



Exploring the interplay of tourism impacts, quality of life, and community engagement in developing sustainable nature-based tourism in Pakistan

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Abstract Nature-based tourism is experiencing significant growth in Pakistan, holding substantial potential to enhance the well-being of mountain communities that have limited livelihood options. This study delves into the perceptions of local mountain communities regarding the economic, social, and environmental facets of tourism development and how these perceptions influence both their material and non-material aspects of life, ultimately shaping their support for sustainable tourism in the area. Focusing on the unique context of Hunza Valley in Gilgit-Baltistan, Pakistan, the study encompasses 528 mountain residents. The study finds a positive correlation between residents' perception of the economic benefits of tourism and their overall quality

of life, underscoring the critical role of economic advantages in elevating well-being. It also unveils that the perceived sociocultural impact of tourism has a favorable influence on the quality of life, encompassing both tangible and intangible dimensions, emphasizing the significance of cultural interactions and recreational opportunities in enhancing the overall well-being of residents. Intriguingly, the research reveals a link between the perceived environmental impacts and non-material aspects of life, indicating a close relationship between environmental sustainability, psychological well-being, and overall quality of life. This study underscores the positive association between a higher quality of life and residents' support for sustainable tourism development, indicating that contented residents are more inclined to endorse initiatives that promote economic, social, and environmental sustainability in tourism development.

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Introduction

Tourism holds significant appeal for economic development in both developing and developed countries (Adedoyin et al., 2021; Tecel et al., 2020), especially in rural mountain regions of the world where local communities have limited livelihood options, and

tourism has great potential to grow (Ali, 2023; Ali & Shedayi, 2023). However, to realize this potential, it is essential to ensure that local communities actively participate in tourism development (Sharma and Hasti (2023). Community involvement at the grassroots level fosters self-reliance and, subsequently, improves the living standards of the local population (Cooper & Hall, 2016; Sakata & Prideaux, 2013). When managed effectively and with genuine local community engagement, tourism can offer better livelihoods to the local population and contribute to ecological preservation and socio-cultural development (KC et al., 2015; de Haas, 2002). For local economic development, tourism can contribute immensely, especially in areas with limited alternative income sources and regions grappling with high poverty and unemployment rates (Ashley, 2006; Mitchell & Coles, 2009). In such contexts, tourism offers various economic opportunities for the local community, including job prospects for youth and women, the chance to establish various enterprises, the attraction of investments in the economy alongside non-economic advantages such as capacity building, facilitating cultural exchange, and enhancing sectors like transportation, telecommunications, water supply, and healthcare (Sakata & Prideaux, 2013). Tourism also plays a pivotal role in environmental restoration while helping to alleviate conflicts related to resource utilization, and by providing additional income, it can discourage environmentally damaging economic activities such as intensive farming, mining, and commercial fishing (Hunt et al., 2014; Ambe et al., 2010; Tokalu, 2005).

Gilgit-Baltistan, located in the extreme north of Pakistan, boasts a breathtaking mountainous terrain that has garnered considerable attention as a sought-after tourist destination. Travelers are lured to this area by its wide array of outdoor activities, cultural attractions, and natural beauty. The region's natural landscapes, options for summer getaways, winter sports opportunities, and rich cultural heritage have all contributed to the flourishing tourism industry, with positive socio-cultural effects (Ali, 2022). Significantly, the improved security situation in the region has played a pivotal role in attracting domestic and international visitors. Establishing infrastructure via the China-Pakistan Economic Corridor (CPEC) and enhancing road networks have facilitated this upsurge in tourism (Baig & Zehra, 2020; Baig et al., 2019). Consequently, tourism is emerging as a

crucial economic driver for the mountain communities in the area. Nonetheless, for this burgeoning trend to bring sustained benefits to the region, developing the tourism sector that fosters socio-cultural growth and the local economy over the long haul is imperative. Communities aspiring to cultivate tourism as an alternative industry for economic advancement must embrace a sustainable approach that aligns with the preferences and aspirations of their residents (Puczko & Ratz, 2000). This entails increasing the participation of residents in tourism-related employment and fostering indigenous enterprises (Gursoy & Rutherford, 2004). Furthermore, preserving socio-cultural sustainability involves utilizing local products and safeguarding traditional skills to ensure the region's cultural heritage remains intact and contributes to the tourism experience. Environmental sustainability is a pressing concern in the region, given its susceptibility to climatic variations, including glacier dynamics and mountain lake ecosystems. Recent history has witnessed severe challenges for local communities, including glacial outbursts, droughts, and avalanches, which have displaced residents and posed significant risks to their lives and livelihoods. Consequently, it is imperative to establish sustainable infrastructure, manage water resources efficiently, and implement strategies to address climate change and its associated impacts. These measures, alongside their importance for the safety and well-being of the local community, are also vital for sustainable tourism development (Baig & Zehra, 2020).

