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Tracing livelihood transition through tourism: A qualitative analysis of Hunza Valley in the post-Karakoram Highway era using the Sustainable Livelihood Framework for Tourism

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Abstract

This study examines how construction of the Karakoram Highway (KKH) has influenced the livelihoods of residents in Pakistan's Hunza Valley (HV) through tourism growth, using the Sustainable Livelihood Framework for Tourism (SLFT). Although transport infrastructure such as the KKH can generate economic opportunities, these effects remain underexplored in the literature from a localized and multidimensional livelihood perspective, particularly in tourism contexts. Using a qualitative design, the study draws on in-depth interviews and field observations to assess changes in human, social, natural, physical, financial, institutional, and informational assets associated with the KKH and subsequent tourism expansion. Fifteen semi-structured interviews were conducted between June and September 2025 and were complemented by systematic field observations in central, lower, and upper Hunza. The findings indicate that while the KKH has expanded economic opportunities, it has also created trade-offs across livelihood capitals; for example, financial gains have often been accompanied by pressures on natural and cultural assets. Notably, the study identifies information capital as a critical emerging resource that enables residents to increase tourism-related income, attract visitors, and adapt to rapidly changing market dynamics. Consistent with prior SLFT-based research, community responses vary depending on social relations, resource availability, and gaps in policy implementation. Sustainable livelihood outcomes therefore require tourism planning that meaningfully involves local communities and policies that balance economic development with cultural sustainability and environmental protection. The study contributes to tourism scholarship on mountainous regions and offers recommendations for infrastructure development that is sensitive to local livelihood patterns in developing economies.

Introduction

The Hunza Valley (HV), located in the Gilgit–Baltistan (GB) region of northern Pakistan, historically functioned as an isolated and largely self-sustaining mountainous society prior to the construction of the Karakoram Highway (KKH) (Khan, 2022). The development of the KKH between 1958 and 1978 constituted a major turning point in the livelihoods of Hunza residents, initiating substantial economic, social, and cultural transformations (Hussain et al., 2017). By eliminating the valley's long-standing geographic isolation, the KKH established an all-weather road network linking GB with Pakistan's urban centers and China's expanding markets (Anwar et al., 2019). This infrastructural shift significantly enhanced mobility, trade, and market

access, enabling local communities to diversify their livelihood strategies beyond subsistence agriculture and barter-based exchange systems.

Transport infrastructure is widely recognized as a key driver of regional economic transformation, as it reduces transaction costs, improves market connectivity, and stimulates service-sector growth—particularly tourism—in previously isolated regions. Empirical studies demonstrate that enhanced accessibility consistently increases tourism demand and generates new livelihood opportunities, while simultaneously producing environmental and social pressures that necessitate effective governance and planning responses (Suntikul & Dorji, 2016; Harold & Wiroto, 2023). The Sustainable Livelihood Framework for Tourism (SLFT) offers a multidimensional analytical lens for examining these dynamics by tracing how infrastructural change reshapes human, social, natural, physical, financial, institutional, and informational assets, as well as the interactions among them. Applying the SLFT to the Hunza context therefore highlights both livelihood gains—such as income diversification, skill development, and market participation—and associated trade-offs, including natural resource stress and cultural commodification.

Despite the growing body of SLF-based research on tourism–livelihood linkages, two critical gaps remain. First, there is a lack of long-term, in-depth SLFT studies that explicitly examine the multidimensional livelihood impacts of large-scale cross-border road infrastructure in high-mountain environments; existing research often treats infrastructure as a contextual background rather than the central driver of change (Hussain et al., 2017; 2024). Second, although recent scholarship increasingly emphasizes the role of digital access and digital literacy in shaping rural tourism entrepreneurship, the systematic integration of 'information capital' within SLFT-based analyses remains limited in many regional studies. Emerging empirical evidence indicates that digital penetration and literacy significantly mediate entrepreneurial responses in rural tourism settings, thereby influencing the distribution of benefits and the nature of trade-offs among livelihood capitals. Addressing these gaps, this study applies a modified SLFT that explicitly incorporates information capital and provides an empirically grounded qualitative analysis of how the KKH has reshaped livelihood portfolios in Hunza and generated capital-specific trade-offs.

The Hunza Valley has a distinctive historical trajectory, moving from long-standing isolation to increased openness to visitors. External interest occurred intermittently, beginning with early ethnographic travelers and later evolving into more sustained tourism following the establishment of modern road connectivity. The construction of the KKH, together with subsequent upgrades, fundamentally improved accessibility and catalyzed a steady rise in visitor numbers (see Table 1). The following section summarizes key local characteristics that shape livelihood responses, including geography, settlement patterns (lower, central, and upper Hunza), dominant livelihood activities, and recent infrastructure investments.

Table 1. The number of tourists who visited Hunza

Year Number of	Visitors x Days in Karimabad
1979	302
1980	1153
1981	2358
1982	2973
1983	3863
1984	4937
1985	5361

Source: Data taken from Kreutzmann from all visitors' books in Karimabad, Hunza (Kreutzmann, 1990, September).

The Pakistan Tourism Development Corporation (PTDC), established on 30 March 1970, began operations in Hunza with the aim of promoting tourism in Pakistan, including the development of visitor accommodations such as motels. Hotel bed capacity in Hunza increased substantially, from eight beds in 1979 to 275 beds in 1987. Many visitors travelled in groups and typically stayed for short periods—averaging 1.8 days per visitor—in Karimabad, the main tourism hub in Hunza that is visited by most tourists (Kreutzmann, 1990). The construction of the KKH not only improved local mobility but also facilitated access for both domestic and international tourists (Karrar, 2020, 2022). To accommodate growing demand, the Tourist Promotion Service Pakistan (TPSP) proposed establishing 50-room deluxe hotels in Karimabad and Sost (Kreutzmann, 1990).

Tourism in Gilgit–Baltistan (GB) experienced a period of growth (Ali, 2023; Khan, 2022) until the events of 11 September 2001. The subsequent "war on terror," alongside rising regional insecurity, triggered a major crisis for the tourism sector in GB (Khan, 2022). Stakeholders in the tourism and hotel industries reportedly incurred financial losses amounting to billions of rupees, and approximately 70% of the workforce shifted to other sectors following the contraction of hospitality-related businesses, with severe implications for local livelihoods (Muhammad, 2011). Although Hunza is widely described as a comparatively peaceful destination, it nevertheless experienced a sharp decline in tourism, partly attributable to negative international media portrayals (Muhammad, 2011). More recently, domestic tourist arrivals have increased following political reforms in GB and the completion of the Karakoram Highway improvement project under the China–Pakistan Economic Corridor (CPEC) in 2015. For example, average annual domestic arrivals rose from around 50,000 before 2014 (Rana, 2014) to 600,000 in 2015 and were projected to exceed 1,000,000 in 2016 (Hussain, 2016), as shown in Figures 1 and 2.

