for example, ChatGPT and similar) have also changed the shape of the tourism sector (Dinç et al., 2026; Sigala et al., 2024). Operational efficiency has improved significantly with the introduction of GAI. Kim et al. (2024) also assessed the impact of ChatGPT on sustainable tourism actions and found it to be highly beneficial.

The hospitality and tourism sector was one of the booming sectors before the pandemic. However, it reached its lowest point during the two years of the pandemic, when physical travel restrictions were in place. Many studies have examined the impact of AI and GAI on sustainable tourism; however, very few have collated these studies through a bibliometric approach. Most of the studies were either empirical, meta-analyses, or systematic reviews (Kim et al., 2024; Sigala et al., 2024; Chiwaridzo & Chiwaridzo, 2024). A bibliometric approach was undertaken due to the following benefits over other methods: "it enables and empowers scholars to (1) gain a one-stop overview, (2) identify knowledge gaps, (3) derive novel ideas for investigation, and (4) position their intended contributions to the field." (Donthu et al., 2021; Donthu et al., 2020)

Hence, this study aims to address the gap by collecting notable literary works on the roles of AI and GAI in sustainable tourism. It generalises the findings and provides four major discussion points. Technology and sustainable tourism are discussed, followed by the impact of AI and GAI in specific subsections. It also summarizes sustainable tourism behavior at the end. Additionally, it aims to provide future directions in this domain. To sum up, the following specific research questions address the role of AI and GAI in sustainable tourism.

RQ1: To conduct a general analysis that assesses the general developments and trends of publications in the chosen field.

RQ2: To mine the significant literary works that impacted this field and the type of cooperation relationships that exist among the existing literature.

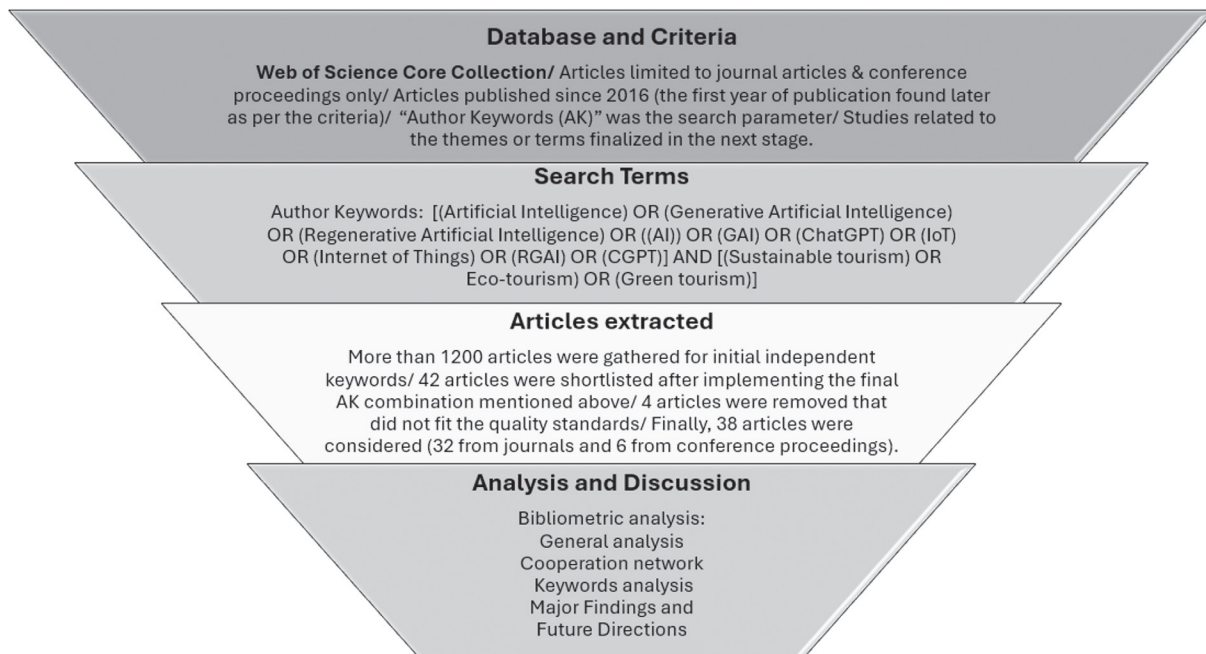
RQ3: To generate themes and sub-themes out of the analysis and the critical insights based on the current literature.