In the case of Gilgit-Baltistan community support for tourism development is less examined area whereas, scholars have examined other dimensions of tourism such as economic contribution of tourism (Karim et al., 2021a, 2021b), welfare valuation of tourism (Ali, 2023), residents perception of tourism development (Nazneen et al., 2020), tourists' willingness to pay for nature-based tourism (Ali & Shedayi, 2023), climate change an tourism (Baig et al., 2021). This study is thus, focused on exploring the intricate relationship between local community engagement in tourism, their perception of tourism's effects, various aspects of their well-being, and their support for sustainable tourism development in the mountainous regions of Pakistan. The primary objective is to gain insights into how the local community's participation in tourism influences their overall quality of life and their inclination to endorse sustainable tourism

practices. This research underscores the importance of comprehending how local community participation affects their well-being, considering the unique tourism dynamics in Pakistan's mountainous areas. There is a noticeable gap in empirical research on community engagement in tourism and the repercussions associated with quality of life in these regions. Consequently, the potential linkages between community participation and sustainable tourism development in such areas remained inadequately explored. This study intends to fill this void in our understanding. This research is expected to bridge the literature gap and provide the necessary impetus for policy practitioners. It underscores the imperative nature of inclusive community participation in tourism development. This study accentuates that sustainable tourism practices should strike a harmonious balance between harnessing economic advantages from tourism and responsibly managing its socio-cultural and environmental impacts. In essence, this case study highlights the necessity for an all-encompassing approach to tourism development that benefits both the local community and the environment within which tourism operates.

Literature review

Tourism significantly connects with the local community's well-being, as per the World Health Organization (WHO). Well-being encompasses the overall satisfaction with the daily lives of individuals, influenced by socio-economic, cultural, and environmental conditions. Within tourism development, the quality of life is intricately intertwined with how tourism impacts residents and their communities. While numerous research studies have examined residents' perspectives on how tourism affects communities and the environment, the complementary effects of tourism on quality of life have been relatively least concerned area (Allen, 1990; Andereck & Nyaupane, 2011). In recent years, research has increasingly concentrated on how tourism is perceived to affect the quality of life of individuals in destination areas. Greiner (2010) discovered that the perceived impacts of tourism on the quality of life and standard of living are interconnected with various factors, including the level of economic development, local socio-cultural attributes, and the degree of tourism in the

destination area. The economic impacts individuals perceive due to tourism are closely tied to the level of economic development in the destinations, with high levels generally resulting in positive perceptions of economic effects. In contrast, lower levels often lead to negative perceptions (López-Guzmán et al., 2011). Likewise, Eslami et al. (2019) suggest that the residents of Langkawi Island support sustainable tourism development, and their perception of the positive impacts outweighs the negative ones. The research also explained how residents' attachment to the community influences their perception of the impact of tourism on different aspects of life satisfaction, leading to support for sustainable tourism development.

The perceived impacts of tourism on the overall quality of life are also associated with local socio-cultural attributes, such as the extent of acculturation and local community participation in tourism-related activities. Destinations with higher levels of acculturation and local engagement in tourism activities tend to experience more favorable perceived impacts on the standard of living (Chen & Li, 2017). The overall quality of life comprises two distinct dimensions: non-material and material aspects. Concerning material aspects, tourism can bring economic benefits to a community, such as increased job opportunities and income. However, increased economic activity can also result in higher living costs, competition for resources, and a decline in residents' overall standard of living (Nelson, 2012). Regarding the non-material aspect, tourism can affect life quality in both ways, i.e., positively and negatively. To a positive extent, it can enhance cultural pride, preserve traditions, and facilitate cultural exchange. Conversely, tourism can lead to heightened stress levels, intercultural competition, and a homogenization of cultures (Nopiyani & Wirawan, 2021). Hence, quality of life arguably plays a critical role in sustainable tourism development, as it shapes residents' attitudes towards tourism and inculcates support for related initiatives. Gursoy and Rutherford (2004) observed that residents who perceived an improved quality of life due to tourism development were more likely to support sustainable tourism initiatives. Liang and Hui (2016) delved into how quality of life and residential status are instrumental in determining support for sustainable tourism, especially concerning non-material aspects of life. Likewise, Gautam (2023) found that residents' quality of life positively influenced their support for

sustainable tourism development. The integrated model accounted for 27.25% of the variation in support.

Nevertheless, to harness the full potential of tourism in a region, it is essential to emphasize proper planning and the effective implementation of policies for tourism development. Long-term planning is crucial for promoting sustainable tourism (Choi and Sirakaya, 2006). Tourism can have significant adverse consequences without such measures, particularly in environmentally fragile regions like Gilgit-Baltistan in Pakistan (Ali, 2023; Ali & Shedayi, 2023). Likewise, the rapid urbanization in the region alarms disturbing the trends of rural tourism (Baig et al., 2019; Baig & Hussain, 2020). These negative impacts can manifest as ecological degradation and socio-cultural costs (Ali et al., 2021). Given the vulnerability of such regions, sustainable tourism development becomes of utmost importance. In this approach, the local community takes on a central role, as they are the direct recipients of the impacts of tourism. Furthermore, sustainable community tourism development represents an alternative philosophy for planning and achieving developmental goals (Chili, 2015). To this end, community participation becomes pivotal in determining the community's perception of sustainable tourism (Sheldon and Abenoja, 2001; Choi & Murray, 2010). Sustainable tourism development attitudes among community residents lead to greater personal environmental responsibility and increased community participation. This results in improved residents' quality of living and enhanced visitor tourism experiences (Cheng et al., 2019). On the contrary, research was conducted in Ba Be National Park regarding residents' support for tourism development. Only residents who believe in tourism's social and environmental benefits support additional tourism development, and perceptions of local benefits do not relate to residents' support for tourism activities (Huong & Lee, 2017)). The limited knowledge of positive local tourism impacts among residents could be a possible explanation for this. It is widely acknowledged that the local community's perception of tourism and development is crucial to achieving sustainable tourism (Murphy, 1985; Karim et al., 2021b). If the local community views tourism as a secure and advantageous undertaking, they are more inclined to contribute to sustainable tourism development in the destination. Recognizing the degree of involvement of the local community and

its active participation in tourism-centered planning influences the prosperity and sustainability of tourism in the destinations. To gauge citizens' perceptions of Community-Based Tourism (CBT) as a sustainable development strategy for rural regions in Kenya, Juma and Khademi-Vidra (2019) argue that integrating CBT with agriculture and other economic activities can promote sustainable development. Nevertheless, they consider capacity-building programs and technical support essential for unlocking CBT's full potential in Kenya's rural regions and contributing to the sustainability of socio-economic and physical environments.

