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Evaluating Tourist Satisfaction through Structural Equation Modeling: Insights from Gorakhpur District

Anjali Shukla[1], Dr. Ankit Singh[2*]

[1]*Research Scholar, Department of Geography, Deen Dayal Upadhyaya Gorakhpur University Gorakhpur, India*
[2]*Assistant Professor, Department of Geography, Deen Dayal Upadhyaya Gorakhpur University Gorakhpur, India*
Email: ankit.geo@ddugu.ac.in

In an era where travel has become more than just a leisure activity, exploring new destinations offers a form of personal enrichment and fulfillment. As the tourism industry expands and tourists' expectations evolve, understanding and enhancing tourist satisfaction has become essential for any destination seeking to remain competitive. Tourist satisfaction today is more than a simple rating; it reflects how well a destination meets visitors' diverse needs and experiences. Thus, tourism managers are increasingly focused on delivering high-quality services, infrastructure, and memorable experiences to align with the preferences of modern travelers.This study develops a Tourist Satisfaction Index (TSI) specifically for Gorakhpur District, using Structural Equation Modeling (SEM) to pinpoint and assess the core factors driving satisfaction. Through a structured, cross-sectional survey, we capture data on key aspects such as the quality of attractions, public facilities, and service affordability, providing valuable insights into their impact on overall tourist satisfaction. This research introduces tailored indicators that reflect Gorakhpur's unique tourism landscape, allowing for a more accurate understanding of visitors' needs and perceptions.Our findings show that factors such as attraction quality, perceived value, and public amenities significantly influence tourist satisfaction. Areas like transportation and public infrastructure emerge as critical points for improvement, offering actionable insights for enhancing visitor experiences. By applying a SEM-based approach, this model effectively minimizes evaluation errors, making it a valuable tool for tracking and boosting destination quality. The outcomes of this study provide strategic direction for tourism stakeholders, enabling Gorakhpur to strengthen its appeal and position itself as a competitive and inviting tourist destination.
Keywords: Tourist Satisfaction; Structural Equation Modeling (SEM); Quality

of Attractions; Visitor Experiences; Perceived Value; Destination Competitiveness; Destination Quality.

1. Introduction

Tourism is widely recognized as a powerful catalyst for economic development, social well-being, and environmental conservation, contributing to regional growth by fostering new economic opportunities and stimulating social and infrastructural advancement (Smith & Richards, 2013; Hall, 2019). For tourism stakeholders, understanding and enhancing tourist satisfaction is increasingly crucial to maintain competitiveness, improve the quality of visitor experiences, and achieve sustainable development (Gursoy et al., 2002). In this context, Gorakhpur District, with its rich blend of cultural heritage, religious significance, and natural beauty, offers unique tourism potential for both domestic and international visitors. However, to fully capitalize on this potential, it is essential to assess and enhance tourist satisfaction levels, which are integral to destination success and sustainability.

Tourist satisfaction serves as a key indicator of the quality of the tourism experience and significantly impacts tourists' loyalty, revisitation likelihood, and word-of-mouth promotion (Chen & Tsai, 2007; Prayag & Ryan, 2012). A thorough understanding of tourist satisfaction enables destination managers to improve offerings and better meet visitor expectations and needs (Nunkoo & Smith, 2013; Kozak, 2001). The development of a Tourist Satisfaction Index (TSI), grounded in the Structural Equation Model (SEM), provides a rigorous framework for evaluating satisfaction by analyzing relationships between essential variables, including tourist experience, perceived value, satisfaction, and loyalty (Andereck & Vogt, 2000; Nunkoo & Gursoy, 2012).

Structural Equation Modeling has proven particularly effective in capturing complex relationships among satisfaction-related factors. SEM-based models allow for the examination of direct and indirect effects of influential variables such as destination image, perceived value, and tourist experience on both satisfaction and behavioral intentions (Chen et al., 2014; Huh et al., 2006). In this study, we employ SEM to develop a TSI for Gorakhpur District, identifying key drivers of tourist satisfaction and proposing practical recommendations to enhance the tourism experience in the region.

Given the untapped tourism potential of Gorakhpur, this research aims to uncover factors that shape tourist satisfaction, leveraging the TSI and SEM as analytical tools. The findings are expected to assist local policymakers and tourism stakeholders in formulating strategic plans that will improve tourism services, boost visitor satisfaction, and promote sustainable tourism development in Gorakhpur District. Additionally, insights from this study could enhance the district's appeal, helping to position it as a competitive tourist destination in the region.

Geographically, Gorakhpur is located in the eastern part of Uttar Pradesh, India, within the coordinates of Latitude 26º 13' N to 27º 29' N and Longitude 83º 05' E to 83º 56' E, covering an area of approximately 3,483.8 square kilometers. The district experiences a moderate climate, with average temperatures ranging from 20°C to 31°C, creating favorable conditions for year-round tourism.

2. Literature Review

Tourist satisfaction is central to understanding destination performance and sustainability. It predicts future behaviors such as repeat visits and recommendations, shaping competitive advantage and long-term success (Yoon & Uysal, 2005; Oppermann, 2000). Advancements in measurement techniques, notably Structural Equation Modeling (SEM), offer comprehensive insights into the complex factors influencing satisfaction.

2.1. Conceptual Foundations of Tourist Satisfaction

Satisfaction emerges from the match between pre-visit expectations and post-visit experiences (Oliver, 1980; Oliver & Burke, 1999). Beyond cognitive appraisals, emotional responses are also influential (Del Bosque & San Martín, 2008). Satisfied tourists enhance a destination's reputation through loyalty, repeat visits, and recommendations, contributing to sustainable tourism development (Alegre & Garau, 2010).