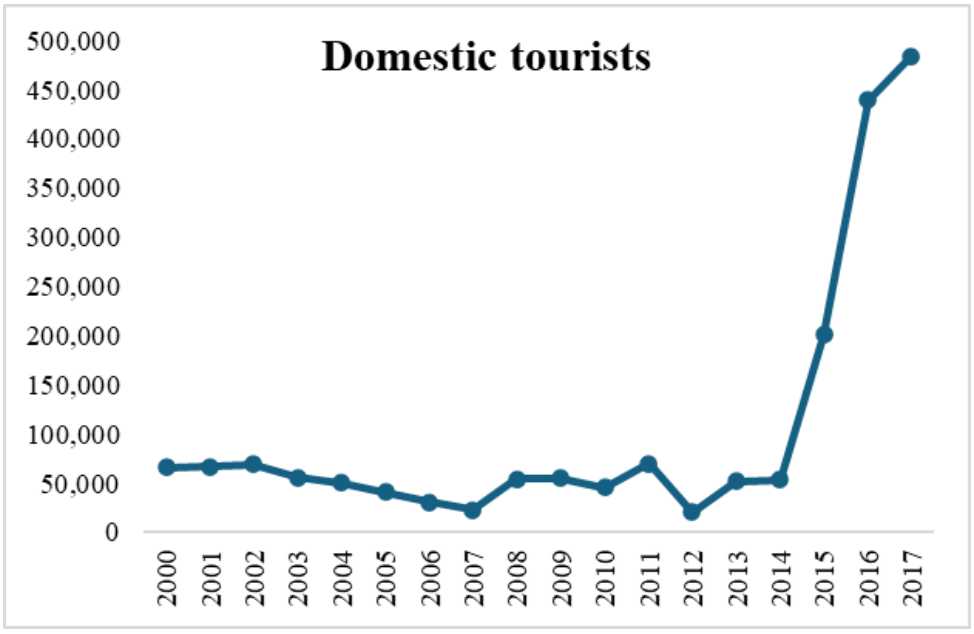

Figure 1. Number of domestic tourists' arrival in Gilgit Baltistan
Source: Gilgit Baltistan Tourism Department.

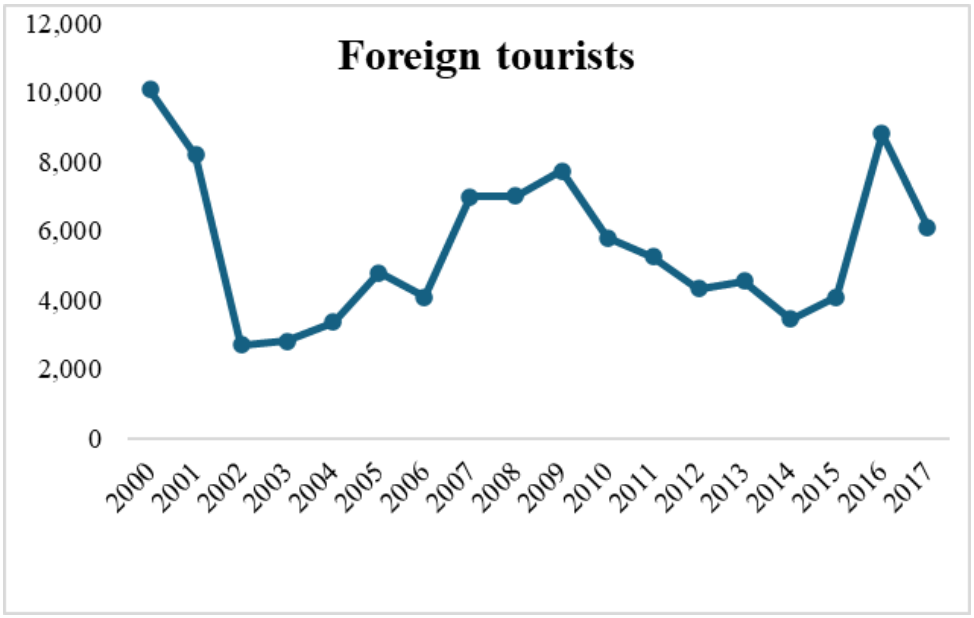

Figure 2. Number of foreign tourists' arrivals in Gilgit Baltistan
Source: Gilgit Baltistan Tourism Department

Infrastructure development has widely been recognized as a major driver of tourism growth, with multidimensional impacts on local livelihoods, including economic, physical, social, informational, and

institutional dimensions. Gurung (2012) observes that tourism development in Nepal's mountainous regions substantially transformed traditional settlement roles following the liberalization of national borders in the 1950s. For example, the 1981 national census reported that 97% of Nepal's population depended on agriculture, a figure that declined to 66% two decades later. Across diverse geographical contexts, tourism development and infrastructure investment have produced significant local economic effects. In northern Tanzania, tourism expansion has improved household wealth and overall well-being among participating communities (Mgonja et al., 2023). Similarly, community-based tourism around Uganda's Bwindi Impenetrable National Park has generated employment opportunities, mobilized financial resources, and supported local development initiatives (Ahebwa & Duim, 2013). In Botswana's Okavango Delta, Community-Based Natural Resource Management programs have raised living standards by meeting basic needs, providing social services, and creating employment, although they have also contributed to the decline of traditional activities such as hunting and agriculture (Mbaiwa & Stronza, 2010). In Gilgit–Baltistan (GB), Pakistan, infrastructure development has similarly facilitated a sharp rise in tourism following a prolonged period of isolation, contributing to the preservation of distinctive cultural characteristics. As tourism expanded, local livelihoods shifted from subsistence agriculture toward service-oriented activities associated with the tourism sector (Hussain et al., 2017, 2024).

Building on previous applications of the Sustainable Livelihood Framework (SLF), this study examines the impacts of tourism on local livelihoods following the construction of the Karakoram Highway (KKH). Tourism activity in the Hunza Valley (HV) emerged after the completion of the KKH and was further intensified by developments under the China–Pakistan Economic Corridor (CPEC). Prior to the KKH, local livelihoods were largely based on subsistence agriculture; however, they have since shifted toward a strong dependence on tourism-related activities.

Existing research on infrastructure development and livelihoods in tourism contexts relies predominantly on quantitative methods, with relatively limited use of qualitative approaches capable of capturing lived experiences and multidimensional livelihood change. Addressing this methodological gap, the present study adopts a qualitative research design and applies a modified version of the SLF. Moreover, much of the existing literature focuses on developed-country contexts, leaving a notable lack of empirical evidence from developing and mountainous regions. In particular, scholarly attention to the livelihood impacts of tourism induced by large-scale transport infrastructure—such as the KKH in Hunza—remains limited. Studies that focus specifically on the experiences of HV residents are especially scarce.

More broadly, research examining transport infrastructure development and its implications for tourism-led livelihood change remains fragmented. While conceptual frameworks such as the SLF have been widely applied to assess the livelihood impacts of infrastructure development, they often overlook tourism as an intervening or mediating process. Existing studies tend to analyze either infrastructure–livelihood linkages or tourism impacts in isolation, resulting in a lack of integrated analytical frameworks that simultaneously capture infrastructure, tourism, and livelihood dynamics. This qualitative study addresses this gap by applying a modified SLF that explicitly incorporates tourism as a central mechanism shaping livelihood outcomes.

Furthermore, applications of such integrated frameworks in South Asia remain limited, particularly in relation to the KKH in Hunza, Pakistan. This study makes two principal contributions. First, it extends the SLF by updating asset categories and introducing *informational capital* as an explicit livelihood asset, thereby offering a refined analytical tool for future research. Second, it provides empirically grounded insights into the social and economic effects of tourism expansion in HV. The findings offer practical value for government agencies, local communities, development practitioners, and policymakers by informing tourism governance, infrastructure planning, and rural economic development strategies.

Using a qualitative methodology grounded in the modified SLF, this study investigates the transition of livelihoods from subsistence agriculture to tourism-based activities following the construction of the KKH. The primary objective is to assess how tourism has affected the livelihoods of HV residents across different livelihood capitals. Accordingly, the research examines how the KKH has reshaped human, social, natural, financial, institutional, and informational capitals, as well as the trade-offs that have emerged among them. To address these questions, the paper outlines the SLF extension to include informational capital, presents qualitative field evidence from Hunza, and analyzes resulting livelihood outcomes and policy implications. By linking tourism impacts to multiple livelihood assets, this research advances understanding of the complex interconnections between tourism development and rural livelihoods.

