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Quantitative Analysis of Tourism Dynamics in the Himalayas: Dual Perspective Study

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Abstract:
This study investigates significant factors which emerge as opportunities and challenges in the tourism sector of Ladakh, a Himalayan region, through a comparative analysis of perspectives from local residents and tourists. Employing advanced analytical techniques, the research identifies key factors influencing the region's tourism industry. A comprehensive review of existing literature is conducted to establish latent constructs, which are analysed using Structural Equation Modelling. The findings reveal significant determinants of local residents' support for tourism development and factors influencing tourists' intention to revisit. Comparative analysis of the significant factors that emerge from the two dataset reveal that socio-cultural aspects emerge as a critical factor for both groups, underscoring the importance of cultural sensitivity and community participation. Additionally, environmental appeal, economic benefits, social barriers, and safety concerns are identified as influential elements. These insights provide valuable guidance for policymakers to promote sustainable tourism development in the region.

Keywords: Tourism Industry, Local Residents, Tourists, Challenges, Opportunities, Comparative Analysis.

1. Introduction

Tourism has become a significant driver of economic growth in various regions across the globe, including the remote and culturally rich area of Ladakh. However, the rapid and often unplanned development of tourism activities can have significant impacts on the local socio-economic and environmental landscape (Brooks et al., 2023; J. K. L. Chan, 2023; Geneletti & Dawa, 2009). In the case of Ladakh, a region characterized by its arid climate, high altitude, and fragile ecosystems, the introduction of tourism has led to a rapid transformation from a self-sufficient agricultural economy to a cash-based economy heavily reliant on the tourism industry (Sood, 2014).

While tourism has provided employment opportunities and increased economic prosperity for the local community, its impacts on the region's physical and socio-cultural environment have raised concerns. The degradation of the natural environment, which is the primary attraction for visitors, and the disruption of traditional cultural practices have the potential to undermine the long-term sustainability

of the tourism such fragile regions (Badar & Bahadure, 2020; Kataya, 2021; Owais et al., 2024a; Sood, 2014).

Understanding the perspectives of both local residents and tourists is crucial in identifying these challenges and opportunities effectively. However, there is a notable gap in the research that effectively and comprehensively combines the perspectives of both local residents, and tourists. This study is uniquely positioned to bridge a critical gap in tourism research by simultaneously capturing and analysing the perspectives of both local residents and tourists in Ladakh. Unlike previous studies that often focus on a single stakeholder group, this research integrates the views of those who are directly impacted by tourism—local residents who provide services and endure the environmental and cultural impacts—and those who drive the industry's demand—tourists who seek experiences and contribute to economic growth. By combining these dual perspectives, the study offers a comprehensive understanding of the multifaceted challenges and opportunities within the tourism sector. This holistic approach emphasis on comparing and contrasting the viewpoints of locals and tourists, paving the way for targeted interventions that address the specific needs and concerns of both groups.

This study aims to identify the primary challenges encountered by the tourism industry in Ladakh and the primary opportunities for its development by utilising a robust methodological approach that includes Structural Equation Modelling after conducting Exploratory Factor Analysis and Confirmatory Factor Analysis. Through the analysis of two separate survey data from 384 locals and 384 visitors, this study offers a comprehensive knowledge of the elements that affect locals' support for tourism growth and tourists' happiness and inclinations to return.

This study's goals are to compare and identify the major opportunities and challenges in Ladakh's tourism sector as seen by both visitors and locals, investigate the connections between different elements and support for tourism growth, and offer useful information to those involved in tourism planning and management. It is anticipated that the study's conclusions would aid in the development of policies that maximise tourism's benefits while reducing its drawbacks.

In this paper, we first provide an overview of the pertinent literature before going into great depth on the study's methods. The outcomes of the descriptive analysis, Exploratory Factor Analysis, Confirmatory Factor Analysis, and Structural Equation Modelling are then examined for each of the datasets revealing the important factors for each of the survey groups and then a comparison of the results from the viewpoints of locals and visitors is presented. This is followed by conclusion.

Objectives of the study

- To identify and compare the major challenges and opportunities in Ladakh's tourism industry from the perspectives of local residents and tourists.

- Research questions
  - What are the significant challenges faced by the tourism industry in Ladakh?
  - What are the key opportunities for tourism development in Ladakh?
  - How do these perspectives differ between local residents and tourists?

2. Review of Literature

Local Residents: Hypothesis Development and Literature Review

Local communities play a crucial role in shaping the tourism industry's performance (Ayazlar, 2019; Brooks et al., 2023; J. K. L. Chan, 2023; Cheuk et al., 2015; Hamzah, 2021; Mak et al., 2017; Michael et al., 2013; Vujović et al., 2021). This section explores key positive and negative factors influencing local satisfaction and support for tourism development to identify the primary challenges and opportunities in the sector.

Tourism impacts society's ecology, economy, culture, and demographics, often leading to cultural shifts, fragmented norms, and environmental degradation (Uslu et al., 2020). The extent of these effects depends on a destination's carrying capacity, influencing how locals perceive and support tourism based on its social, economic, and environmental consequences (Hu & Xu, 2023; Kennell, 2016; Ramli et al., 2024).

The Ladakh region faces natural and man-made disasters, including earthquakes, flash floods, and landslides (Bhat et al., 2023). Over-tourism has adversely impacted both residents and tourist destinations, leading to ecological degradation through shifts in land and resource use (Baloch et al., 2023a; Gupta & Chomplay, 2021; A. Xu et al., 2024; Deb et al., 2023; Soheb et al., 2022). While tourism provides economic benefits, it depletes natural resources and environmental capital (Baloch et al., 2023). Conversely, it can also promote environmental awareness and community participation in waste management (Zhao & Li, 2018).

