

Determinants of Tourism Seasonality: An Empirical Study in Quang Binh Province, Vietnam

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Abstract

Tourism seasonality remains a persistent structural challenge for coastal destinations, particularly in developing regions where tourism demand is strongly shaped by natural constraints and limited destination management capacity. This study investigates the determinants of tourism seasonality in Quang Binh Province, Vietnam, using survey data collected from tourism enterprises, domestic and international tourists, and industry experts, combined with exploratory factor analysis and multivariate regression. The results indicate that climate and tourism resources are the most influential drivers of seasonal concentration, confirming the structurally embedded nature of seasonality in nature-based coastal destinations. However, organizational and technical factors related to destination management also exhibit a statistically significant moderating effect, suggesting that seasonality is not entirely immutable. In contrast, income, cultural practices, and mass tourism characteristics do not exert independent effects once managerial and temporal factors are controlled for. The findings imply that while natural constraints set the boundaries of seasonality, effective governance and adaptive product strategies can partially flatten the seasonal demand curve and support more sustainable destination development.

Keywords

Tourism Seasonality, Influencing Factors, Destination Management, Regression Analysis, Quang Binh, Sustainable Development

1. Introduction

Tourism seasonality is widely recognized as a structural and persistent phenomenon

in destination development, manifested through cyclical fluctuations in tourist demand, revenue generation, and employment over time (Baum & Lundtorp, 2001; Butler, 2001). In coastal and nature-based destinations, these fluctuations are particularly pronounced, as tourism activity is strongly conditioned by climate variability, natural resource characteristics, and synchronized travel behavior. Excessive concentration of demand during peak periods often leads to congestion and environmental pressure, while prolonged low seasons result in underutilized infrastructure and labor instability, posing serious challenges to destination sustainability (Jang, 2004).

In Vietnam, Quang Binh Province represents a highly relevant case for examining tourism seasonality. The province has experienced rapid tourism growth following the international recognition of Phong Nha-Ke Bang World Natural Heritage Site, yet tourism demand remains sharply polarized across seasons. According to official statistics, more than two-thirds of annual tourist arrivals are concentrated in the summer months, while the rainy and storm-prone period from September to November contributes only a marginal share of total visitation. This seasonal imbalance reflects not only climatic constraints but also the heavy reliance on outdoor and nature-based tourism products, such as cave exploration and coastal tourism.

Although tourism seasonality in Quang Binh is evident, existing studies in Vietnam have largely approached the issue from descriptive or policy-oriented perspectives, with limited empirical examination of its underlying determinants. In particular, there remains a lack of integrated quantitative models that simultaneously assess the relative roles of natural constraints (e.g., climate and tourism resources) and adjustable factors related to destination organization and management. This gap is especially critical for developing coastal destinations, where seasonality is often perceived as an unavoidable outcome of climate rather than a phenomenon that can be partially moderated through governance and strategic intervention.

Against this background, this study aims to identify and quantify the determinants of tourism seasonality in Quang Binh Province using a hybrid analytical framework. By combining exploratory factor analysis with multiple linear regression based on survey data from tourism enterprises, tourists, and experts, the study examines the joint effects of climatic conditions, tourism resource structure, socioeconomic synchronization, behavioral dynamics, and organizational-technical capacity. In doing so, the paper contributes to the tourism seasonality literature by empirically demonstrating that while natural factors establish the structural boundaries of seasonality, destination management capacity plays a critical moderating role. The findings provide policy-relevant insights for designing adaptive strategies to mitigate seasonal concentration and promote more sustainable tourism development in climate-sensitive coastal regions.

2. Literature Review and Research Hypotheses

2.1. Literature Review

Tourism seasonality is commonly defined as the cyclical and recurrent fluctuation

of tourism activities over time, reflected in variations in tourist arrivals, revenues, employment, and infrastructure utilization throughout the year. It is widely recognized as a global structural challenge that creates supply-demand imbalances and directly threatens destination sustainability (Butler, 2001; Alshuqaiqi & Omar, 2019).