The remainder of the study is organized as follows. The next section outlines the methodology employed in this research. Section three includes a bibliometric analysis that elaborates on general developments and trends in the domain, along with cooperation analysis and keyword co-occurrence analysis. The study concludes with findings, discussion, implications, and limitations.

2. Methodology

This study employs a stage-wise methodology (see Fig. 1) to address the research questions outlined in the previous section. Any bibliometric analysis finalises the database to retrieve articles that meet the search criteria or the study's objectives (Dash, 2023; Chen et al., 2022; Donthu et al., 2021; Donthu et al., 2020). However, planning was the first step, which involved setting research questions, defining inclusion and exclusion criteria, and establishing search criteria (most essential for deriving the relevant articles). Once the requirements are set, the database must be finalised for mining the articles. Although numerous databases are widely used, specific criteria were employed to finalise the selection. Scopus and Web of Science (WoS) were always the top choices. It was noted that Scopus includes almost all the articles indexed by Web of Science. However, the opposite is not true (Dash, 2023; Chen et al., 2022). Web of Science Core Collection was chosen as the database. WoS is considered the best index among the indices, based on a high-quality criterion. Some criteria were set for including literary works. Articles related to "Artificial Intelligence (AI); Generative Artificial Intelligence (GAI); Regenerative Artificial Intelligence (RGAI); ChatGPT; Internet of Things (IoT); Sustainable tourism; Eco Tourism; Green tourism"; Articles limited to journal articles & conference proceedings only; Articles published since 2016 (the first year of publication found later as per the criteria). "Author Keywords (AK)" was the search parameter, although other options were available. AK typically covers a study's most important topics or themes, as the author is best positioned to do so. First, all the above-mentioned AKs were used independently before finding the best combinations for the study objectives. More than 1200 articles were gathered from random initial combinations. Forty-two studies were short-listed after implementing the following combination (after many combinations). Similar words with varying spellings were also used to achieve the best possible results. Manual screening, quality checks, and duplication checks ensured the removal of four articles (Dash et al., 2023; Donthu et al., 2021; Donthu et al., 2020). Finally, the author identified 38 articles, comprising 32 from journals and 6 from conference proceedings.

Figure 1
Methodology used for the study



3. Bibliometric analysis

"Bibliometric analysis is an expedient approach to examine the evolution of research domains, including topics and authors, based on the disciplines' social, intellectual, and conceptual structures" (Verma & Gustafsson, 2020; Donthu et al., 2021; Donthu et al., 2020). This research design has been adapted by researchers in various domains such as strategic management (Ferreira et al., 2016), corporate social responsibility (Bhattacharyya & Verma, 2020), green washing (Montero-Navarro et al., 2021), COVID-19 (Verma & Gustafsson, 2020), natural disasters (tourism) (Chen et al., 2022) and panic buying behavior (pandemic) (Dash, 2023). Previous studies have mostly employed a detailed, structured bibliometric analysis of the selected articles. The bibliometric analysis generally included three major components: (1) general trend analysis or performance analysis, (2) Keywords co-occurrence analysis, and 3. Cooperation network (Dash et al., 2023; Chen et al., 2022; Donthu et al., 2021; Donthu et al., 2020; Verma & Gustafsson, 2020). The VOSviewer v.1.6.20 software package was used for analysis.

3.1. General analysis or performance analysis

The bibliometric analysis generally begins with a general performance analysis. It includes publication-related metrics, citation-related metrics, and both publication-citation-related metrics (Donthu et al., 2021; Donthu et al., 2020; Cobo et al., 2011). First, trends in publications and citations over the years (2016-2024) were evaluated to understand current trends and potential research directions. 2024 turned out to be the best year in terms of the number of publications (18) (See Figure 2). At the same time, 2022 was the most productive year with 141 citations, closely followed by 2021 (135) and 2024 (132).

Figure 2
Trends of publications and citations over the years (2016-2024)