Hypotheses

- **H1:** The perceived environmental scope (ENS) of tourism significantly increases local residents' satisfaction with tourism advancement.
- **H2:** The perceived environmental challenges (ENC) of tourism significantly reduce local residents' satisfaction with tourism advancement.

Tourism offers numerous benefits, including increased income, improved living standards, employment opportunities, infrastructure development, and higher tax revenues (Öztürk et al., 2015; Pekerşen & Kaplan, 2023). However, it also brings challenges such as dependency on imports and rising costs of goods and services (Kariyapol & Agarwal, 2020; Scarlett, 2021). In Ladakh, tourism has become the main income source, with rapid growth in accommodations, dining, and travel services. Between 2011 and 2018, the number of lodging facilities and tour companies nearly quadrupled (Dolma, 2019). Travelers spent an estimated INR 196 Crore in the Leh region in 2011 (Pelliciardi, 2013), and tourism has been shown to significantly boost socioeconomic development and reduce poverty (Dar et al., 2019). Additionally, Uslu et al. (2020) found a strong link between local happiness and the perceived positive economic impact of tourism.

Hypotheses

- **H3:** The perceived Economic Scope (ECS) of tourism significantly increases local residents' satisfaction with tourism advancement.

- **H4:** The perceived Economic Challenges (ECC) of tourism significantly reduce local residents' satisfaction with tourism advancement.

Tourism offers socio-cultural benefits such as fostering cultural exchange, promoting peace, and appreciating diverse cultural norms and values (Öztürk et al., 2015; Ramkissoon, 2023). However, it also has drawbacks, including language disruptions, shifts in local identity, commercialization of traditional culture, loss of uniqueness, and cultural conflicts between tourists and host communities (Baloch et al., 2023c; Chong, 2020). Kozak et al. (2015) highlight that, while tourism can drive positive outcomes like urbanization, sanitation awareness, language acquisition, and cultural preservation, it may also lead to increased crime rates. Negative socio-cultural, economic, and environmental impacts perceived by locals influence their satisfaction with tourism development (Hecht et al., 2019).

Hypotheses

- **H5:** The perceived Socio-Cultural Scope (SCS) of tourism significantly increases locals' satisfaction with tourism advancement.
- **H6:** The perceived Socio-Cultural Challenges (SCC) of tourism significantly reduce locals' satisfaction with tourism advancement.

Infrastructural challenges, such as inadequate transportation, healthcare, security, and water supply, pose significant obstacles to tourism development (Castro et al., 2020; K. X. Li et al., 2018; Moses, 2021; Wang & Liu, 2020; Xu et al., 2024). Well-developed infrastructure enhances tourism destination competitiveness and appeal to visitors (Chan et al., 2023; Israilov et al., 2020; Melkani & Kumar, 2021; Ronghang & Sen, 2022; Turayev & Atamurodov, 2021).

Involving local communities in planning is key to addressing these challenges (Melkani & Kumar, 2021). Poor physical infrastructure negatively affects local satisfaction (Etminani-Ghasrodashti et al., 2017; Medeiros et al., 2021; Oyedele & Oyesode, 2019), while improved infrastructure enhances quality of life (Otegbulu & Adewunmi, 2009).

Hypothesis

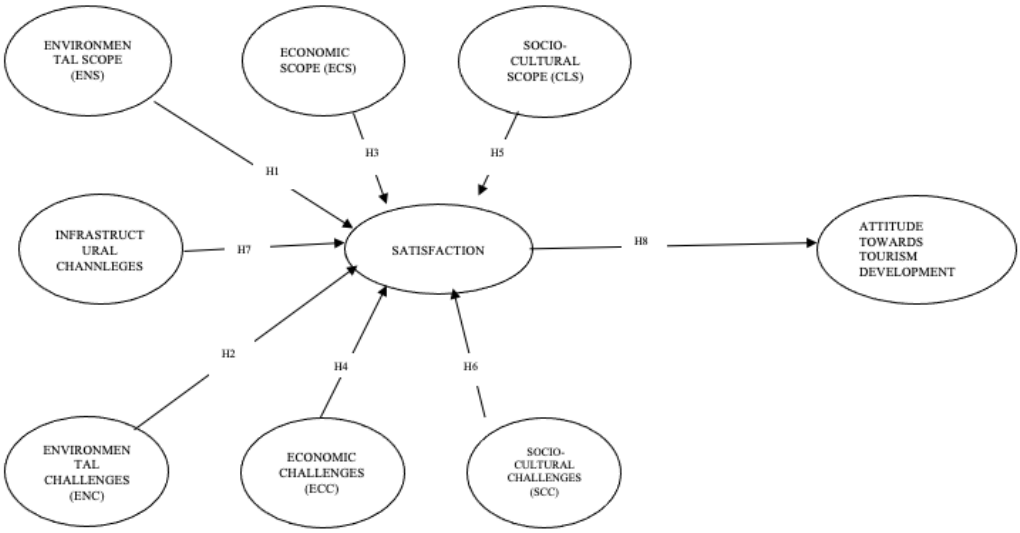
- **H7:** The perceived infrastructural challenges (INC) significantly reduce local residents' satisfaction with tourism development.

Several factors, such as perceived benefits, personal opinions, and community loyalty, influence local support for tourism (Brankov et al., 2019; Meyer et al., 2017; Öztürk et al., 2015). Tourism generates diverse economic, socio-cultural, and environmental impacts, with varying levels of benefit to the local community (Andronicean u, 2019; Szczepańska-Woszczyna & Kurowska-Pysz, 2016; Thetsane, 2019). Uslu et al. (2020) highlight that perceptions of these impacts significantly affect local satisfaction, which subsequently shapes attitudes toward tourism development.

Hypothesis

- **H8:** Satisfaction of local residents with tourism advancement significantly and positively impacts their attitude or support toward tourism development.