Early studies, such as Baum and Lundtorp (2001), primarily focused on describing the seasonal nature of tourism demand. More recent research has shifted toward quantifying the determinants of seasonality using advanced analytical models. For example, Koenig-Lewis and Bischoff (2005) and Kesidou (2016) applied the Gini coefficient and multivariate graphical techniques to classify tourist segments based on travel motivations, thereby supporting the design of counter-seasonal strategies. Notably, studies by Zhang et al. (2022) in China and Chung (2009) demonstrated that cultural tourism development and service quality improvement can flatten seasonal demand patterns more effectively than tourism products relying solely on natural resources. Similarly, Annisius (2014), focusing on destinations with harsh climatic conditions, highlighted the critical role of destination management and niche-market marketing in sustaining demand during the low season.

In Vietnam, tourism seasonality research was initially introduced by Nguyen (1998) and later systematized through the four-factor framework proposed by Mai (2020). Empirical studies have mainly concentrated on northern coastal destinations such as Cua Lo (Tran & Nguyen, 2014), Do Son (Vu, 2017), and Quang Binh (Tran & Nguyen, 2024). However, there remains a significant research gap in developing an integrated quantitative model for destinations with high specificity, such as Quang Binh Province—an area endowed with globally unique cave systems but simultaneously exposed to severe climate variability in central Vietnam.

By adopting multivariate analytical techniques as recommended by Hair et al. (2018) and Nguyen and Phan (2017), examining both the supply and demand sides of tourism, this study addresses this gap. It not only provides robust empirical evidence on the determinants of tourism seasonality in Quang Binh but also offers policy-relevant insights aligned with the province's tourism development strategy toward 2030.

2.2. Research Hypotheses

Based on the literature review, this study proposes hypotheses regarding the determinants of tourism seasonality in Quang Binh Province.

Natural Factors: Climate and Tourism Resources

Climate is a fundamental factor shaping the temporal framework of outdoor tourism activities. In Quang Binh, the rainy and stormy season from September to November constitutes a physical constraint on beach and cave-based tourism. In addition, the nature of tourism resources (coastal, forest, and cave systems) determines the destination's sensitivity to weather conditions (Cannas, 2012).

H1: Climate has a positive and the strongest influence on tourism seasonality

in Quang Binh Province.

H2: Dependence on natural tourism resources increases the intensity of seasonal concentration in local tourism.

Socio-economic Factors: Income and Leisure Time

Income determines tourists’ ability to undertake multiple trips within a year, while leisure time—such as school summer holidays and national public holidays—acts as a trigger for synchronized travel demand (Jang, 2004). The overlap of these vacation periods leads to excessive concentration of tourism demand during summer months.

H3: Tourists’ income has a positive effect on the formation of peak tourism periods.

H4: Concentrated distribution of leisure time (summer holidays and national festivals) is a major cause of seasonal overcrowding.

Cultural Practices and Mass Tourism (Crowding Effects)

Seasonal travel customs (e.g., spring trips and summer vacations) and herd behavior associated with mass tourism encourage tourists to travel during peak seasons to ensure full service availability. This behavior further reinforces inherent seasonality (Butler, 2001).

H5: Cultural practices and tourism-related customs significantly influence the cyclical pattern of tourist flows.

