



## Tourist Satisfaction Analysis Based on SEM Model - A Case Study of Hunza Valley

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**Abstract:** With the development of Pakistan's tourism industry, many ecologically protected areas have experienced varying degrees of tourist-driven exploitative development, but there exists both a mutually beneficial relationship and contradictions between ecological protection and tourism development. This paper focuses on the Hunza Valley in the Gilgit-Baltistan region of Pakistan. By conducting on-site survey questionnaires and SEM model analysis, the study found that the ecological tourism development in Hunza Valley significantly impacts overall tourist satisfaction, followed by tourism infrastructure, management quality, and services. The study also reveals that the transportation conditions in the area do not significantly impact tourist satisfaction, and tourist satisfaction determines the repeat visitation rate. In conclusion, this research suggests that ecological tourism plays a positively significant role in developing the tourism industry. Areas like the Hunza Valley, which primarily rely on ecological resources, should prioritize the enrichment of communication and display methods for ecological tourism, strengthen the level of tourism services and product offerings, and thus achieve the coordinated development of conservation and development under the premise of protection.

### 1. Introduction

In the 1990s, with the gradual introduction of customer value theory into the tourism industry, the notion of customer perception of value was expanded and gained extensive attention from the academic community all over the world [1-2]. Customer loyalty theory introduces that customer value and its satisfaction, as significant prior variables determining customer brand loyalty, have become a major focus in exploring the driving factors of customer loyalty. Against the backdrop of increasing pressure on tourists in current ecological tourism areas, this provides a considerable foundation for uncovering the function of customer loyalty formation in ecological tourism areas. It not only offers a new cognitive path for scientifically managing tourists in ecological tourism areas but also has practical significance for enhancing the quality of sustainable development in ecological tourism areas. Although there has been extensive research on tourist loyalty in tourist areas, studies specifically focusing on tourist loyalty in the Hunza Valley ecological tourism area are relatively scarce. Given this, the present study selects the Hunza Valley, a key ecological tourism area in the Gilgit-Baltistan region of Pakistan, as the research object. Firstly, it constructs a multi-dimensional factor structure for the tourist perceived value of Hunza Valley and uses it as an important antecedent variable to explore tourist loyalty in ecological tourism areas. Simultaneously, it introduces tourist satisfaction as a mediating variable and employs structural equation modeling to identify the relationships among tourist loyalty and other factors in ecological tourism areas.

### 2. Literature Review

The concept of tourist perceived value is primarily based on the explication of customer value in the field of marketing, where customer value is considered a strategic weapon to attract and retain customers and a significant factor for the success of service providers [3-4]. Dodds et al. [5] initially understood customer value as a balance between what a product gives and what is received. Ren et al. [6] investigated the influence of local residents' engagement in ecotour on their ecological behaviors. The research utilized questionnaire data from ecotour demonstration villages in western China and employed the PLS-SEM model to rectify measurement misspecification. One of the most representative viewpoints is Zeithaml's discourse [7], which defines customer

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value as the overall evaluation that customers make of the utility of a product or service based on the comparison between the benefits gained and the costs incurred, where a greater gap between "gains" and "losses" indicates greater customer value, meaning the product or service is more valuable to the customer. Currently, the perception of customer value comes primarily from two aspects: the "loss-gain contrast theory" and the "utility evaluation theory." The former one means the basic results customers perceive when evaluating what they gain and lose when purchasing a product or service, while the latter represents the overall evaluation customers make of the utility of a product or service based on the comparison between perceived gains and losses. Comparing the two perspectives, the "utility evaluation theory" more accurately conveys customers' value demands when customers purchase products or services.

The literature defines the connotation of tourist perceived value by essentially referring to customer perceived value, which mainly refers to the value perceived by customers for a product or service. The conceptual definition of tourist perceived value continues to adopt the content system of customer value while incorporating tourists' specific preferences for tourism products or services. This forms the basic judgment of the concept of tourist perceived value. Given the "utility evaluation theory" defined the customer's perceived value, the perceived value of tourists in an ecological tourism area represents the overall evaluation that tourists make of the experiential utility of the ecological tourism products or services provided by the tourism area. This evaluation is based on the comparison and balance between the total benefits perceived (perceived gains) during the completion of a complete ecological tourism activity in the ecological tourism area and the total costs incurred (perceived losses) when purchasing the products or services of the ecological tourism area.

