



Impact of Tourist Participation on the Performance of Sports Tourism Complexes in Guilan Province through the Mediation of Green Product Innovation

Ali Nazarian ¹, Nazanin Ghasemi ², Reza Hosseinvand ³, Behnam Asheghi ^{4*}, Maryam Salehi Golbaghi ⁵

1. Sport Sciences Department, Faculty of Literature and Human Science, Lorestan University, Khorramabad, Iran
2. PhD Student in Sports Management, University of Guilan, Rasht, Iran
3. PhD in Sports Management, Department of Sports Management, Faculty of Physical Education and Sports Sciences, Mazandaran University. Sari, Iran
4. Assistant Professor, Mazandaran Institute of Technology, Babol, Iran
5. Master's Student, Department of Tourism Management and Economics, Faculty of Tourism, University of Tehran, Tehran, Iran

* Corresponding Author Email: Behnam.asheghi@yahoo.com



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ABSTRACT

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Tourist Participation, Tourism, sports Tourism, Green Product Innovation, Guilan Province

This study investigates the impact of tourist participation on the performance of sports tourism complexes in Guilan Province, with green product innovation as a mediating variable. Given the concurrent expansion of the tourism industry and the paramount importance of sustainable development, this research addresses a critical intersection. The research is applied in purpose, descriptive-correlational in nature, and field-based in execution. The statistical population included managers and experts of tourism complexes, organizers of sports tourism tours, and adventure sports tourists in 2023. Data were collected using standardized questionnaires measuring customer participation, green product innovation, and sports tourism complex performance. Reliability was confirmed via Cronbach's alpha and composite reliability, while face and content validity were established by a panel of 13 sports management professors. Data were analysed using path analysis with PLS-SEM (version 4). The results demonstrated that tourist participation significantly directly affects both the performance ($t = 2.783$) and green product innovation ($t = 33.004$) of the complexes. Furthermore, green product innovation itself had a significant direct effect on performance ($t = 10.313$). Crucially, the mediating role of green product innovation in the relationship between tourist participation and performance was confirmed and statistically significant ($t = 9.138$). This study concludes that fostering tourist participation and integrating green product innovation are essential strategies for enhancing the performance of sports tourism complexes, leading to greater environmental compatibility and economic development.

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1. INTRODUCTION

Today, due to the weakening of traditional economic activities (mining, forestry, and agriculture) and a lack of entrepreneurial thinking, utilizing new methods to strengthen the economic foundation is of paramount importance (Eusébio et al., 2018). In this context, tourism, particularly sports tourism, presents a solution for development and overcoming these challenges, given its strong capacity to attract both domestic and foreign investment. Furthermore, the goal of tourism, as one of the world's largest industries, is to foster global development, enhance employment at every destination, and ensure its sustainability (Rojo-Ramos et al., 2021). Considering Iran's economic sanctions and the inability to rely on oil exports, sports tourism can be considered a fundamental pillar for Iran's economic sustainability, aiding the transition away from a single-product economy.

The tourism industry today has created significant environmental challenges; therefore, it must adopt sustainable practices to minimize its ecological impact. Research on pro-environmental behavior in tourism settings, sporting events, and sports tourism has become more prominent since the 1990s. Understanding tourist behavior towards the environment is a critical issue in environmental sociology, which has gained practical importance for various reasons beyond its theoretical relevance. Currently, tourist loyalty is a topic that has attracted the attention of researchers, as well as marketing and tourism management specialists, given the growing public interest in environmental protection (Han et al., 2015).

In this regard, Rojo-Ramos et al. (2021) stated that the primary goal of tourism is to promote the economic development of cities through their natural, cultural, and heritage potential, thereby enhancing the conservation of these resources. Iran, and specifically Guilan Province, possesses abundant potential for sports tourism, including mountains, forests, seas, and raging rivers. It seems that Guilan Province can leverage its tourism

capabilities to improve the performance of its sports tourism complexes. Indeed, researchers have suggested that in the future, tourism could surpass oil as the world's most important economic activity (Morillo Moreno, 2007).

Today, value creation in sports organizations, based on knowledge generation, has gained increasing importance due to the necessity of confronting various changes, particularly in the realm of technology emerging in the sports and technology environment (Rahimi et al., 2020). The sports and technology landscape is changing rapidly, and decision-makers must quickly adapt to their competitors (Fatahi Milasi et al., 2024). In the current environment of the sports industry, where competition among sports organizations is intense and transcends geographical boundaries, a challenge arises for these organizations to acquire and maintain a distinctive position. Consequently, creating value in sports organizations based on knowledge is receiving attention as a factor for increasing interest, driven by the need to confront various changes (Fatahi Milasi et al., 2024).

One such innovation is the creation and production of green products. Currently, due to growing environmental concerns in society, companies are focusing their efforts on offering environmentally friendly products and services (Ishaq & Di Maria, 2020). Scholars in the field of sports tourism have realized that they receive a more positive response from their customers when they act in an environmentally responsible manner (Olsen et al., 2014). Simultaneously, they have found that if they address the environmental concerns of their customers, those customers are more likely to choose the products and services offered by the respective company (Kang & Hur, 2012). Accordingly, companies are actively moving towards sustainable marketing strategies, such as green marketing (Martin & Schouten, 2011).