Method

Study design and sustainable livelihood framework

This research utilized a qualitative research paradigm and embraced a Sustainable Livelihood Approach to investigate the effects of KKH construction on the livelihoods of residents in HV within the framework of tourism. The central research problem guiding this study is how the construction and subsequent upgrading of the KKH have reshaped the livelihood capitals and livelihood strategies of residents in HV, and what trade-offs among capitals (economic, natural, cultural, institutional, social, and informational) have emerged as a result of tourism expansion? To address this problem the study follows a three-part qualitative research design aligned with the SLFT: data collection, purposive sampling and semi-structured, in-depth interviews with residents, business owners and local officials, complemented by participant observation and documentary review to capture lived experiences and temporal change; data management and analysis, systematic coding of interview transcripts using SLFT asset categories (human, social, natural, economic, institutional, information) and thematic analysis to identify patterns and trade-offs; and interpretation and triangulation, cross-checking emergent themes against observational notes, secondary sources and local statistics to ensure analytic validity and to draw policy-relevant conclusions. This explicit problem, task alignment, clarifies how the SLFT shapes sampling, data collection, and the analytic logic of the study.

This investigation employed an adapted version of the Sustainable Livelihood Framework, referred to as the Sustainable Livelihood Framework in the Context of Tourism (SLFT), which was refined by Shen et al. (2008) to ensure its comprehensive applicability to the tourism sector. The rationale for altering the Sustainable Livelihood Approach was predicated on the necessity of perceiving tourism within a more expansive context, rather than solely regarding it as an instrument for development. Furthermore, the Sustainable Livelihood Approach aspires to achieve household livelihood sustainability at the micro level, while tourism sustainability is frequently addressed at the macro level, encompassing industries and destinations. The authors revised the Sustainable Livelihood Approach with the objective of integrating fundamental principles of sustainable livelihoods and tourism, culminating in the conceptualization of the SLFT Sustainable Tourism Livelihoods Approach. This framework encompasses assets, both tourism-related and non-tourism-related activities, outcomes, institutional arrangements, and the context of vulnerability.

Within the SLFT, tourism is conceptualized as an overarching context wherein all relevant factors are interwoven, influenced, and shaped. The SLFT synthesizes essential principles from both the Sustainable Livelihood Framework and tourism, providing a structured framework for analyzing rural development through the lens of tourism as a livelihood strategy (Shen et al., 2008). Tourism livelihood assets in the SLFT consist of human, social, natural, economic, and institutional capital. The assets delineated within the SLFT were modified in accordance with the research conducted by Chowdhury (2021), who adapted the Sustainable Livelihood Framework and incorporated the concept of information capital. In light of this prior research, information capital has been introduced in this study as a critical resource for individuals engaged in the tourism sector at destination sites. Moreover, a preceding study (Chowdhury, 2021) has suggested extensions such as freedom and information capital; however, these extensions do not adequately encapsulate the livelihood impacts pertinent to the tourism context, which this study further employed. In this context, information is delineated as "knowledge acquired by individuals through various technological means within the study area." Herein, the internet is regarded as the paramount medium for disseminating knowledge relevant to the tourism information landscape.

Furthermore, according to this framework, the researcher explored the impacts of livelihood in the context of tourism after the construction of KKH. According to the first category, human capital helped to explore how the onset of tourism in HV impacted social relations, interaction, lifestyle, and culture. The second asset consists of social capital. The third category, i.e., natural capital, represents the skills, knowledge, ability to labor, and good health that together enable people to pursue different livelihood strategies and achieve their livelihood objectives (DFID, 2009). Similarly, the fourth category, i.e., economic capital, explored the impacts of tourism on infrastructure, producer goods, and financial resources. The fifth capital, i.e., institutional capital, included participation in decision-making and policymaking and benefit-sharing of the tourism market. The sixth asset consists of information capital, which is novel capital introduced in SLFT. It emerged as a critical asset due to digital transformation in the tourism market. Tourism depends on digital platforms for different purposes, like online booking, social media advertising, and reviews. Digital literacy helps individuals to attract tourists in a tourism competitiveness economy (Lasibey et al., 2024; Ritonga, 2023).

Study area

The study area is located in Northern Pakistan, connected with China via the Khunjerab Pass, and covers approximately 14,201 km² (Moazzam et al., 2023; Shah et al., 2024). For clarity, all elevation data are presented in meters above sea level (MASL). Elevation in Hunza Valley ranges from roughly 1,400 MASL in lower riverine locations to mountain peaks exceeding 7,800 MASL; Karimabad (the administrative center) lies at approximately 2,438 MASL. The valley is commonly divided into three physiographic zones: Lower Hunza (~1,700–1,900 MASL), Central Hunza (~2,000–2,400 MASL), and Upper Hunza (~2,500–2,900 MASL), and these elevation bands are relevant to livelihood differences documented in the study. Figure 3 shows: (a) display elevation bands (MASL);(b) includes a focused map that highlights the core survey sites (Karimabad, Aliabad, Gulmit, Passu, and other sampled settlements) with site coordinates.

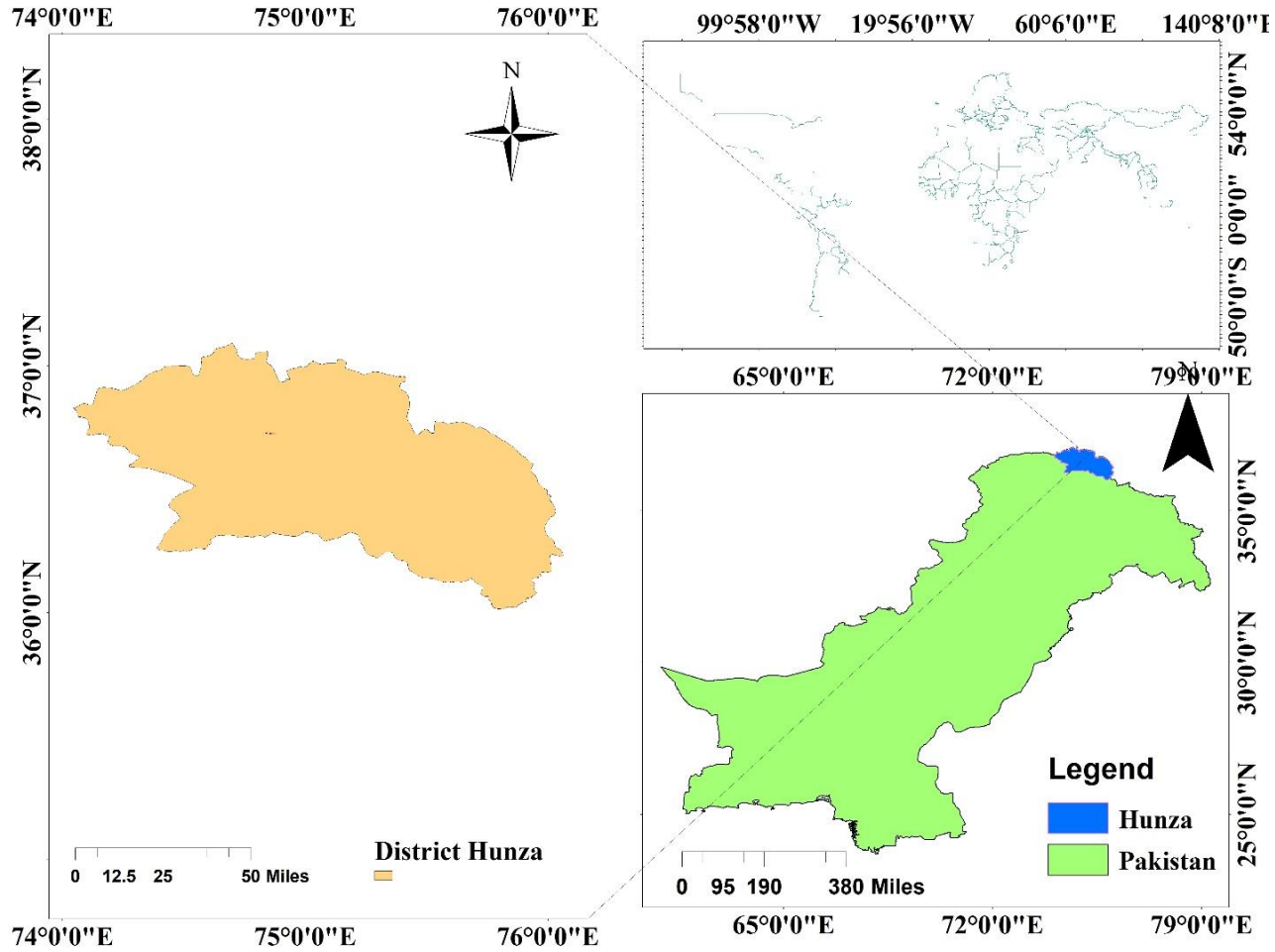

Figure 3. Study area map (2025).