Jamal et al. [8] focused on community-based family tourism, examining the functions and experiences of tourists perceived value. They categorized a tourist's perceived value into five simple dimensions: functional value (facilities), functional value (price), experiential value (host-guest interaction), experiential value (activities, culture, and knowledge), and emotional value. The results indicated that functional, experiential, and emotional factors are crucial for the perceived value of community-based family tourists. Governments and suppliers should emphasize these value dimensions to enhance the overall value of tourists. Yi et al. [9] explored the perceived value of Asian cruise passengers' tourism experiences and its impact on satisfaction and behavioral intentions. To measure the multidimensional perceived value of Asian tourists, they used the cognitive-affective perceived value model. The statistical results showed that Asian cruise passengers have four sub-dimensions of cognitive perceived value: "facilities," "food and dining," "entertainment," and "staff." Additionally, the perceived value of cruise tourism experiences affects tourism satisfaction and the intentions of tourists. Lee et al. [10], using the example of Aogu Coastal Wetland, specifically examined the tourist perceived value scale for wetland ecological parks. Through exploratory and confirmatory factor analysis, they identified six dimensions of wetland park tourist perceived value: environment, distinction, service, management, knowledge education, and cost.

Customer loyalty theory explains that customer-perceived value is the most crucial determining antecedent factor for customer loyalty to enterprise products and services [11]. This argument reflects that customer perceived value is a direct driving factor in the mechanism of customer loyalty formation. In practice, whether an ecological tourism area can consistently gain a competitive advantage to sustain its development fundamentally depends on whether it can continually nurture and win the loyalty of tourists to the ecological tourism area. The study of customer loyalty concepts began in the 1990s and can be considered from two aspects: customer attitude and behavioral loyalty. Backman et al. [12] gained recognition and pointed out that behavioral loyalty mainly refers to the frequency of tourists' engagement in tourism activities, use of tourism facilities, and enjoyment of tourism services in the tourism area, reflecting the consistency of tourists' revisit and repurchase in the tourism consumption process. Attitudinal loyalty means the emotional preference of tourists for the products provided by the tourism area. Petrick [13] studied leisure vacation tourists and empirically revealed that customers perceived value significantly and positively impacts tourists' intention to revisit. Lee et al. [14] noted that tourist perceived value significantly predicts the intention to revisit. As the abovementioned theories, the higher perceived value generated by tourists in the process of consuming tourism products and services in ecological tourism areas, due to the expected experiential utility, is a prerequisite for driving their loyalty to the ecological tourism area. Customer satisfaction is the cumulated evaluation of customers' purchasing experiences for a specific product or service [15]. When customers felt satisfied with a particular product or service, they tend to repeat their purchases, leading to a form of continuous behavior [16-18]. Oh [19] research indicates that customer perceived value is a direct precursor to customer satisfaction and repurchase intention. Other studies found that customer value is a precursor factor for customer satisfaction, behavioral intentions, and customer loyalty [20-21].



In terms of tourist loyalty, tourist satisfaction is often treated as a determining factor for tourists' revisiting and word-of-mouth recommendations, with tourist satisfaction positively influencing tourist loyalty [22]. The high perceived service quality by tourists has a critical impact on tourist satisfaction and determines whether tourists will revisit and have the intention to recommend [23]. Chi et al. [24] found that tourist perceived value indirectly and positively influences loyalty to a destination through the mediating role of satisfaction in their empirical testing.

Given the literature review, the study will focus on tourist perception in terms of management quality and service, tourism infrastructure, transportation conditions, environment and ambiance, ecosystem conservation and display, and satisfaction of tourists.