Figure 1: Hypothesised Model: Local Residents' Perspective



Tourists Perspective: Hypothesis Development and Literature Review

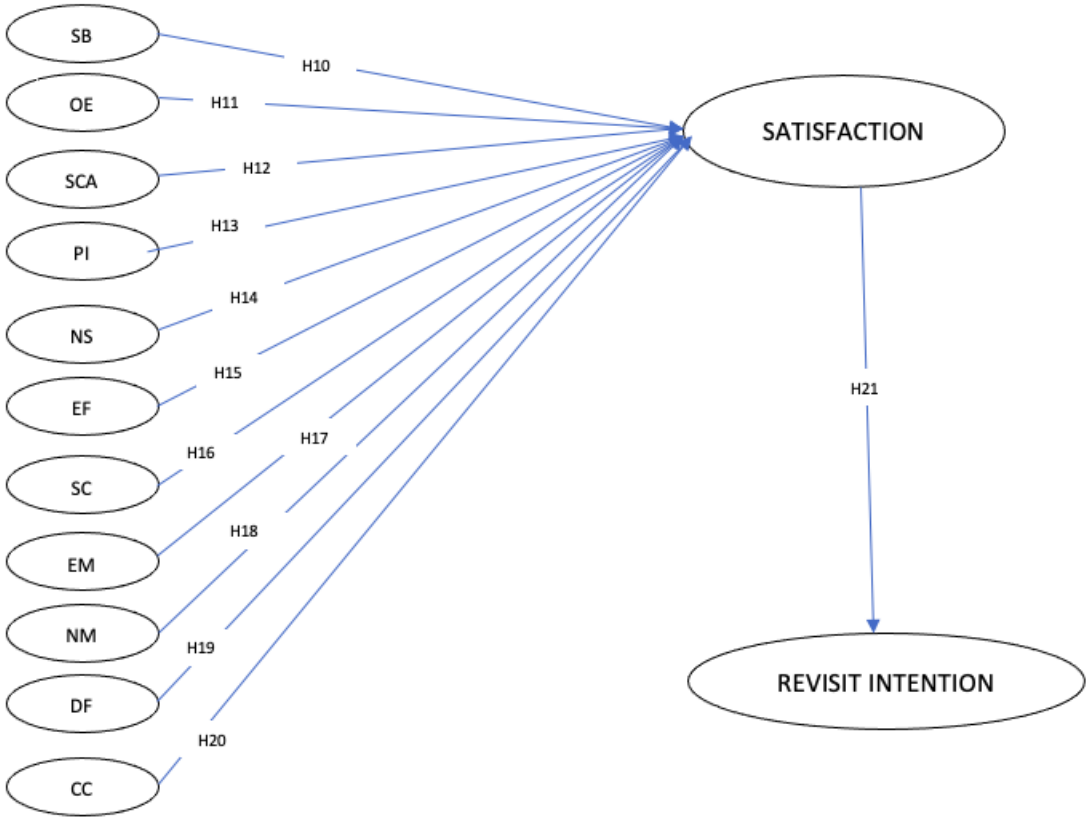
Measuring people's perceptions of a destination is crucial for improving the travel and tourism sector (Petrosillo et al., 2006; Rasoolimanesh et al., 2023; Seow et al., 2024). Individual preferences and values influence how tourists see the destination (Hall, 2005; Higham & Cohen, 2011; Scott et al., 2012). Therefore, this portion of the study identifies key elements that have a substantial influence on visitors' happiness and intention to return, which may present important opportunities or problems for the tourism industry in the future.

Tourist Satisfaction

Tourists are motivated to look for required goods or services to satisfy their needs. Tourists are thrilled when their vacation experiences surpass their expectations (Gnanapala, 2012; Seow et al., 2024). A destination's positive reputation is built and maintained by customer satisfaction and the degree to which goods and services available in a region either match or exceed the anticipation influence their revisit intention (Ćulić et al., 2021; Gnanapala, 2012, 2015; Siregar et al., 2021). Word of mouth communications, tangible assets and services have significant impact on customers' happiness and inadequate infrastructural facilities and amenities have adverse impact on tourist satisfaction (Akama & Kieti, 2003; Kim & Lee, n.d.; Zabkar et al., 2010). Destination image, tourist satisfaction and revisit intention are significantly influenced by service quality, destination trust, sustainable practices and overcrowding and under crowding (Papadopoulou et al., 2023; Siregar et al., 2021; Thipsingh et al., 2022).

This study adapts 13 constructs from previous studies and explores various factors and measures their impact on tourist satisfaction and revisit intentions as per the hypothesised model presented below:

Figure 2: Hypothesises Model: Tourists' Perspective



Null Hypothesis H10: The perceived SB of tourist has no impact on tourist satisfaction.

Null Hypothesis H11: The perceived OE of tourist has no impact on tourist satisfaction.

Null Hypothesis H12: The perceived SCA of tourist has no impact on tourist satisfaction.

Null Hypothesis H13: The perceived PI of tourist has no impact on tourist satisfaction.

Null Hypothesis H14: The perceived NS of tourist has no impact on tourist satisfaction.

Null Hypothesis H15: The perceived EF of tourist has no impact on tourist satisfaction.

Null Hypothesis H16: The perceived SC of tourist has no impact on tourist satisfaction.

Null Hypothesis H17: The perceived EM of tourist has no impact on tourist satisfaction.

Null Hypothesis H18: The perceived NM of tourist has no impact on tourist satisfaction.

Null Hypothesis H19: The perceived DF of tourist has no impact on tourist satisfaction.

Null Hypothesis H20: The perceived CC of tourist has no impact on tourist satisfaction.

Null Hypothesis H21: Tourist satisfaction has no impact on tourist revisit intention.

3. Data and Methodology

Primary data has been collected from 384 local residents and 384 tourists from both the districts of Ladakh i.e. Leh and Kargil.

