Tourism seasonality in academic research: A review of sustainability issues

A turizmus szezonalitása a tudományos kutatásban: a fenntarthatósági kérdések áttekintése

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Tourism seasonality creates recurring fluctuations in visitor demand, posing major challenges for destination sustainability. This study addresses a research gap by examining seasonality through an integrated economic, environmental and social sustainability lens. Using a bibliometric and systematic review of 804 Web of Science publications, the study maps current knowledge and key research trends. Findings show that peak seasons intensify environmental degradation and socio-cultural pressures, while off-seasons contribute to income instability and underused infrastructure. At the same time, seasonality can support ecosystem recovery and product diversification. The study concludes that seasonality is a structural feature requiring context-specific, interdisciplinary policies and proposes a conceptual framework linking seasonality to the three pillars of sustainability.

A turisztikai szezonalitás, vagyis a látogatói kereslet visszatérő ingadozása, jelentős kihívást jelent a desztinációk fenntarthatósága szempontjából. A tanulmány a szezonalitás integrált gazdasági, környezeti és társadalmi fenntarthatósági szempontú vizsgálatával egy eddig kevéssé feltárt kutatási területhez kíván hozzájárulni. A tanulmány 804 Web of Science-publikáció bibliometriai és szisztematikus áttekintése alapján térképezi fel a jelenlegi tudásanyagot és a főbb kutatási trendeket. Az eredmények szerint a főszezon fokozza a környezeti terhelést és a társadalmi-kulturális feszültségeket, míg a holtszezon jövedelemingadozást és az infrastruktúra alacsony kihasználtságát eredményezi. Ugyanakkor a szezonalitás lehetőséget teremthet az ökoszisztémák regenerálódására és a turisztikai termékek diverzifikációjára. A tanulmány megállapítja, hogy a szezonalitás strukturális sajátosság, amely kontextushoz igazodó, interdiszciplináris szakpolitikai válaszokat igényel, és egy olyan koncepcionális keretet javasol, amely a szezonalitást a fenntarthatóság három pilléréhez kapcsolja.

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1. Introduction

Tourism seasonality refers to recurring fluctuations in visitor demand within a specific period, influenced by natural and institutional factors, and affecting tourist flows, revenue, employment, and the utilization of tourism infrastructure (BAUM–LUNDTORP 2001, BUTLER 2001). As a fundamental characteristic of tourism systems, seasonality shapes the dynamics of supply and demand across destinations and remains a persistent structural feature of the industry.

In recent years, the global tourism sector has experienced substantial growth alongside increasing temporal concentration of visitor flows. According to the United Nations World Tourism Organization (UN Tourism 2025), international tourist arrivals declined sharply from 1.47 billion in 2019 to 406 million in 2020, reflecting the unprecedented impact of the Covid19 pandemic, widely recognized as the most significant disruption in the history of international tourism. This global shock fundamentally altered tourism

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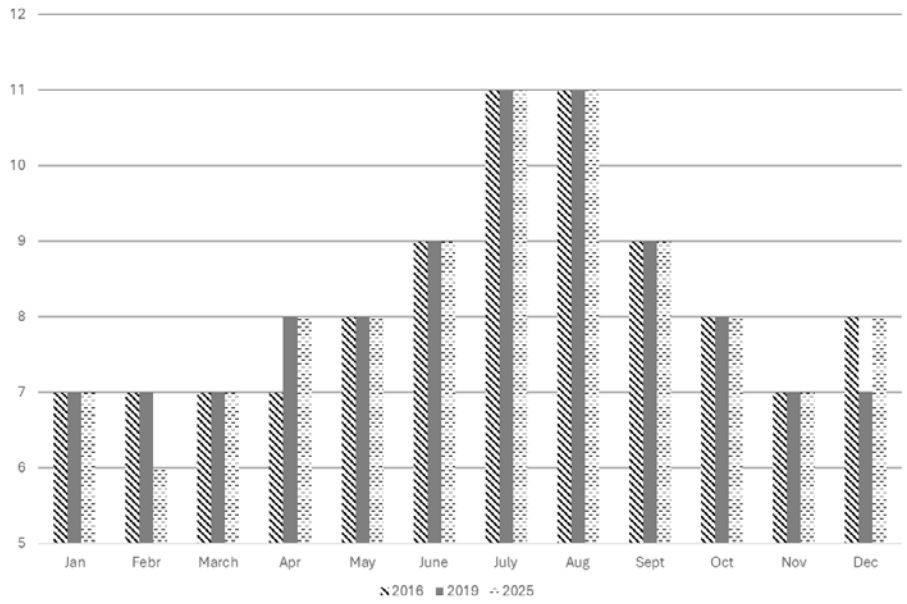
dynamics, intensifying volatility and exposing the vulnerability of tourism systems to external crises. This was followed by a steady recovery reaching approximately 1.52 billion in 2025, representing a 4.0% year-on-year increase. Monthly data indicate growth in most months of 2025, with peaks in January (11%) and April (10%), and only a slight decline in March (-1%). However, arrivals remain strongly concentrated in July and August (11% each), confirming the persistence of seasonal patterns in global tourism flows *(Figure 1).* This pattern is further supported by global statistics, as 31.0% of international tourist arrivals occur during the summer months (June to August), while tourism receipts peak at 31.0% in the third quarter (July to September), highlighting the strong seasonal concentration of tourism activity (UN Tourism 2025).