### 3. Survey data on Tourist Satisfaction at Hunza Valley

#### 3.1 Evaluation Model and Questionnaire Design

In 1989, the Swedish Customer Satisfaction Barometer was launched as a means for businesses to evaluate their endeavors in attaining customer satisfaction [25], and its positive outcomes served as inspiration for the development of the American Customer Satisfaction Index [26], which is generally adopted customer satisfaction index theoretical model worldwide. This model incorporates various factors such as customer expectations, post-purchase perceptions, purchase price, customer loyalty, and customer complaints into a logical model of econometrics. Chi et al. [27] conducted a 345-questionnaire survey at a major tourist destination in Arkansas – Eureka Springs. The findings indicated that the destination image directly influences attribute satisfaction, with both destination image and attribute satisfaction being direct variables for overall satisfaction. Overall satisfaction and attribute satisfaction, in turn, positively influence destination loyalty. The main part of this research questionnaire consists of 26 observable indicators across 6 structural variables. The 7-point Likert scale method is employed for quantifying the indicators, wherein respondents' questionnaire responses are assigned values on a 7-point scale corresponding to 7 (Very Satisfied), 6 (Satisfied), 5 (Basically Satisfied), 4 (Neutral), 3 (Basically Dissatisfied), 2 (Unsatisfied), 1 (Very Unsatisfied).

#### Observable variables include:

|  |  |
|--|--|
| Q1 Ecological conservation status                | Q2 Interpretive signage within the scenic area |
| Q3 Richness of ecological and cultural displays  | Q4 Scenic beauty                               |
| Q5 Tourist density in the area                   | Q6 Honesty of small vendors                    |
| Q7 Commercialization level within the area       | Q8 Hygiene quality of the environment          |
| Q9 Convenience of tourist shuttle buses          | Q10 Arrangement of scenic tour routes          |
| Q11 Pricing of tour transportation               | Q12 Safety of tour transportation              |
| Q13 Availability of public toilets               | Q14 Public leisure facilities within the area  |
| Q15 Signage and directional indicators           | Q16 Safety facilities within the area          |
| Q17 Basic infrastructure including communication | Q18 Tourism advisory services                  |
| Q19 Tourism complaints                           | Q20 Proactiveness of staff service             |
| Q21 Flexibility of staff service                 | Q22 Timeliness of staff service                |
| Q23 Overall impression of Hunza Valley           | Q24 Expenditures within the scenic area        |

#### 3.2 Sample Selection and Data Collection

This study targets tourists who physically visited the Hunza Valley for the survey. The questionnaire is designed from the perspective of the tourists and is subsequently analyzed. For research purposes and the needs of subsequent analysis, it is generally recommended to have a sample size no less than 10 times the number of questionnaire items. With a total of 30 questions in the measurement tool for this study, a minimum of 300 samples is suggested. In this study, 330 questionnaires were distributed, resulting in 312 samples that met the research requirements, achieving an effective questionnaire rate of approximately 95%. The survey was

conducted through the online channel by using the popular online survey tool, SurveyMonkey, and the survey period is from October 2023 to November 2023.

### 3.3 Demographic Characteristics Analysis of Tourists

Among the 312 collected samples, the gender distribution is approximately equal, with 58% (181 samples) being male and 42% (131 samples) female. In terms of age, 78% of the respondents in the effective questionnaires fall within the 20 to 40 age group. Regarding education, the highest proportion is from the college-educated group, accounting for 48%. The following are high school and vocational high school at 26%, those with education beyond college at 11.8%, and junior high school at 6.4%. The samples obtained in this study encompass various educational backgrounds.

In terms of occupation, the highest proportion is professional and technical personnel at 23.4%, followed by service and sales personnel at 16.3%. The majority of respondents have a monthly income ranging from 200 to 400 US dollars, constituting 37.5%.

### 3.4 Overall Tourist Satisfaction

Overall, tourists have a relatively high evaluation of their trip to the Hunza Valley, with 70.8% of them considering it "basically satisfied" or "satisfied." Additionally, 13.4% of tourists find it "very satisfying," indicating that the perception of the Hunza Valley is at a generally high level of overall satisfaction.