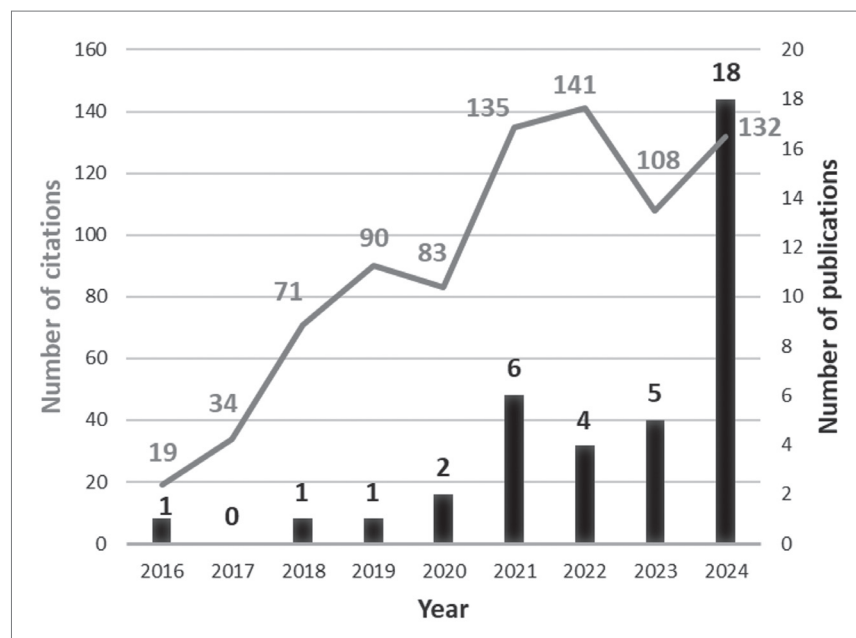


Figure 3
Top 10 domains of research on sustainable tourism and the use of AI and GAI

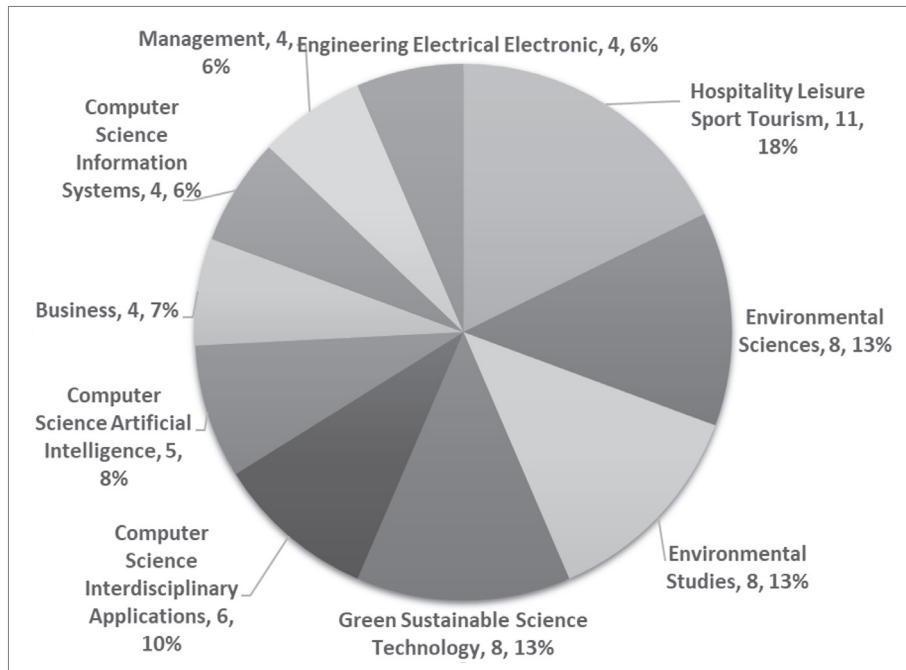


Figure 3 shows the breakdown of the top 10 research domains on Sustainable Tourism and the use of AI and GAI. The hospitality, leisure, and sport tourism field leads the distribution with 11 publications. Environmental science, environmental studies, and green sustainable science and technology domains, each with eight articles, closely follow it. (Note: Some articles are part of multiple domains as per WoS core collections.)

Once the performance analysis was completed to understand the number of publications and citations over the last few years, an attempt was made to delve into the details. Based on four criteria — countries, institutions, authors, and journals (Dash et al., 2023; Chen et al., 2022) — two tables are provided below. The top five publications are listed in Table 1, and the top five citations are listed in Table 2. With 11 publications, China is a clear leader among the countries. Kyung Hee University and Ubon Ratchathani University lead among the universities with 3 publications each. Pitakaso, R. leads with 3 publications. Among the journals, sustainability (7) is a clear winner. Talking about citations, China again leads with 583 citations. Among the universities, Beijing Normal University, the University of Applied Sciences, and West Virginia University lead with 548 citations, indicating a collaboration among the authors of these institutions. IEEE Access is a clear leader, with 548 citations among its peers. Sun et al. (2016) were the first to publish a paper in this field and received the most citations (548).