Population and sample size

This study was conducted in the Hunza district of Gilgit-Baltistan province of Pakistan. Hunza is a gateway between China and Pakistan. KKH passes through the HV before it enters the Khyber Pakhtunkhwa province of Pakistan. Data were collected through 15 semi-structured, in-depth interviews (n = 15) conducted between June and September 2025. Participants were recruited purposively to capture the diversity of livelihood positions affected by tourism: interviewees included local tourism entrepreneurs and guesthouse/hotel owners (n = 5), handicraft/artisan sellers (n = 3), transport operators and tour guides (n = 2), community elders and household heads (n = 3), and local government/tourism department officers (n = 2). The sample comprised both men and women, aged 30–65 years (detailed participant demographics are presented in Appendix Table 1). Selection criteria required that participants (a) be resident in Hunza, and (b) be directly or indirectly associated with tourism livelihoods or involved in local tourism decision-making. Semi-structured interviews were conducted in the local language, audio-recorded with consent, and verbatim-transcribed. The interview guide was developed from the literature on infrastructure and livelihoods and was piloted and revised following expert review. Interviews continued until thematic saturation was reached, i.e., no new substantive themes emerged, which occurred at interview 15 (Guest et al., 2006; Iqbal, 2025; Kumari et al., 2026). Data were

analyzed using reflexive thematic analysis and coded against the SLFT asset categories (human, social, natural, economic, institutional, information).

Table 2. Demographics of participants

Participant	Age	Marital status	Participants Insights
P1	55yrs	Married	Emphasis on the importance of the daughter's education.
P2	38yrs	Married	Abolishment of Monarch paves ways for education and health opportunities
P3	40yrs	Married	Infrastructure results in healthcare improvement
P4	45yrs	Married	Marriages within the same villages and simple marriages
P5	50yrs	Married	Learning the Chinese language in educational institutes in GB
P6	53yrs	Married	CPEC improved the internet issues in GB
P7	55yrs	Married	Agha Khan's visits aided in the improvement of education and the establishment of educational institutions
P8	40yrs	Married	Females are active in the tourism industry
P9	47yrs	Married	Recognition of traditional music, arts, and dance worldwide
P10	47yrs	Married	Tourists are responsible for pollution in HV
P11	30yrs	Married	Residents of HV are no longer dependent on agriculture
P12	44yrs	Married	KKH and CPEC projects were turning points in the tourism sector
P13	60yrs	Married	Advancing in technology helped in the tourism sector
P14	65yrs	Married	Formation of link roads
P15	50yrs	Married	The Government of Pakistan is not serious about tourism promotion

Data collection and analysis

A semi-structured interview guide was employed for data collection, which consists of open-ended questions. The interviews aim to explore how connectivity brought by KKH construction resulted in the onset of tourism and how tourism impacted the livelihoods of residents in HV on different dimensions, like economic, social, daily life, and cultural patterns, as suggested by SLFT. Probing techniques further aided in getting rich patterns of data (Robinson, 2023). Sample questions included in the interview guide are given below:

- *How has tourism contributed to diverse ways of survival?*
- *What are the impacts of tourism on the traditional livelihood system?*

Semi-structured interviews offer a platform for a researcher to inquire deeply about a phenomenon (Megaldi & Berler, 2020). And a researcher has a framework to explore themes. Good interviews usually consist of a balance between core questions, probs, and follow-up questions (Iqbal et al., 2025; Rubin & Rubin, 2012). All the transcripts were organized and systematically grouped into five themes supported by SLFT, and further thematic analysis was considered. Further, the steps of Thematic Analysis were conducted according to the guidelines given by Braun and Clarke's (2006, 2021) reflexive thematic analysis to classify identity types and the themes that emphasized them. The steps are given as (a) data familiarization and the writing of

familiarization notes, (b) categorizing identities holistically by coding each story based on the research questions, (c) refining, defining, and cataloging each identity, (d) discovering each identity type for underlying themes through systematic coding, and (e) positioning examples as one part of a larger verification process.

Ethical consideration

For the protection of the rights and well-being of participants, the study followed strict ethical procedures. To ensure the confidentiality of participants, oral informed consent was obtained from all participants, and they were fully informed about the purpose of the study. Participants were given the right not to answer any sensitive questions or to withdraw at any time without any consequences. Participants were selected based on their appropriateness for the assignment and their willingness to participate. In addition, the study also followed the ethical guidelines developed by the Declaration of Helsinki. By keeping the participants' names and identities hidden during the data collection, analysis, and reporting of the study's findings, the subjects' anonymity and confidentiality were maintained. The interview process, data analysis, and results distribution were all conducted with utmost consideration for privacy and confidentiality (Arifin, 2018). The collected data was securely stored, and the participants' identities were kept secret.

Results and discussion

This study explored the livelihood impacts of KKH on residents of Hunza in the context of tourism. The study employed a modified form of STLF, which consists of six capitals listed in Figure 4. Figure 4 provides the conceptual framework used to organize and interpret the findings across the six livelihood capitals.