The population determined for survey of local residents is the local community living in and around some of the major tourist hotspots of the two Districts. According to the tourist inflow figures provided by the Department of Tourism, a total of 3,64,906 tourists visited in the year 2021-22 (3,14,077 tourists visited Leh and 50829 visited Kargil in the ratio of 86:14 percent for Leh and Kargil). At least 384 individuals with a 5% error margin have been identified as the sample size that can accurately reflect the population, 95 percent confidence interval and 50 percent population proportion as per Krejcie and Morgan formula. Accordingly, the surveys have been applied to 384 local residents in the ratio of 86:14 from Leh and Kargil districts, respectively. Respondents have been selected through the purposive sampling technique to include households located in and around 5 km range of the major tourist hotspots of Kargil city, Baro area, Drass War memorial, Hunderman village, Drang Drung Glacier, Maitreya Buddha statue from Kargil district and Leh city, Thiksey monastery, Hemis monastery, Alchi, Shey, Pangong Lake, Tsomoriri Lake, Changspa village near Shanti Stupa, Sankar Village, Hunder in Nubra Valley, Disket in Nubra Valley and Nimo Village market area from Leh district. Data has been collected between June 2023 and February 2024. The information gathered came from both in-person and telephone interviews. The scales used in the research have been formulated with the help of literature and validated through CVR calculation using inputs from nine researcher, field experts and academicians.

For surveying tourists, 384 sample size has been selected using the same criteria. Tourist have been surveyed from various tourist destinations of Ladakh and have been approached during moments of relaxation or when they seem to have some spare time. The survey was conducted in the peak tourist season between the month of April 2024 and August 2024. The data obtained has been collected using face to face interviews.

Analytical Techniques

In order to thoroughly examine the perspectives of the local community and tourists, Exploratory Factor Analysis was conducted using Principal Component Analysis and Varimax Rotation.
Several constructs and items have been reduced from the Structural Equation Model of both the datasets to enhance the model fitness. Validity and Reliability tests of the constructs have been undertaken using Cronbach Alpha, Composite reliability (CR), AVE and MSV for each construct (Dey et al., 2013; Ezeuduji & Mhlongo, 2019; Helen & Praise, 2020).
The structural model and Confirmatory Factor Analysis has been worked on AMOS 24 and Exploratory Factor Analysis has been worked on SPSS 27. Various model fitness indices have been calculated and assessed.

Local Residents' Perception: Scales and Factors

The scales for assessing the perspective of local residents were developed through an extensive literature review and feedback collected from nine academicians and field experts. Following this process, the Content Validity Ratio was calculated, resulting in the removal of irrelevant items (Anjana & Choudhuri, 2018).

Items were measured on a five point Likert Scale ranging from highly satisfied to highly dissatisfied. Out of total of 42 items forming 12 Constructs, a final set of 9 constructs consisting of 31 items have been retained for analysis of structural model in AMOS 24 post Exploratory Factor Analysis and Confirmatory Factor Analysis. Final Constructs are Economic Scope (ECS), Socio-Cultural Scope (SCS), Environmental Scope (ENS), Economic Challenge (ECC), Socio-Cultural Challenge (SCC), Environmental Challenge (ENC) and Infrastructural Challenge (INC).

Tourists Perception: Scales and Factors

The scales used in studying tourist perspective have been taken from existing research. For sampling tourists, eleven constructs measuring facilities, attractions and challenges have been adapted from Jangra et al. 2021 which are Social Barrier (SB); Organizational Efforts (OE); Socio-cultural attractions (SCA); Pollution Issues (PI); Networking Services (NS); Elementary Facilities (EF); Supplementary Conveniences (SC); Environmental Management (EM), Natural Magnetism (NM), Destination Fears (DF) and Carriage Concerns (CC). The construct Satisfaction (SF) has been adapted from Viet et al., 2020. The construct of Revisit Intention (RV) has been adapted from Pai et al., 2020.

Items were measured on seven point Likert Scale ranging from extremely dissatisfied to extremely satisfied. Out of the total of 13 constructs consisting of 48 items, 12 constructs and 46 items have been retained for the analysis of the structural model.

4. Results and Findings

Local Residents: Descriptive Statistics

Exploratory Factor Analysis and Extracted Constructs

The preliminary results indicated that all communalities exceeded 0.50, with the exceptions of ECS5 and GCC3. The initial analysis identified 12 factors that collectively accounted for 80.3% of the data's variance, as indicated by the Average Variance Extracted (AVE). Items ENC4, ECS5, SCC1, SCC2 and CLS5 have been removed post Exploratory Factor Analysis due to cross loading and insufficient loading.

Exploratory Factor Analysis: Repeated Results

Following the repetition of Exploratory Factor Analysis after deleting insignificant items, all communalities were found to be above 0.5, with most exceeding 0.7, except for two items: CLS3 and GCC3.

Three items measuring Green Coverage Challenges (GCC) and three items measuring Biodiversity Challenges (BDC) were grouped under a single factor post Exploratory Factor Analysis. These items addressed various environmental aspects of tourism, such as the extent of human-wildlife conflict, disturbance to high-altitude birds, biodiversity disruption, reduction in forest cover, decline in vegetation and agricultural practices, and the lack of environmentally sustainable tourism management practices. The public's responses indicated that the challenges posed by tourism to biodiversity and green coverage were perceived similarly, justifying their combination under a single construct. Consequently, these six items were consolidated and named Biodiversity Challenges (BDC).