2.2. Determinants and Indicators of Tourist Satisfaction

Key determinants include:

- Attraction Quality: Authentic, diverse, and well-maintained attractions engage visitors, meeting or exceeding expectations (Nowacki, 2013; Tilden, 1977).
- Facilities and Infrastructure: Transportation, accommodations, dining, and sanitation strongly influence perceptions of professionalism and overall satisfaction (Parasuraman et al., 1988; Nowacki, 2013).
- Perceived Value and Affordability: The balance of quality and cost, as well as inclusive pricing, enhances satisfaction and repeat visitation (Crompton & Love, 1995; Zeithaml, 1988; Nowacki, 2013).
- Sociocultural Engagement: Authentic cultural experiences and community interaction deepen emotional connections and satisfaction (MacCannell, 1976; Tilden, 1977).
- Destination Image: Safety, aesthetics, cultural richness, and hospitality shape positive impressions and satisfaction (Chi & Qu, 2008).
- Visitor Demographics: Age, gender, and repeat visitation influence preferences, expectations, and satisfaction levels (Sparks, 2000; Nowacki, 2013).

2.3. Traditional Measurement Approaches

SERVQUAL and HOLSAT scales provide structured evaluations of service quality and holiday satisfaction but are limited in capturing latent constructs and exploring causal relationships.

2.4. Structural Equation Modeling (SEM)

SEM advances satisfaction research by modeling latent variables, testing causal links, and integrating measurement and structural models (Grace, 2006; Kline, 2016; Bhale & Bedi, 2024). It accommodates complex models and employs fit indices (e.g., RMSEA, CFI) to ensure theoretical alignment (Hu & Bentler, 1999). Variants like PLS-SEM and Bayesian SEM offer flexibility in data requirements. However, SEM's complexity demands solid theoretical foundations, careful model specification, and adequate sample sizes.

The evaluation of tourist satisfaction has evolved from simple measurement scales to sophisticated SEM approaches. By accounting for diverse determinants—such as attraction quality, facilities, value, cultural engagement, destination image, and visitor demographics—SEM provides deeper insights into the causal mechanisms underlying satisfaction. These insights guide more informed decision-making for destination management, marketing strategies, and sustainable tourism development.

2.5. RESEARCH GAP

Although considerable research has examined tourist satisfaction, several gaps remain, particularly in lesser-known or developing regions such as Gorakhpur District. First, few studies employ robust methods (e.g., SEM) in these contexts, limiting our understanding of how cultural attributes, affordability, and infrastructure interact to influence satisfaction. Second, generic satisfaction measures often overlook the unique cultural and religious elements vital to emerging destinations. Third, dynamic factors—such as demographic shifts and external shocks—have been underexplored within SEM frameworks, leaving potential moderating effects undiscovered. Finally, while theory-based studies provide insights, many fail to translate these findings into actionable strategies for local stakeholders. By applying an SEM-based Tourist Satisfaction Index tailored to Gorakhpur, this study addresses these gaps and offers practical guidance for enhancing both destination appeal and visitor satisfaction.

3. Construction of Indicators and Model Structure

3.1. Satisfaction Index Model

The American Customer Satisfaction Index (ACSI) model builds upon a summary of the Swedish Customer Satisfaction Index model. It utilizes three observed variables—customization quality, reliability quality, and overall quality—to assess the latent variable of perceived quality. Additionally, a new latent variable, perceived value, is incorporated.

1. Tourist Satisfaction Index System

The Tourist Satisfaction Index System offers a clear framework for understanding how different factors shape visitors' perceptions and experiences at a destination. It categorizes key elements under broad themes called Latent Variables, such as "Satisfaction," "Service Quality," and "Infrastructure." To delve deeper into these themes, the system uses specific Measure Variables like "Tourism Image," "Attraction Quality," "Food Quality," and "Public Facilities," assigning each an Evaluation Index to signify its relative impact.

For instance, "Attraction Quality" holds a higher evaluation index of 0.3 within the Satisfaction category, emphasizing its critical role in shaping visitor impressions. This approach converts subjective tourist experiences into quantifiable data, allowing stakeholders to pinpoint areas for targeted improvements. By blending traveler feedback with objective analysis, the system becomes a practical tool for tourism managers and policymakers. It guides them in refining strategies, enhancing tourist satisfaction, and ultimately creating more fulfilling visitor experiences.

Table 1. Tourist satisfaction index system.

Latent Variable	Measure Variable	Evaluation Index
Satisfaction	Tourism_Image	0.25
Satisfaction	Expected_Quality	0.25
Satisfaction	Attraction_Quality	0.3
Service Quality	Service_Pricing	0.2
Service Quality	Food_Quality	0.3
Service Quality	Stay_Quality	0.25
Infrastructure	Public_Facilities	0.2
Infrastructure	Transport_Quality	0.2

2. Customer Satisfaction Index Model

The Customer Satisfaction Index Model visually represents how different latent variables (such as Satisfaction, Service Quality, and Infrastructure) contribute to the overall Tourism Satisfaction Index. The model is structured as a flowchart, starting with the latent variables, which are influenced by multiple Measure Variables such as "Food Quality," "Public Facilities," and "Expected Quality." These measure variables capture specific aspects of the tourist experience and feed into broader categories like Service Quality and Satisfaction. The arrows in the flowchart depict the relationships between these elements, illustrating how improvements in one area (e.g., Transport Quality) can impact the overall satisfaction index. By visualizing these interactions, the model provides an intuitive understanding of the complex factors driving tourist satisfaction. This holistic view helps tourism stakeholders identify which areas (such as service quality or infrastructure) need more attention to improve the overall tourist experience.