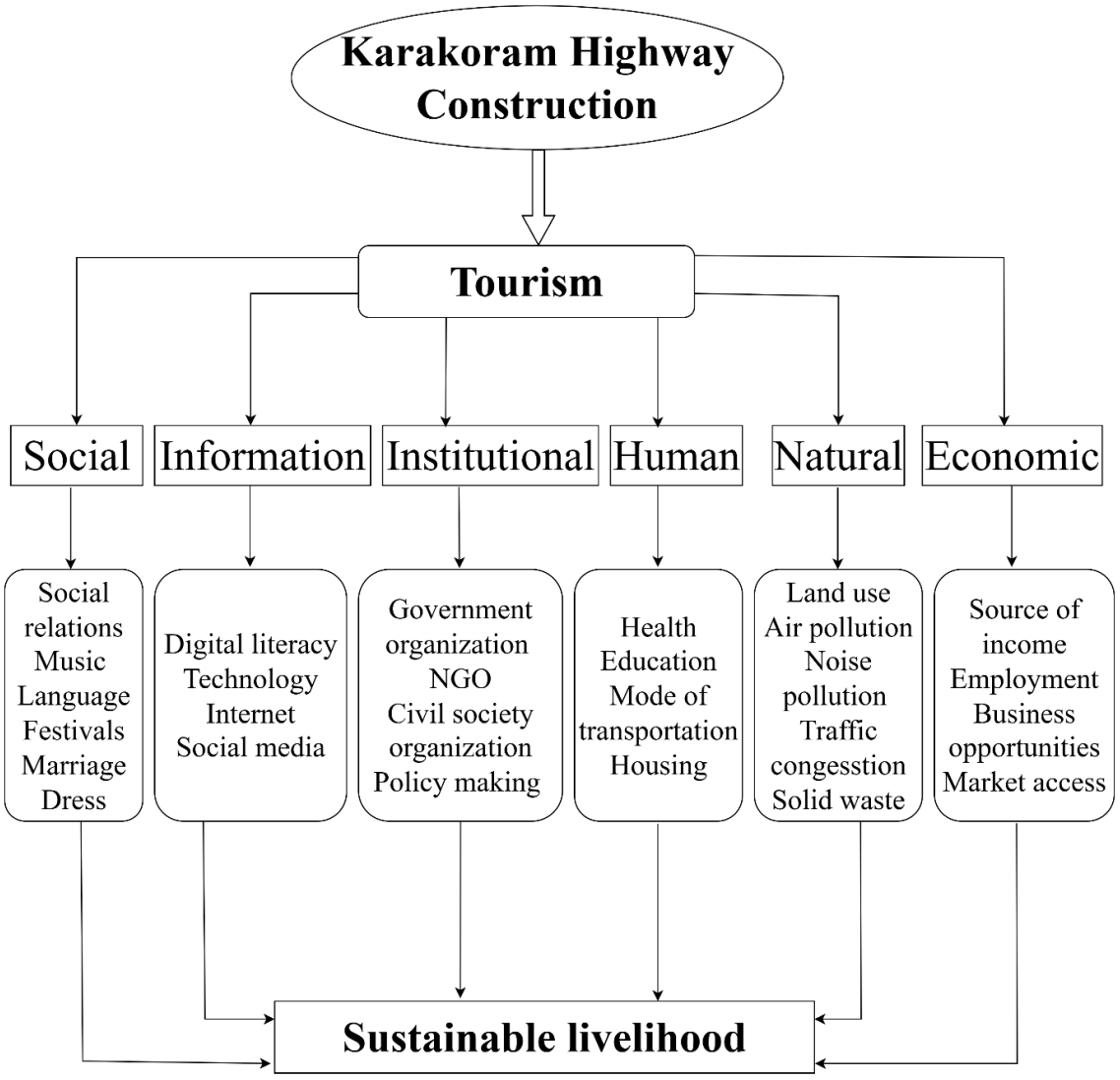

Figure 4. Conceptual framework: Modified Sustainable Livelihood Framework for Tourism (SLFT) applied to analyze KKH-induced livelihood transformations in Hunza.

To provide a concise overview of how the KKH-driven tourism transformation has shaped each livelihood capital, the key positive, negative, and trade-off effects are summarized in Table 3.

Table 3. Livelihood impacts of the KKH on Hunza residents across six capitals: Summary of positive, negative, and trade-off effects

Capital	Key positive changes (evidence)	Key negative changes (evidence)	Complex / trade-off effects
Human capital	Improved access to education, language learning, and improved healthcare access (p3, p1, p2).	Loss of traditional health knowledge was only partially mitigated; uneven access to higher education (p2).	Education > tourism jobs (guides) increase incomes but can drive out youth from agriculture and traditional livelihoods.
Social capital	Strengthened external networks; renewed interest in cultural products; women's economic participation (p1, p9).	Commodification of culture; changes in marriage practices and ceremonies (p4, p1).	Social networks help market handicrafts, but commodification can erode ceremonial meaning.
Natural capital	New income diversifies pressure off subsistence agriculture (p11).	Environmental degradation, litter, traffic congestion, and loss of farmland to guesthouses (p 10, p11).	Economic incentives to convert land to tourism infrastructure reduce natural resilience.
Economic capital	New income sources: hotels, guesthouses, handicrafts, transport (p13, p1).	Unequal benefit distribution; seasonal/unstable incomes; capital thresholds for entry (text).	Economic gains are concentrated among those with capital/skills; others face displacement from agriculture.
Institutional capital	Establishment of tourism department; some local initiatives for heritage restoration (text).	Weak federal representation, limited benefit-sharing, and participation in decision-making (p15).	Institutional gaps limit the equitable distribution of tourism rents despite local initiatives.
Information capital	Improved digital access (optical fiber), online bookings, social-media promotion, stereotype change (p13).	Digital divide: uneven digital literacy and market capture by better-connected actors (p6).	Information capital amplifies economic opportunities but can increase inequality and depends on infrastructure + skills.

To further clarify how gains in one livelihood asset often produce unintended pressures on others, a capital-level trade-off matrix is presented in Table 4.

Table 4. Cross-capital trade-off matrix: How gains in one livelihood capital create positive spillovers and unintended pressures on others

From (gain in)	Likely positive effects	Potential negative effects on other capitals
Economic (tourism income)	Investment in housing, services; women's income	Natural capital loss (land conversion), cultural commodification (social capital)
Information (digital access)	Broader markets, lower search costs, promotional reach	Benefits accrue to the digitally literate; it widens inequality (economic capital)
Human (education, language skills)	Better access to guide/employment opportunities	Youth migration; decline in agricultural labor (natural/economic)

Institutional (tourism dept.)	Improved planning, heritage restoration	If poorly inclusive > exclusion of marginal groups (social)

Human capital: Evolving educational, health, and skill capacities under KKH-Enabled tourism

The findings of the study revealed that there was a Monarch system in the study area, which was a main hurdle to getting an education. The Monarch system was abolished by then Prime Minister Zulfiqar Ali Bhutto of Pakistan in 1973. It was compulsory to seek permission from the King before moving out of HV. Additionally, people rarely move out of HV. The abolishment of the king system and the construction of KKH helped in the transformation of human capital, such as education and health. The residents of HV have a better level of education now and have preferential educational opportunities due to the onset of tourism. One of the participants said that:

> *"Before the 1960s, King ruled the residents of Hunza. It was ended by Zulfiqar Ali Bhutto, then Prime Minister of Pakistan, in the 1970s. Before the termination of the king system, people were unable to go outside for educational purposes… Two notable events are contributing to increased education in Hunza after the 1970s: 1) the termination of the king system, as it was a major hurdle to getting education 2) the construction of KKH increased the tourism industry, mostly foreign tourist visits, and residents started to learn foreign languages. The males at that time started to become tourist guides, so they had exposure with the others; They were aware of the importance of education, convinced their families to get an education, and gave importance to their children's education. After the 1980s, people went outside of Hunza to get an education."* (Participant 3, 40 years old)

The study findings revealed that females were engaged in agricultural and domestic chores back then; now, there is a shift in this paradigm, and the residents are aware of the importance of female education. One of the female participants showed enthusiastic remarks about female education:

> *"Now females are so lucky, they do not have restrictions on getting education. Parents emphasize getting education for their daughters; if they want to go abroad for higher education, they allow them"* (Participant 1, 55 years old)

Study findings show that this region was disconnected from the rest of the country and had deteriorated health conditions. The locals were using indigenous treatment methods. Mostly, females died from pregnancy-related complications. Moreover, they were unaware of the overall importance of health.

> *"Before KKH, we did not have hospitals. If someone got sick, traditional treatment methods were used by our parents. The road construction did not just bring facilities; it also increased health awareness. Interaction with people from other regions taught us how to better care for ourselves. Overall, KKH has dramatically improved healthcare and reduced mortality rates, giving us a much better quality of life."* (Participant 2, 38 years old)

It was evident that interaction with others due to the construction of KKH not only improves the standard of education but also awareness about the overall health condition.

Social capital: Networks, cultural exchange and the politics of commodification

Social capital covered in this study included social relations, culture, marriage, and vital festivals of HV, impacted by the tourism influx. Study findings indicated that social relations were immensely impacted by tourism influx; it was evident that different ceremonies like marriages and religious ceremonies had changed. Marriages were simple, with no other cultural influence within limited economic resources. Marriage happened at an early age and was arranged by elders in the family; adults choose their life partner on their own. People not only adopted other cultures in their marriages, like Punjabi culture, but also adopted events from Karachi.