Figure 1

Share of international arrivals (%)



Source: UN Tourism (2025)

The impacts of tourism seasonality extend beyond economic fluctuations to environmental and social dimensions. Temporal concentration places pressure on natural resources, ecosystems, and infrastructure while also affecting local communities through congestion and fluctuating employment patterns (GÖSSLING et al. 2018, PEETERS et al. 2018). As a result, seasonality has become a key concern in achieving sustainable tourism development. Seasonality has an impact on any kind of tourism destinations such as coastal (RUGGIERI–PLATANIA 2024), lakeside (BARCZA et al. 2023), mountain (STEIGER et al. 2023), health (MARTON et al. 2019), urban (ASHWORTH–PAGE 2011) or rural areas (MARTÍN MARTÍN et al. 2020).

Against this background, this study aims to explore the relationships between tourism seasonality and sustainability across its economic, environmental, and social dimensions. Accordingly, the study addresses the following research questions (RQ):

- (RQ1): How has academic research on tourism seasonality evolved over time, and which methodological approaches have been employed in this field?
- (RQ2): How and through which mechanisms do tourism seasonality affect the economic, environmental, and social dimensions of sustainability in tourism destinations?
- (RQ3): Embedded within the author's doctoral research, this study maps the state of knowledge, uncovers gaps, and proposes implications to inform future empirical data collection.

The study is structured as follows: after the introduction chapter, the methodological framework for collecting relevant academic studies about tourism seasonality is identified. The more detailed analysis of previous studies' results has two main pillars. The first part

gives a bibliometric overview about the involved articles, the second part is aimed at mapping implications regarding sustainable tourism development, within that focusing on the three pillars of sustainability (environmental, social, and economic pillar).

2. Methodology for literature review, process of selecting relevant studies

The literature review was conducted using the Web of Science database to identify and analyse relevant academic publications on tourism seasonality. The initial keyword search was based on the terms "tourism" AND "seasonality", which resulted in 804 documents after applying filters for English language and article or review article document types. Abstracts were carefully screened, and studies unrelated to sustainability issues were excluded. After this initial mapping, a more focused screening process was conducted. The review concentrated on studies that directly addressed the relationship between tourism seasonality and the three pillars of sustainability: environmental, social, and economic impacts. Studies that were only indirectly related, or focused mainly on technical, institutional, or unrelated methodological aspects, were excluded. As a result, the literature was narrowed down to a more relevant set of key publications for an in-depth review.