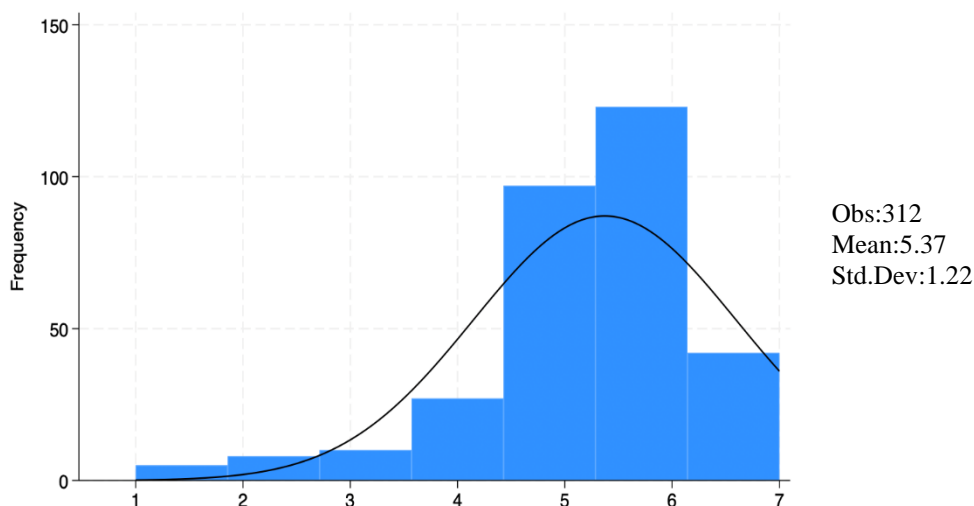


Figure 1: Histogram of the Mean Distribution of Overall Tourist Evaluation of the Hunza Valley

### 3.5 Satisfaction with Destination Elements

According to the survey results, tourists express high satisfaction with the ecological conservation status of the Hunza Valley, the richness of ecological and cultural displays, tourist density in the area, honesty of small vendors, arrangement of scenic tour routes, pricing of tour transportation, tourism advisory services, and overall impression of Hunza, which are above 5.2 points on average. However, the availability of public toilets and public leisure facilities within the area is relatively low, scoring below 4.8. During the survey, many tourists reflected that there is a limited number of information boards at the Hunza Valley, leading to a lack of clarity about the tour routes for visitors.



| Variable | Obs | Mean     | Std. dev. | Min | Max |
|----------|-----|----------|-----------|-----|-----|
| Q1       | 312 | 4.862179 | 1.895225  | 1   | 7   |
| Q2       | 312 | 5.060897 | 1.778618  | 1   | 7   |
| Q3       | 312 | 5.221154 | 1.708444  | 1   | 7   |
| Q4       | 312 | 5.060897 | 1.544457  | 1   | 7   |
| Q5       | 312 | 5.423077 | 1.705065  | 1   | 7   |
| Q6       | 312 | 5.285256 | 1.758409  | 1   | 7   |
| Q7       | 312 | 4.907051 | 1.882654  | 1   | 7   |
| Q8       | 312 | 5.009615 | 1.77783   | 1   | 7   |
| Q9       | 312 | 4.814103 | 1.842005  | 1   | 7   |
| Q10      | 312 | 5.24359  | 1.469395  | 1   | 7   |
| Q11      | 312 | 5.224359 | 1.463703  | 1   | 7   |
| Q12      | 312 | 4.932692 | 1.815959  | 1   | 7   |
| Q13      | 312 | 4.605769 | 1.707285  | 1   | 7   |
| Q14      | 312 | 4.538462 | 1.789159  | 1   | 7   |
| Q15      | 312 | 4.951923 | 1.494124  | 1   | 7   |
| Q16      | 312 | 5.051282 | 1.638739  | 1   | 7   |
| Q17      | 312 | 4.842949 | 1.644737  | 1   | 7   |
| Q18      | 312 | 5.266026 | 1.309034  | 1   | 7   |
| Q19      | 312 | 5.112179 | 1.612924  | 1   | 7   |
| Q20      | 312 | 4.871795 | 1.790356  | 1   | 7   |
| Q21      | 312 | 4.804487 | 1.763395  | 1   | 7   |
| Q22      | 312 | 4.951923 | 1.667043  | 1   | 7   |
| Q23      | 312 | 5.36859  | 1.563873  | 1   | 7   |
| Q24      | 312 | 4.88141  | 1.686539  | 1   | 7   |