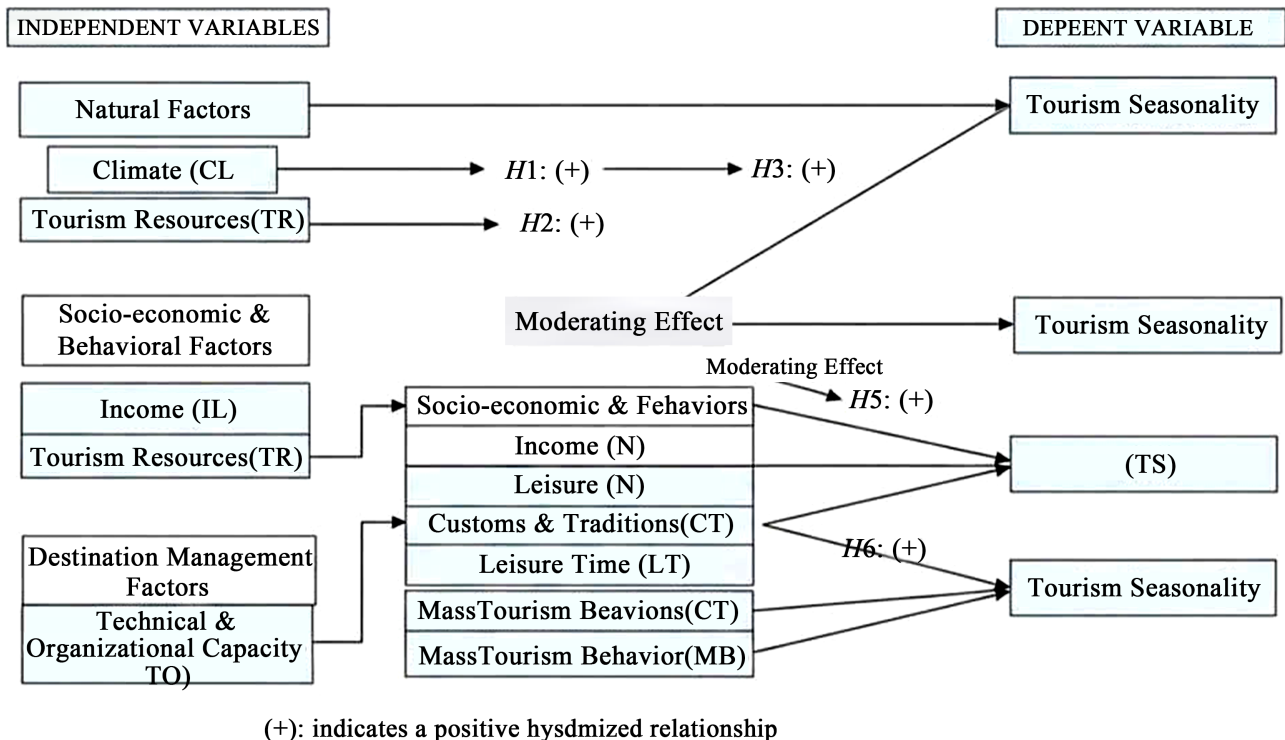


Figure 1. Proposed conceptual framework of tourism seasonality determinants in Quang Binh Province.

H6: The expansion of mass tourism intensifies tourist concentration during peak seasons.

Organizational and Technical Factors

Organizational and technical factors represent “soft” determinants that can be influenced by destination managers. A lack of indoor tourism products, inflexible pricing strategies, and ineffective promotion during the low season often shorten the tourism season. Conversely, effective organization and management can mitigate seasonal fluctuations (Jang, 2004; Quang Binh Department of Tourism, 2023).

H7: Destination organizational capacity and technical management exert a significant moderating effect on tourism seasonality.

Based on the theoretical arguments and the proposed hypotheses discussed above, the conceptual framework for this study is synthesized and illustrated in **Figure 1**.

3. Methodology

3.1. Research Design

This study adopts a quantitative research approach using a structured questionnaire survey. The research was conducted in two stages. The first stage involved a pilot study to refine measurement scales through expert consultation and focus group discussions. The second stage consisted of a formal survey to collect primary data and test the proposed regression model.

3.2. Data Collection and Sample Size

Data were collected in Quang Binh Province using a multi-stakeholder sampling strategy that captures perspectives from both the supply side (tourism businesses) and the demand side (tourists). The sample size was determined based on **Yamane’s (1967)** formula with a 95% confidence level and a permissible error of $\pm 5\%$:

$$n = N / (1 + N(e))^2 \quad (1)$$

- **Supply side:** 400 representatives of tourism-related enterprises, including travel agencies, accommodation providers, and restaurants operating in Quang Binh.
- **Demand side:** 400 tourists, of whom 300 were domestic visitors and 100 were international visitors. This distribution reflects the actual structure of the local tourism market (Quang Binh Department of Tourism, 2023).
- **Validation group:** Qualitative inputs from 70 experts, including policymakers and academic scholars, were used to enhance the robustness and interpretability of the empirical findings.

3.3. Measurement Scales and Variables

All observed variables were measured using a five-point Likert scale, ranging from 1 (“strongly disagree”) to 5 (“strongly agree”).

- **Dependent variable:** Tourism seasonality, measured through fluctuations in tourist arrivals, tourism revenue, and infrastructure utilization.

- **Independent variables:** Seven groups of determinants were examined, including: 1) Climate, 2) Tourism resources, 3) Income, 4) Leisure time, 5) Cultural practices, 6) Mass tourism (crowding effects), and 7) Organizational and technical factors.

3.4. Data Analysis Techniques

Data were processed using SPSS software, following standard multivariate analysis procedures (Hair et al., 2018).