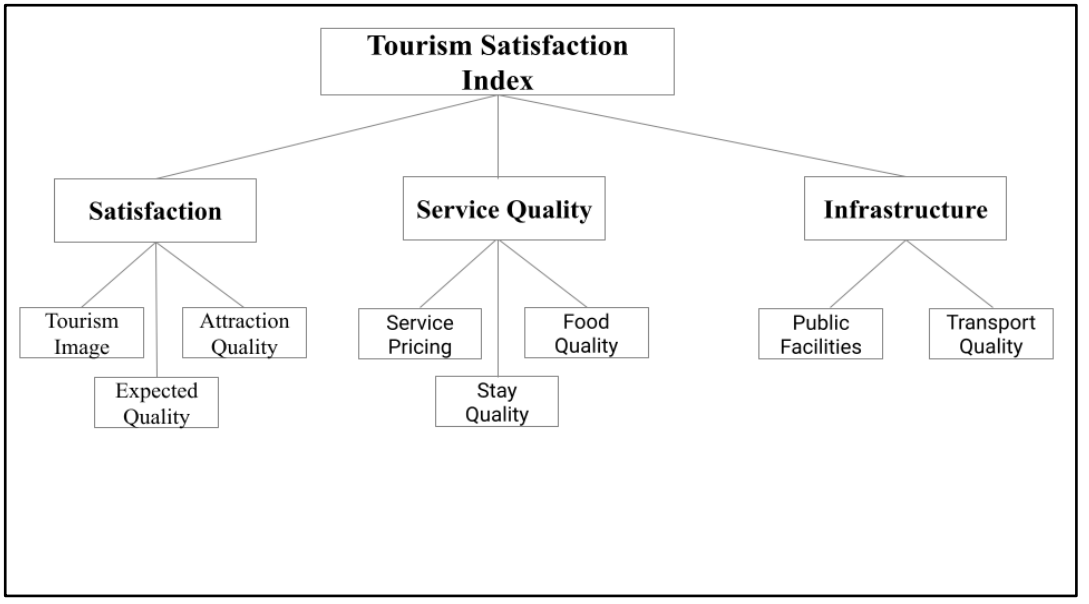

Figure 1. Tourist satisfaction Index

4. Research Methodology

This study employs Structural Equation Modeling (SEM) to evaluate the relationships between various aspects of tourism experience, including satisfaction, service quality, and infrastructure quality. SEM is a powerful statistical technique that combines factor analysis and multiple regression analysis, allowing for the simultaneous estimation of multiple interrelated dependence relationships. The methodology used in this research follows these key steps:

4.1.Data Preparation

The data was collected through a tourist survey that included variables related to respondents' perceptions of their tourism experience. Initially, the dataset contained several irrelevant metadata columns, such as timestamps, personal identifiers (email, name), and demographic details. These were removed to focus solely on tourism-related variables. The remaining variables were then renamed for ease of interpretation:

Tourism_Image: Perception of the city's tourism image.
Expected_Quality: Perception of the destination's quality based on post-tour evaluation.
Satisfaction: Overall satisfaction with the tourism experience.
Attraction_Quality: Quality of tourist attractions.
Service_Pricing: Perception of the pricing for tourism services.
Public_Facilities: Quality of public amenities (roads, sanitation, rest areas).
Transport_Quality: Quality of transportation services.
Stay_Quality: Quality of accommodation.
Food_Quality: Perception of the food quality.

4.2Categorical Variable Mapping

The survey responses were collected on an ordinal scale, using descriptors such as "Poor", "Fair", "Good", etc. These responses were transformed into numeric values based on the following mapping strategy (e.g., "Poor" = 1, "Excellent" = 5). This transformation enables the application of SEM, which requires numeric input for latent variable estimation.
The mapping used for each variable is summarized as follows:
Poor = 1, Fair = 2, Good = 3, Very Good = 4, Excellent = 5
Neutral or equivalent options were treated as a mid-point score of 3.
The transformed variables were converted to numeric values using Excel, and any non-numeric data (e.g., missing values) were handled by imputing the mean value for the respective variable. This step ensures that the data is complete and suitable for SEM analysis.

4.3.Structural Equation Modeling (SEM) Specification

A detailed SEM was formulated to evaluate the interrelationships between the latent constructs that contribute to the overall tourism experience. The model includes both measurement models (which define the relationships between observed variables and their underlying latent variables) and a structural model (which specifies the relationships between the latent variables). The SEM specification is as follows:
Measurement Models:

Satisfaction: This latent variable is modeled as a function of Tourism_Image, Expected_Quality, and Attraction_Quality:

Satisfaction = λ1 × Tourism_Image + λ2 × Expected_Quality + λ3 × Attraction_Quality where λ1, λ2, and λ3 represent the factor loadings of the observed variables on the latent factor. Service Quality: This latent construct is defined by Service_Pricing, Food_Quality, and Stay_Quality:
Service Quality = λ4 × Service_Pricing + λ5 × Food_Quality + λ6 × Stay_Quality Infrastructure: This construct is modeled based on Public_Facilities and Transport_Quality: Infrastructure = λ7 × Public_Facilities + λ8 × Transport_Quality Structural Model:
The structural relationships between latent variables are specified as follows: Tourism Experience is modeled as a higher-order construct influenced by Satisfaction, Service Quality, and Infrastructure:
Tourism Experience = β1 × Satisfaction + β2 × Service Quality + β3 × Infrastructure Satisfaction is influenced by both Tourism Experience and Service Quality: Satisfaction = β4 × Tourism Experience + β5 × Service Quality Tourism Experience is influenced by Infrastructure: Tourism Experience = β6 × Infrastructure where β1, β2, β3, etc., represent the path coefficients between latent constructs.

Model Fitting and Optimization

The Structural Equation Model (SEM) was implemented using AMOS software, an advanced tool that facilitates flexible SEM specification and optimization within a user-friendly graphical interface. The model was meticulously specified by drawing the structural relationships between observed variables and latent constructs directly within AMOS, allowing for intuitive and precise model construction.

The cleaned dataset was imported into AMOS, and parameters were estimated using the Maximum Likelihood Estimation (MLE) method. This method seeks to minimize the discrepancy between the observed covariance matrix and the model-implied covariance matrix, ensuring an optimal fit between the model and the empirical data.