Table 1
Total publications (TP) of the top 5 countries, institutions, authors, and sources

Rank	Country	TP	Rank	Institution	TP	Rank	Author	TP	Rank	Source	TP
1	China	11	1	Kyung Hee University	3	1	Pitakaso, R.	3	1	Sustainability	7
2	Thailand	6	2	Ubon Ratchathani University	3	2	Girau, R.	2	2	2021 IEEE IoT Vertical and Topical Summit for Tourism	2
3	India	5	3	University of Cagliari	2	3	Giusto, D.	2	3	Current Issues in Tourism	2
4	South Korea	5	4	Birla Institute of Technology	2	4	Sole, M.	2	4	Journal of Mining and Environment	2
5	Portugal	4	5	Lund University	2	5	Kim, M. J.	2	5	Business Strategy and Development	1

Table 2
Total citations (TC) of the top 5 countries, institutions, authors, and sources

Rank	Country	TC	Rank	Institution	TC	Rank	Author	TC	Rank	Source	TC
1	China	583	1	Beijing Normal University	548	1	Sun, Y., Song, H., Jara, A. J., & Bie, R.	548	1	IEEE Access	548
2	Switzerland	551	2	University of Applied Sciences Western Switzerland	548	2	Tussyadiah, I., & Miller, G.	46	2	Information and Communication Technologies in Tourism 2019	46
3	Usa	551	3	West Virginia University	548	3	Rahmadian, E., Feitosa, D., & Zwitter, A.	38	3	Sustainability	43
4	England	50	4	University of Surrey	46	4	Tiwari, S., Rosak-Szyrocka, J., & Zywolek, J.	36	4	Current Issues in Tourism	41
5	Poland	43	5	University of Groningen	38	5	Loureiro, S. M. C., & Nascimento, J.	30	5	Energies	36

3.2. Keywords co-occurrence analysis

After a general analysis of the shortlisted publications, a science-mapping analysis is typically conducted. It can include citation analysis, co-citation analysis, bibliographic coupling, co-word analysis, and co-authorship analysis (Donthu et al., 2021; Donthu et al., 2020; Cobo et al., 2011). The VOSviewer package was used to visualize the co-occurrence of keywords (author) in a study (Dash et al., 2023; Chen et al., 2022). It was done to assess the authors' particular focus areas. A total of 141 keywords were used in the publications. Artificial intelligence was the top keyword (18), followed by sustainable tourism (14). It was apparent that our selection criteria were based on these two terms. Other heavily used keywords included eco-tourism, sustainable development, ChatGPT, and the Internet of Things. Figure 4 visualises the keywords and their co-occurrences.

Figure 4
Co-occurrence of author keywords of all publications



3.3. Cooperation network

After the general and keyword analysis, network analysis (cooperation) was conducted based on three criteria: country/region, institution, and author. Tables 1 and 2 already provide the top 5 listings for these criteria.

3.3.1. Country / region

Figure 5a considered all the counties with a minimum of one document. A total of 32 countries were identified and organised into 7 clusters. Four countries were excluded from this analysis because they were identified as outliers. China, India, Thailand, Malaysia, Finland, and South Korea cooperated the most. The top 5 countries led their respective clusters, with other countries following closely behind. The collaborations were spread universally across countries from different continents. However, China, South Korea, and India demonstrated the strongest link strength, showcasing their networking capabilities.