> *"During those periods, most marriages were held within the village due to accessibility. If it was arranged with a person from a different village, relatives were preferred. I still remember my elder sister's wedding, when her procession came on foot from a distant village and stopped at our house for a day. The next day, early in the morning, my uncle carried the bride on his shoulders."* (Participant 4, 45 years old)

After the KKH construction, HV remains a famous wedding destination for national tourists. A similar response was lamented by another participant, by sharing his experience about a destination wedding:

"The famous cultural sites of Baltit and Altit forts are famous points of destination weddings during summers. Destination wedding is a new phenomenon; we were unaware of that before." (Participant 1, 55 years old)

Negative languages were spoken by people in the past. The king and some of the influential people were able to speak other languages. This was elaborated by one of the participants:

"Agha Khan visited Hunza in 1960 for the first time. Mir of Hunza (Title of Hunza's King) translated English speech given by Agha Khan to Burushaski (Native language of Hunza). He had not given this speech by himself because people could not understand English." (Participant 7, 55 years old)

KKH construction resulted in the influx of tourists. The locals, due to interaction with others, are aware of the importance of learning different languages. After CPEC, people were also learning the Chinese language. The language has also changed; words from alien languages, including Urdu and English, have influenced the local dialects, Burushaski, Wakhi, and Shina. The pronunciation of words has changed. Even the dress code has changed from traditional gowns and hats to modern textile garments.

"After the 1970s, the residents of Hunza engaged in the transportation sector and tourism. With increases in foreign tourism, different language centers were opened in Hunza, such as Japanese and Spanish... There was a time when people in Hunza focused primarily on English. With the development of the CPEC, the Chinese language has become especially important. For example, during the Bachelor's degree program at Karakoram International University (KIU), it is mandatory for students to take Chinese language courses worth 3 credits. (Participant 5, 50 years old)

Moreover, tourism is a source of renewal for ancient sites. Once these sites were abandoned, they were renovated to boost tourism. Females of HV have mastered skills in making traditional caps, clutches, and gaining popularity. One of the participants showed his remarks:

"Due to the influx of tourism, traditional places were renovated it resulting in the promotion of local culture. Traditional music, dance, handicrafts, and embroidery have gained recognition. Baltit and Altit forts, built around 900 and 1100 years ago, the abandoned residences of the royals, have now been rehabilitated and opened for tourists. These have become public attractions, and people from around the world come to Hunza and visit these places. (Participant 9, 47 years old)

It is evident that tourism has changed the way of life and impacted language and dress.

Natural capital: Land, environment and the ecological costs of tourism expansion

The people of Hunza were dependent on agriculture, and land was the main natural asset according to the participants. People were dependent on subsistence farming. They grow vegetables and crops like wheat and maize as staple food and depend on agricultural produce for the entire year. After KKH construction, people entered the tourism and hospitality business they built guest houses, opened restaurants, and cafes on that agricultural land. In this way, managing land was changed due to the onset of tourism. One of the participants said:

"Now we are not as dependent on agriculture as our ancestors were. In Hunza, most households now build guest houses, shops, and hotels. The hotel or guest's house makes far more profit than crops grown in the same land." (Participant 11, 30 years old)

On the one hand, tourism is the main reason for transitioning from subsistence agricultural livelihoods to tourism livelihoods, and on the other hand, tourism is also the main reason for damaging natural assets.

"One of the main negative impacts is pollution. Hunza is a beautiful place, but tourists often spread litter, even in the mountains. I have heard that plastic bags can now be found in the mountains. Traffic jams and overcrowding have made everyday life more challenging." (Participant 10, 47 years old)

This study also sheds light on the disadvantages of tourism, as it is a source of pollution of the natural environment.

Economic capital: Diversification, seasonality, and uneven benefit distribution

The basic physical infrastructure consists of houses, bridges, and tracks. Participants argued that the houses were made of mud without basic facilities, such as no electricity or gas. There were traces of the old Silk Road and tracks for animals. For locals, only animals were a mode of transportation. Crossing rivers was extremely difficult. People used small boats or suspension bridges. One participant said that:

> *"There was just one pony track that connected Hunza with China in the north and Gilgit in the south. For travelling, the well-off people used to have horses. I remember the bridge that connects our village to KKH was built in 1979; before that, we crossed the river by boat (Garradi). Before this old Silk Road passed through our village. The traditional houses of stone and mud have changed to fully concrete buildings to accommodate visitors, having all facilities."* (Participant 14, 65 years old)

The infrastructure of HV has changed since the influx of tourism after the 1980s. Long before people used animals as a means of transportation, or used to travel on foot. After KKH, different vehicles started to operate, and CPEC makes the mode of transportation easier. Different bus services operate directly from Hunza to major cities of Pakistan due to the connectivity provided by the infrastructure network. Additionally, the infrastructure eases the tourists ' visit to HV.

> *"To engage with the tourists, hotels started to be operated and built in the Hunza valley. People are engaged in the tourism sector, so new hotels were constructed to accommodate tourists; these hotels are the source of income for the residents of Hunza. Other sectors related to the tourism industry, like fruits, bakeries, and general stores, flourished. Recently, Serena Hotel and Awari Hotel were opened in Hunza. These are the results of tourism, and tourism relates to the infrastructure provided by KKH and CPEC."* (Participant 13, 60 years old)

In tourism and hospitality, females are also earning an income. Tourists are enthusiastic to explore the local cuisine and are attracted to the Indigenous products. Females of Hunza possess the ability for handicrafts. They learn this attribute from their elders. The senior citizens of Hunza wear traditional caps. Those caps are made by their daughters, daughters-in-law, or granddaughters. Most of the female entrepreneurs sell traditional handmade crafts.

> *"Many women in Hunza, particularly in cities like Karimabad and Aliabad, are now active in the tourism sector. They have opened shops selling traditional foods and clothing, often earning more than men."* (Participant 1, 55 years old)

Institutional capital: Governance, representation, and the distribution of tourism rents

Institutional capital in this study covered two topics: participation in decision-making and benefit sharing in the context of tourism. Some of the participants argue that the province of Gilgit-Baltistan is a disputed territory, and we do not have representation in the federal government. If any of the laws are framed by the local government of Gilgit-Baltistan, they must be approved by the federal government. So, as residents of Hunza, our voices are not heard, nor are we consulted by any government officials before framing any law regarding tourism.

> *"The tourism department was reestablished in the 2000s; we can infer how serious the government of Pakistan is in the context of tourism promotion in our area."* (Participant 15, 50 years old)

In the context of benefit-sharing in the context of tourism, participants argued that the government of Pakistan is generating benefits from our natural resources like water, mountains, and tourism, but the residents of HV are not getting benefits from it. The participants argued that tourism alone can generate huge investments if the federal government is serious about it.

Information capital: Digital access, market visibility, and new inequalities

Information Capital in this study is novel capital, including digital literacy. Some of the participants argue that the internet is the most important means of information in disseminating information. Before, we were not aware of the benefits of the internet. The Internet further aided the promotion of tourism. One of the participants said that.

> *"Technology is advancing day by day. We had PTCL as a means of information then. Now, we have Android phones. Life becomes easier now; I can get online booking, and it is an easier method."* (Participant 13, 60 years old)

Further, one of the participants highlighted the importance of the optic fiber project under CPEC.