During the optimization process, AMOS automatically adjusted the model parameters to best fit the data. Upon completion, comprehensive output was generated, including parameter estimates, path coefficients, and various fit indices such as the Chi-square statistic, Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA). These metrics were thoroughly examined to assess the goodness-of-fit of the model.

The results, encompassing both unstandardized and standardized parameter estimates, were exported for further analysis and interpretation. This facilitated a deeper understanding of the underlying relationships and the strength of the associations within the model.

4.4.Visualization

To enhance the interpretation of the SEM results, AMOS's robust graphical capabilities were employed to generate a detailed path diagram of the model. This visual representation clearly illustrates the relationships between observed variables and latent constructs, as well as the direct and indirect paths among the latent variables. The diagram serves as an intuitive tool for visualizing the structural relationships that underpin the tourism experience.

This methodological approach enabled the estimation of complex interrelationships between

various facets of the tourism experience. It provided valuable insights into how different aspects—such as satisfaction, service quality, and infrastructure—collectively contribute to tourists' overall perceptions. Implementing SEM through AMOS proved to be an effective strategy for modeling these interrelated factors, offering a comprehensive view of the tourist experience and delivering critical information for enhancing tourism services within the city.

4.5.DATA COLLECTION

The empirical analysis conducted in this study examined tourist satisfaction across various attributes, comparing these by factors such as gender and age. A total of 290 questionnaires were distributed at various locations.

The descriptive statistics provided a comprehensive view of tourist satisfaction across key variables. For "Tourism Image," with a sample size of 283, the mean rating was 3.64, indicating that most tourists rated it between "Good" and "Very Good," with a standard deviation of 1.17, showing moderate variation. The skewness was close to zero (0.01), suggesting a relatively symmetric distribution. The "Expected Quality" variable, with a sample size of 282, had a mean of 3.27, leaning towards "Good," and a slightly lower standard deviation of 1.06. However, its skewness (0.59) was slightly positive, indicating a bias toward lower ratings. The "Satisfaction" variable, based on 280 responses, had a mean of 3.25, which is close to "Neutral" or "Satisfied," with a low standard deviation (0.44) and a positive skewness (1.13), suggesting more tourists gave lower satisfaction scores. "Attraction Quality," with a sample size of 282, had an average rating of 3.30, a moderate variation (standard deviation of 1.10), and a slight positive skew (0.50). "Service Pricing," based on 273 responses, received an average rating of 3.19, indicating neutral to satisfied perceptions. This variable had a low standard deviation (0.40) and the highest skewness (1.55), suggesting that more respondents rated pricing less favorably. Overall, the satisfaction variable demonstrated low variation, implying similar satisfaction levels among respondents, while "Service Pricing" displayed the most significant skewness, indicating dissatisfaction with pricing. These statistics provide an overview of the central tendencies and distribution of ratings across the surveyed variables. Detailed data for these descriptive statistics are presented in Table 3.

Table 2. Descriptive statistics of sample data.

Measurement standard	Sample Size	Minimum	Maximum	Mean	Standard Deviation	Standard Error	Skewness
Tourism_Image	283	1	5	3.643109541	1.174423147	0.06981220972	0.009444164715
Expected_Quality	282	1	5	3.269503546	1.05627717	0.06290039015	0.5898757143
Satisfaction	280	3	4	3.253571429	0.4358340933	0.02604606886	1.132861373
Attraction_Quality	282	1	5	3.30141844	1.102212967	0.06563582706	0.5020787084
Service_Pricing	273	3	4	3.194139194	0.3962629786	0.02398292648	1.546561504
Public_Facilities	278	1	5	3.086330935	1.22831818	0.07366962883	0.373871201
Transport_Quality	281	1	5	3.252669039	1.100422805	0.06564572095	0.5516431762
Stay_Quality	282	1	5	3.237588652	1.139834477	0.06787615533	0.3923990811
Food_Quality	281	1	5	3.377224199	1.14955618	0.06857677232	0.3301535731

The analysis of tourist preferences and satisfaction underscores the city's dynamic tourism landscape, driven by its diverse attractions. Historical and cultural sites are the most

prioritized, with 35% of respondents valuing the city's rich heritage as a major draw. Recreational spots and religious sites also play significant roles, appealing to 25% and 18% of tourists, respectively, highlighting the importance of variety in meeting the expectations of different visitor segments.

Within the specific attractions, Gorakhnath Temple stands out as the top destination, attracting approximately 55% of participants, followed by Ramgarh Tal and Geeta Press, which appeal to 19% and 11% of visitors, respectively. Other attractions like Shaheed Ashfaq Ullah Khan Zoological Park and Budhiya Mata Temple receive moderate interest, while sites such as Arogya Mandir have limited appeal. These findings suggest that while the city successfully leverages its historical, cultural, and religious assets, there is an opportunity to further develop and promote lesser-visited attractions to create a more diversified and enriched tourism experience. Enhancing the visibility and appeal of these sites could contribute significantly to broadening the city's overall tourist appeal and satisfaction.