Community participation and environmental sustainability are indirectly associated with tourism development, influenced by how residents perceive the effects of tourism in tourist destinations. Consequently, these elements are intricately intertwined with residents' endorsement of sustainable tourism in these locales. It highlights the importance of exploring missing mechanisms in residents' attitudes research, such as social impacts, trust, place attachment, pro-social and pro-environmental behaviors, and support for tourism development (Pezeshki et al., 2023). Their study found five strategies for sustainable tourism in small heritage sites: meet demand, provide emotional support, engage in promotional activities, support economic activities, and encourage user activities: cultural and historical awareness, community attachment, individual characteristics, and community. Nevertheless, by engaging stakeholders, including residents, in the tourism planning process, this framework can guide destination managers, marketers, community planners, and policymakers in developing planning, development, and crisis recovery strategies (Ramkissoon, 2023).

Methodology

Study site

Gilgit-Baltistan, located in the northern reaches of Pakistan, is a high mountainous region with a population of approximately two million. This region offers an abundance of tourism and recreational opportunities, catering to domestic and international tourists. Encompassing a vast expanse of 72,496 square kilometers, it shares geographical boundaries with the Xingjian province of China to the northeast,

Wakhan of Afghanistan to the north, the occupied Jammu and Kashmir region of India to the south-east, and Azad Jammu and Kashmir within Pakistan to the south. The region of Gilgit-Baltistan in Pakistan has gained fame in the tourism industry owing to its distinctive landscapes, rich cultural heritage, and diverse biodiversity. This appeal has led to a consistent increase in domestic and international tourists in recent years. Tourists are drawn to the area's recreational offerings, which encompass the appreciation of its natural beauty, majestic mountains, breathtaking scenery, and captivating snowfall. Over the past five years, there has been a remarkable surge in tourist arrivals to Gilgit-Baltistan. 2014, the region welcomed 68,855 visitors, comprising 64,354 domestic and 4,501 foreign tourists. In contrast, by 2019, the numbers had escalated significantly, with 1,660,352 tourists exploring the area, of which 1,649,523 were domestic, and 10,829 were foreign (Tourism et al., 2019). The Tourism Department of the Government of Gilgit-Baltistan anticipates that this upward trajectory will persist. This influx of tourists is expected

to have substantial socio-economic benefits for the region. However, it also necessitates the formulation and implementation of sustainable tourism policies. Without proper planning and policies in place, mass tourism in the region could lead to adverse socio-economic and ecological consequences, putting the long-term sustainability of tourism at risk (Ali, 2023; Ali & Shedayi, 2023).

The focus of this study is the Hunza district within Gilgit-Baltistan, covering an area of 10,109 square kilometers and boasting a population of 52,652 residents, with a population density of five individuals per square kilometer. The Hunza region is one of Pakistan's renowned tourist destinations, with many natural wonders. It is home to historic forts, notably Altit and Baltit forts, many glaciers, pristine lakes, and towering peaks, and boasts a rich biodiversity and diverse cultural heritage. This valley has been experiencing tremendous tourism growth over the last few years primarily because of better infrastructure and accommodation facilities (Fig. 1).