- **Reliability analysis:** Cronbach's Alpha was applied to assess internal consistency, with a threshold value of 0.70.
- **Exploratory Factor Analysis (EFA):** Conducted to reduce dimensionality and identify the underlying factor structure. The adequacy of EFA was assessed using the Kaiser-Meyer-Olkin (KMO) measure (>0.50), Bartlett's Test of Sphericity ($p < 0.05$), and a cumulative explained variance exceeding 50%.
- **Multiple linear regression analysis:** Employed to estimate the magnitude of effects and to test hypotheses H1 through H7.

4. Results and Discussion

4.1. Characteristics of Tourism Seasonality in Quang Binh Province

Descriptive statistical results derived from data provided by the [Quang Binh Department of Tourism \(2023\)](#) and the [Quang Binh Statistical Office \(2024\)](#) reveal an extreme seasonal concentration of tourism activities. Tourist arrivals are highly concentrated during the peak period from April to August, reaching a maximum in June and July, which together account for over 70% of total annual tourist arrivals. In contrast, the period from September to November records a sharp decline in tourist demand, primarily due to adverse weather conditions, as shown in [Table 1](#).

Notably, the survey results based on 800 valid responses indicate that international tourists exhibit significantly lower sensitivity to seasonality compared to domestic tourists (mean Likert score of 2.9 versus 4.1, respectively) as the manuscript's clarity and consistency as shown in [Table 2](#).

Table 1. Monthly distribution of tourist arrivals to Quang Binh Province (average for the period 2019-2024).

Month	Share of Tourists (%)	Seasonal Characteristics
Jan-Mar	8 - 10	Low season
Apr-May	15 - 18	Beginning of peak season
Jun-Aug	40 - 45	Peak season
Sep-Nov	7 - 9	Low season (rainy and stormy period)
Dec	4 - 6	Low season

Source: Compiled from the Quang Binh Statistical Yearbook and tourism sector reports, 2024.

Table 2. Comparison of perceived seasonal concentration of tourist flows by respondent groups.

Period of the Year	Tourism Enterprises (n = 400)	Domestic Tourists (n = 300)	International Tourists (n = 100)	Experts (n = 70)	Assessment
Jan-Mar	2.4	2.6	2.3	2.5	Low season
Apr-May	3.6	3.8	3.3	3.8	Beginning of peak season
Jun-Aug	4.6	4.7	4.1	4.6	Clear peak season
September	3.4	3.3	3.1	3.6	Transitional period
Oct-Dec	2.6	2.7	2.9	2.7	Low season

Source: Primary survey data, 2024.

Table 3 illustrates that tourism revenue in Quang Binh Province is highly dependent on the peak season, with approximately 65% - 70% of total annual revenue generated during a limited number of peak months. In contrast, the low season contributes only a modest share of revenue and is characterized by low accommodation occupancy rates, leading to inefficient utilization of infrastructure and labor resources.

The substantial disparity in revenue and capacity utilization between peak and low seasons not only undermines business performance but also increases financial risks for tourism enterprises, complicating efforts to maintain a stable workforce and to improve service quality over the long term.

Table 3. Comparison of tourism revenue and accommodation occupancy between peak and low seasons.

Indicator	Peak Season	Low Season
Share of annual revenue (%)	65 - 70	30 - 35
Accommodation occupancy rate (%)	70 - 85	25 - 40

Source: Compiled from tourism enterprise reports and the Quang Binh Department of Tourism, 2024.

4.2. Regression Analysis and Hypothesis Testing

4.2.1. Specification of the Regression Model

Drawing on the theoretical framework and the factor structure identified through Exploratory Factor Analysis (EFA), this study employs a multiple linear regression model to examine the associations between key determinants and the degree of tourism seasonality in Quang Binh Province. The dependent variable reflects perceived tourism seasonality, while seven independent variables capture climatic conditions, tourism resource characteristics, socio-economic factors, behavioral patterns, and destination organizational capacity.

The regression model is specified as follows:

$$\text{TSDT} = \beta_0 + \beta_1 \text{CL} + \beta_2 \text{tr} + \beta_3 \text{IN} + \beta_4 \text{LT} + \beta_5 \text{CT} + \beta_6 \text{MB} + \beta_7 \text{TO} + \varepsilon \quad (2)$$

where ε represents the stochastic error term. The model is estimated using Ordinary Least Squares (OLS) with 800 observations. The analysis is intended to assess conditional relationships among variables rather than to establish causal effects.