Table 1: Exploratory Factor Analysis: Study of Local Residents' Perspective

KMO Measure of Sampling Adequacy.		**0.786**
Bartlett's Test of Sphericity	Chi-Square	16481.373
	Degrees of freedom	666
	Significance	0

Descriptive Statistics, Communalities of Statements and Factor Loadings

Items	**Communalities**	**FACTOR LOADING***	**Cronbach's Alpha (revised)**	**FACTOR LABEL**
ECS1	0.736	0.816	0.878	ECONOMIC SCOPE (ECS)
ECS2	0.86	0.908		
ECS3	0.668	0.748		
ECS4	0.776	0.857		
CLS1	0.817	0.853	0.824	CULTURAL SCOPE (CLS)
CLS2	0.745	0.798		
CLS3	0.478	0.58		
CLS4	0.712	0.793		
ENS1	0.799	0.856	0.877	ENVIRONMENTAL SCOPE (ENS)
ENS2	0.831	0.838		
ENS3	0.797	0.83		
INC1	0.724	0.846	0.828	INFRASTRUCTURAL CHALLENGES (INS)
INC2	0.805	0.891		
INC3	0.731	0.838		
SCC3	0.867	0.924	0.871	SOCIO0CULTURAL CHALLENGES (SCC)
SCC4	0.742	0.856		
SCC5	0.891	0.94		
ECC1	0.969	0.983	0.963	ECONOMIC CHALLENGES (ECC)
ECC2	0.965	0.981		
ECC3	0.869	0.931		
ENC1	0.969	0.846	0.956	ENVIRONMENTAL CHALLENGES (ENC)
ENC2	0.809	0.878		
ENC3	0.958	0.84		
ENC5	0.961	0.836		
BDC1	0.943	0.938	0.944	BIO-DIVERSITY CHALLENGES (BDC)
BDC2	0.929	0.92		
BDC3	0.818	0.826		

GCC1	0.935	0.931			
GCC2	0.897	0.941			
GCC3	0.353	0.53			
STD1	0.815	0.824	0.863		
STD2	0.752	0.743		SATISFACTION	
STD3	0.788	0.79			
ATT1	0.715	0.783	0.893		
ATT2	0.735	0.765		ATTITUDE	
ATT3	0.82	0.846			
ATT4	0.782	0.831			

**** Extracted using PCA and Varimax Rotation with Kaiser Normalization and converged in 6 iterations.***

Tourist Perception: Exploratory Factor Analysis

The table below presents the results of Exploratory Factor Analysis. First, the KMO Measure of Sampling Adequacy is 0.783, validating the suitability of the data for factor analysis. All communalities for the items listed are above 0.8 except the lowest communality of 0.720 for SB4. High Cronbach's Alpha indicates that the internal consistency (reliability) of the items within each factor to be good.

The highest satisfaction levels are observed in Natural Magnetism, Satisfaction, Socio-Cultural Attractions, and Environmental Management, indicating strong points for tourism promotion. Conversely, Networking Service, Carriage Concerns, Elementary Facilities, and Organizational Efforts are perceived as challenges that require significant improvement to enhance the overall tourism experience and foster loyalty.

Table 2: Exploratory Factor Analysis: Study of Tourists' Perspective

KMO Measure of Sampling Adequacy.					**0.783**
Bartlett's Test of Sphericity		Chi-Square			41439.715
		Degrees of freedom			1128
		Significance			0.00
Items	Mean	**Communalities**	**FACTOR LOADING***	**Cronbach's Alpha (revised)**	**FACTOR LABEL**
SB1	5.91	0.907	0.901	0.932	SOCIAL BARRIER (SB)
SB2	5.91	0.937	0.926		
SB3	5.89	0.867	0.894		
SB4	5.88	0.720	0.816		
OE1	3.03	0.938	0.94	0.973	ORGANISATIONAL EFFORTS (OE)
OE2	3.06	0.957	0.951		

OE3	3.1	0.92	0.935		
OE4	3.01	0.942	0.945		
OE5	3.08	0.785	0.859		
SCA1	5.54	0.992	0.935	0.993	SOCIO-CULTURAL ATTRACTIONS (SCA)
SCA2	5.54	0.986	0.93		
SCA3	5.55	0.976	0.926		
SCA4	5.55	0.968	0.917		
PI1	5.65	0.986	0.941	0.991	POLLUTION ISSUES (PI)
PI2	5.66	0.991	0.944		
PI3	5.62	0.972	0.937		
NS1	2.48	0.918	0.888	0.973	NETWORKING SERVICE (NS)
NS2	2.46	0.967	0.92		
NS3	2.47	0.962	0.917		
EF1	3.96	0.945	0.899	0.987	ELEMENTARY FACILITIES (EF)
EF2	3.93	0.982	0.913		
EF3	3.91	0.961	0.896		
EF4	3.94	0.973	0.916		
SC1	4.68	0.868	0.789	0.949	SUPPLEMENTARY CONVENIENCE (SC)
SC2	4.59	0.968	0.883		
SC3	4.51	0.917	0.881		
EM1	5.29	0.935	0.889	0.984	ENVIRONMENTAL MANAGEMENT (EM)
EM2	5.25	0.985	0.927		
EM3	5.22	0.945	0.904		
EM4	5.23	0.964	0.914		
NM1	6.83	0.988	0.951	0.988	NATURAL MAGNETISM (NM)
NM2	6.83	0.986	0.945		
NM3	6.82	0.961	0.929		
DF1	6.06	0.936	0.919	0.952	DESTINATION FEARS (DF)
DF2	6.03	0.949	0.922		
DF3	6.01	0.938	0.933		
DF4	5.89	0.769	0.801		
CC1	2.32	0.833	0.814	0.828	CARRIAGE CONCERNS (CC)
CC2	2.22	0.908	0.91		
SF1	5.96	0.96	0.886	0.996	SATISFACTION (SF)
SF2	5.97	0.994	0.891		
SF3	5.96	0.983	0.878		

SF4	5.97	0.991	0.886		
SF5	5.98	0.99	0.879		
RV1	4.90	0.992	0.865	0.995	REVISIT INTENTION (RI)
RV2	4.89	0.991	0.857		
RV3	4.91	0.969	0.862		
RV4	4.91	0.993	0.876		

Local Residents: Reliability and Validity

The CR values for the constructs exceed the 0.7 threshold, indicating good internal consistency.