Figure 5a
Country / region collaboration network, 32 countries, 7 clusters

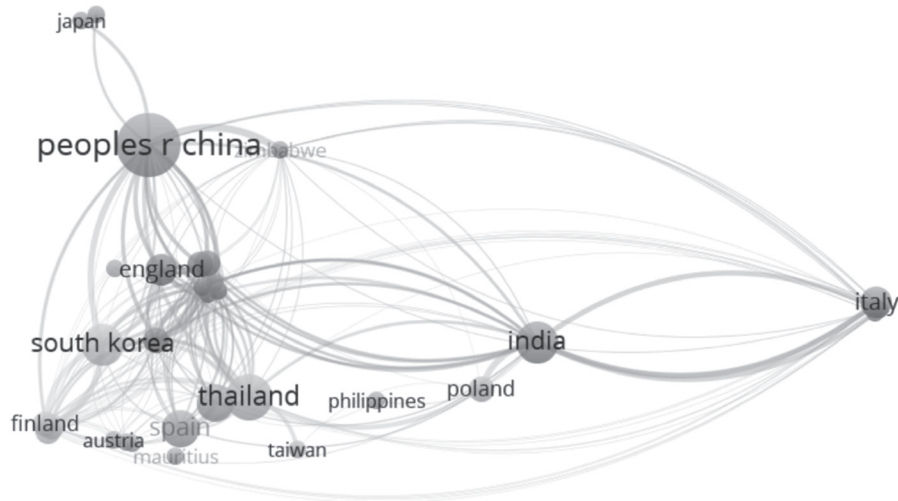
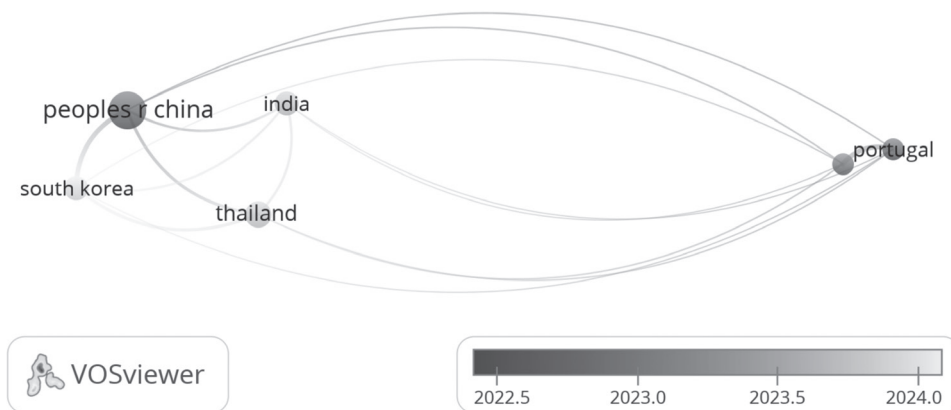


Figure 5b displays the cooperation network between countries based on a minimum of four document criteria. It was considered that the top 5 countries had at least 4 publications (Table 1). However, 6 countries met the requirements and were grouped into two clusters. Four countries, India, South Korea, Thailand, and China, were in one cluster, and the other two countries, Portugal and Spain, were grouped together. Only two clusters showed strong collaboration among the top countries, with a minimum of 4 publications. It showed specific Geographic groupings, such as Asia and Europe. China and South Korea demonstrated the strongest link strength, indicating their robust collaboration.

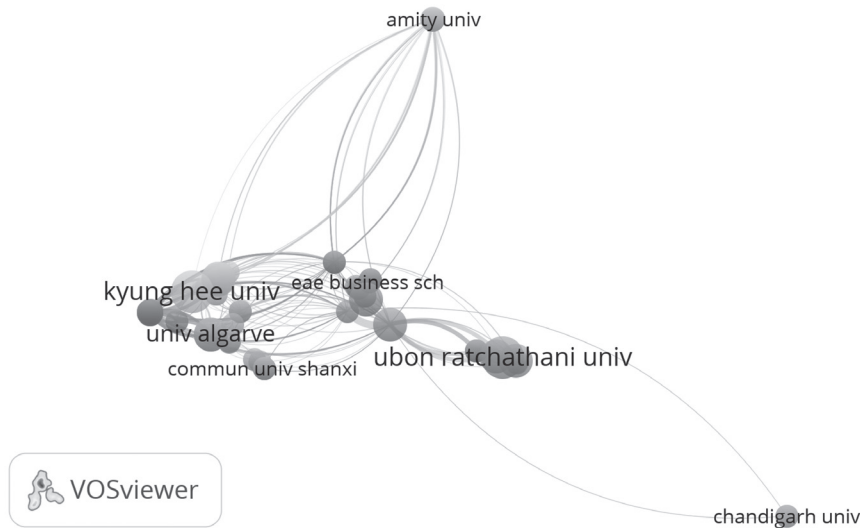
Figure 5b
Country / region collaboration network, 6 countries, 2 clusters