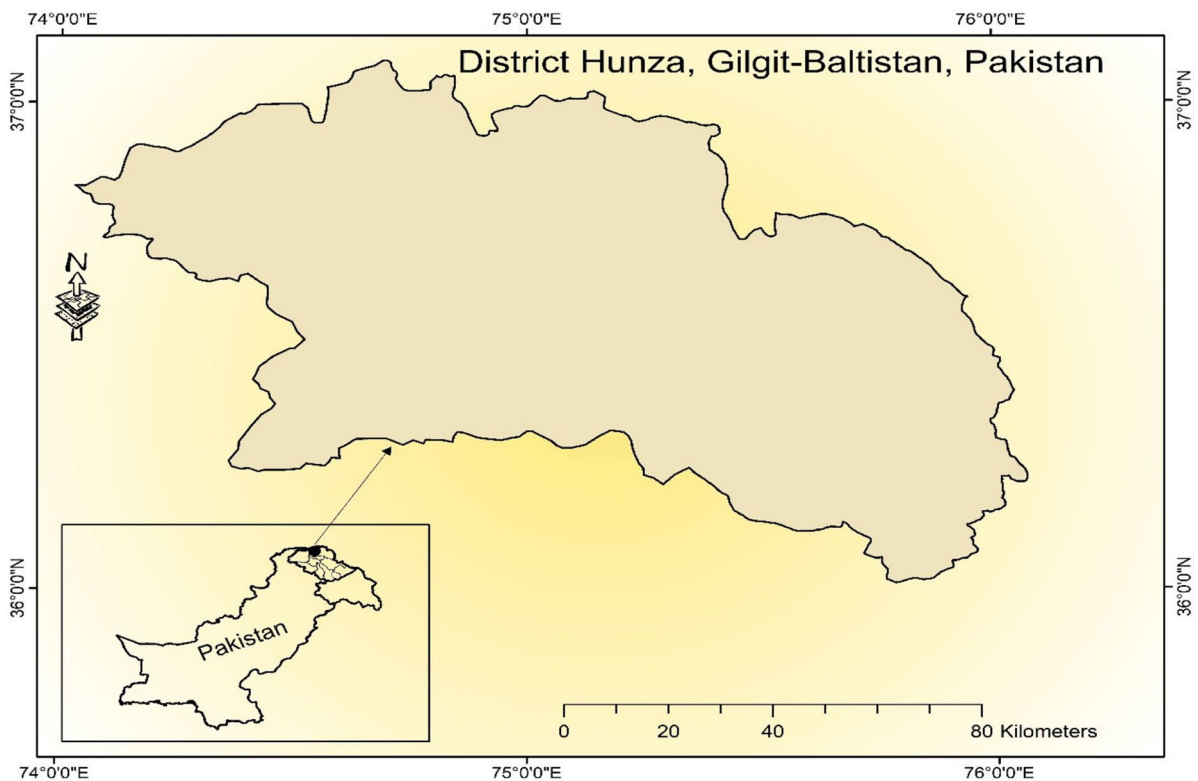


Fig. 1 Map of the study area

Data collection

Hair et al. (2019) recommended a minimum sample size of 10 times the number of indicators for reliable results in Structural Equation Modeling (SEM). With 26 indicators in our study, this suggests a minimum sample size of 260. However, to ensure a more robust and representative dataset, we collected responses from 530 participants. Following previous studies, two academic experts developed and reviewed a structured questionnaire to collect the primary data. Further, the questionnaire was also tested through pilot testing over 30 respondents, and necessary modifications were incorporated. The final field survey was administered during the months of August–October 2022. The survey questionnaire used in this study comprised two sections. The earlier section of the questionnaire was dedicated to collecting demographic information from respondents, including details such as gender, age, educational level, and monthly income. The later section followed an interdisciplinary approach commonly utilized in similar research endeavors. The questionnaire was developed following the studies of Eslami et al. (2019), Jaafar et al. (2017), Kim et al. (2013), and Lee (2013). The respondents for this study were selected using a multistage sampling method. Hunza Valley is governed by the district administration of the government of Gilgit-Baltistan, and it is divided into three parts: upper Hunza, central Hunza, and lower Hunza. In the second, ten areas (2 from lower Hunza, four from central Hunza, and four from upper Hunza) were selected randomly, and in the third stage, 530 respondents were surveyed from these ten areas. However, data analysis was done based on 528 final usable responses. Respondents were asked to express their opinions using a five-point Likert scale (1–5), with one strongly disagreeing and five strongly agreeing. All question statements underwent a comprehensive review and evaluation by experts to ensure the questionnaire's clarity, relevance, and effectiveness. Furthermore, the constructs and items were subjected to rigorous tests to ascertain their reliability and validity.

Results

This study employed SmartPLS 4 software for data analysis, which commenced with preliminary data quality checks, including outlier detection and

handling of missing values, followed by descriptive statistics and tests for normality. Structural Equation Modeling (SEM) was used to investigate the relationships among variables. It encompassed the evaluation of critical factors to validate the measurement scales used in the model, including factor loadings, Average Variance Extracted (AVE) to measure indicator variance explained by their respective constructs, construct reliability to assess internal consistency, and the validity of indicators to ensure their suitability for measuring latent variables, thereby establishing a solid basis for subsequent analyses of latent variable relationships.

Table 1 illustrates the socioeconomic profile of the participants of the research study. Most participants were male (74%), and 26% were female. Regarding the age group, those above 18 years were selected for the survey with no upper limit. Most of the respondents were between the age range of 26–35 (29%), followed by 36–50 (28%) and 18–25 (26%). Most respondents (45%) had a university/

Table 1 Demographic Profile of Respondents

Variable	Frequency	Percentage
Gender		
Male	391	74.05
Female	137	25.95
Age of Respondents		
18–25	136	25.76
26–35	153	28.98
36–50	150	28.41
50–60	63	11.93
Above 60	26	4.92
Education		
No education	48	9.09
Primary	43	8.14
Secondary	88	16.67
Higher Secondary	111	21.02
University/College	238	45.08
Monthly Income of household		
less than 50000	296	56.06
50000–100000	124	23.48
100000–200000	45	8.52
200000–300000	36	6.82
300000–400000	13	2.46
400000–500000	9	1.70
Above 500000	5	0.95

college education. 21% had completed higher secondary education, 17% had completed secondary education, and 8% had completed primary or no formal education. The educational status of the respondents provides more value to our research as more qualified individuals are expected to understand the subject matter better. The monthly income of the household varied greatly. Most respondents (56%) had a monthly income below PKR 50,000, while 23% had an income between PKR

50,000–100,000. Only 1% of the respondents had a monthly income above 500,000.