3. Results

3.1. BIBLIOMETRIC INFORMATION ABOUT THE ACADEMIC ARTICLES

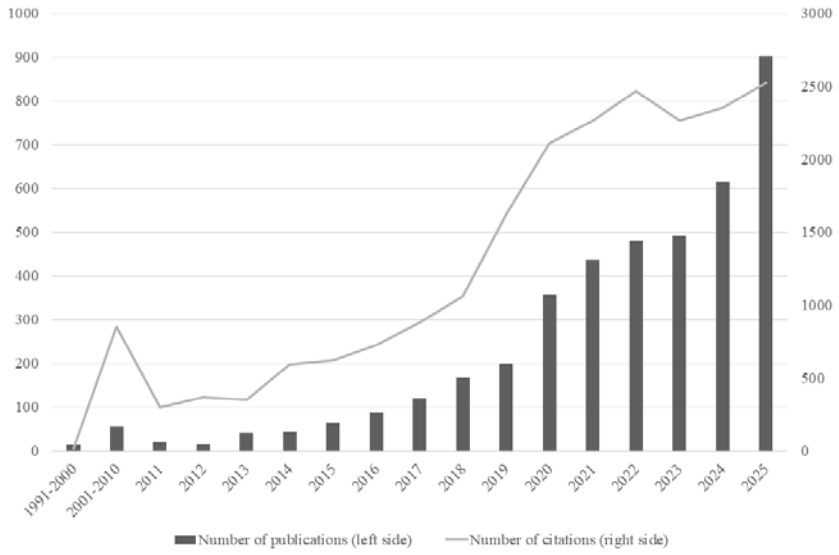
To clarify the research landscape, the results were first analysed according to major research areas. The largest share of publications was classified under *Hospitality, Leisure, Sport & Tourism* with 350 records, followed by *Environmental Sciences* with 138 records, *Environmental Studies* with 134 records, *Management* with 110 records, and *Economics* with 102 records. This distribution shows that tourism seasonality has been studied as a multidisciplinary topic, strongly connected to tourism management, environmental concerns, and economic impacts.

Second, publication trends over time were reviewed by distinguishing between periods before and after the early 2000s (post-millennium period). The results show a gradual increase in research output, with a more pronounced growth in publications after 2015 *(Figure 2)*.

The results were also examined in relation to the Sustainable Development Goals (SDGs). The strongest connection was with SDG 11: *Sustainable Cities and Communities*, with 582 records, followed by SDG 14: *Life Below Water*, SDG 13: *Climate Action*, and SDG 15: *Life on Land*. This confirms that tourism seasonality is closely linked to sustainability challenges, especially in urban destinations, coastal areas, and environmentally sensitive regions.

Figure 2

Volume of academic articles about tourism and seasonality



Source: Web of Science

In terms of geographical distribution, Spain was the leading country with 170 records, followed by China, the United States, Italy, and England. This indicates that much of the existing literature focuses on destinations with strong seasonal tourism patterns, particularly Mediterranean and highly visited tourism regions *(Table 1)*.

Table 1

Bibliometric data about academic articles addressing tourism and seasonality (number of articles)

Document type	• *Article (785)* • *Review article (19)*
Web of Science categories (TOP5, one article can be included in more categories)	• *Hospitality Leisure Sport Tourism (350)* • *Environmental Sciences (138)* • *Environmental Studies (134)* • *Management (110)* • *Economics (102)*
SDGs (TOP5, one article can be included in more categories)	• *SDG11: Sustainable Cities and Communities (582)* • *SDG14: Life Below Water (93)* • *SDG13: Climate Action (76)* • *SDG15: Life On Land (54)* • *SDG03: Good Health And Well Being (45)*
Countries addressed in the study	• *Spain (170)* • *People Republic of China (102)* • *USA (79)* • *Italy (73)* • *England (59)* • *Australia (51)* • *Other (270)*
Open Access	*388 articles*

Source: own elaboration based on Web of Science (N=804)

3.2. DESTINATIONS ADDRESSED IN ACADEMIC STUDIES

This process identified key patterns in the literature on tourism seasonality and sustainability. The full-text review focused on destination types addressed in the selected studies. Since several studies covered overlapping contexts, classification was based on the dominant destination type or geographical focus. The reviewed literature mainly examines Mediterranean, island, coastal, urban, rural, mountain, and protected-area destinations with strong seasonal fluctuations. Mediterranean countries such as Spain, Italy, and Greece experience pronounced summer peaks, while Northern and Central/Eastern Europe show more moderate seasonal patterns. Urban and island destinations are particularly affected by concentrated visitor flows and seasonal pressure due to limited infrastructure and capacity. Most reviewed studies focus on mature tourism destinations (KRABOKOUKIS–POLYZOS 2024, KOIMTZIDIS et al. 2025, VIERA-GONZÁLEZ 2025).