All constructs have AVE values above the acceptable 0.5 level, indicating strong convergent validity. The MSV values are consistently lower than the AVE values, ensuring excellent discriminant validity. α values confirm good internal consistency and convergent validity for all of the constructs. The low MSV values relative to AVE ensure discriminant validity, and the high MaxR(H) values suggest strong reliability.

Table 3: Reliability and Validity of Scales: Study of Local Residents' Perspective

	CR	**AVE**	***α***	**MSV**	**MaxR(H)**
SCC	0.794761	0.568263	0.871	0.005476	0.939058
ECS	0.8397	0.539479	0.878	0.072361	0.915681
CLS	0.822854	0.503144	0.824	0.237169	0.918625
ENS	0.813689	0.555376	0.877	0.237169	0.897195
ENC	0.904768	0.706175	0.956	0.005476	1.006211
ECC	0.976170	0.9318	0.963	0.005929	0.983387
INC	0.787598898	0.737280333	0.828	0.007056	0.918723

Tourists: Reliability and Validity

In all cases, CR > 0.7, AVE > 0.5, and CR > AVE, which confirms convergent validity for all constructs. Similarly, for all constructs where MSV is available, AVE > MSV, meaning there are no concerns for discriminant validity.

Table 4: Reliability and Validity of Scales: Study of Tourists' Perspective

Factors	**CR**	**AVE**	**MSV**
NM	0.99	0.97	0.11
EF	0.99	0.95	0.22
OE	0.97	0.88	0.09

PI	0.99	0.97	0.22
NS	0.97	0.93	0.22
SCA	0.99	0.97	0.22
SB	0.95	0.81	0.09
EM	0.98	0.94	0.15
DF	0.96	0.85	0.09
SC	0.85	0.66	0.57

Local Residents: Results of Confirmatory Factor Analysis

Confirmatory Factor Analysis was conducted subsequent to Exploratory Factor Analysis, utilizing the ten factors that were identified and retained through the Exploratory Factor Analysis process. To test the hypothesized relationships, Structural Equation Modelling was performed. To improve the model fitness BDC has been deleted from the structural model.

The estimates of the path analysis reveal that the benefits of tourism development as perceived by local residents impacts the level of satisfaction of the locals significantly and positively. This is shown by less than 1 percent level of significance of the constructs ENS, CLS and ENS on SATISFACTION. However, the impact of challenges in form of ENC, ECC and SCC on SATISFACTION although negative are not statistically significant. INC shows neither significant not negative implications on the level of SATISFACTION. The impact of SATISFACTION on attitude of locals towards tourism development (ATTITUDE) is found to be highly positive and significance.

Thus, the results show that the satisfaction of local residents is significantly impacted by factors such as economic benefits, environmental benefits and cultural benefits.

Hypothesis Testing

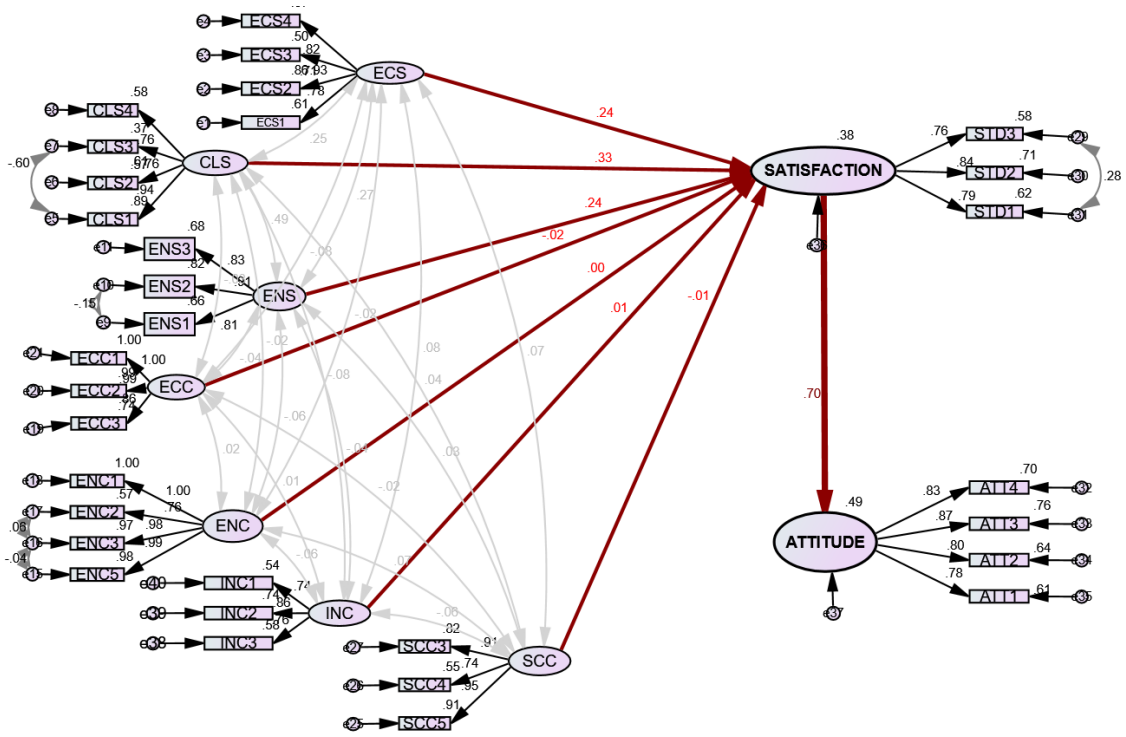
SEM analysis shows that Environmental Scope (ENS), Economic Scope (ECS), and Cultural Scope (CLS) positively influence local satisfaction, while Environmental Challenges (ENC), Economic Challenges (ECC), Socio-Cultural Challenges (SCC), and Infrastructural Challenges (INC) have negligible effects. Satisfaction strongly impacts attitudes towards tourism development (H8 supported, weight = 0.698, $t = 11.238$, $p < 0.001$), emphasizing its role in shaping positive support for tourism.