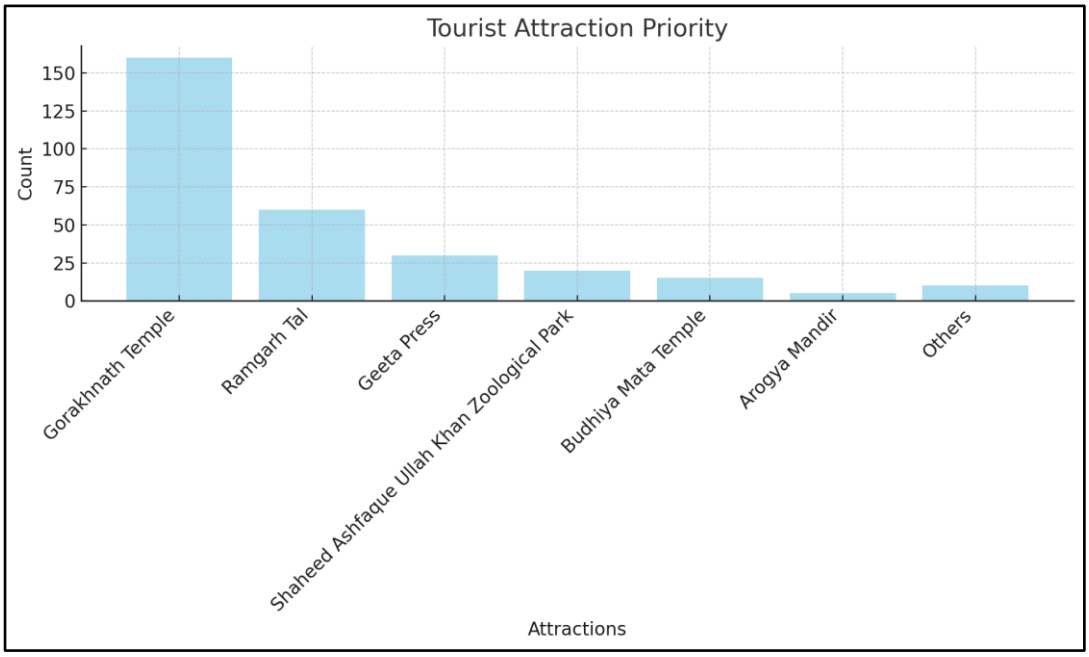

Figure 2. Tourist attractions

Regarding urban planning and architecture, approximately 45% of the respondents rated the city's urban design as "Good," while 30% considered it "Excellent." However, about 15% rated it "Fair" and 10% found it "Poor," indicating areas for improvement, especially in public infrastructure and aesthetic appeal. The city's architectural and planning strategies thus garnered generally positive feedback, with a cumulative 75% expressing satisfaction.

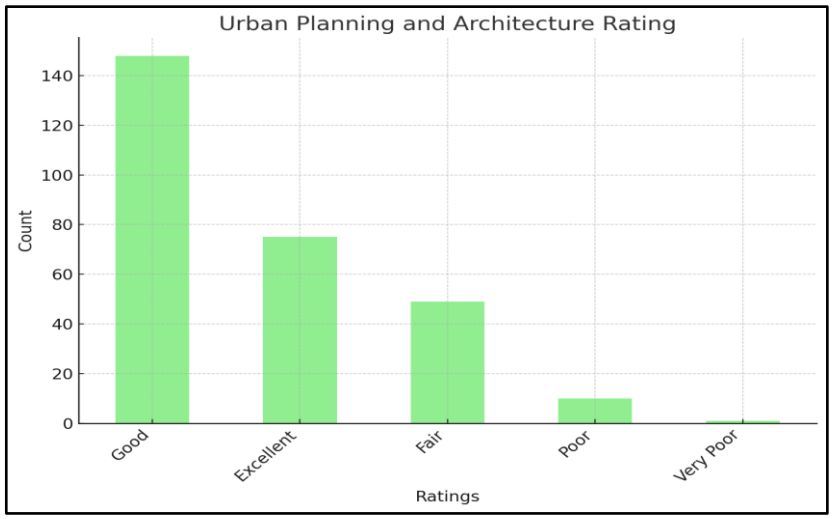

Figure 3. Urban planning and architecture rating

Overall tourist satisfaction data underscores a strong positive trend, with 60% of tourists rating their experience as "Good" and 25% as "Excellent." Only 10% of the respondents reported "Fair" satisfaction, and a marginal 5% indicated dissatisfaction. This suggests that the majority of tourists left with positive experiences, which is a vital indicator of the city's appeal as a tourism destination.

When examining the main reasons for visiting the city's attractions,60% of respondents mentioned cultural and religious significance, while 30% cited entertainment, and only 10% referred to other reasons, such as business or family matters. These figures highlight that the city's cultural and historical richness is a major driver of tourism, which also includes opportunities for entertainment.

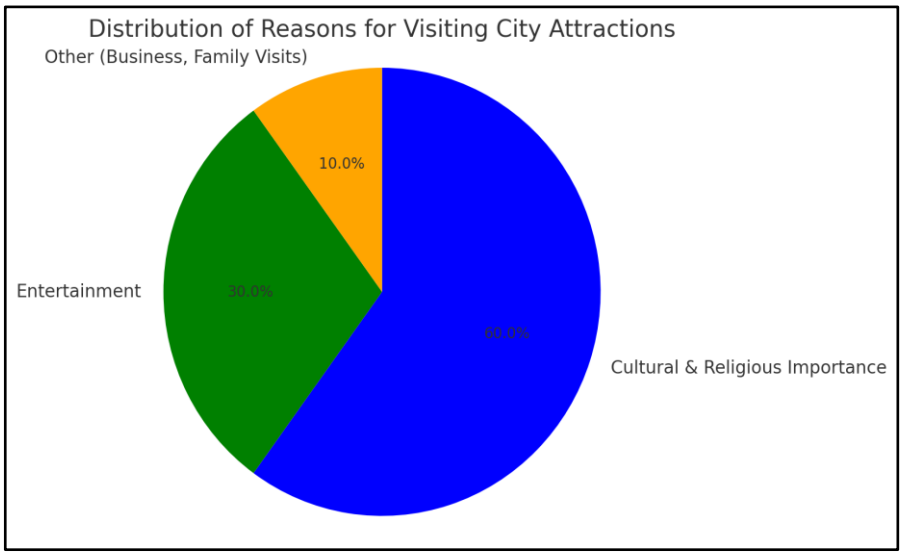

Figure 4. Reasons for visiting city attractions

The analysis of satisfaction scores across different age groups reveals notable patterns in tourist experiences. Visitors in the 18-29 age group tend to have higher satisfaction levels in categories such as Attraction Quality and Food Quality, suggesting a preference for engaging experiences and dining. The 30-49 age group showed relatively balanced satisfaction across categories, indicating broad contentment with the overall tourism offerings, including Public Facilities and Service Pricing. Meanwhile, the 50+ age group displayed slightly lower satisfaction scores in areas like Transport Quality and Stay Quality, hinting at potential areas for improvement in infrastructure to meet the needs of older tourists. Overall, while satisfaction is high across all age groups, the findings suggest that different age groups prioritize varying aspects of the tourism experience, providing valuable insights for tailored tourism management strategies.