3.3.2. Institutions / organizations

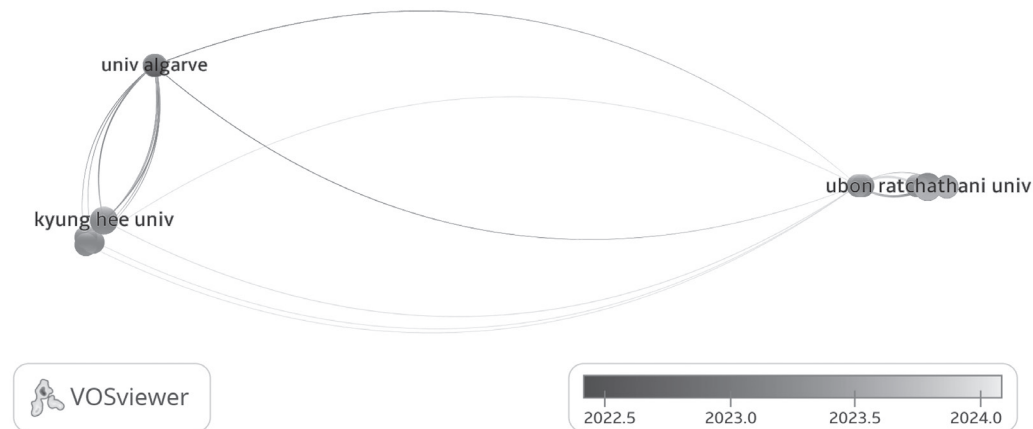
Further, the cooperation analysis of the institutions was conducted. The collaborative relationships were visualised in Figures 6a and 6b. Figure 6a envisions 72 institutions grouped under 7 clusters (a minimum of one document). Again, 7 clusters for 72 institutions proved strong associations. The top 5 institutions have led to strong collaborations with others. The top two universities, Kyung Hee University and Ubon Ratchathani University, had the maximum link strengths, respectively.

Figure 6a
Institution collaboration network, 72 institutions, 7 clusters



To deepen understanding of the collaboration among the top 5 institutions, a collaborative network was assessed using at least 3 document criteria. It was considered one of the top 5 institutions with at least 2 publications (Table 1). However, 11 institutions met the requirements and were grouped into three clusters. Figure 6b shows that 5 institutions led by Ubon Ratchathani University formed one cluster. Kyung Hee University led the second group, and the third cluster was led by the University of Algarve. Only three clusters demonstrated strong collaboration among the top 11 institutions, with each cluster publishing at least 3 papers. It did not show any specific Geographic grouping, although. Kyung Hee University and Lund University had the strongest links.

Figure 6b
Institution collaboration network, 11 institutions, 3 clusters



4. Results and discussion

The above bibliometric analysis of thirty-eight articles provided a performance analysis, followed by science mapping and network analysis. The use of AI and GAI in tourism, especially sustainable tourism, has become an integral part of the planners and customers, especially in the last decade (Afaq et al., 2024; Kim et al., 2024; Del Vasto & Castro, 2024; Sigala et al., 2024; Chiwaridzo & Chiwaridzo, 2024). This study provided general outcomes from bibliometric analysis. Based on the analysis and findings suggested by the articles used, the author attempted to outline a few specific themes that emerged. The themes followed a logical flow. The themes were derived mainly by studying the four aspects of the papers: title, objective, findings, and discussion. All 38 articles were studied in detail and grouped into four specific themes. The first theme primarily focused on the linkage between technology and sustainable tourism. Narrowing down, another cluster focused on AI and sustainable tourism. The next theme was an offshoot of AI, i.e., GAI and sustainable tourism. The final theme was derived from the discussions covered in some of the studies used in the bibliometric analysis. It discussed sustainable tourism behavior. Hence, broadly, these four themes were outlined using a funnel approach.

4.1. Technology and sustainable tourism (smart sustainable tourism)

Technology, in general, has become a crucial component in tourism, making it a more intelligent and engaging tourism experience. With the new generation of tourists being tech-savvy and highly environmentally conscious, sustainable tourism planners must provide a full range of technology-enabled services (Afaq et al., 2024; Chiwaridzo & Chiwaridzo, 2024). Numerous technological domains can be integrated into sustainable tourism, including sensors, open data, big data, open APIs (Application Programming Interfaces), Robotics, IoT (Internet of Things), BCT (Blockchain technology), NLP (Natural Language Processing), NFC (Near Field Communication), RFID (Radio Frequency Identification), and many others (Sánchez-Rivero et al., 2025; Rahmadian et al., 2022; Vu et al., 2018). The benefits of using these technologies are many. Carbon emissions and footprints will be minimal, physical interactions will decrease, human errors will be minimised, and customer satisfaction will increase.

The ultimate goal of making the tourism business sustainable is achieved through the adoption of the latest technologies. To run a sustainable tourism business, open innovation is the key. Just like any other business, four technological aspects must be adhered to: "(a) technological research, (b) vertical technological cooperation, (c) horizontal technological cooperation, and (d) technology delivery practices" (Gallego Gomez & Vaquero Frias, 2022; Chesbrough, 2006). Online travel platforms, such as TripAdvisor, MakeMyTrip, Booking.com, and even Google Maps, can be integrated into the sustainable tourism campaign. Many of these platforms already incorporate eco-friendly, sustainable practices into their systems. Overcrowding, noise, environmental hazards, and pollution can be communicated to potential tourists using technology (Rahmadian et al., 2022), thereby avoiding environmental harm. It marks the beginning of a new era in integrating technology into sustainable tourism.