Table 5: Path Analysis and Hypothesis Testing of Local Residents' Perspective Analysis

Path			**Standardised Regression Weights**	**S.E.**	**t value**	**P value**	**Hypothesis Results**
SATISFACTION	<--	ECS	0.239	0.051	4.431	***	H3: Hypothesis supported
SATISFACTION	<--	CLS	0.331	0.04	5.504	***	H5: Hypothesis supported
SATISFACTION	<--	ENS	0.243	0.04	3.928	***	H1: Hypothesis supported

SATISFACTION	<--	ENC	0	0.046	-0.002	0.998	H2: Hypothesis not supported
SATISFACTION	<--	ECC	-0.016	0.052	-0.338	0.735	H4: Hypothesis not supported
SATISFACTION	<--	SCC	-0.011	0.065	-0.229	0.819	H6: Hypothesis not supported
SATISFACTION	<--	INC	0.01	0.043	0.19	0.85	H7: Hypothesis supported
ATTITUDE	<--	SATISFACTION	0.698	0.063	11.238	***	H8: Hypothesis supported

Figure 3: STRUCTURAL MODEL: LOCAL RESIDENTS' PERSPECTIVE



Model Fit Indices

The model fitness table below represents a comprehensive evaluation of a structural equation model using various fit indices, each compared against established benchmarks as suggested by Hu and Bentler (1999).

Table 6: Model Fit Indices: Study of Local Residents' Perspective

Measure	Estimate	Threshold*	Interpretation
CMIN	765.591	--	--
DF	400.000	--	--
CMIN/DF	1.914	Between 1 and 3	Excellent
CFI	0.967	>0.95	Excellent
SRMR	0.049	<0.08	Excellent

RMSEA	0.049	<0.06	Excellent
PClose	0.635	>0.05	Excellent
TLI	0.962	>0.95	Excellent
IFI	0.967	>0.95	Excellent
GFI	0.90	>0.9	Acceptable

**Hu and Bentler (1999) calculated using Gaskin, J. & Lim, J (2016) AMOS Plugin.*

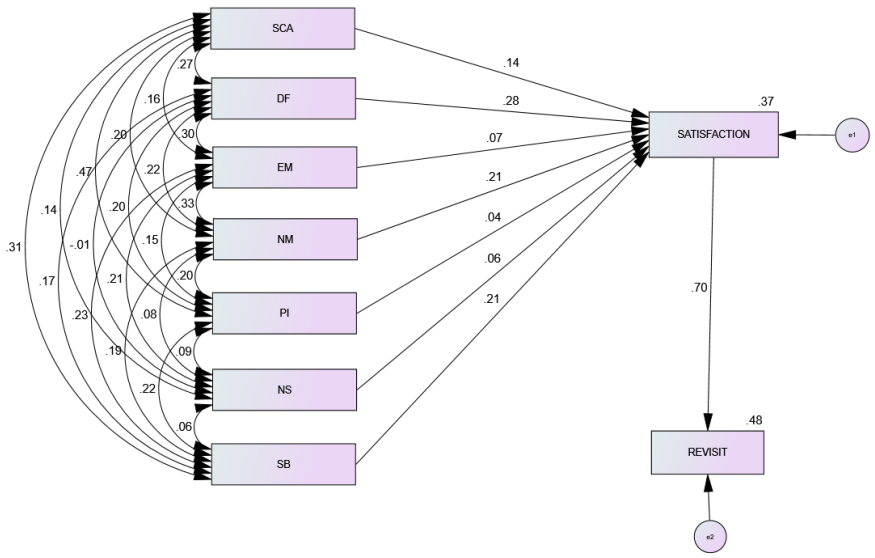
Tourists Perspective: Confirmatory Factor Analysis

To improve model fitness, imputed values were used, and constructs CC, SC, EF, and OE were excluded to enhance GFI. SEM results show that Social Barriers (SB), Socio-Cultural Attractions (SCA), Natural Magnetism (NM), and Destination Fears (DF) positively influence Satisfaction, which strongly drives Revisit Intentions. Pollution Issues (PI), Environmental Management (EM), and Networking Services (NS) have no significant impact on Satisfaction.

Table 7: Path Analysis and Hypothesis Testing of Local Residents' Perspective Analysis

Path			**Standardised Regression Weights**	**S.E.**	**t value**	**P value**	**Hypothesis Results**
SATISFACTION	<---	SB	0.21	0.056	4.811	***	H10: Hypothesis Supported
SATISFACTION	<---	SCA	0.142	0.034	2.941	0.003	H12: Hypothesis Supported
SATISFACTION	<---	PI	0.037	0.032	0.791	0.429	H13: Hypothesis Not Supported
SATISFACTION	<---	EM	0.073	0.038	1.583	0.113	H17: Hypothesis Not Supported
SATISFACTION	<---	NS	0.059	0.041	1.408	0.159	H14: Hypothesis Not Supported
SATISFACTION	<---	NM	0.211	0.063	4.791	***	H18: Hypothesis Supported
SATISFACTION	<---	DF	0.281	0.036	6.336	***	H19: Hypothesis Supported
REVISIT	<---	SATISFACTION	0.696	0.05	18.974	***	H21: Hypothesis Supported

Figure 4: STRUCTURAL MODEL: TOURIST PERSPECTIVE



Additionally,

Null Hypothesis H11: Is not supported and OE is not supported by the model.

Null Hypothesis H15: Is not supported and EF is not supported by the model.