3.3. METHODS USED IN ACADEMIC STUDIES

Academic research about tourism seasonality integrates a wide range of methodologies however, secondary data dominates the international publishing practice (SENBETO et al. 2024). The reviewed studies employ diverse data sources, analytical techniques, and geographical contexts to investigate tourism seasonality and sustainability. Most rely on secondary data from statistical databases, official reports, and online sources, while some incorporate primary data through interviews or digital mobility records *(Table 2)*.

GROSSI and MUSSINI (2021) investigated seasonal tourism patterns across six destinations in the Veneto Region of Italy. Their study decomposed changes in the Gini index of monthly tourist arrivals into two components: seasonal stability and seasonal magnitude. Since the Gini index is widely used to measure seasonal concentration, this decomposition provides a deeper understanding of temporal imbalances and reveals differences within and between destinations. NADAL et al. (2004) also highlighted differences in visiting patterns according to source market and season, suggesting that visitors during the main season may differ from those visiting a destination during the shoulder season.

ZARAGOZÍ et al. (2021) analysed tourism mobility using Passive Mobile Data (PMD) in Salou, Spain. The dataset captured movements of residents and tourists, and mobility patterns were visualized using flow maps and alluvial diagrams to examine seasonal variations.

RUGGIERI and PLATANIA (2024) analysed tourism seasonality across Mediterranean islands using longitudinal data from 2008–2018. By applying several quantitative seasonality indicators, the study distinguished between structural patterns of seasonal concentration and variations in tourism intensity, demonstrating how different measurement approaches influence the interpretation of seasonal imbalances and sustainability.

Overall, the reviewed studies show considerable variation in data and analytical approaches. However, in most cases, academic studies addressing tourism seasonality have a longer perspective, depending on data availability,

few decades period is analysed. Regarding the involved stakeholders, travellers are in the forefront of involved studies. The data input for articles points out the 'traditional' understanding of tourism as there is a stronger focus on arrivals and guest nights registered by commercial accommodation.

management. In nature-based destinations, visitor flows are also influenced by weather conditions and special events, while traditional data often fail to capture mobility patterns accurately, highlighting the need for alternative monitoring tools such as vehicle counters (ÞÓRHALLSDÓTTIR–ÓLAFSSON 2017).

Table 2

Methodological characteristics of selected studies on tourism seasonality

Author(s), year	*Source of data*	*Variable*	*Method used*	*Destination*	*Stakeholders*
Secondary data					
VIERA-GONZÁLEZ (2025)	*Mobile positioning data*	*Tourism flows, seasonality indices*	*Gini index decomposition and multiscale spatial analyse*	*Spain (national and regional level)*	*Destination management organizations, public authorities*
KOIMTZIDIS et al. (2025)	*Remote sensing / night-time lights data*	*Seasonal intensity and tourism activity trends*	*Spatial analysis of night-time light data*	*Greek islands (Aegean, Crete)*	*Local/regional authorities, communities*
RUGGIERI – PLATANIA (2024)	*Accommodation records*	*Overnight stays, seasonal concentration indices*	*Statistical indicators and time-series analysis*	*Mediterranean islands (comparative sample)*	*Island tourism policymakers and planners*
KRABOKOUKIS – POLYZOS (2024)	*Monthly tourism statistics; overnight stays in accommodation establishments from Eurostat and Statista*	*Arrivals, overnight stays, tourism seasonality indices (RSI, Kendall's W), seasonal patterns, tourism trends*	*Relative Seasonality Index (RSI), Kendall's W stability index, time-series decomposition, comparative statistical analysis*	*Mediterranean countries including Spain, Italy, Greece, Croatia, Cyprus, Portugal, Turkey, etc.*	*Tourism planners and policymaker*
Primary data					
DHIMITRI et al. (2025)	*Online questionnaire survey (primary data; 186 stakeholders)*	*Visitor motivations, destination quality, seasonality barriers, tourism product quality*	*Descriptive statistics, frequency analysis, Spearman correlation, multiple regression analysis*	*Albanian Adriatic Coast, Albania*	*Tourism enterprises, institutions, local authorities*
GKARANE et al. (2025)	*Semi-structured interviews with tourism practitioners (primary data)*	*Seasonality challenges, sport events, off-season tourism impacts*	*Qualitative thematic analysis*	*Regional destinations in Greece*	*Tourism practitioners, local businesses, destination manager*
GAO et al. (2024)	*Online questionnaire survey (primary data; 419 stakeholders*	*Sustainable tourism perceptions, tourism awareness, ecological protection, sociocultural development*	*Factor analysis and structural equation modelling (SEM)*	*Haikou, China*	*Tourists, government, travel agencies, local residents*