4.2. AI and sustainable tourism

After discussing the general role of technology, let us examine the specific role of AI in sustainable tourism. AI enhances sustainable tourism through various means: 1. Resource optimisation by using AI tools for better planning and control, 2. Creation of smart tourism with better infrastructure and efficient transportation, 3. Use of predictive and prescriptive analytics to solve the issue of over-tourism, 4. Customised solutions for both tour operators and customers by offering environmentally friendly options, and 5. Improved communication with enhanced interactive features is crucial. To ensure environmental, social, and economic sustainability, AI should be utilised widely (Del Vasto & Castro, 2024; Rane et al., 2023). Data management, CRM, collaboration (both internal and external), data refinement and dissemination across clouds, stakeholder relationship management, and an overall AI-enabled decision-making process can be used to

plan and execute sustainable tourism practices. In any sector, including sustainable tourism, the use of AI is widely accepted, depending on factors such as "social influence, hedonic motivation, anthropomorphism, and performance" (Chi et al., 2020).

As the modern tourist becomes increasingly concerned about the environment, she will be more open to using AI to explore sustainable tourism options. One of the best examples is the "Smart Tourism Destination" project in Spain. It utilises AI and other technologies to enhance destination awareness, management, and improvement (Gallego Gomez & Vaquero Frias, 2022). Gomes et al. (2018) found that tourists utilise social media content both before, during, and after their trips. AI can add immense value by guiding potential tourists toward sustainable tourism through content on the topic. Content creators are utilising AI extensively to enhance their performance. Buitrago-Esquinas et al. (2024) developed a heterointelligence model that integrates human and artificial intelligence to address current challenges in sustainable tourism. It can address the prevailing issues by understanding AI's strengths and weaknesses.

4.3. GAI and sustainable tourism

Although AI has added immense value to sustainable tourism, GAI is the real winner nowadays. "Generative AI (GAI) is a specific type of AI that creates new, original content like text or images based on patterns learned from large datasets. The key distinction is the output: traditional AI systems analyse existing data to make predictions or perform specific functions, whereas GAI generates novel data that resembles its training data but is unique" (Fui-Hoon Nah et al., 2023; Dasborough, 2023). GAI tools, especially ChatGPT and similar ones, have revolutionised the tourism industry, including its sustainability aspects (Dinç et al., 2026; Kim et al., 2024; Sigala et al., 2024; Cheng et al., 2024). As these tools generate unique and novel data, they can offer superior benefits compared to AI that relies on existing data. GAI can provide unique solutions, such as suggesting more eco-friendly options, promoting community-oriented sustainable tourism models, and offering highly customised solutions for specific groups, while also contributing to the generation, refinement, analysis, and recommendations of new data.

However, the use of GAI is not free from challenges in sustainable tourism. If not given the proper commands or prompts, it can promote over-tourism that completely negates the efforts. The data used for training the GAI tool is crucial, as it can generate recommendations that are not environmentally friendly. Human behaviour is inherently complex, and no GAI tool can accurately predict it. Marginal errors might be detrimental to sustainable tourism. GAI and LLM tools pose threats, including cybersecurity risks, job losses, unreliable outputs, and data fabrication. Tourists, tourism managers, employees, and educators (all stakeholders) are significantly affected by GAI tools such as ChatGPT (Dinç et al., 2026; Kim et al., 2024; Carvalho & Ivanov, 2024). Overall, GAI is essential for sustainable tourism, but it must be handled with care.

4.4. Sustainable tourism behaviour (STB)

After discussing the impact of technology on sustainable tourism, let us briefly assess the latest trends in modern tourists' sustainable tourism behaviour. "The behaviour of the tourists should be sustainable and not harm the environment. In addition, it should add value to the environment" (Quoquab et al., 2019; Holmes et al., 2021). Sustainable travel practices not only support the environment but also promote the development of a circular economy. All three crucial factors — social, cultural, and economic — are integrated with environmental aspects in STB (Rahmadian et al., 2022; Loaiza et al., 2019; Richard & Hall, 2000). Additionally, STB is influenced by various types of values, including functional, social, and emotional values. Hence, tourism companies must cultivate these values to influence the STB of their potential tourists. Sustainable tourism develops when tourists care for the environment, value the quality of life, and consider the needs of future generations (Kim et al., 2024). They emphasise the need for tourism businesses to consider consumers' varying levels of sustainable tourism behaviour when designing AI-driven strategies (Kim et al., 2024).