**Table 1:** Tourists' Perceived Satisfaction Evaluation of the Elements of the Hunza Valley

#### 4. Factor Analysis and Reliability Analysis

##### 4.1 Kaiser-Meyer-Olkin (KMO) Sample Adequacy Measure and Bartlett's Sphericity Test

To identify the primary factors influencing tourist satisfaction, a KMO sampling adequacy and Bartlett's test of sphericity were examined on the 21 measurement items. The results are presented in Table 2.

|                                  |                    |          |
|----------------------------------|--------------------|----------|
| KMO Measure of Sampling Adequacy |                    | .902     |
|                                  | Approx. Chi-Square | 3120.424 |
| Bartlett's test of sphericity    | df                 | 278      |
|                                  | Sig.               | .000     |

**Table 2:** KMO Measure of sampling adequacy and Bartlett's test of sphericity

The results indicate that the KMO value of the sample is 0.902, indicating a high level of correlation among the variables, making it suitable for factor analysis. Additionally, the significance probability of Bartlett's sphericity test on the survey results is 0.000, less than 0.01. The rejection of the spherical hypothesis suggests that factor analysis is appropriate.

##### 4.2 Factor Extraction

The major goal of factor analysis is to unravel a few latent, unobservable factors hidden within a large number of observable variables. By condensing numerous original observed variables into a few factors through factor

analysis, researchers can use these factors instead of the original observed variables for further statistical analysis.

The results of factor analysis indicate that one observed variable, " Tourism complaints " has a relatively low factor loading of 0.413. Although it does not meet the deletion criteria (factor loading below 0.4).

After organizing the factor analysis results, 22 observed variables were extracted into 5 main factors: Management Quality and Service (F1), Tourism Infrastructure (F2), Intra-Area and External Transportation Conditions (F3), Scenic Area Environment and Ambiance (F4), and Ecosystem Conservation and Display (F5), refer table 3 for details.

| Observed Variable | Factor loading | Latent Variable | Eigenvalue | % of Variance | Cumulative % of Variance |
|-------------------|----------------|-----------------|------------|---------------|--------------------------|
| Q21               | .853           | F1              | 7.981      | 38.312        | 38.312                   |
| Q22               | .869           |                 |            |               |                          |
| Q20               | .825           |                 |            |               |                          |
| Q19               | .719           |                 |            |               |                          |
| Q18               | .605           |                 |            |               |                          |
| Q17               | .691           | F2              | 1.523      | 7.261         | 45.573                   |
| Q16               | .675           |                 |            |               |                          |
| Q13               | .671           |                 |            |               |                          |
| Q14               | .601           |                 |            |               |                          |
| Q15               | .524           |                 |            |               |                          |
| Q10               | .751           | F3              | 1.449      | 6.95          | 52.523                   |
| Q9                | .739           |                 |            |               |                          |
| Q12               | .692           |                 |            |               |                          |
| Q11               | .621           |                 |            |               |                          |
| Q5                | .685           | F4              | 1.351      | 5.818         | 57.341                   |
| Q7                | .662           |                 |            |               |                          |
| Q6                | .599           |                 |            |               |                          |
| Q1                | .781           | F5              | 1.186      | 5.028         | 64.369                   |
| Q3                | .706           |                 |            |               |                          |
| Q4                | .627           |                 |            |               |                          |
| Q2                | .502           |                 |            |               |                          |

**Table 3:** Factor loading Table

### 4.3 Reliability analysis

To evaluate the reliability of the data, the frequently used methodology is Cronbach's Alpha. In exploratory research, this coefficient can be less than 0.7 but should be greater than 0.5. When the coefficient exceeds 0.5, the scale is considered to have relatively high internal consistency. In the study, the Cronbach's Alpha values for each factor calculated using SPSS 26.0 were all above 0.6, indicating that the data is reasonably reliable.

| Latent Variable | Number of Observed Variable | Cronbach's Alpha |
|-----------------|-----------------------------|------------------|
| F1              | 5                           | .905             |
| F2              | 5                           | .861             |
| F3              | 4                           | .802             |
| F4              | 3                           | .716             |
| F5              | 4                           | .693             |
| Tourist loyalty | 2                           | .825             |

**Table 4:** Reliability analysis table



## 5. Hypothesis Testing Based on Structural Equation Model

### 5.1 Hypotheses of the Structural Equation Model

Building upon the statistical analyses, the study proposes the following research hypotheses:

H1: Management Quality and Service have a significant positive impact on tourist overall satisfaction (SAT).