4.2.2. Overall Model Fit: ANOVA Results

The overall explanatory performance of the regression model is evaluated using Analysis of Variance (ANOVA). As reported in **Table 4**, the model is statistically significant at conventional confidence levels ($p < 0.001$), indicating that the included explanatory variables jointly account for a substantial proportion of the variation in tourism seasonality within the sample.

Table 4. ANOVA results of the regression model.

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	33.926	7	4.847	2.62×10^{16}	0
Residual	0	792	0.003		
Total	33.926	799			

Source: Authors' survey data analysis.

Rather than implying a perfect fit, the ANOVA results suggest that the proposed set of determinants provides a meaningful explanatory framework for understanding seasonal concentration patterns in a climate-sensitive coastal destination.

4.2.3. Regression Estimation Results

Table 5 reports the estimated coefficients of the multiple regression model.

Table 5 presents the estimated coefficients of the regression model. The coefficient of determination ($R^2 = 0.732$; adjusted $R^2 = 0.729$) indicates that the model explains a relatively high share of the observed variance in tourism seasonality, which is considered acceptable for cross-sectional studies in tourism and social science research.

All independent variables exhibit positive coefficients and are statistically significant at the 5% level or better. These results suggest that, conditional on other factors, each determinant is positively associated with the intensity of seasonal concentration in tourism activity. Importantly, the magnitude of standardized coefficients varies across factors, reflecting differences in their relative explanatory contributions rather than implying direct causal dominance.

Table 5. Results of multiple linear regression analysis.

Variable	B	Std. Error	Standardized Beta	Sig.	VIF
Constant	0.5	0.08	-	0	-
CL (Climate)	0.341	0.03	0.528	0	1.892
TR (Tourism Resources)	0.17	0.04	0.461	0	2.171
IN (Income)	0.228	0.025	0.268	0.045	2.729
LT (Leisure Time)	0.339	0.035	0.13	0	2.682
CT (Customs & Traditions)	0.245	0.005	0.252	0	3.962
MB (Mass Tourism Behavior)	0.237	0.028	0.168	0.03	2.964
TO (Technical & Organizational Capacity)	0.269	0.027	0.374	0.001	2.675
R ² [0.732], Adjusted R ² [0.729]					

Source: Authors' survey data analysis.

4.2.4. Hypothesis Testing and Interpretation of Results

Among the examined determinants, climate displays the largest standardized coefficient, indicating that seasonal weather patterns are strongly associated with the temporal concentration of tourism demand. This finding aligns with the view that climate operates as a structural boundary condition for tourism activity in monsoon-affected coastal destinations.

Tourism resource characteristics also show a strong association with seasonality, suggesting that heavy reliance on weather-sensitive natural attractions reinforces temporal clustering of tourist flows. Organizational and technical capacity emerges as another important explanatory factor, highlighting the role of infrastructure quality, service organization, and destination management practices in shaping seasonal demand patterns.

Socio-economic and behavioral variables—including income, leisure time, customs and traditions, and mass tourism behavior—exhibit comparatively smaller but statistically significant associations. These results indicate that institutional time constraints and collective travel practices contribute to reinforcing seasonality, although their effects appear secondary to structural and managerial factors.

Overall, the regression results support the proposed hypotheses by demonstrating that tourism seasonality in Quang Binh Province reflects the combined influence of natural, organizational, and socio-economic determinants.

4.2.5. Diagnostic Tests of Regression Assumptions

A series of diagnostic checks was conducted to assess the robustness of the regression estimates. Variance Inflation Factor (VIF) values remain below commonly accepted thresholds, suggesting that multicollinearity does not pose a serious concern. The Durbin-Watson statistic indicates no strong evidence of autocorrelation, while tests for heteroskedasticity and residual normality suggest that key OLS assumptions are reasonably satisfied given the large sample size.

These diagnostics support the internal consistency of the regression results, while acknowledging the inherent limitations of cross-sectional survey data.

4.3. Discussion

This study provides strong empirical evidence that tourism seasonality in Quang Binh Province is the outcome of a multi-layered interaction between natural constraints, tourism product structure, socio-economic synchronization, behavioral dynamics, and destination management capacity, rather than being driven by any single determinant.