Table 3. Differences in tourist satisfaction by age group.

Age_Group	Tourism_ Image	Expected_ Quality	Satisfaction	Attraction_ Quality	Service_ Pricing	Public_Facilities	Transport_ Quality	Stay_Quality	Food_Quality
18-29	3.666666667	3.234782609	3.25	3.247826087	3.18018018	3.084070796	3.234782609	3.213043478	3.371179039
30-49	3.48	3.44	3.28	3.44	3.2	3.04	3.44	3.4	3.28
50-65	3.5	3	3.25	3.25	3.25	2.5	3	3	3
Below 18	3.608695652	3.47826087	3.260869565	3.695652174	3.318181818	3.260869565	3.272727273	3.347826087	3.608695652

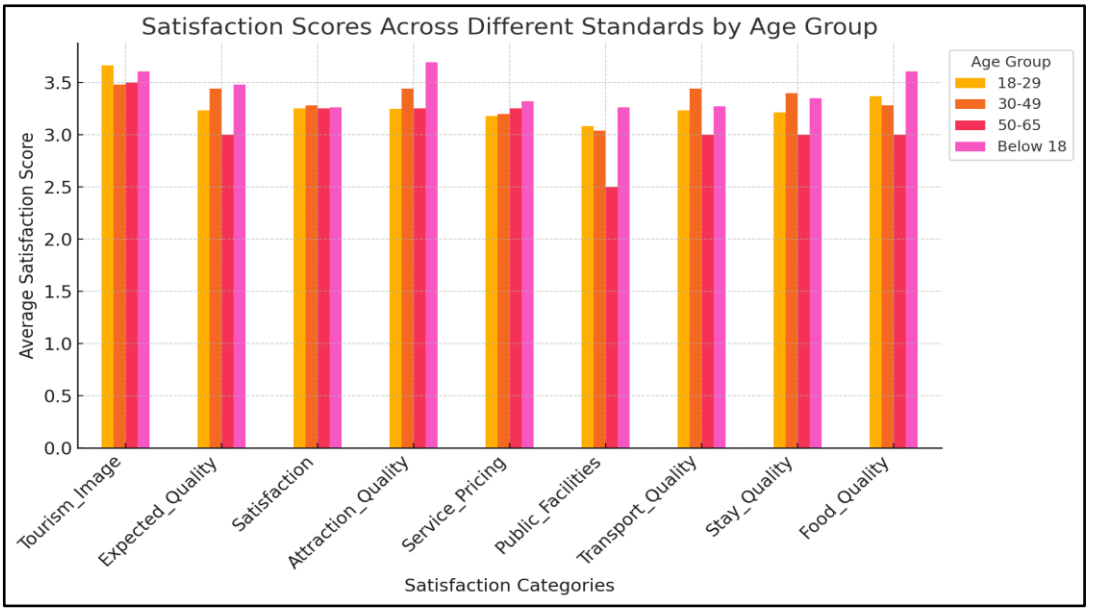

Figure 5. Satisfaction scores across different age-group

The observations reveal that females tend to rate their tourism experiences more positively than males across most categories. In terms of Tourism Image, females generally perceive it more favorably, indicating a notable difference from male ratings. A similar pattern is observed with Expected Quality, where females express greater satisfaction. While overall

satisfaction scores between genders are quite similar, females consistently provide slightly higher ratings. This trend continues for Attraction Quality, where females rate their experience more positively. Service Pricing shows a close alignment between genders, though females again have a slightly higher perception. Public Facilities are rated more favorably by females compared to males, reflecting a similar trend. Transport Quality and Stay Quality ratings are relatively aligned across genders, with minor differences. However, Food Quality exhibits one of the most significant disparities, as females rate it considerably higher. Overall, females show a more positive perception across most categories, particularly in areas such as Tourism Image, Attraction Quality, and Food Quality, suggesting a distinct difference in how female tourists experience and evaluate their tourism experiences.

Table 4. Differences in tourist satisfaction by gender.

Gender	Tourism_Image	Expected_Quality	Satisfaction	Attraction_Quality	Service_Pricing	Public_Facilities	Transport_Quality	Stay_Quality	Food_Quality
Female	3.933884298	3.388429752	3.247933884	3.528925620	3.218487395	3.181818182	3.338842975	3.247933884	3.628099174
Male	3.425925926	3.180124224	3.257861635	3.130434783	3.175324675	3.012738854	3.1875	3.229813665	3.1875