Source: own elaboration

3.4. IMPLICATIONS OF SEASONAL IMBALANCE ON SUSTAINABILITY

Seasonal imbalances in tourism affect sustainability by shaping visitor distribution, resource use, and destination resilience. The uneven temporal distribution of visitors creates congestion in peak periods and underused infrastructure in off-peak seasons, complicating sustainable destination

Although tourism is widely viewed as a driver of economic growth, its negative impacts particularly in regions with unused capital and unstable income structures remain less studied. Evidence shows that vulnerability to tourism seasonality may reduce the share of high-growth firms and reinforce structural imbalances within destinations (STOJČIĆ et al. 2022).

3.4.1. Impact on the environment

The relationship between sustainable tourism and the environment is often described as symbiotic, as both can benefit from each other. Tourism relies heavily on natural resources and landscapes for its development, while at the same time it can contribute to their protection. The attractiveness of natural areas forms the foundation of tourism, making the preservation of these resources essential for its long-term viability. Moreover, tourism can generate positive environmental outcomes by raising awareness among visitors and local communities and by providing financial resources for conservation efforts (GHULAMRABBANY et al. 2013).

However, alongside these benefits, tourism can also generate negative environmental impacts if not properly managed. Uncontrolled tourism development may gradually degrade the natural resources on which tourism depends. For this reason, tourism is considered highly dependent on and sensitive to environmental quality; when environmental conditions decline, destinations may lose their attractiveness and visitor numbers may decrease (HASSAN 2000).

3.4.2. Impact on the socio-cultural dimensions of tourism

The negative socio-cultural impacts of tourism, particularly in protected areas, can be profound. Drawing on credible sources such as LEUNG et al. (2018), SPENCELEY and SNYMAN (2017), and UNWTO (2018), these impacts can generally be grouped into external and internal categories.
Externally driven impacts include:

- Prioritizing tourists in the allocation of essential resources (e.g., water and energy), which can deprive residents of basic needs and lower their quality of life.
- Rising social instability, including increased crime, gambling, begging, substance abuse, and sexual exploitation.

Internally driven impacts include:

- Loss of self-esteem and dignity: Locals not engaged in tourism may feel excluded or undervalued, while those in low-status service roles may experience humiliation or feel their skills are ignored, leading to strained and superficial interactions with tourists.
- Emotional harm: Misrepresentation of local culture or disrespectful tourist behaviour can deeply offend residents, potentially leading to tension or conflict between communities and visitors.

While these internal and psychological effects are less visible, they can have lasting consequences on a community's cultural identity, social cohesion, and collective well-being. From the perspective of potential tourism product development, cultural tourism is defined as a great area for attracting visitors outside of the main season. However, establishing an attractive image as a cultural destination has its challenges in mature coastal destinations, as highlighted by FIGINI and VICI (2012) in their study conducted in Rimini (Italy). Events are also in the forefront of developments outside of the peak season. Besides supporting economic sustainability of business operation, they attract residents so this way contributing to the socio-cultural advances of a certain area (CONNELL et al. 2015).

3.4.3. Impact on the economy

Within the framework of traditional tourism assessments, economic impacts are typically viewed positively, often measured through the revenues generated by tourism. However, tourism – particularly in protected areas – can also generate significant negative economic consequences. The following discussion draws on key findings from selected academic sources, including LEUNG et al. (2018), PEETERS et al. (2018), and DAMNJANOVIĆ (2021). The negative economic impacts of tourism flow's seasonal variation include:

- Income fluctuation and seasonal unemployment: Due to the seasonal nature of tourism during off-peak periods or in times of crisis, such as pandemics or economic downturns, many people lose their jobs or experience significant income reduction.
- Economic leakage: A large portion of tourism revenue may flow out of the local community and into the hands of foreign investors. This undermines the core goal of tourism, which is to support local development, and can increase residents' dissatisfaction.
- Unequal distribution of economic benefits: Tourism income is often concentrated in the hands of a few, rather than being fairly distributed across the community. This contributes to growing inequality and relative poverty in the area.