In today's business world, the growth of new markets and the expansion of competitive space

among companies and institutions is a given. Just as a new market equates to new customers, the focus on maximizing customer satisfaction for increased sales and profitability is paramount (Bavarsad et al., 2019). Consequently, customer relationship strategies and their precise implementation can enhance customer satisfaction. Furthermore, customer knowledge management systematically makes information and intellectual capital accessible to all (Heisig & Kannan, 2020). This enables an organization to prioritize effectively, conduct its daily operations with greater efficiency and effectiveness, and take a significant step towards developing products and improving the services it offers to customers. This approach, in turn, serves to increase the participation of sports tourists in the hospitality complexes of Guilan Province.

Green marketing involves the marketing of products presumed to be environmentally safe, encompassing a wide range of activities including product modification, changes to the production process, sustainable packaging, and modified advertising (Belz & Peattie, 2009). The term 'green marketing' emerged in the late 1980s and early 1990s (Katrandjiev, 2016). Its primary objective is the selection and approval of marketing mix strategies based on the principle of environmental protection, generally in response to customer environmental concerns (Wu & Liu, 2022).

Green purchase intention refers to consumers' behavioral tendency to buy a specific product to fulfill environmental needs, a tendency shaped by individuals' environmental awareness (Dehghani Poudesh et al., 2013). Today, the environment has increasingly become a vital and critical issue for all segments of society, both as customers and producers. According to Chen (2008), persuading customers to purchase products is difficult without providing them with sufficient information. Companies need to disclose more information about their products' environmental performance to gain consumer trust (Mirfakhroдини & Shabani, 2016). Furthermore, companies, by considering customers'

environmental concerns, provide services aligned with their demands (De Medeiros et al., 2018).

Consequently, stakeholders are beneficial when they assist an organization in achieving its goals, and conversely, they are in conflict with the organization when they oppose its missions. In essence, stakeholders possess the power to be both a threat and a benefit to an organization (Stucki et al., 2018). Collaboration with customers necessitates cooperation in designing cleaner production processes, which can lead to the creation of more environmentally sustainable products and the use of green packaging (Pourzamani & Mashayekhifard, 2014).

Given the points mentioned above, the importance of conducting research to investigate green product innovation in the participation of sports tourists and, subsequently, the improvement of sports tourism complex performance is highlighted.

In today's competitive landscape, businesses strive to thrive by creating sustainable competitive advantage through enhanced organizational performance and adapting to emerging changes (Sanjaghi et al., 2011). The importance of performance lies in its role in organizational improvement and advancement, as well as in workforce well-being. Organizational performance is so critical that it can determine whether organizations ascend or decline in the current competitive era. Studying organizational performance helps managers understand what decisions to make, which processes to reinstate, and which to terminate (Ho, 2008).

One factor that can aid in improving the performance of hospitality complexes is green product innovation. Furthermore, the presence of green product innovation within an organization, particularly in sports tourism complexes, leads to improved environmental performance. From another perspective, green product innovation increases popularity among customers, not only reducing the negative effects of the organization's environmental performance but also impacting its

competitive advantage (Chen et al., 2020). The greenness of a product improves business performance as it enhances profitability, boosts employee motivation and commitment, and fosters customer loyalty (Wang & Zhang, 2020). Producing green products offers economic advantages, including reduced production costs, sustainable market presence, access to foreign markets, and enhanced competitiveness based on green practices, alongside environmental benefits such as reduced environmental pollution, convergence of product quality with green features, and improved knowledge of product life cycle assessment focused on environmental impacts (Andalib Ardakani & Eslamieh, 2017).

Given the importance of the issues raised, conducting research in the field of green innovation and the performance of hospitality complexes is emphasized.

To define the research problem, previous studies were reviewed. It was found that various studies have examined the outcomes of customer collaboration for new product development in the tourism industry (Aamadizad & Kafche, 2021), the relationship between green management and sustainable performance and green innovation (Soroushnia et al., 2024), the impact of green marketing strategy on organizational performance within sports federations (Ghanbari & Dehghan, 2018), sports tourism attraction and economic prosperity (Daye et al., 2019), and the connection between tourism infrastructure development and business growth in tourist destinations (Kanwal et al., 2020; Khan et al., 2020; Musavengane & Kloppers, 2020). Furthermore, several previous studies emphasize the role of natural resources in developing and growing adventure sports tourism activities (Wang & Yang, 2021; Okonkwo et al., 2017; McKay, 2016). Other research has focused on developing well-being through adventure sports tourism (Ritpanitchajchaval et al., 2023; Houge Mackenzie et al., 2023; Schlemmer et al., 2021). Additionally, some studies separately investigated the role of social media participation and its effects

on travel intention or tourism engagement (Liu & Chong, 2023).

The review of prior research identified a gap concerning the role of individual participation in relation to the performance of sports tourism complexes, specifically through the mediating variable of green product innovation to assess the level of sports tourist participation.

In today's developing countries and those experiencing economic stagnation, tourism, particularly sports tourism, can serve as a resource for improving the performance of hospitality complexes (Pedrana, 2013). Moreover, due to its job creation and revenue generation, sports tourism can lead to the economic development of tourist destinations and sports tourism complexes (UNWTO, 2018). However, the rate of increase in tourist visits to these destinations and complexes is of paramount importance. Consequently, to enhance the performance of this sports business, tourist destinations and hospitality complexes require the participation and presence of sports tourists (Benur and Bramwell, 2015). If tourist destinations fail to create conditions to attract sports tourists, they will face economic stagnation and community unemployment, resulting in diminished performance. Therefore, the importance of conducting research aimed at increasing sports tourist participation and improving the performance of sports tourism complexes is highlighted.