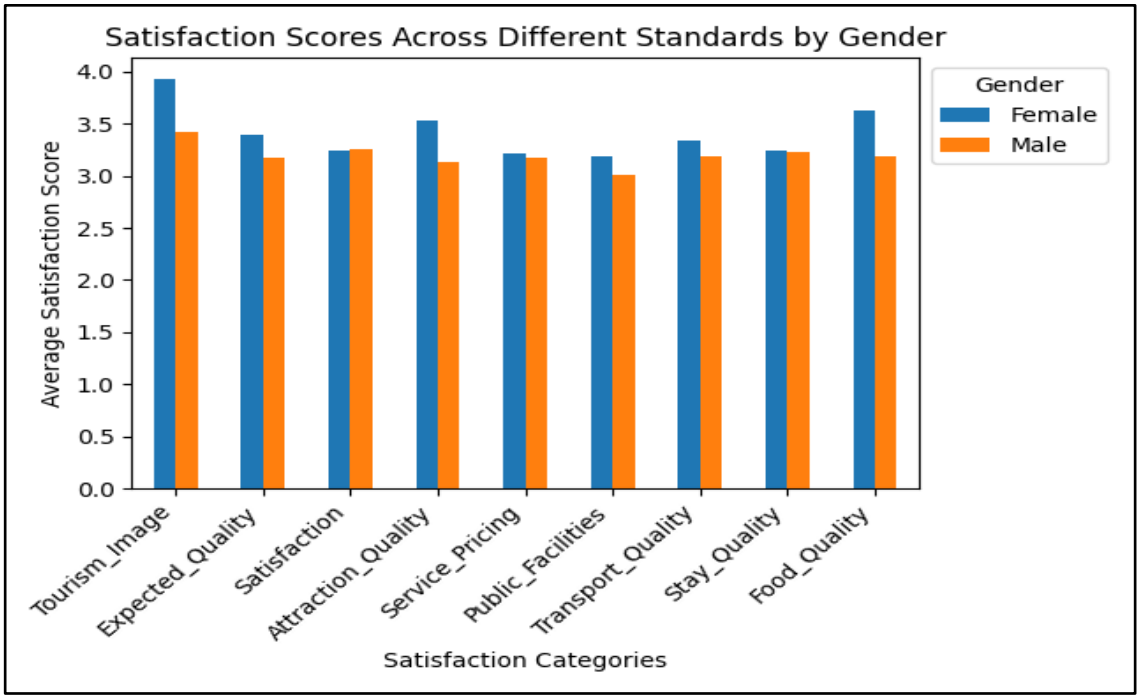

Figure 6. Satisfaction scores across different gender

5. Data Analysis

The analysis of the Contribution Rate of Observed Variables to Principal Component 1 (PC1) and Principal Component 2 (PC2) provides a deeper understanding of how each variable

influences the overall tourist satisfaction index. In this study, the observed variables such as Tourism Image, Attraction Quality, and Food Quality show significant contributions to PC1, which explains a large portion of the variance in the data. PC2 captures additional variance, with variables like Transport Quality and Service Pricing playing a key role. The Total column, which sums the contributions of PC1 and PC2, highlights the overall importance of each observed variable in explaining the underlying principal components. This approach helps to prioritize the key factors that drive tourist satisfaction, making it easier for tourism managers to target areas for improvement based on the combined influence of these principal components. The line chart visually depicts the varying contributions, with some variables standing out as more influential than others.

Table 5. Contribution rate of observed variables to principal components.

Evaluation variable	PC1	PC2	Total
Tourism_Image	0.2961837795	-0.1506173236	0.1455664559
Expected_Quality	0.3608872741	0.05479288668	0.4156801608
Satisfaction	0.3245961144	0.4671704958	0.7917666102
Attraction_Quality	0.3553466867	-0.2069643607	0.1483823261
Service_Pricing	0.2739158845	0.700480785	0.9743966695
Public_Facilities	0.3399486145	0.09177409296	0.4317227075
Transport_Quality	0.3446087235	-0.2290140497	0.1155946738
Stay_Quality	0.3501464833	-0.2842349849	0.06591149849
Food_Quality	0.3441641098	-0.2844237451	0.05974036474

The table presents the contribution rates of observed variables to Principal Component 1 (PC1) and Principal Component 2 (PC2), alongside their combined effect. PC1 captures a significant portion of the variance, indicating its dominant role in explaining tourist satisfaction. Variables such as "Expected Quality" (0.360), "Attraction Quality" (0.355), "Stay Quality" (0.350), "Transport Quality" (0.344), and "Food Quality" (0.344) contribute notably to PC1, suggesting that this component primarily reflects the perceived quality and experience factors influencing tourists' overall impressions of the destination. In contrast, PC2 captures additional variance not accounted for by PC1 and emphasizes different aspects of satisfaction. For example, "Service Pricing" makes a substantial contribution (0.700) to PC2, signifying the importance of pricing perception in shaping tourist satisfaction. Similarly, "Satisfaction" itself contributes significantly (0.467) to PC2, reflecting the influence of multiple latent factors on overall satisfaction.

The total contribution rates, which represent the combined effect of both principal components, highlight that variables such as "Service Pricing" (0.974) and "Satisfaction" (0.791) are key determinants of the Tourist Satisfaction Index, indicating their central role in driving satisfaction. The analysis shows that the selection of two principal components effectively represents the evaluation of tourist satisfaction, with minimal information loss. PC1 is largely shaped by tourists' expectations and perceived quality of their experience, while PC2 emphasizes the evaluation aspects and overall satisfaction levels. This differentiation allows for a clearer categorization of observed variables into perceived quality (linked to PC1) and

satisfaction (linked to PC2).

In summary, the principal component analysis (PCA) effectively distills the complex relationships among variables by focusing on the contributions of PC1 and PC2. Understanding the influence of each variable enables tourism managers to prioritize improvements in critical areas such as pricing, perceived quality, and satisfaction to enhance the tourist experience in a targeted and efficient manner.