Table 2 highlights the descriptive statistics of the variables of the undertaken case study. The variable "Participation in the Local Community (PLC)" had an average score of 3.77, with a standard deviation (SD) of 1.06. This mean score indicates that, on average, the study participants reported a moderate level of engagement in their local community. Regarding perceptions, the mean scores for "Perceived Economic

Table 2 Descriptive Statistics

	Mean	SD	Mini	Max
Participation in the local community (PLC)	3.77	1.06	1.00	5.00
I regularly attend local community events	3.92	0.99	1.00	5.00
I am an active member of a local community organization	3.77	1.08	1.00	5.00
Local people should have an active role in decision-making bodies	3.62	1.12	1.00	5.00
Perceived Economic Impacts (PEI)	3.76	1.03	1.00	5.00
Tourism provides business opportunities and employment for local people	3.66	1.15	1.00	5.00
The demand for local products increases with the increase in tourist inflow to the region	4.08	0.82	1.00	5.00
Tourism results in economic opportunities for the local community	3.53	1.10	1.00	5.00
Perceived Socio-cultural Impacts (PSI)	4.23	0.99	1.00	5.00
Tourism ensures recreational opportunities for residents	4.11	0.95	1.00	5.00
Local culture and historical sites are preserved due to tourism	4.36	0.97	1.00	5.00
Tourism results in an increase in the pool of cultural activities in the locale	4.21	1.06	1.00	5.00
Perceived Environmental Impacts	4.15	1.06	1.00	5.00
The degradation of the environment and biodiversity is evident due to tourism development	4.11	0.95	1.00	5.00
An increase in tourist inflow increases waste and garbage in the area	4.36	0.97	1.00	5.00
The beauty of the natural landscape is damaged due to tourism infrastructure development	4.21	1.06	1.00	5.00
Water quality is decreasing due to environmental pollution, primarily because of increased tourism	3.93	1.24	1.00	5.00
Non-Material life domain	4.08	0.87	1.00	5.00
I enjoy the quality of life I spend	4.36	0.73	1.00	5.00
I feel happy to interact with tourists who are respectful of my way of life	4.26	0.76	1.00	5.00
I am provided with many quality recreation and leisure opportunities	3.62	1.12	1.00	5.00
Material life domain	3.71	1.07	1.00	5.00
I am happy with the living standards I have	3.77	1.04	1.00	5.00
My financial position has increased due to the tourism sector	3.65	1.09	1.00	5.00
The overall quality of life (QoL)	3.64	0.99	1.00	5.00
I am delighted with the condition of my life	3.80	0.91	1.00	5.00
I have obtained all the things I wanted in my life	3.41	1.07	1.00	5.00
Overall, I am delighted with my life	3.71	0.97	1.00	5.00
Sustainable Tourism (SST)	3.93	0.83	1.00	5.00
I support tourism-based plans for sustainable tourism	3.99	0.81	1.00	5.00
Tourism leads to cultural exchanges between tourists and residents	3.94	0.78	1.00	5.00
Tourism policies help to educate people about the environment and conservation	3.86	0.88	1.00	5.00
Tourism planning helps the local economic employment	3.98	0.78	1.00	5.00
A tourism plan ensures the reduction of the negative impacts of tourism	3.90	0.91	1.00	5.00

Impacts," "Perceived Socio-cultural Impacts (PSI)," and "Perceived Environmental Impacts" were 3.76, 4.23, and 4.15, respectively, with standard deviations (SD) of 1.03, 0.99, and 1.06. These scores fall within the range of 4 (Agree) to 5 (Strongly Agree), signifying that, on average, residents perceived a high level of positive socio-cultural and economic impacts. However, notably, they held strongly negative perceptions of the environmental impacts. The overall quality of life (Mean=3.64, S.D=0.99), non-material life domain (Mean=4.08, S.D=0.87), and material life domain (Mean=3.71, S.D=1.07) collectively indicate that residents were content with their overall quality of life, encompassing both material and non-material aspects. Regarding support for Sustainable Tourism Development (SSTD), it had a mean of 3.93 and a standard deviation of 0.83, suggesting that, on average, study participants expressed a high level of endorsement for sustainable tourism development.

Confirmatory Factor Analysis (CFA) was employed to assess the model's fitness, incorporating various latent constructs and their observable indicators. These constructs included Participation in the local community (PLC), Perceived Economic Impacts (PEI), Perceived Socio-cultural Impacts (PSI), Perceived Environmental Impacts (PENI), Non-material life domain, Material life domain, Overall quality of life (QoL), and Sustainable Tourism Development (SSTD). Convergent validity was evaluated for each factor by examining factor loadings and Average Variance Extracted (AVE). Factor loadings indicate the degree of the relationship between each item and its corresponding factor. At the same time, AVE represents the proportion of variance in each latent construct captured by its observable indicators. Additionally, composite reliability was assessed to gauge the internal consistency of items within each factor. The findings suggest that the measurement model demonstrates robust validity and reliability. Notably, all factors exhibit high factor loadings exceeding 0.5, indicating solid associations between items and their respective factors. AVE values surpass the commonly accepted threshold of 0.5, signifying that each latent construct adequately explains variance in its observable indicators. Furthermore, composite reliability values surpass the recommended threshold of 0.7, signifying internal solid consistency within each construct. In light of these results, it can be confidently asserted that the measurement model offers a valid

and reliable instrument for evaluating the constructs relevant to tourism and life quality. Table 3 presents the results of our comprehensive examination of construct reliability and validity for the latent variables employed in our study. Cronbach's alpha with Composite reliability values was meticulously calculated to assess internal consistency reliability, illustrating the degree of interconnectedness among items that measure the same construct. The results indicate that all constructs exhibited Cronbach's alpha and Composite reliability values exceeding the suggested threshold of 0.7, which signifies excellent internal consistency. Moreover, to evaluate convergent validity, Average Variance Extracted (AVE) was utilized, indicating the extent to which items measuring the same construct share variance with each other instead of measurement error. Encouragingly, the AVE values surpassed the acceptable benchmark of 0.5, affirming strong convergent validity.