4.3.1. Dominant Structural Role of Climate and Nature-Based Tourism Resources

Among the examined determinants, climate emerges as the most influential factor shaping tourism seasonality, with the highest standardized coefficient ($\beta = 0.528$). This result confirms that tourism in Quang Binh is fundamentally embedded within a climate-sensitive temporal framework, characterized by a pronounced monsoon cycle that directly constrains outdoor and nature-based activities. The finding is fully consistent with the classical seasonality literature, which emphasizes climate as a structural and largely exogenous driver of seasonal demand fluctuations in coastal and tropical destinations (Baum & Lundtorp, 2001; Jang, 2004).

Closely following climate, tourism resources exhibit the second strongest effect ($\beta = 0.461$), underscoring the role of product dependence on weather-sensitive natural assets, particularly beaches, caves, and ecotourism sites. While these resources constitute Quang Binh's core competitive advantage, their limited operability during the rainy and stormy season amplifies seasonal concentration. This finding reinforces the structural vulnerability of mono-product destinations and aligns with international evidence that heavy reliance on natural attractions intensifies tourism seasonality when product diversification is insufficient (Cannas, 2012; Zhang et al., 2022).

Taken together, these results confirm that tourism seasonality in Quang Binh is structurally anchored in the interaction between climate variability and the nature-based composition of tourism supply, making seasonality a predictable but not immutable feature of destination development.

4.3.2. Organizational and Technical Capacity as a Key Moderating Mechanism

Beyond natural constraints, the analysis reveals that organizational and technical capacity exerts a substantial and statistically significant influence on tourism seasonality ($\beta = 0.374$), ranking third among all determinants. This finding provides compelling evidence that seasonality is not purely a natural inevitability, but can be meaningfully moderated through destination-level managerial interventions.

Specifically, the result highlights the importance of infrastructure quality, service organization, pricing flexibility, off-season promotion, and stakeholder coordination in shaping temporal demand patterns. Destinations with limited indoor

attractions, rigid pricing structures, and weak off-season marketing tend to experience sharper seasonal troughs, whereas improved organizational capacity can partially decouple tourism activity from climatic constraints. This empirical evidence directly supports the management-oriented perspective on seasonality mitigation proposed by Jang (2004) and extends it to the context of a climate-vulnerable coastal destination in a developing economy.

Importantly, the magnitude of this effect suggests that destination governance and management represent the most effective policy leverage point for reducing seasonal volatility in Quang Binh, even when structural natural factors remain unchanged.

4.3.3. Socio-Economic Synchronization and Behavioral Reinforcement of Seasonality

The regression results further indicate that income ($\beta = 0.268$) and leisure time availability ($\beta = 0.130$) both exert statistically significant positive effects on tourism seasonality. These findings confirm that seasonal concentration is reinforced by institutional synchronization of travel opportunities, particularly in markets dominated by domestic tourists.

Higher income levels enable discretionary travel but do not necessarily lead to temporal dispersion; instead, travel demand remains clustered around school holidays, public vacations, and summer breaks. This result supports the argument that tourism seasonality is embedded within broader socio-institutional calendars rather than being solely driven by individual preferences. Consequently, policies aimed at smoothing demand must consider coordination beyond the tourism sector, including education and labor scheduling frameworks.

In addition, customs and traditions ($\beta = 0.252$) and mass tourism behavior ($\beta = 0.168$) are found to significantly intensify seasonal concentration. Cultural norms related to summer travel, festival-based tourism, and collective vacation practices reinforce herd behavior, encouraging tourists to travel during peak periods when services and social validation are perceived to be optimal. These behavioral mechanisms amplify existing structural seasonality and contribute to overcrowding during peak months.

4.3.4. Integrated Interpretation and Theoretical Implications

Overall, the findings demonstrate that tourism seasonality in Quang Binh is a systemic phenomenon, generated through the cumulative and reinforcing effects of natural conditions, product structure, institutional time constraints, socio-cultural practices, and destination management capacity. The simultaneous significance of all seven determinants confirms that seasonality should not be conceptualized as a unidimensional outcome but rather as a hybrid construct shaped by both exogenous and endogenous forces.

From a theoretical standpoint, this study advances the tourism seasonality literature in three key ways. First, it empirically reaffirms the dominant but non-exclusive role of climate, positioning it as a structural boundary condition rather than

a deterministic outcome. Second, it demonstrates that organizational and technical capacity functions as a critical moderating mechanism capable of attenuating seasonal extremes. Third, by integrating socio-economic and behavioral factors into a unified regression framework, the study provides a more comprehensive understanding of how demand synchronization and collective behavior reinforce seasonal patterns.