Null Hypothesis H16: Is not supported and SC is not supported by the model.

Null Hypothesis H20: Is not supported and CC is not supported by the model.

Model Fit Indices

The model fit indices suggest a strong overall fit: CMIN/DF = 3.092 (acceptable), CFI = 0.980 (very good), SRMR = 0.028 (excellent), GFI = 0.988 (very good), AGFI = 0.922 (good but slightly below excellent), IFI = 0.981 (very good), NFI = 0.972 (strong), and RMSEA = 0.074 (acceptable). Most indices indicate an excellent fit, with minor concerns regarding AGFI and CMIN/DF, highlighting room for slight improvement. Overall, the model is considered well-fitted and reliable.

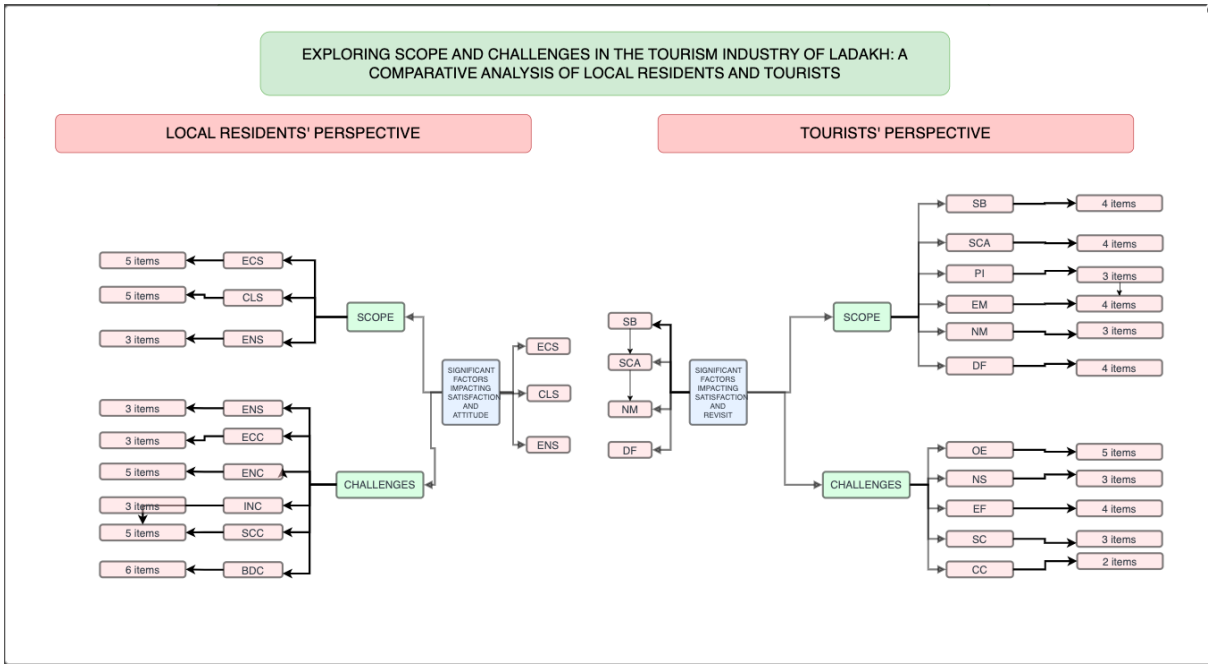
Table 8: Model Fit Indices: Study of Local Residents' Perspective

Measure	Estimate	Threshold	Interpretation
CMIN	21.647	--	--
DF	7.000	--	--
CMIN/DF	3.092	Between 1 and 3	Acceptable
CFI	0.980	>0.95	Excellent
SRMR	0.028	<0.08	Excellent
GFI	0.988	>0.95	Excellent
AGFI	0.922	>0.95	Excellent
IFI	0.981	>0.95	Excellent
NFI	0.972	>0.95	Excellent
RMSEA	0.074	<0.06	Acceptable
PClose	0.114	>0.05	Excellent

5. Findings from Study of Perception of Local Residents and Tourist: A Comparison

Structural model analysis highlights that environmental scope, socio-cultural scope, and economic benefits positively impact locals' satisfaction, which influences their attitude and support for tourism. However, challenges in these areas do not significantly affect satisfaction or support. Key factors for locals are economic, environmental, and socio-cultural scopes, making them crucial for tourism development in Ladakh.

Figure 5: A Comparative Analysis



For tourists, Confirmatory Factor Analysis and SEM reveal that socio-cultural attractions, natural magnetism, social barriers, and destination fears significantly affect satisfaction and revisit intentions. These factors are essential for tourism development in Ladakh.

Both analyses underscore the importance of socio-cultural elements, natural magnetism, and economic benefits. Locals value tourism for economic growth and sustainability, while tourists prioritize cultural attractions and safety. These insights can guide policymakers to align strategies with locals' and tourists' needs, fostering a sustainable and thriving tourism industry.

6. Conclusion

This study provides a comprehensive analysis of various challenges and potentials of the tourism industry in Ladakh, utilizing perspectives from both local residents and tourists. The study works on two separate datasets which has been collected from 384 local residents and 384 tourists, sampled using convenience sampling from Leh and Kargil, reflecting the ratio of tourist visits to these districts. The study rigorously tested the reliability and validity of constructs through Exploratory Factor Analysis, followed by Confirmatory Factor Analysis and Structural Equation Model to assess model fitness.

The study finds that socio-cultural aspects, natural magnetism, and economic benefits are pivotal for developing a sustainable tourism industry in Ladakh. By addressing both the aspirations of local

residents and the expectations of tourists, policymakers and stakeholders can formulate strategies that foster a thriving tourism sector that benefits all parties involved. The study underscores the necessity of a balanced approach that integrates cultural, environmental, and economic considerations to ensure the long-term success and sustainability of tourism in Ladakh.

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