On the one hand, in today's world, the concern for retaining customers is the most significant challenge and simultaneously the key success factor for any organization. Serving them is considered the oldest, yet the newest, issue for organizations (Chen, Li & Chen, 2021). Such a concern necessitates sports organizations moving towards innovation, whether through short-term programs or strategic plans, to create a context where tourism centers can transform their organizational structure into an environment flexible towards innovation through inventive initiatives and strategic transformation programs. Indeed, organizations, especially sports tourism complexes, have no choice in the new conditions but to adapt their supply of

goods and services to the new environment (Dickson, Darcy & Walker, 2020). For this reason, the researcher in this study intends to investigate the impact of customer participation and green product innovation on the performance of sports recreation complexes in Guilan Province and provide suggestions to improve the performance of sports tourism complexes so that their business performance improves.

In this research, green product innovation is proposed as a mediating variable because it plays a key role in transferring the effect of tourist participation to the performance of sports tourism complexes. Tourist participation can create new motivations and needs for the complexes, which, if addressed creatively and sustainably, manifest as green product innovations. These innovations not only help improve service quality and tourist satisfaction but also enhance the environmental, economic, and social performance of the tourism complexes. Therefore, green product innovation acts as a bridge connecting active tourist participation with the improvement of sustainable performance in the complexes.

The integration of the three variables tourist participation, green product innovation, and the performance of sports tourism complexes is based on a conceptual and applied logic (Ahmadizad & Kafshe, 2021; Tuti & Sulistia, 2022; Chen et al., 2020; Bai & Chang, 2015; Abbas & Khan, 2023). Tourist participation, as a valuable source of information, ideas, and feedback, can stimulate changes and innovation in tourism services and products. When this participation is directed towards environmentally friendly solutions, it leads to green product innovation in the processes, products, and services of tourism complexes. Ultimately, these innovations result in increased productivity, improved brand image, attraction of environmentally conscious tourists, and enhanced overall performance of the complexes. Consequently, these three variables are placed together in a sequential, cause-and-effect chain to comprehensively examine the process of how

tourist participation affects performance through the mediation of green product innovation.

Thus, the present study focuses on improving the performance of sports tourism complexes in Guilan Province by aiming to protect the environment and develop green product innovation to attract and engage sports tourists, thereby creating an opportunity for performance enhancement at tourism destinations in Guilan Province. Furthermore, sports tourism is experiencing widespread growth due to technological advancements and lifestyle changes. Because of its economic, social, cultural, political, and other benefits, this industry is attracting countries that possess natural and artificial potential for sports tourism growth and are seeking to leverage the advantages of this industry to improve the performance of their tourist destinations.

The point raised regarding the need for a more precise articulation of the main problem is noteworthy. However, in the present study, the main problem has been identified based on field evidence, previous research, and an analysis of trends in the sports tourism sector of Guilan Province. The problem statement addresses the performance challenges faced by tourism complexes, including their weakness in adapting to the modern needs of tourists, environmental pressures, and the failure to leverage the potential of tourist participation. Furthermore, given the increasing environmental awareness among tourists and their preference for sustainable experiences, the need for green product innovation is introduced as a response to these shifting behaviors and customer expectations.

Therefore, the identified weakness in this research is not explicitly in the performance of the "tourists" themselves, but rather in the tourism complexes' suboptimal utilization of tourist participation. Green product innovation is considered a mediating strategy to convert tourist participation into performance improvement.

On the other hand, despite the growth and importance of sports tourism in Iran, particularly in Guilan Province, limited domestic research has

been conducted in this field. Although interest in the topic is growing, there is insufficient knowledge and information regarding various aspects of green innovation and the participation of sports tourists,

Moreover, given the importance and growing share of sports tourism, planning to strengthen its environmental infrastructure and enhance the quality of services and facilities related to this sports field for sports tourists appears more crucial than ever. For this purpose, the researchers in the present study seek to answer the following question:

How does tourist participation affect the performance of sports tourism complexes in Guilan Province through the mediation of green product innovation?

The conceptual model of the research, developed based on the review of the research background—

2. Methodology

Ontology and epistemology are two fundamental concepts in philosophy and research methodology that significantly influence how research is conducted. This study adopts a positivist ontological approach and an objectivist (pragmatist) epistemological stance. The present research regards social realities related to customer participation, green product innovation, and the performance of sports tourism complexes as objective and measurable phenomena independent of the researcher's mind and their understanding and measurement rely on scientific methods and empirical data. In practice, the researcher employs quantitative methods and standardized tools such as questionnaires to collect and analyze data, aiming to achieve an objective and generalizable understanding of the relationships between variables. This approach is grounded in the belief that knowledge can be attained through systematic observation, empirical data collection, and statistical hypothesis testing. It allows for precise examination of causal relationships among variables, provides generalizable results for the statistical population, and offers a foundation for practical decision-making in managerial and developmental contexts.

and consequently, about improving the performance of sports tourism complexes in Guilan Province. Therefore, conducting the present research seems essential.

customer participation (Ahmadizad & Kafshe, 2021; Tuti & Sulistia, 2022; Chen et al., 2020), performance of tourism complexes (Bai & Chang, 2015), and green product innovation (Wang & Zhang, 2020; Abbas & Khan, 2023; Talebi & Moaezikhah, 2023) along with the hypotheses, is presented in (Figure 1).