H2: Tourism Infrastructure has a significant positive impact on SAT.

H3: Intra-area and External Transportation Conditions have a significant positive impact on SAT.

H4: Scenic Area Environment and Ambiance have a significant positive impact on SAT.

H5: Ecosystem Conservation and Display have a significant positive impact on SAT.

H6: SAT of tourists has a significant positive impact on tourist loyalty.

### 5.2 Hypothesis Testing

A quantitative model that includes a set of independent variables and one or more dependent variables can typically be represented by an equation for each dependent variable, indicating the relationships between this dependent variable and other independent and dependent variables. When causal relationships are incorporated, this quantitative model is referred to as a Structural Equation Model (SEM).

In this study, Amos 22.0 statistical software was employed for the analysis of the structural equation model, and the model established in this paper based on relevant theories and literature was validated.

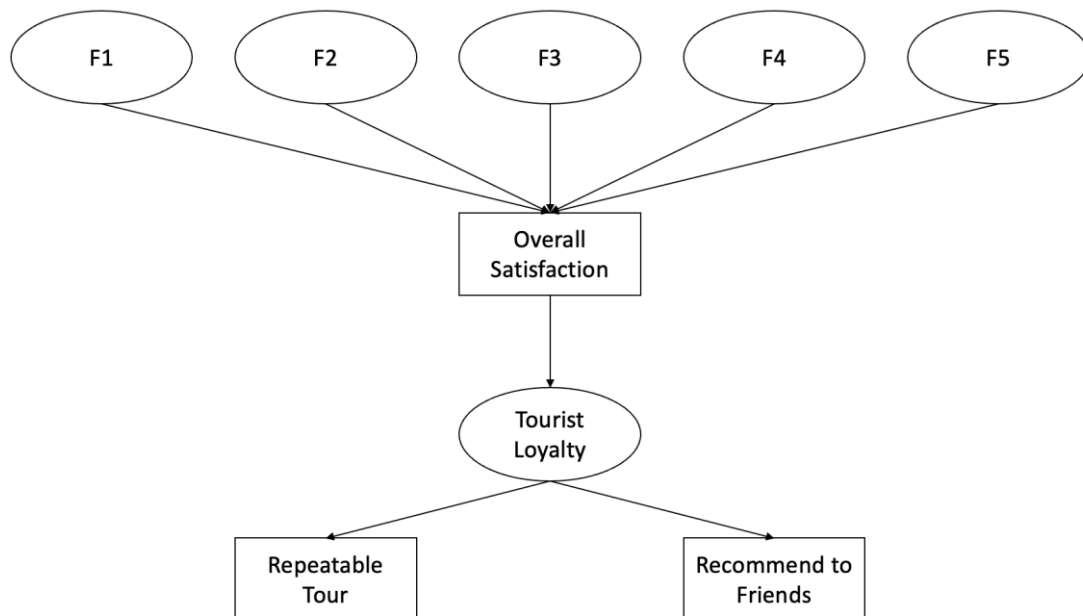


Figure 2: Prototype Model

The outcomes of the fit model analysis are illustrated in Tables 5 and 6. From these tables, it can be observed that the model's fitting performance is quite ideal, with the CMIN/DF index being less than 4. Additionally, indices such as GFI, NFI, IFI, and CFI are very close to 1, and the Root Mean Square Error of Approximation (RMSEA) is below 0.1, indicating a good fit.

| Index    | Chi Square      |                  | GFI  | NFI  | IFI  | CFI  | RESEA |
|----------|-----------------|------------------|------|------|------|------|-------|
| Quantity | CMIN<br>465.712 | CMIN/DF<br>3.713 | .825 | .833 | .882 | .838 | .091  |

Table 5: Initial goodness of fit of the SEM model

|               | Coefficient | S.E. | Standardized Coefficient | C.R.   | P value |
|---------------|-------------|------|--------------------------|--------|---------|
| SAT ← F5      | .622        | .118 | .447                     | 5.092  | ***     |
| SAT ← F3      | .016        | .125 | .018                     | .121   | .915    |
| SAT ← F2      | .295        | .153 | .275                     | 2.153  | .039    |
| SAT ← F4      | .039        | .115 | .042                     | .339   | .775    |
| SAT ← F1      | .119        | .052 | .184                     | 2.315  | .031    |
| Loyalty ← SAT | .801        | .071 | .071                     | 10.915 | ***     |