The evaluation of discriminant validity for the measures, assessing the extent to which items distinguish between constructs or capture distinct concepts, adhered to the criteria outlined by Preacher and Hayes (2004). This involved comparing the correlations between constructs with the square root of the Average Variance Extracted (AVE) for each respective construct. Table 4 shows the outcomes of the test of discriminant validity of the constructs conducted to identify that each latent variable is significantly distinct from the other variable. The results indicate an excellent discriminant validity as the correlations between the constructs are significantly less than 0.85, the acceptable value of divergent validity. This suggests that each construct measures a distinct and separate construct from the others.

Table 5 and Fig. 2 encapsulate the results of an extensive examination of the structural equation model (SEM), providing a detailed portrayal of relationships, standard deviations, and p-values. Noteworthy is the statistical significance observed in all research hypotheses, save for hypotheses two, six, and eleven, affirming their validity. The investigation unfolds intriguing insights into the intricate dynamics of tourism-related variables and their impacts on quality of life. Firstly, the study uncovered that active Participation in Local Communities yields a direct and notably positive influence on Perceived Economic Impact (H1) and Sociocultural Impacts (H3). Surprisingly, this participation did not significantly

Table 3 CFA of the measurement model

	Factor loading	Composite reliability	AVE	Cronbach's alpha
Participation in the local community (PLC)		0.85	0.619	0.783
I regularly attend local community events	0.918			
I am an active member of a local community organization	0.893			
Local people should have a voice in the decision-making process	0.467			
Perceived Economic Impacts (PEI)		0.77	0.598	0.664
Tourism provides business opportunities and employment for local people	0.787			
The demand for local products increases with the increase in tourist inflow to the region	0.728			
Tourism is an economic contributor to the local community	0.802			
Perceived Socio-cultural Impacts (PSI)		0.806	0.615	0.792
Tourism development increases the number of recreational opportunities for residents	0.814			
Tourism Provides incentives for the preservation of local culture and the restoration of historical buildings	0.79			
Tourism development results in an increase in a variety of local cultural activities	0.835			
Tourism provides an opportunity for cultural exchange between residents and tourists	0.782			
Perceived Environmental Impacts		0.876	0.722	0.871
The natural environment and biodiversity deteriorate as a result of tourism development	0.819			
An increase in tourist inflow increases waste and garbage in the area	0.876			
The beauty of the natural landscape is damaged due to tourism infrastructure development	0.881			
Due to environmental degradation as a result of tourism, the water quality is declining	0.818			
Material life domain		0.802	0.712	0.797
I am satisfied with the personal quality of life in Gilgit Baltistan	0.875			
I feel happy to interact with tourists who respect my way of life	0.844			
I am provided with many quality recreation and leisure opportunities	0.811			
Material life domain		0.745	0.596	0.707
I am satisfied with my Standard of living	0.882			
My financial situation has improved as a result of the improved tourism sector	0.74			
Overall quality of life (QoL)		0.754	0.662	0.742
The conditions of my life are excellent so far	0.836			
I have gotten the important things I want in life	0.753			
I am satisfied with my life as a whole	0.848			
Sustainable Tourism Development (SSTD)		0.843	0.586	0.795
I support tourism-based plans and development to sustain local sociocultural values and traditions	0.775			
Tourism development leads to cultural exchanges between residents and visitors	0.78			
Tourism-related policies result in the promotion of environmental education and conservation	0.752			
Tourism planning initiatives to develop the local economy and local employment	0.8			
Planned tourism provides regulatory environmental standards to reduce the negative impacts of tourism	0.719			

Table 4 Discriminant validity

	MLD	NMLD	PEI	PEnI	PLC	PSI	QoL
MLD	1						
NMLD	0.41	1					
PEI	0.52	0.39	1				
PEnI	0.12	0.34	0.15	1			
PLC	0.48	0.45	0.55	0.12	1		
PSI	0.55	0.49	0.58	0.17	0.46	1	
QoL	0.82	0.23	0.68	0.1	0.37	0.38	1
SSTD	0.48	0.53	0.37	0.21	0.32	0.43	0.39

affect perceived Environmental Impacts (H2), suggesting nuanced associations within these domains. Secondly, the sway of PEI extends beyond its direct influence, exhibiting significant and positive effects on both the MLD (H4) and the NMLD (H5). These findings underscore the broader implications of economic perceptions on diverse aspects of individuals' lives. Thirdly, while Perceived Environmental Impacts lack a significant impact on the MLD (H6), they notably contribute to the positive dynamics of the NMLD (H7). This emphasizes the varied nature of environmental perceptions and their selective influence on different dimensions of well-being. The fourth set of findings delves into the domain of PSI, revealing its significant and positive effects on both MLD (H8) and NMLD (H9). These outcomes highlight the pervasive influence of sociocultural considerations on diverse aspects of individuals' lives. Fifthly, the MLD emerges as a significant contributor

to overall QoL (H10), underlining the tangible impact of material well-being on individuals' holistic life satisfaction. In contrast, the NMLD, while influential in other respects, does not significantly influence overall QoL. Lastly, the study establishes that the holistic perception of QoL carries substantial weight, directly and positively impacting Support for SSTD (H12). This underscores the role of individual well-being in fostering support for sustainable practices in the tourism sector. These findings collectively illuminate the intricate connections among variables in tourism and quality of life. The results offer nuanced insights into how participation, economic, environmental, and sociocultural perceptions collectively shape individuals' experiences and attitudes, providing valuable implications for sustainable tourism development.