> *"Our area faced a lot of internet issues. The Internet project under CPEC resolved this issue. Now, everyone owns a cell phone. They upload pictures on social media, which is accessed by a large audience from different countries. Foreign YouTubers visit our area more frequently. Once our area was notorious for terrorism, but this stereotype does not exist anymore. This is because of the internet".* (Participant 6, 53 years old)

This shows the importance of disseminating information in the context of tourism. Although information capital appears as a single coded category in our analysis, its effects unfold through multiple mechanisms that significantly shape who benefits from tourism and how. First, market promotion: optical fiber and mobile internet enabled residents to publish images, register small businesses, and access online booking platforms; interview evidence indicates that social-media visibility increased tourist arrivals and shifted destination perceptions. Second, access to information and coordination: digital channels lowered search costs for tourists and enabled more efficient price discovery for local services, increasing short-term occupancy and income. Third, skills and inclusion: benefits from digital tools depend on digital literacy; those with prior education or training were better able to monetize online access, while less-connected groups remained excluded. Fourth, risk and inequality: digitalization also magnified precarity for seasonal workers and for landholders who sold plots to better-connected investors. Finally, governance implications: information capital amplifies the need for local capacity-building, supportive platforms, and protections to ensure benefits are broadly distributed. Empirically, our data show clear links between improved connectivity, individual entrepreneurial responses, and emergent inequalities, a pattern that justifies treating information capital as a distinct analytical asset in SLFT but also calls for finer-grained measurement in future work.

Overall, the findings reveal that the livelihoods in Hunza were undergoing a multidimensional change since the construction of KKH and the consequent tourism boom. Human capital has been enhanced due to increased education, language acquisition, and better access to health, yet the benefit has been uneven and have led to the decline of farm skills. The impact of social capital is mixed, as tourism has increased the external networks, the resurgence of cultural heritage, and the involvement of women in market activities; it has also led to the commodification of cultures and changes in marriages and ceremonies. Natural capital, which was previously based on subsistence agriculture, has been redefined with the conversion of land to tourism infrastructure as a source of income but as a cause of congestion, pollution, and environmental stress over a long period. The economic capital has been increased by the hotel industry, transport, and handicrafts, but the benefits are disproportionately enjoyed by households with financial, educational, or location advantages, which results in seasonal and class-based inequalities.

The institutional capital is also not strong; its efforts to come up with new initiatives involving tourism have been hampered by the lack of political representation and benefit sharing to ensure equitable involvement in tourism governance. Lastly, information capital, which has been enhanced with mobile network and fiber-optic connectivity by CPEC, has become a decisive edge that has facilitated online marketing, booking, and visibility around the globe, but with uneven digital literacy, has developed new fault lines regarding who can benefit through tourism opportunities. All these interrelations demonstrate that despite the significant positive effect of tourism on the livelihood prospects, there have been significant trade-offs between the capitals that raise the questions of sustainability, equity, and long-term resilience.

Interpretation

This section interprets the empirical patterns identified in the Findings by situating them within the Sustainable Livelihood Framework for Tourism (SLFT) and wider debates on tourism-led transformation in mountain regions. Instead of restating the results, the discussion highlights three analytical insights: (i) the livelihood gains emerging after the construction and renovation of the KKH are substantial but uneven; (ii) the six capitals evolve through mutually reinforcing as well as conflicting pathways; and (iii) these interactions shift across different stages of tourism development, shaping long-term sustainability and equity in HV.

The results show that human capital, especially education, skills, and health, have undergone considerable change following the opening of HV to broader exchange by KKH. Before the highway, mobility and educational access were constrained, as were health services, which were very minimal under the Monarch system. The infrastructure of KKH and subsequently CPEC allowed residents to get in touch with other educational institutions, language schools, and health care. Hussain et al. (2019) also present similar results, as these findings reveal that connectivity through tourism enhances formal knowledge, skills, and overall well-being in isolated areas. Similar tendencies are also described by Marwat and Faryal (2022), who also imply that the development of infrastructure around tourism can frequently provoke the growth of human capital in remote mountain areas. Nevertheless, it is also shown that the returns on human capital are unequally distributed. The younger, educated people, especially the men in the society, have moved to occupations that deal with tourism, whereas the older and less educated communities are still bound by their traditional ways. This imbalance underscores a new form of intra-community differentiation, and it may point to the fact that

the growth of human capital, in general, may unwittingly exacerbate generational and gender gaps. The same tendency of connectivity-based socioeconomic differentiation is described by Alam and Iqbal (2025).

The nature of social capital has been changed by tourism essentially in relation to language use, dress, ceremonial life, and expression of culture. Dress codes and marriage have been affected, and language learning (especially English and Chinese) has been triggered by increased interaction with tourists. The same changes resonate with the results of Hussain et al. (2019, 2024), who report that the culture and social norms of Gilgit-Baltistan have been changing fast because of tourism and more significant exposure to the outside world. Meanwhile, it has been indicated that these changes are not only adaptive but also commercial. The commodification of culture is seen through destination weddings, cultural shows performed to tourists, and a market-oriented need to seek traditional crafts. Such commodification can make the intrinsic meaning of cultural practices watered down or distorted, as it is argued by Hussain et al. (2024). The results thus indicate a two-fold process in that tourism renews some cultural resources and at the same time remakes social relations and rituals for economic purposes. The focus of subsistence agriculture has been transferred to tourism market demands, and now, natural capital is the basis of subsistence agriculture. Inhabitants have turned agricultural lands into guesthouses, restaurants, and shops, which is expected, according to Qutoshi et al. (2021), who record the same land-use alteration and environmental deterioration in the mountain areas of GB. The production of waste, traffic jams, and change of landscape have become significant issues. These environmental pressures imply that, despite its economic value, the tourist boom leads to a high burden on the local ecosystem and raises questions about the long-term sustainability of natural capital.

Tourism has emerged as the leading means of living, with people getting employment in hospitality, transport, retail, and handicrafts. Physical capital, such as roads, concrete housing, and transport networks, has grown at a high rate since KKH, which is allowing further market integration. These results are consistent with those of Hussain et al. (2017) and Karim et al. (2020), who discuss the importance of CPEC and the KKH in the development of income opportunities and the conversion of the agricultural economies into tourist-based ones. Women's entrepreneurship has also risen, especially in handicrafts and local foods, which have been matched with Bano and Khayyam (2018). Economic capital is, however, unevenly distributed. The greatest proportion of tourism benefits is taken up by the households owning land in strategic sites or those who already have access to financial assets, whereas the rest of the population experiences volatilities in seasons or loss of the traditional ways of living. This trend explains the reasons why tourism may contribute to the growth of economic opportunities and inequalities based on class at the same time.

Institutional capital remains the weakest dimension in HV's livelihood system. Limited political representation, fragmented planning, and weak benefit-sharing mechanisms restrict local participation in tourism governance. Although initiatives exist, such as heritage renovations led by AKDN and the Government of Norway, residents frequently report exclusion from decision-making processes. These findings complement Bibi (2020), who highlight governance inconsistencies and limited federal engagement in tourism development in scenic regions of Pakistan. Without stronger institutional frameworks, tourism benefits will continue to accrue unevenly, and environmental pressures may remain inadequately managed. The addition of information capital in this study reveals the central role of digital connectivity in shaping contemporary tourism economies. Improved internet access, reinforced by CPEC's optic fiber infrastructure, facilitates online bookings, social media promotion, and market visibility, patterns consistent with Buhalis and Amaranggana (2014). Digital literacy enhances entrepreneurial behaviors and resilience, as documented in rural tourism studies by Yang et al. (2024). However, those without digital skills or access remain disadvantaged, indicating that information capital, like economic capital, can reproduce social and class inequalities.

The six capitals do not exist as autonomous entities, but as a network of mutual dependence. The increase in physical capital (KKH, CPEC) has also triggered economic diversification, which subsequently has increased the human and information capital through expansion in skills and market opportunities. However, these very processes have created pressure on the natural and social capital in terms of land conversion, congestion, and cultural commodification. These interactions are mediated by institutional capital: in the context of weak governance, economic and information capital grow in a manner that is disproportionate to other already advantaged groups. Therefore, the results of livelihood in HV are not due to the unilateral transformations of each capital, but the dynamism of transformation between them, which at times consolidate gains in one region and cause vulnerabilities in others. Collectively, the results indicate that the HV tourism through transformational infrastructure like the KKH and CPEC has created significant livelihood impacts in terms of human, economic, and information capital. But such benefits are moderated by environmental pressures, cultural commodification, unequal distribution of benefits, and governance loopholes. Using the SLFT as a

systems-based approach, the discussion herein demonstrates the nature of interactions between capitals, the development of trade-offs, and how the nature of tourism development changes over time. Such observations are relevant to the wider discussions on sustainable mountain tourism by emphasizing the fact that long-term resilience lies not only in the opportunities of the market and infrastructure, but also in the competence of institutional stewardship, environmental protection, and participative developmental trajectories.