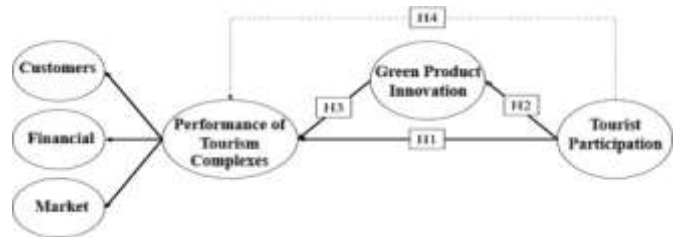


Figure 1. Conceptual research model

In terms of purpose, the present study is applied research, and in terms of methodology, it is descriptive-survey research. A quantitative research method was used to test the hypotheses. The statistical population included all managers and experts of tourism complexes, tourism agency experts, organizers of sports tourism tours, and adventure sports tourists in Guilan Province in 2023. A combination of purposive sampling (for selecting sports tourism destinations) and convenience sampling (for tourists present at the tourism sites) was used to select the statistical sample. The study applied three criteria for participant selection:

- 1) At least 5 years of managerial experience in tourism complexes,
- 2) Experience as a tour guide and participation in sports tourism events (for an extended period, with a minimum of 5 years),
- 3) Involvement in adventure sports tourism groups (with at least 5 years of experience).

Table 1 provides a detailed breakdown of the study's statistical population.

Table 1. Breakdown of the statistical population by occupation and location

Total	Tourist	Tour Leader	Manager	Tourist Attractions
15	12	3	0	Almas Road
23	17	2	4	Saravan Paintball
16	11	3	2	Saravan Lake
6	4	2	0	Nourmas Lake
14	10	3	1	Saghaleksar Lake
17	12	3	2	Gisoom Beach
19	13	4	2	Chamkhaleh Beach
24	16	5	3	Rudsar Beach Volleyball Site
12	10	2	0	Dorfak Mountain
17	13	4	0	Subatan Highlands
4	3	1	0	Lakan Jungle
11	7	2	2	Hashtpar Cable Car (Toboggan)
17	11	3	3	Heyran Complex
3	3	0	0	Dudvazan Waterfall
4	3	1	0	Laton Waterfall
6	5	1	0	Visadar Waterfall
3	2	1	0	Milash Waterfall
3	2	1	0	Darband Rashi Cave
3	3	0	0	Avishou Cave
7	5	1	1	Subatan Cave
4	3	1	0	Espahdan Cave
228	165	43	20	Total

The statistical population for this study was estimated based on the sufficient number required for modeling in PLS software, which is 10 to 20 times the dimensions outlined in the conceptual model (Nazarian et al., 2021). Accordingly, the minimum sufficient sample size was determined to be 120 participants, calculated as 20 participants per each of the 6 latent variables. However, to ensure a higher response rate and proper completion of questionnaires, 240 questionnaires were distributed. The distribution targeted individuals present at the tourism destinations whose reasons for being there were either managing the complexes, engaging in sports and health activities, or general physical activity, and who were willing and consented to complete the questionnaire. Ultimately, 228 completed questionnaires were collected.

While the simplicity of using this method has made it popular among PLS-SEM users, prior research indicates that its estimates may lack precision. Reliance on small samples can yield weak results, whereas larger samples make PLS estimates

more reliable. It is crucial for a researcher to consider whether the sample size is sufficient to ensure accurate decision-making with confidence in the findings. Therefore, in this study, the sample size was increased to 228 participants, providing a more suitable estimate of the population. Furthermore, estimating sample size in multivariate analyses is more complex than in univariate or bivariate analyses due to the multitude of parameters the researcher aims to estimate. The presence of various quantitative variables in a multivariate analysis and their different distribution shapes in the statistical population further complicate the conditions for using the normal distribution to estimate parameters. Typically, such situations demand larger sample sizes for multivariate analyses.

The Maximum Likelihood method, the most common technique for parameter estimation in Structural Equation Modeling (SEM), is prevalent because it allows for the construction of confidence intervals for estimated parameters using rules

governing the normal distribution and enables statistical tests with specific confidence levels. However, while the Maximum Likelihood method is somewhat robust to violations of multivariate normality, more severe violations necessitate larger sample sizes to obtain reliable estimates of the free parameters in a model. Consequently, data were collected from 228 participants via convenience sampling, who responded to the questionnaire online.

The data collection procedure was as follows: First, tourism agencies, tourism complexes, and tourist destinations in Guilan Province were purposively selected. The tourism destinations utilized in this study included: Diamond Road, Saravan Paintball, Saravan Lake, Saghaleksar Lake, Nourmas Lake, Gisoom Beach, Chamkhaleh Beach, Rudsar Beach Volleyball Site, Dorfak Mountain, Subatan Highlands, Lakan Jungle, Hashtpar Cable Car (Toboggan), Heyran Sports Tourism Complex, and the waterfalls of Dudvazan, Latun, Visadar, and Milash, as well as the caves of Darband Rashi, Avishou, Subatan, and Espahdan.

Following the selection of these sites and necessary coordination with the relevant authorities, the researchers were present at these centers on various days. They then distributed the research questionnaire using a convenience sampling method among the managers and experts of these complexes and the sports tourists present at these locations.

The research questionnaire consisted of two sections: the first section gathered participants'

demographic information, and the second section collected data related to the three main variables of the study. These variables were Customer Participation (questions 1-6), adapted and validated from [Chen et al. \(2020\)](#); Green Product Innovation (questions 7-13), adapted and validated from [Wang and Zhang \(2020\)](#); and Performance of Sports Tourism Complexes (questions 14-22), adapted and validated from [Bai and Chang \(2015\)](#). All questionnaires in this study used a five-point Likert scale (from Very Low to Very High).