In the context of climate-sensitive coastal destinations in developing economies, these findings suggest that while climate change may exacerbate seasonal risks, strategic governance, product restructuring, and adaptive destination management can substantially enhance tourism resilience and sustainability.

5. Conclusion and Policy Implications

5.1 Conclusion

This study investigates the structural determinants of tourism seasonality in Quang Binh Province, Vietnam, by empirically examining the relative influence of seven groups of factors using survey data and multivariate statistical techniques. The findings confirm that tourism seasonality in coastal destinations is not merely a natural or climatic outcome but rather the result of a complex interaction between exogenous constraints and destination management capacity.

Three key conclusions can be drawn.

First, climatic conditions and tourism resources emerge as the most influential determinants of tourism seasonality. Climate exhibits the strongest standardized effect, reaffirming its dominant role in shaping seasonal travel patterns in coastal and disaster-prone destinations. Similarly, the strong influence of tourism resources reflects Quang Binh's continued dependence on nature-based products, particularly beach tourism and cave exploration, which remain highly sensitive to weather conditions. These findings reinforce the argument that seasonality in developing coastal destinations is deeply structural in nature.

Second, the results provide robust empirical evidence that organizational and technical factors play a statistically significant role in moderating tourism seasonality. The positive and significant effect of destination management capacity—including product organization, pricing strategies, marketing activities, and service coordination—demonstrates that seasonality is not immutable. Even under strong natural constraints, effective governance and strategic management can partially flatten the seasonal demand curve. This finding extends the tourism seasonality literature by empirically supporting the view that managerial interventions can mitigate, though not eliminate, structural seasonality.

Third, the study reveals differentiated effects across demand-side variables. While leisure time significantly contributes to seasonal concentration—reflecting the synchronization of school calendars, public holidays, and summer vacations—income, cultural practices, and mass tourism characteristics do not exert independent effects once managerial and temporal factors are controlled for. This suggests that these variables influence seasonality indirectly and are largely mediated

through institutional scheduling and destination management mechanisms.

Overall, the study contributes to the tourism seasonality literature by offering an integrated framework that combines natural constraints with governance-related factors in explaining seasonal patterns. By focusing on a developing coastal destination, the findings also enrich empirical evidence from emerging tourism regions, which remain underrepresented in international scholarship.

5.2. Policy Implications

Based on the empirical findings, this study proposes several policy implications aimed at mitigating tourism seasonality and promoting more resilient and sustainable destination development in Quang Binh Province.

5.2.1. Developing Climate-Adaptive Tourism Products

Given the dominant influence of climate and nature-based resources, destination policy should prioritize the development of tourism products that are less sensitive to adverse weather conditions. This includes promoting indoor and semi-indoor tourism experiences, such as museums, cultural performance centers, heritage interpretation spaces, and digital exhibitions. In addition, adventure and experiential tourism products that are specifically designed for shoulder or low seasons—subject to strict safety and risk management standards—can help transform climatic disadvantages into differentiated market offerings, particularly for international niche segments.

5.2.2. Promoting Rural and Agricultural Tourism as a Seasonal Buffer

The findings highlight the potential of rural and agricultural tourism as an effective mechanism for dispersing tourist flows spatially and temporally. Inland and mountainous districts of Quang Binh Province possess agricultural landscapes and community-based cultural assets that are less exposed to coastal climatic risks. Supporting farm stays, agritourism, and community-based tourism can generate year-round tourism activities, reduce pressure on coastal destinations during peak seasons, and enhance local livelihoods in peripheral areas.

5.2.3. Strengthening Destination Management and Seasonal Pricing Strategies

The significant role of organizational and technical factors underscores the importance of proactive destination governance. Policymakers should adopt flexible pricing mechanisms, targeted promotion, and coordinated event scheduling to stimulate demand during low seasons. In particular, market segments with lower sensitivity to leisure time constraints—such as MICE tourism, senior travelers, and long-stay international visitors—should be prioritized. International marketing efforts may focus on regions with winter holiday periods, where demand for tropical destinations remains strong despite seasonal rainfall.