**Table 6:** Initial Regression Result

Tables 7 and 8 illustrate the outcome of adjusted SEM model achieved by using AMOS 22.0 after dropping two insignificant paths which have less than 1.65 C.R values or less than 0.1 P values.

| Index    | Chi-Square      |                  | GFI  | NFI  | IFI  | CFI  | RESEA |
|----------|-----------------|------------------|------|------|------|------|-------|
| Quantity | CMIN<br>761.316 | CMIN/DF<br>3.095 | .805 | .813 | .862 | .798 | .085  |

**Table 7:** Adjusted goodness of fit of the SEM model

|               | Coefficient | S.E. | Standardized Coefficient | C.R.   | P value |
|---------------|-------------|------|--------------------------|--------|---------|
| SAT ← F5      | .648        | .138 | .437                     | 5.292  | ***     |
| SAT ← F2      | .346        | .095 | .308                     | 3.621  | ***     |
| SAT ← F1      | .109        | .055 | .164                     | 2.151  | .029    |
| Loyalty ← SAT | .801        | .068 | 1.000                    | 11.455 | ***     |

**Table 8:** Adjusted Regression Result

### 5.3 Hypothesis Testing Results and Interpretation

Summarizing the results of the hypothesis examined in the study, as illustrated in the following table.

| No. | Hypotheses   | Accept/Reject |
|-----|--|---------------|
| H1  | Management Quality and Service have a significant positive impact on SAT.                    | Accepted      |
| H2  | Tourism Infrastructure has a significant positive impact on SAT.                             | Accepted      |
| H3  | Intra-Area and External Transportation Conditions have a significant positive impact on SAT. | Rejected      |
| H4  | Scenic Area Environment and Ambiance have a significant positive impact on SAT.              | Rejected      |
| H5  | Ecosystem Conservation and Display have a significant positive relationship with SAT.        | Accepted      |
| H6  | SAT of tourists has a significant positive impact on tourist loyalty.                        | Accepted      |

**Table 9:** Result of Hypotheses Analysis

SEM analysis reveals that the factors influencing overall tourist satisfaction at the Hunza Valley are, in order of importance: Ecosystem Protection and Display, Tourism Infrastructure, and Management Quality and Service. Factors traditionally considered influential, such as "Scenic Environment and Atmosphere" and "Intra- and Inter-Area Transportation Conditions," do not significantly impact overall tourist satisfaction, rejecting hypotheses H3 and H4. Additionally, overall tourist satisfaction significantly influences loyalty.

### 6. Conclusion and discussion

The correlation coefficient between ecosystem conservation and display and overall tourist satisfaction is the highest, with a coefficient of 0.648. This suggests that the quality of ecological conservation and display





significantly influences tourists' satisfaction with the entire tourism experience. This research finding holds vital significance for unraveling the persistent contradiction between ecological conservation and tourism development in the management philosophy of ecological conservation areas.

### Implications

**Key to Enhancing Tourist Satisfaction: Ecological Conservation and Display.** The pivotal factor in improving tourist satisfaction is the conservation and display of the ecological environment. Despite being the most crucial influencing factor on tourist satisfaction, the current state of ecological system display in the context of Pakistan's ecological tourism development is relatively weak.

**Balancing Measures for Environmental Atmosphere and Transportation Conditions.** If measures taken in aspects such as "Scenic Environment and Atmosphere" and "Intra- and Inter-Area Transportation Conditions" (e.g., building cable cars) adversely affect the quality of ecological conservation, priority should be given to protecting the ecology. This is because these two factors do not significantly impact overall tourist satisfaction.

**Emphasizing Ecological Conservation Education in Protected Areas.** Protected areas should focus on enhancing the interpretation of ecological conservation. Uncovering the meaning and value behind ecological conservation, diversifying the ways ecological tourism is presented, and extending the tourism industry chain are essential for sustainable development.

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