To assess face and content validity, the initial questionnaire was provided to specialists, and necessary revisions were made based on their feedback (13 individuals). Furthermore, the reliability of the research constructs was confirmed using Cronbach's alpha and composite reliability.

For analyzing the demographic status of the participants, descriptive statistics were employed using SPSS software version 25. To test the research hypotheses, Structural Equation Modeling (PLS-SEM) and Smart PLS software version 4 were utilized. Statistical tests such as the T-statistic, path coefficients, significance of path coefficients, and the explained variance of endogenous constructs (R^2) were used. Model fit was assessed using indicators such as the Average Variance Extracted (AVE), Fornell-Larcker matrix, and the coefficient of determination (R^2).

The research methodology, summarized based on the Research Onion model, is presented in (Table 2).

Table 2. Research onion based on the model of Saunders et al (2009)

Research Philosophy	Research Approach	Research Strategy	Research Method Choice	Time Horizon	Data Collection Approach
Positivist	Inductive	Descriptive/Survey	Quantitative method	Cross-sectional	Via questionnaire

3. Findings of the Research

The research findings were analyzed in two sections: descriptive and inferential. In the descriptive section, some demographic characteristics of the research subjects, including

gender, education, place of employment, work experience, and age of the sample, are presented (Table 3).

Table 3. Description of the research sample

Percentage of frequency	N-Abundance	Variable	
59.21	135	Male	Gender
40.79	93	Female	
11.84	27	Less than Associate's Degree	Education
14.47	33	Associate's Degree	
39.92	91	Bachelor's Degree	
33.77	77	Master's Degree and Higher	
Standard deviation		Average (Years)	Background
6.825		6.7	
Standard deviation		Average (Years)	Age
6.567		37.5	

In this study, confirmatory factor analysis (CFA) was used to assess the construct validity of the research instrument. This method is employed to examine the degree of fit between the hypothetical model and the actual data. In other words, confirmatory factor analysis evaluates whether the factors specified by the researcher can explain the variance of the observed variables based on a specified pattern. The results of this analysis, conducted using Smart PLS software version 4, indicated that all items of the research instrument have appropriate factor loadings, and no item was

deleted (Table 3). The factor loading represents the strength of the relationship between the latent variable and its corresponding manifest variable. The higher the factor loading of an indicator, the greater its role in explaining the construct. The standard criterion for factor loadings typically falls between 0.5 and 0.7, although the minimum acceptable value is 0.4. The obtained factor loading values from the conceptual model test, presented in Table 4, showed that all components have appropriate factor loadings.

Table 4. Evaluation of reliability, convergent validity and factor loading of the research instrument

Cronbach's Alpha	Internal Consistency Reliability	Composite Reliability (CR)	Average Variance Extracted (AVE)	Factor Loadings	Items	Constructs
0.915				0.871	Frequency of meetings with customers visiting tourist complexes	Customer Participation
0.910				0.853	Consulting with customers visiting tourist complexes	
0.918				0.857	Inviting customers to join the project (such as purchasing equipment, changing the decoration of tourist centers, etc.)	
0.929	0.921	0.937	0.712	0.849	Conducting face-to-face interviews to understand customer needs and perspectives	
0.924				0.785	Monitoring user visits to the website for customer assessment	
0.920				0.844	Developing future scenarios for customer assessment	
0.930				0.830	Offering products and services made from eco-friendly materials	Green Product Innovation
0.921	0.933	0.944	0.707	0.826	Providing products that avoid the use of hazardous raw materials within the hospitality	

					complexes			
0.931				0.832	Using eco-friendly products within the hospitality complexes			
0.926				0.848	Utilizing materials compatible with the environment within the hospitality complexes			
0.941				0.858	Reclaiming end-of-life products for decorating and designing the hospitality complexes			
0.932				0.833	Using raw materials that cause minimal pollution for product development			
0.936				0.859	Using the minimum amount of raw materials to design eco-compatible green products			
0.849				0.909	Customer satisfaction level with the hospitality complexes			
0.853	0.851	0.909	0.768	0.853	Level of quantitative and qualitative service development in the hospitality complexes			Customers
0.845				0.867	Increase in the number of customers compared to before			
0.868				0.818	Increase in the complexes' revenue by attracting more customers and providing better facilities			
0.861	0.879	0.920	0.793	0.916	Increase in the profitability of the hospitality complexes through customer attraction and improved facilities			Financial
0.875				0.933	Rate of return on investment for the hospitality complexes considering the provision of better services			Performance
0.918				0.932	Market share of the hospitality complexes compared to other tourism sectors			
0.927	0.921	0.948	0.860	0.946	Number of new services introduced by the hospitality complexes compared to competitors			Market
0.909				0.903	Competitive position of the hospitality complexes relative to other competitors			

In this study, the acceptable value for Composite Reliability and Cronbach's Alpha indices was set above 0.7. As observed in Table 3, the coefficients of Cronbach's Alpha and Composite Reliability indicate the appropriate reliability of the research instrument. Furthermore, the factor loading index of the research components revealed that the factor "number of new services introduced by the tourism centers compared to competitors" with a factor loading of (0.946) was the most important factor, while "monitoring user visits to the complex's website for customer assessment" with a factor loading of (0.785) was the least important factor in this research.

To examine the convergent validity of the research variables, the Average Variance Extracted (AVE) index was used. According to Henseler et al. (2015), the acceptable value for this index is above 0.5. The results indicated that the condition for convergent validity was met.