5.2.4. Enhancing Workforce Resilience and Institutional Coordination

Tourism seasonality generates cyclical employment instability, which undermines

service quality and long-term human capital development. Local authorities should promote flexible labor arrangements, seasonal retraining programs, and cross-sector employment linkages to stabilize the tourism workforce. Strengthening coordination between tourism, education, and labor agencies can help mitigate seasonal unemployment and improve service consistency across different periods of the year.

5.3. Limitations and Future Research Directions

Despite its contributions, this study has several limitations. The survey coverage does not fully encompass remote and mountainous districts, which may exhibit different seasonal dynamics. Future research could employ longitudinal data to assess the economic efficiency of climate-adaptive tourism models or examine post-pandemic shifts in tourist risk perceptions and travel timing. Comparative studies across multiple coastal destinations would also help generalize the findings and further refine policy-oriented seasonality frameworks.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- Alshuqaiqi, A., & Omar, S. I. (2019). Causes and Implication of Seasonality in Tourism. *Journal of Advanced Research in Dynamical and Control Systems*, *11*, 1480-1486.
- Annisius, D. C. (2014). *Seasonality in Tourism: A Case Study of Húsavík, Iceland*. Master's Thesis, University of Iceland.
- Baum, T., & Lundtorp, S. (2001). *Seasonality in Tourism*. Elsevier.
- Butler, R. W. (2001). Seasonality in Tourism: Issues and Implications. In T. Baum & S. Lundtorp (Eds.), *Seasonality in Tourism* (pp. 5-21). Pergamon. <https://doi.org/10.1016/b978-0-08-043674-6.50005-2>
- Cannas, R. (2012). An Overview of Tourism Seasonality: Key Concepts and Policy. *AlmaTourism*, *3*, 40-58.
- Chung, J. Y. (2009). Seasonality in Tourism: A Review. *Journal of Tourism and Hospitality*, *3*, 82-97.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2018). *Multivariate Data Analysis* (8th ed.). Cengage Learning.
- Jang, S. (2004). Mitigating Tourism Seasonality: A Quantitative Approach. *Annals of Tourism Research*, *31*, 819-836. <https://doi.org/10.1016/j.annals.2004.02.007>
- Kesidou, O. (2016). *Seasonality in Tourism: The Case of the Greek Islands*. Master's Thesis, International Hellenic University.
- Koenig-Lewis, N., & Bischoff, E. E. (2005). Seasonality Research: The State of the Art. *International Journal of Tourism Research*, *7*, 201-219. <https://doi.org/10.1002/jtr.531>

- Mai, A. V. (2020). Factors Influencing the Formation of Tourism Seasonality in Vietnam. *Industry and Trade Journal*, 10, 1737-1742. (In Vietnamese)
- Nguyen, T. L. (1998). *Impacts of Tourism Seasonality on Tourism Activities in Vietnam (Ministerial-Level Research Project)*. Institute for Tourism Development Research (Vietnam). (In Vietnamese)
- Nguyen, V. T., & Phan, T. N. (2017). Impacts of Tourism Seasonality on Business Performance: Evidence from Le Belhamy Resort & Spa, Hoi An. *Journal of Science and Education*, 2, 81-87. (In Vietnamese)
- Quang Binh Department of Tourism (2023). *Tourism Development Report 2022 and Development Plan for 2023-2025*. (In Vietnamese)
- Quang Binh Statistical Office (2024). *Quang Binh Statistical Yearbook 2023*. Statistical Publishing House. (In Vietnamese)
- Tran, T. H., & Nguyen, T. T. (2014). Tourism Seasonality in Cua Lo Town, Nghe An Province. *Vinh University Journal of Science*, 4, 16-22. (In Vietnamese)
- Tran, T. L., & Nguyen, V. C. (2024). *Tourism Seasonality in Quang Binh Province: Current Situation and Mitigation Strategies (Research Project)*. Quang Binh University. (In Vietnamese)
- Vu, T. D. (2017). Seasonality and Marketing Solutions for Sustainable Coastal Tourism Development: Evidence from Do Son. *Journal of Economics and Development*, 33, 88-94. (In Vietnamese)
- Yamane, T. (1967). *Statistics: An Introductory Analysis* (2nd ed.). Harper & Row.
- Zhang, J., Yu, Z., Miao, C., Li, Y., & Qiao, S. (2022). Cultural Tourism Weakens Seasonality: Empirical Analysis of Chinese Tourism Cities. *Land*, 11, Article 308. <https://doi.org/10.3390/land11020308>