AI is perceived to have a positive impact on behaviour (Tussyadiah & Miller, 2019), potentially encouraging STB among tourists. They classified AI impacts as Beneficial AI, Destructive AI, and Risky AI, and the customers were grouped into: The Laggards, The Aficionados, and The Realists (Tussyadiah & Miller, 2019). They recommend that The Realists are likely to respond positively to AI systems that recommend responsible behaviour. The adoption of AI and GAI has a significant effect on STB in this era of an increasingly connected world. Kim et al. (2024) have explicitly focused on the impact of ChatGPT on travel consumer behaviour and sustainable action.

5. Implications and recommendations

This study has explored a burning topic in tourism and has also highlighted crucial implications. The objective of this study was to explore emerging research trends in the impacts of AI and GAI using bibliometric and science-mapping approaches. The managers can get insights about the role of technology in sustainable tourism and plan accordingly. They can gain a better understanding of the latest technologies, especially AI and GAI tools, and how they are being integrated into their strategies. The existing business practices have changed, and managers must become more aware of the new needs of tech-savvy tourists. Narrowing down, specific AI and GAI tools must be provided to all tourism industry managers, as modern eco-friendly tourists widely use them. The managers can use AI tools for sustainable tourism for the following activities: tourist flow prediction, optimisation of resource use (e.g., energy/water), reducing waste, monitoring environmental impact, personalising eco-friendly recommendations, crowd management at protected sites, and AI-driven education on sustainable practices.

Let us summarise the recommendations based on the findings and the four themes derived above. First, if AI and GAI generate enormous economic, social, and environmental benefits, trust must be built with great care. Sustainable tourism companies invest heavily in their businesses; hence, the tools must be trustworthy. The same applies to tourists, who also care about the environment and are willing to pay extra for it. Second, as sustainable tourism is a premium segment that attracts high-net-worth individuals (mainly), the generation of content must be rich, and the interfaces must be top-notch. Third, when integrating AI or GAI into sustainable tourism campaigns, potential tourists should be educated and awareness raised, enabling personalised services to be offered. Fourth, fabrication of quantitative data must be prevented, as it has become a significant headache for GAI users. Finally, the use of technology for sustainable tourism should be open and accessible, with shared ownership, allowing the general public to benefit.

6. Conclusions

The current study has focused broadly on the impact of AI and GAI. Future research can delve deeper into the effects of AI tools, and comparative analysis can be an add-on. GAI is an inherent part of AI; hence, future researchers should deliberate on this and distinguish between the two before applying. The behavioural aspects can be explored in detail in future research, as they shed light on the tools' actual impact. Sustainable tourism dimensions can also be expanded to provide a holistic view of the theme. It is assumed that sustainable tourism and the use of AI tools are limited to young tourists only. Future research should focus on this to determine the impact of socio-demographic characteristics. Bibliometric analysis offers outcomes that can be developed into themes; however, future research can incorporate major theories before the objectives are set. It helps structure the study and enables incremental outputs to be established.

Declaration of Competing Interests

The authors declare that they have no known competing interests that could have appeared to influence the work reported in this paper.

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Appendix A

Articles collected from the database (Web of Science)

(Afaq et al., 2024; Amoshie et al., 2024; Bahou et al., 2024; Bijlani, 2021; Bozkurt & Seker, 2023; Buitrago-Esquinas et al., 2024; Cheng et al., 2024; Chiwaridzo & Chiwaridzo, 2024; Del Vasto & Castro, 2024; Farinha et al., 2021; Gallego Gomez & Vaquero Frias, 2022; Girau et al., 2018, 2020; Harisanty et al., 2024; He et al., 2024; Ji et al., 2024; Jiang et al., 2023; Kim, Hall, et al., 2024; Kim, Kang, et al., 2024; Li, 2023; Loureiro & Nascimento, 2021; Makoondlall Chadee et al., 2021; Nag & Mishra, 2024a, 2024b; Pinho & Leal, 2024; Pitakaso, Khonjun, et al., 2024; Pitakaso, Sethanan, et al., 2024; Rahmadian et al., 2022; Shafiee et al., 2023; Sigala et al., 2024; Suanpang & Pothipassa, 2024; G. Sun, 2020; Y. Sun et al., 2016; Thumrongvut et al., 2023; Tiwari et al., 2022; Tussyadiyah & Miller, 2019; Wallinger et al., 2023; Wei, 2021)