For assessing discriminant validity, the Fornell-Larcker matrix was used (Table 5). Discriminant validity indicates the uniqueness of a measurement instrument; meaning the instrument has discriminant validity if its correlation with instruments measuring different constructs is low. The interpretation of this matrix is that the square root of the AVE for a construct should be greater than its correlations with other constructs.

Table 5. Divergent validity of research dimensions with the Fornell-Larcker matrix method

Constructs	Market	Financial	Tourist Participation	Customers	Green Product Innovation
Market	0.927				
Financial	0.866	0.891			
Tourist Participation	0.657	0.730	0.844		
Customers	0.758	0.840	0.754	0.876	
Green Product Innovation	0.715	0.801	0.819	0.872	0.841

In this study, the values on the main diagonal of each column must be greater than the values below them and, if present, greater than the values to their right. According to Table 5, this condition is met, confirming that the structural model is fitted in terms of the discriminant validity index.

The structural model of the research was evaluated using the criteria of the coefficient of determination (R^2) and the predictive power index (Q^2) (Hair et al., 2017) (Table 4). The R^2 value ranges between zero and one, indicating model fit at three levels: weak (0.25), moderate (0.50), and strong (0.75). In this study, the R^2 value was at an acceptable level, demonstrating a suitable fit for the structural model. Furthermore, the Q^2 criterion was used to determine the model's predictive power. The results showed that all research constructs had Q^2 values above

zero. Therefore, the research model possesses predictive power (Table 5).

This study also employed the PLS predict method for out-of-sample prediction. According to Shmueli et al. (2019), PLS-SEM is considered a causal-predictive methodology. Essentially, PLS operates by separating data into training and holdout samples, aiming to estimate model parameters and evaluate the model's predictive strength. Given the symmetric nature of prediction errors in the available data, the Root Mean Square Error (RMSE) and Mean Absolute Error (MAE) were used. Table 5 shows that PLS-SEM produces lower RMSE and MAE values for most indicators in the PLS analysis compared to the benchmark linear model (LM). Additionally, the Q^2 values for the PLS model indicators performed better than those generated for the LM model ($Q^2 > 0$).

Table 6. Structural model evaluation

MAE	RMSE	Q^2 predict	R Square	R Square Adjusted	Constructs
0.605	0.765	0.425	0.873	0.872	Market
0.537	0.660	0.573	0.730	0.728	Performance of tourism complexes
0.564	0.693	0.529	0.925	0.924	Financial
0.530	0.668	0.562	0.846	0.845	Customers
0.431	0.581	0.668	0.671	0.670	Green Product Innovation

Based on Henseler et al. (2009), the SRMR criterion was used to evaluate the measurement and structural models. The recommended value for SRMR is less than 0.08, and in this study, a value of 0.076 was obtained.

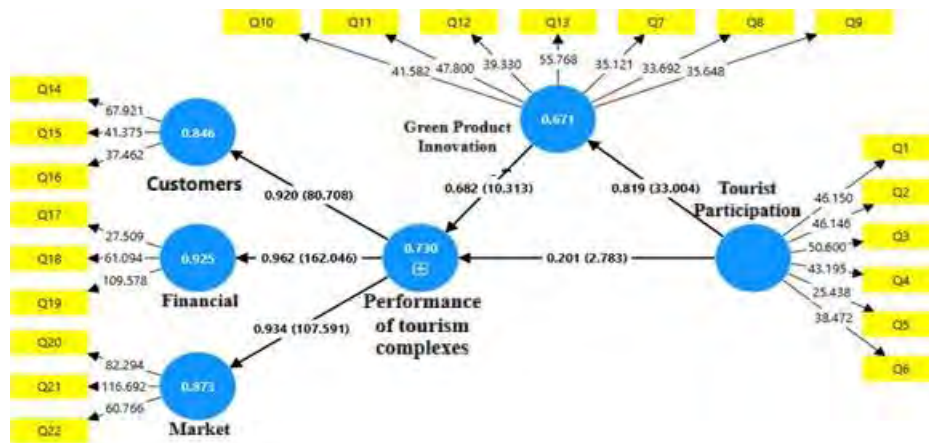


Figure 2. Structural model of research

Table 7. Examining the direct hypotheses of the research

P	T-Statistic	Path Coefficient	Paths	Hypothesis
0.001	2.783	0.201	Performance of Tourism Complexes <- Tourist Participation	H1
0.001	33.004	0.819	Green Product Innovation <- Tourist Participation	H2
0.001	10.313	0.682	Performance of Tourism Complexes <- Green Product Innovation	H3

The primary criterion for examining the significance of the relationship between variables is the t-test statistic or t-value. If the observed factor loadings have a t-value greater than 1.96, the relationship is significant at the 0.05 level; and if this value exceeds 2.58, the relationship is significant at the 0.01 level. This statistic only indicates the significance of the relationships and does not reflect their strength.

As presented in Table 5, the t-statistics for the research variables indicate that all research hypotheses are significant (t-value > 1.96). The path analysis results revealed that tourist participation has a significant effect on the performance (t = 2.783) and on green product innovation (t = 33.004) of the tourism complexes in Guilan Province. Furthermore, the effect of green product innovation on the performance of the tourism complexes in Guilan Province is significant (t = 10.313).

Table 8. Examining the indirect hypotheses of the research

P	T-Statistic	Path Coefficient	Paths	Hypothesis
0.001	9.138	0.559	Performance of Tourism Complexes <- Green Product Innovation <- Tourist Participation	H4

As shown in Table 7, the t-statistics for the research variables indicate that the mediating hypothesis of the research also has a significant effect on the relationship between the variables of tourist participation and the performance of sports tourism complexes in Guilan Province (t-value >

1.96). The results demonstrated that tourist participation has a significant effect on the performance of tourism complexes in Guilan Province through the mediation of green product innovation (t = 9.138).