The above results provide a comprehensive understanding of how diverse factors collectively shape individuals' experiences and attitudes within the realm of tourism, and one pivotal aspect highlighted is the role of active participation in local communities. The findings underscore that engaging with local communities meaningfully goes beyond mere tourism consumption. Instead, it positively influences individuals' perceptions of the economic and socio-cultural dimensions of their tourism experiences. This emphasizes the importance of fostering genuine connections and interactions between tourists and the communities they visit, contributing to a richer and more authentic travel experience. Another critical dimension explored in the study is the influence of economic perceptions on individuals' well-being, and the significant and positive impact of perceived economic impacts on both material and non-material life domains suggests that economic factors associated with tourism, such as job opportunities and income generation, extend beyond financial

Table 5 Results of SEM

Hypothesis		Estimate	Standard Deviation	P values
H-1	PLC→PEI	0.416	0.036	0.00
H-2	PLC→PEnI	0.028	0.057	0.63
H-3	PLC→PSI	0.34	0.045	0.00
H-4	PEI→MLD	0.528	0.045	0.00
H-5	PEI→NMLD	0.143	0.046	0.00
H-6	PEnI→MLD	-0.012	0.036	0.74
H-7	PEnI→NMLD	0.248	0.041	0.00
H-8	PSI→MLD	0.125	0.05	0.01
H-9	PSI→NMLD	0.301	0.053	0.00
H-10	MLD→QoL	0.51	0.039	0.00
H-11	NMLD→QoL	0.051	0.041	0.22
H-12	QoL→SSTD	0.306	0.045	0.00

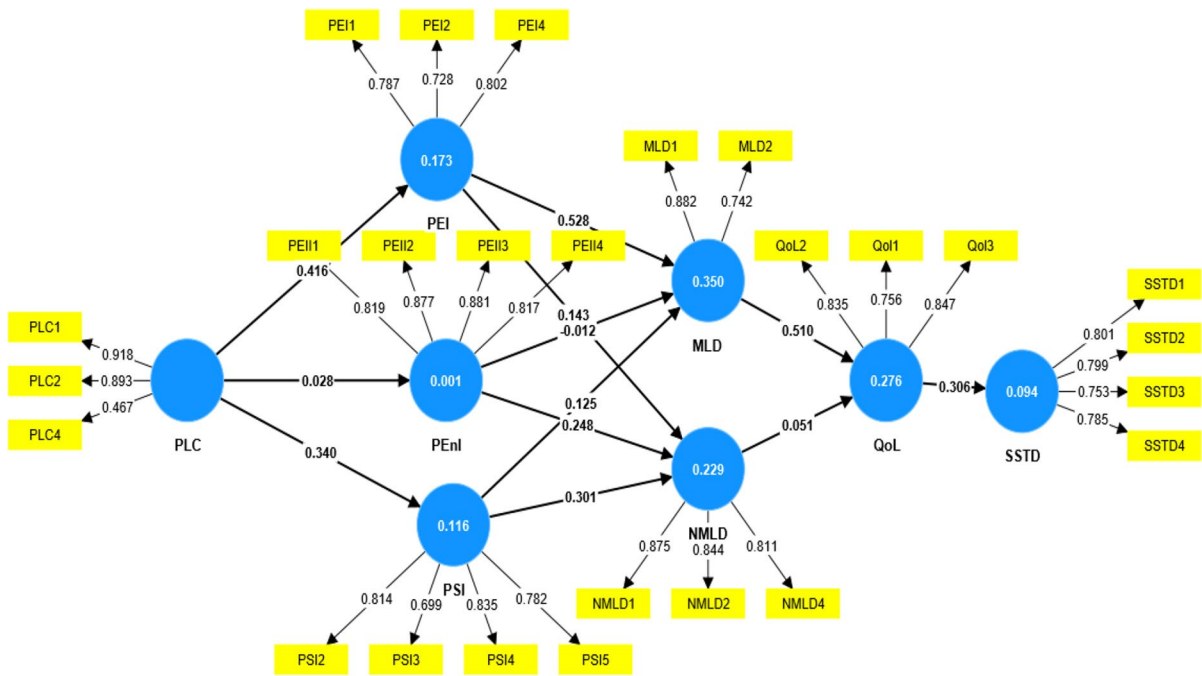


Fig. 2 SEM Analysis

considerations. This recognition underscores the substantial role that economic aspects play in shaping the overall well-being of individuals during and after their tourism experiences. Moreover, environmental considerations also emerge as a noteworthy aspect. The nuanced relationship between perceived environmental impacts and different life domains reveals that individuals recognize and value the tangible benefits of a positive environmental impact and the non-material aspects such as aesthetics, conservation efforts, and a sense of environmental stewardship. This recognition suggests that environmentally responsible tourism practices can contribute significantly to individuals' overall satisfaction with their travel experiences. Furthermore, the study highlights the influential role of sociocultural impacts on both material and non-material life domains. Cultural experiences, social interactions, and preserving local traditions and heritage contribute to individuals' well-being. This underscores the enduring impact of sociocultural dimensions in shaping how individuals perceive and derive satisfaction from their lives through tourism experiences. Regarding quality of life, the Material Life Domain is a significant contributor. Tangible aspects such as income, housing, and infrastructure

significantly influence individuals' general life satisfaction. On the other hand, while influential in specific aspects, the Non-Material Life Domain may not play a substantial role in shaping individuals' overall quality of life.