Consumption of goods and services is obviously a positive impact of tourism flows. BAKHAT and ROSELLO (2013) highlights that tourism demand for certain goods such as fuel has a slightly different pattern of residents' consumption patterns. This way, price changes during main season might

impact local demand more, as travellers are not 'withdrawn' by extra charges once they are at the destination.

Positive economic impact of incentives for attracting visitors during the shoulder season is clear such as highlighted by CISNEROS-MARTÍNEZ et al. (2018) in their study about the Spanish IMSERSO programme. However, they point out that seasonality problem cannot be solved simply by such initiatives, especially at destinations with a high share of international visitors who might have different visitation patterns then domestic senior guests (CISNEROS-MARTÍNEZ et al. 2018). Changes in travel behaviour and motivation might be also induced by external crisis such as Covid19 that also has an impact on temporal imbalance of visitor flows and thereby calling for new tourism product development (BARCZA et al. 2023). *Table 3* summarises the impacts and challenges of tourism seasonality in relation to economic, environmental and social/cultural sustainability.

management, environmental pressure, economic vulnerability, and SDG-related challenges.

The main finding is that seasonality affects destinations through interconnected environmental, economic, and social mechanisms. Peak-season concentration increases pressure on natural resources, ecosystems, infrastructure, and local communities, while off-season decline contributes to unstable income, seasonal employment, underused capacity, and uneven distribution of benefits. However, the literature often examines these impacts separately rather than as part of an integrated sustainability problem.

The review also shows that most studies rely on secondary data and quantitative indicators, such as the Gini index, tourism flow analysis, decomposition techniques, and long-term statistical datasets. These methods are useful for identifying seasonal patterns, but they often remain descriptive. A key research gap is the

Table 3

Impacts and challenges of tourism seasonality on sustainability

Sustainability dimension	*Positive impacts*	*Negative impacts*	*Key challenges*	*References*
Economic	*Boosts local revenue during high season due to increased demand and employment. Supports business growth and investment in tourism infrastructure.*	*High dependency on limited peak months causes unstable income. Underutilization of resources in off-season periods.*	*Achieving stable year-round employment and income. Diversifying local economies beyond tourism.*	*BAUM – LUNDTORP (2001) FERNANDEZ-MORALES (2024) UNWTO (2025)*
Environmental	*Concentrated visitation allows time for environmental recovery in off-seasons.*	*Overcrowding and resource depletion during high season (water, waste, CO_2 emissions). Pressure on fragile ecosystems in coastal/Mediterranean destinations.*	*Balancing tourist flows to prevent overuse. Managing carrying capacity sustainably.*	*GÖSSLING et al. (2018) RUGGIERI et al. (2024)*
Social/Cultural	*Revitalizes local culture and traditions through tourism demand. Enhances community pride and cultural exchange.*	*Over-tourism disrupts local lifestyles and raises cost of living. Seasonal jobs may lead to precarious employment conditions.*	*Maintaining community well-being year-round. Ensuring equitable benefits across residents.*	*VARGAS-SÁNCHEZ et al. (2014) KOENS et al. (2018)*

Source: own elaboration

4. Conclusions

Tourism seasonality remains a structural and largely problematic feature of tourism development, with significant implications for destination sustainability. This review shows that academic interest in the topic has increased, especially after 2015, and that seasonality is increasingly discussed in relation to sustainability, destination limited number of empirical, stakeholder-based, and destination-specific studies that examine how seasonality is actually experienced and which mitigation strategies work in practice.

In terms of implications, the findings suggest that seasonality cannot be addressed through universal solutions. Strategies such as cultural tourism, events, pricing tools, social tourism programmes, product diversification, and demand redistribution may reduce seasonal imbalance,

but their effectiveness depends on destination characteristics, governance capacity, visitor markets, and local stakeholder cooperation.

This study is limited by its reliance on Web of Science and English-language publications, meaning that some relevant research may have been excluded. Nevertheless, it provides a structured overview of the current state of knowledge and identifies key gaps for future research. In line with the author's doctoral research, the findings support the need for a conceptual framework that links seasonality, sustainability pillars, destination characteristics, and future empirical data collection.

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