4. Discussion and conclusion

Tourist participation in sports tourism complexes significantly influences their

performance, particularly through innovation in green products. When tourists actively engage in the

activities and services of these complexes, it not only increases the demand for sustainable products and services but also provides new feedback and ideas that can contribute to the improvement and development of green innovations. This type of innovation can play a crucial role in attracting tourists, as many travelers seek experiences that are environmentally compatible. Furthermore, complexes that focus on green product innovation can build a positive brand image and enhance customer loyalty. Consequently, tourist participation and green product innovation mutually contribute to improving the economic, social, and environmental performance of sports tourism complexes, fostering sustainable development in this industry.

This study aimed to design a model of customer participation in tourism venues and green product innovation on the performance of sports tourism complexes in Guilan Province by examining sports tourism venues in the region. The research investigated the effects of tourist participation and green product innovation on the performance of tourism complexes in Guilan Province. The objective of this research model was to propose a strategy for developing green products and promoting sustainability to distinguish the sports tourism venues of Guilan Province.

The path analysis results revealed that tourist participation has a significant effect on the performance of tourism complexes in Guilan Province. This finding indicates that an increase in tourist participation in the hospitality complexes of Guilan Province can lead to improved performance of these complexes. This result underscores the importance of attracting customers to hospitality complexes. In this regard, Bavarsad et al. (2019) stated that, to enhance business performance and succeed in competitive markets, it is essential to attract more customers and secure target markets. Therefore, customer relationship strategies and their precise implementation can increase customer satisfaction. Additionally, customer knowledge management (Heisig & Kannan, 2020) can assist

managers of hospitality complexes in Guilan Province in adopting innovative methods to enhance tourist participation in these destinations, thereby improving the performance of these complexes. This enables organizations to prioritize effectively, perform daily tasks with greater efficiency, and take significant steps toward developing products and improving services offered to customers, ultimately increasing the participation of sports tourists in the hospitality complexes of Guilan Province.

The path analysis results revealed that tourist participation has a significant effect on green product innovation in the tourism complexes of Guilan Province. This finding indicates that sports tourists' participation is greater in hospitality complexes that utilize environmentally compatible products. Previous studies have similarly confirmed that creating innovative products in the tourism industry increases tourist participation (Aamadizad & Kafche, 2021). Furthermore, if this connection addressing the green needs of tourists between green management and green product innovation (Soroushnia et al., 2024) is properly implemented, it can lead to improved performance in sports tourism destinations. Previous studies have also emphasized the role of natural resources in developing and growing adventure sports tourism activities (Wang & Yang, 2021; Okonkwo et al., 2017; Mckay, 2016). Based on this finding, it can be stated that tourist participation has fostered engagement in green product innovation activities and a growing interest in strengthening this relationship through experiential activities and participation in innovative endeavors. Therefore, it is recommended that managers of these complexes organize projects, meetings, and creative workshops. Increasing awareness among local communities and sports tourism participants through networks can promote the use of green products and increase participant numbers. Tourists' interest in innovative green product schemes is evident not only in their broad participation in such projects but also in the forms their participation takes. These results indicate "active" tourist

participation that goes beyond operational activities, encompassing both involvement in projects and dialogue among different groups of sports tourists.

The path analysis results revealed that green product innovation has a significant effect on the performance of tourism complexes in Guilan Province. This finding indicates that if hospitality complexes use environmentally compatible products, their performance can improve, subsequently fostering the social and economic growth of these tourist destinations. This finding also suggests that managers of hospitality complexes need to take fundamental measures to implement marketing processes, identify customers interested in green services and their demands, and act to meet these demands in the best possible way. Additionally, managers of sports tourism complexes should employ promotional plans or strategies that raise customer awareness towards using services that help reduce environmental pollution. With the development and improvement of electronic methods (such as smart tourism), the desirability and use of green services are enhanced, offering more services at lower cost. In sports tourism complexes, managers can design products and services from recycled materials, design products to avoid consuming hazardous raw materials within the complexes, and use environmentally compatible materials in sports recreation facilities. These actions can impact various sectors, including tourists, financial performance, and their business market. The results of this section align with previous research (Soroushnia et al., 2024; Hajjaran et al., 2022; Rahimi et al., 2020; Wang & Zhang, 2020; Chan et al., 2016). Therefore, it is suggested that managers of sports tourism complexes, by valuing and utilizing green products, can enhance their status and fulfill their social responsibility. This helps reduce harmful environmental elements and, focusing on sustainable development through customer cooperation and participation, provides a positive lived experience for tourists, leading to the

success of their complex, increased customer base, and business success.

The path analysis results revealed that tourist participation has a significant effect on the performance of tourism complexes in Guilan Province through the mediation of green product innovation. This finding indicates that the target customer base is crucial for sports tourism complexes, and attention must be paid to them and their level of participation. Alongside introducing green products and emphasizing the importance of sustainable development and the environment, their participation should be increased. Therefore, to improve the performance of hospitality complexes, managers can develop an innovative approach to green products, sharing the innovations achieved in creating green products and the importance of their use with their customers. This can help increase customer participation. Thus, this finding highlights the key role of active tourist interaction in enhancing the performance of these complexes. It indicates that tourist participation is not merely a passive factor in the tourism process but can serve as a source of inspiration and a catalyst for environmentally compatible innovations. When tourism complexes pay attention to tourists' opinions, needs, and environmental concerns and involve them in the process of designing products and services, green product innovations emerge that align with customer values and provide a competitive edge for the complexes. These innovations can manifest as sustainable tourism products, low-consumption services, or environmental educational activities. Through this, not only do tourist satisfaction and loyalty increase, but the complexes also achieve improved financial, social, and environmental performance. Hence, the present finding underscores the importance of designing strategies that systematically link tourist participation to the green product innovation process and leverage it as a tool for sustainable performance enhancement. The results of this section align with previous research (Ebrahimi & Nasiri, 2024; Ahmadizad & Kafche, 2021; Chen et

al., 2020; Bavarsad et al., 2019; Morgan et al., 2018).