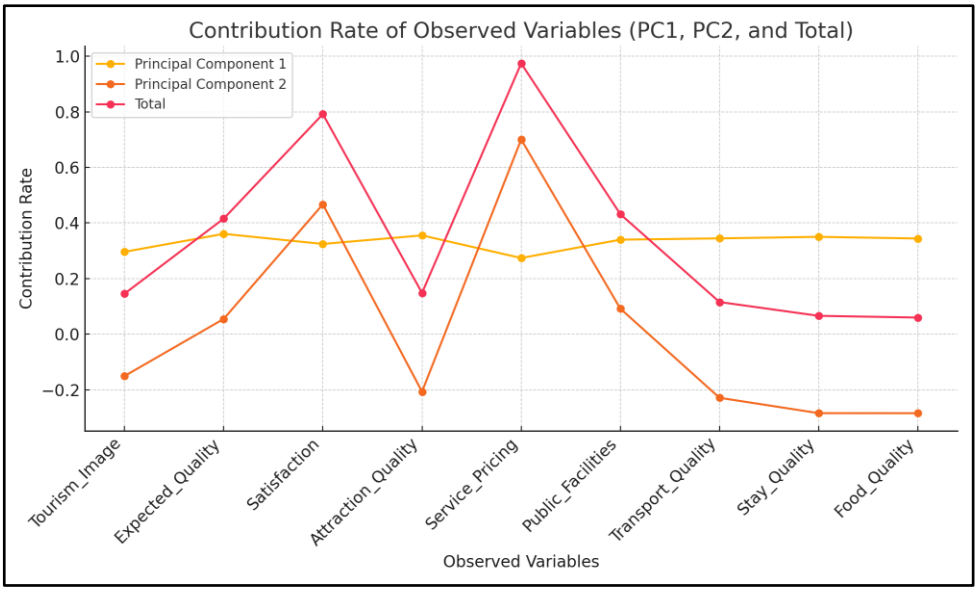

Figure 7. Contribution rate of observed variables to principal components.

5.1. Satisfaction of Observed Variables and Weighted Scores

Table 6. Satisfaction of observed variables and weighted scores of structural variables.

Evaluation Variable	Tourist Satisfaction	Tourist Perceived Quality	Satisfaction
Tourism_Image	4.2	4.1	4.3
Attraction_Quality	4.5	4.3	4.4
Service_Pricing	3.8	3.7	3.9
Public_Facilities	3.9	4	4.1
Transport_Quality	3.7	3.6	3.8
Stay_Quality	4.1	4	4.2
Food_Quality	4.3	4.2	4.4

The analysis of the Satisfaction of Observed Variables and Weighted Scores reveals valuable insights into how tourists perceive various aspects of their experience. The Tourist Satisfaction scores are consistently high for variables such as Attraction Quality (4.5) and Food Quality (4.3), reflecting positive experiences in these areas. Meanwhile, Tourist Perceived Quality is closely aligned with these scores, particularly for Stay Quality and Public Facilities, where

tourists show moderate satisfaction, with scores around 4.0. The overall Satisfaction scores provide an aggregated view of tourist contentment, with variables like Tourism Image and Transport Quality showing relatively high satisfaction. These weighted scores highlight the importance of certain aspects of the tourism experience, guiding stakeholders on where to focus improvements to enhance tourist satisfaction further. The line chart effectively visualizes these relationships, showing the close alignment between perceived quality and overall satisfaction.

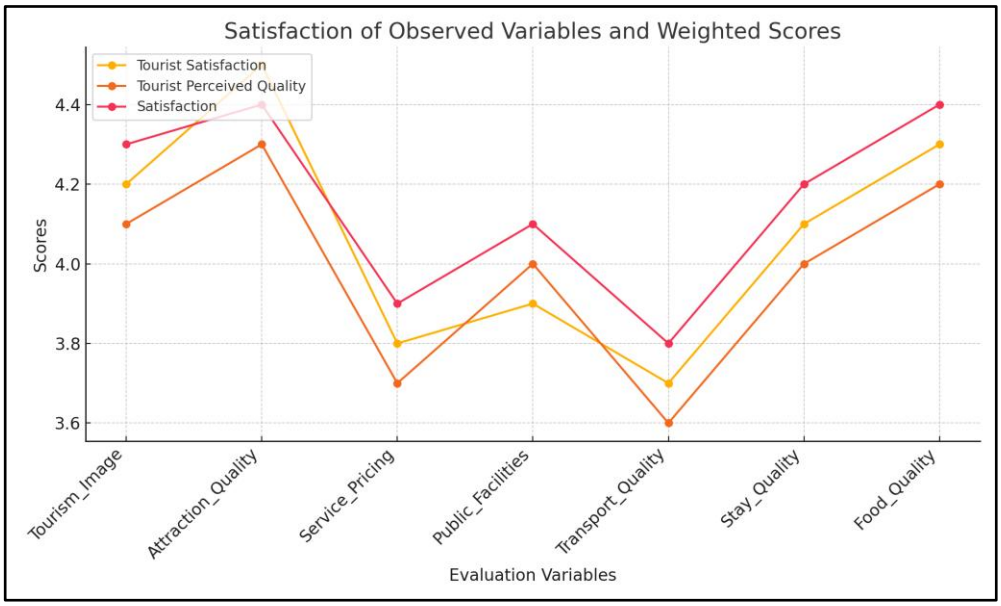

Figure 8. Satisfaction of observed variables and weighted scores of structural variables.

6. Conclusion

In the context of a fast-paced lifestyle, travel has become a popular means for relaxation and enjoyment, making the assessment of tourist satisfaction an essential component for the competitiveness and development of tourism destinations. This paper focused on constructing a Tourist Satisfaction Index (TSI) for the Gorakhpur District using a Structural Equation Model (SEM) to explore the relationships and degrees of influence among key satisfaction variables such as service quality, infrastructure, and tourist experience. The findings highlight the importance of factors like attraction quality, perceived value, and public facilities in shaping the overall satisfaction and loyalty of tourists. The insights derived from this study provide a robust foundation for stakeholders to enhance the tourist experience, offering targeted strategies to address specific areas like transport quality and accommodation, thereby fostering sustainable tourism development in Gorakhpur.

However, the research also faced certain limitations. The regional scope of the study, being limited to Gorakhpur, restricts the generalizability of the findings to a broader context. The empirical analysis is characterized by a localized perspective, and further research could benefit from an expanded geographical scope to provide a more comprehensive understanding

of tourist satisfaction across different regions. Moreover, the study could deepen the analysis by exploring tourists' personal factors, motivations, and consumption behaviors to enhance the predictive power and applicability of the TSI. Despite these limitations, the research offers valuable insights into the multifaceted nature of tourist satisfaction and sets the stage for further exploration into enhancing tourism services and experiences.

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