Finally, the study's implications for sustainable tourism development are crucial. Understanding the factors that influence individuals' experiences and attitudes provides valuable insights for policymakers, destination managers, and stakeholders. Strategies that promote sustainable practices, including fostering community engagement, ensuring positive economic impacts, and managing environmental and sociocultural aspects responsibly, can enhance the overall sustainability of tourism destinations. These findings contribute to a holistic perspective on tourism, emphasizing its multidimensional nature and the interconnectedness of various factors that contribute to individuals' well-being.

Discussion

The study's findings shed light on several key relationships between tourism and quality of life. Firstly, it was

revealed that community participation directly and significantly positively impacts perceived economic and sociocultural impacts but not on perceived environmental impacts. This suggests that residents actively engaged in the local community and tourism planning are expected to perceive more significant economic and sociocultural benefits from tourism development. These results are aligned with prior research demonstrating that community involvement leads to an increased perception of economic benefits and a deeper appreciation for local culture (Murphy, 1988; Gursoy et al., 2002; Eshliki and Kaboudi, 2012). Additionally, community participation can mitigate the anticipated adverse effects of tourism by amplifying its positive effects (Timothy, 1999; Tosun, 2002). Secondly, the study found that perceived economic impacts significantly and positively influence non-material and material life aspects. This indicates that residents benefiting more economically from tourism also report higher satisfaction with their material and non-material well-being. This aligns with previous research highlighting tourism's economic benefits on overall quality of life (Andereck & Nyaupane, 2011). Positive community perception of tourism is closely linked with community well-being, employment, and income generation (Aref, 2011). Thirdly, the perceived sociocultural impact was found to have a significant positive association with both material and non-material aspects of life. This implies that residents perceive more significant sociocultural impacts of tourism, such as increased recreational opportunities and cultural exchanges, and experience greater satisfaction with non-material and material well-being. This aligns with prior research emphasizing the importance of sociocultural impacts in enhancing overall quality of life (McGehee & Andereck, 2004).

Interestingly, the study revealed a positive association between perceived environmental impacts and non-material aspects of life but found no significant effect on material aspects. This suggests that environmental sustainability may be more closely linked to non-material aspects, such as psychological well-being and quality of life, rather than material factors like income and employment. This aligns with previous research indicating that environmental sustainability primarily relates to subjective well-being and overall quality of life (Andereck et al., 2005). Furthermore, the study demonstrated that material aspects of life significantly influence the quality of life, which is consistent with prior research indicating that factors

like income and material well-being are significant determinants for overall life satisfaction (Andereck & Nyaupane, 2011; Diener & Biswas-Diener, 2002). However, no significant relationship was found between non-material aspects of life and overall quality of life, suggesting that while non-material factors are crucial for individual happiness, they may not carry as much weight in shaping overall life satisfaction, particularly in a developing region where material concerns hold greater prominence. Lastly, the study has investigated a positive and significant association between quality of life and residents' support for sustainable tourism development. This suggests that those individuals who are satisfied with their lives are more inclined and likely to support initiatives to promote economic, socio-cultural, and environmental sustainability in tourism development. These results align with prior research exploring the connection between resident's support for sustainable tourism and their quality of life (Eslami et al., 2019; Nun-koo and Ramkissoon, 2011). Given the limited prior research in mountainous communities within developing regions, these findings are particularly significant, testing the association between quality of life and sustainable tourism development.

Conclusion

The findings of this study offer valuable insights into how tourism development influences residents' life satisfaction and their support for sustainable tourism in the destinations. It becomes evident that community participation plays a pivotal role in shaping residents' perceptions of the economic, sociocultural, and environmental impacts of tourism development in tourist destinations. Those actively engaged in community and tourism planning are more likely to expect better socio-economic returns. Furthermore, it was evident that the perceived economic and sociocultural benefits affect both non-material and material aspects of life. This underscores the idea that tourism's economic and sociocultural advantages contribute to residents' overall life satisfaction. Interestingly, while perceived environmental impacts were positively linked to non-material aspects like subjective well-being, they did not significantly affect material aspects such as income and employment. Additionally, the study revealed that material aspects of

life substantially influence the overall quality of life compared to non-material aspects. Residents satisfied with their lives are more likely to endorse initiatives promoting sustainable tourism development. These findings have significant implications for sustainable tourism development policies and practices, particularly in mountain communities in developing regions. They underscore the importance of encouraging community involvement, fostering economic benefits, ensuring environmental sustainability, preserving cultural heritage, and enhancing overall quality of life when pursuing sustainable tourism development. Policymakers and practitioners can utilize these insights to shape strategies that advance sustainable tourism while respecting mountain communities' unique socio-cultural and environmental contexts in developing regions. Further research in this domain can deepen our understanding of the intricate relationships among various factors related to sustainable tourism development, informing future efforts to promote sustainable tourism practices globally.

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Data availability The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Informed Consent A detail consent form was developed and distributed among the potential respondents of the study and only those people were considered as respondents of the study who gave their willingness to participation in the survey voluntarily.

Research involving Human Participants Since the respondents of the study are human being, so necessary consent and willingness to participation in the survey was ensured. All the respondents were vulnerable participated in the study.

Conflict of interest The authors declare that there is not any conflict of interest.

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