Considering the discussed issues, it can be said that in today's competitive landscape, businesses strive to thrive by creating sustainable competitive advantage through enhanced organizational performance and adapting to emerging changes. The importance of performance lies in its role in organizational improvement and advancement, as well as workforce well-being. Organizational performance is so critical that it can determine whether organizations ascend or decline in the current competitive era. Additionally, the modern world has led to increased pollution and environmental problems, consequently raising concerns among governments and organizations about the environment. Therefore, managers seek green methods that support the environment while also improving their organization's performance. The presence of green product innovation in organizations, especially in sports tourism centers, leads to improved environmental performance of the complexes. Guilan Province, with its numerous tourist destinations and the proximity of mountains and sea to each other, creates many attractions for sports tourists (Asheghi et al., 2022). Therefore, factors influencing the attraction of sports tourists are very important and must be given special attention. For success in this field (sports tourism), in addition to having the conditions for tourism readiness, destinations must plan to attract tourists and better introduce their facilities and conditions to tourism markets (Motiei Langroodi et al., 2018). Based on the discussed issues, one factor that distinguishes the performance of any sports tourism complex from others is attention to environmental sustainability and green product innovation.

Based on the research findings, it can be generally concluded that innovation in green products plays a key role in improving the performance of sports tourism complexes. Complexes that actively invest in developing and offering environmentally compatible services and products can not only increase the satisfaction and

attraction of aware and responsible tourists but also, in the long term, enhance their competitiveness, improve their brand image, and achieve sustainable economic growth. Consequently, the adoption of green product innovation should not be considered merely an optional choice but a strategic necessity for the sustainable development of sports tourism.

Research Recommendations

This study was conducted to design a model of customer participation in tourism venues and green product innovation affecting the performance of sports tourism complexes in Guilan Province. Therefore, given the importance of sustainable development alongside customer retention, it is recommended that future research investigate green product marketing across various sports and physical activities.

Furthermore, due to the significant effect of green product innovation on the performance of tourism complexes in Guilan Province, it is recommended that managers of sports tourism complexes prioritize and utilize green products. By doing so, they can enhance their market position, fulfill their social responsibility, reduce environmental harm, and focus on sustainable development. Through collaboration and active customer participation, and by providing a positive lived experience, they can achieve success for their complexes, leading to increased customer numbers and business success.

Practical Recommendations for Managers

1. Given the research finding that tourist participation significantly impacts the performance of tourism complexes in Guilan Province, managers of this hospitality complexes are advised to "establish systematic and continuous platforms for the active participation of tourists in planning processes, service evaluation, and activity design." For instance, digital systems can be used to gather feedback, conduct periodic surveys, organize interactive workshops on-site, or create loyalty clubs that enable tourists to submit suggestions. This participation not only enhances service quality but also fosters a sense of belonging and loyalty

among tourists, ultimately improving the overall performance of the complex.

2. As the effect of tourist participation on green product innovation in the tourism complexes of Guilan Province was significant, managers of these complexes are recommended to design and strengthen feedback and idea-generation processes from tourists in a way that leads to the development of green products and services. In other words, managers can launch collaborative innovation spaces (such as co-design workshops or online platforms for green suggestions) to partner with tourists in generating ideas for environmentally friendly products. This participation can lead to the development of products like recyclable packaging, low carbon footprint tourism programs, or environmental educational activities, thereby shaping green product innovation based on the real experiences and expectations of tourists.

3. Based on the finding that green product innovation significantly affects the performance of tourism complexes in Guilan Province, managers are recommended to institutionalize a strategy of sustainable development and green product innovation as a core approach to improving their complexes' performance. Specifically, managers can design and offer environmentally compatible tourism products such as responsible nature tours, the use of biodegradable materials, or accommodation services with optimized energy consumption to simultaneously increase tourist satisfaction and create a sustainable competitive advantage for their complex. These innovations not only help reduce environmental damage but also enhance brand image, attract environmentally conscious customers, and increase the complex's economic efficiency.

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4. Considering the significant mediated effect of tourist participation, through green product innovation, on the performance of tourism complexes in Guilan Province, managers of tourism complexes are advised to purposefully organize tourist participation within the green product innovation process to leverage it for performance improvement. In other words, managers can create mechanisms to identify the environmental needs, preferences, and ideas of tourists such as green surveys, platforms for submitting innovative suggestions, or direct interaction in environmental education programs to facilitate the creation and development of green tourism products. This process ensures that innovations are grounded in real data and tourist demands, ultimately leading to increased satisfaction, loyalty, and enhanced overall performance of the tourism complexes.

Research Limitations

The primary limitations of this research included the difficulty in accessing a statistical population comprising tourists who visited the tourism complexes solely for sports purposes, and the reluctance of some managers of these complexes to respond to the questionnaires.

5. Conflict of Interest

There is no conflict of interest.

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