Conclusion

The Karakoram Highway has acted as a structural catalyst that redirected long-standing patterns of isolation in Hunza Valley into new pathways for livelihood diversification. Using a modified Sustainable Livelihood Framework for Tourism (SLFT), this study shows how infrastructure-induced tourism simultaneously expanded multiple livelihood capitals (human, economic, and information) while producing uneven outcomes and trade-offs that threaten natural, social, and distributive resilience. Rather than presenting these changes as a single, uniform development dividend, the evidence points to a systemic process of capital conversion: physical connectivity triggered economic opportunities; economic gains stimulated investments in human skills and information use; but these very processes also accelerated land-use change, cultural commodification, and unequal access to benefits where institutional safeguards were weak.

Theoretically, this study contributes to SLFT in two ways. First, it affirms the value of treating information capital as a discrete asset: digital connectivity functions both as an enabling infrastructure and as a skill-dependent resource that mediates market access and reputation formation in contemporary tourism economies. Second, and crucially, the study demonstrates that institutional capital is not merely an external context but a core mediating asset within SLFT. Institutional capital, local governance, representation, benefit-sharing mechanisms, and regulatory capacity determine the conversion rates between other capitals (for example, whether tourism income translates into durable human capital investments or accelerates natural-capital loss). Theoretically, incorporating institutional capital strengthens SLFT's explanatory power by making visible the governance mechanisms that shape who can mobilize assets, how trade-offs are negotiated, and whether livelihood transitions lead to long-term resilience or vulnerability. This revision thereby moves SLFT toward a more relational and governance-sensitive model of livelihood transformation in tourism contexts.

Policy implications flow directly from these analytical insights. Because capitals interact and different stages of tourism development privilege different assets, interventions should be stage-sensitive, targeted, and measurable:

- Build inclusive information capacity (short term, local agencies + NGOs): implement a community digital-skills Programme (target: train 200 micro-entrepreneurs, 50% women, in online marketing and booking platforms in 12 months) and support a community-managed booking cooperative to retain a larger share of online revenues.
- Protect natural capital through zoning and carrying-capacity management (medium term, provincial planning authorities): commission a participatory carrying-capacity assessment for Karimabad and high-visit sites, adopt land-use zoning that restricts conversion of agricultural plots in priority areas, and require sustainable-design standards for new guesthouses.
- Institutionalize participatory benefit-sharing (short–medium term, GB government + local councils): create a statutory local tourism council with reserved seats for women, youth, and artisanal groups, mandate disclosure of tourism license fees and local hiring quotas, and pilot a transparent micro-grant scheme for community-led heritage enterprises.
- Environmental management and waste systems (immediate, municipal + provincial): establish a user-fee financed waste-collection system for peak seasons, install strategically located waste collection points and bins, and monitor littering and water-quality indicators quarterly.
- Skills and enterprise support (ongoing, vocational institutes + donor partners): provide hospitality and business-management training linked to microfinance products (target: reduce entry costs for 150 women-led microenterprises within two years).
- Monitoring and evaluation (cross-cutting): adopt a simple dashboard of monitoring indicators (e.g., % households deriving >25% income from tourism; % women-owned tourism enterprises; agricultural land converted to tourism uses; % households with broadband access; presence/score of local participatory governance mechanism) and report annually to the local tourism council.

In this study, the researcher implemented a purposive sampling technique for the selection of participants, which involves the identification of participants based on specific criteria, thereby limiting the applicability of findings to the broader population. Future investigations might encompass larger demographic groups, such as the entirety of GB, utilizing probability sampling methods to facilitate the generalizability of results across diverse populations. This analysis exclusively considers participants from HV, which may not be representative of other regions within Asia or the global context. Subsequent research endeavors should incorporate additional regions of Asia or international locales to enable a comparative analysis.

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Availability of data and materials

The author declares that she has the survey data collected from the field and used in this study, and it is available upon reasonable request.

Author Contribution

Sunana Alam is the sole contributor to the article. She has generated the idea of the article, has worked in the conceptualization of the research, literature review, design of research methodology, data collection and analysis, and final drafting.

References

Alam, S., & Iqbal, K. (2025). Contours of connectivity: Socioeconomic transformation and local perception of China-Pakistan Economic Corridor (CPEC) in upper Hunza, Pakistan. *FWU Journal of Social Sciences*, *19*(3). https://ojs.sbbwu.edu.pk/fwu-journal/index.php/ojss/article/view/4799

Ali, A. (2023). Estimating the recreational value of mountain tourism to shape sustainable development in Gilgit-Baltistan, Pakistan. *Journal of Cleaner Production*, *426*, 138990. https://doi.org/10.1016/j.jclepro.2023.138990

Ahebwa, W. M., & van der Duim, R. (2013). *Conservation, livelihoods, and tourism: A case study of the Buhoma-Mukono community-based tourism project in Uganda*. *Journal of Park and Recreation Administration, 31*(3), 96–114. https://js.sagamorepub.com/index.php/jpra/article/view/4112

Anwar, S., F. A. Khan & A. Rahman. 2019. Impact of Karakoram Highway on land use and agricultural development of Gilgit-Baltistan, Pakistan. *Sarhad Journal of Agriculture, 35*(2), 417-431. DOI: http://dx.doi.org/10.17582/journal.sja/2019/35.2.417.431

Arifin, S. R. M. (2018). Ethical considerations in qualitative study. *International journal of care scholars*, *1*(2), 30-33. https://doi.org/10.31436/ijcs.v1i2.82

Bano, T., & Khayyam, U. (2018). China-Pakistan economic corridor and apparent socio-cultural transformations in Hunza Valley, Gilgit Baltistan Pakistan. *Transylvanian Review, XXVI* (26), 6969-6977.

Bibi, R. (2020). *Local community perception towards the socio-economic impact of tourism development: A case study of Hunza Valley* (MPhil thesis). Pakistan Institute of Development Economics (PIDE), Islamabad, Pakistan.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*, 77–101. https://doi.org/10.1191/1478088706qp063oa

Braun, V., & Clarke, V. (2021). One size fit all. What counts as quality practice in (reflexive) thematic analysis? *Qualitative Research in Psychology*, *18*(3), 328–352. https://doi.org/10.1080/14780887.2020.1769238

Buhalis, D., & Amaranggana, A. (2014, December). Smart tourism destinations enhance tourism experience through personalization of services. In *Information and communication technologies in tourism 2015: Proceedings of the international conference in Lugano, Switzerland, February 3-6, 2015* (pp. 377-389). Cham: Springer International Publishing.

Camilleri, M. A. (2018). *The tourism industry: An overview*. In *Travel marketing, tourism economics and the airline product* (Tourism, hospitality & event management). Springer. https://doi.org/10.1007/978-3-319-49849-2_1

Chowdhury, T. A. (2021). Applying and extending the sustainable livelihoods approach: Identifying the livelihood capitals and well-being achievements of indigenous people in Bangladesh. *Journal of Social and Economic Development*, *23*(2), 302-320. https://doi.org/10.1007/s40847-021-00163-z

DFID, D. (2009). Department for International Development. *Trading for Peace–An agenda of Reform*.

Gurung, L. (2012). *Exploring links between tourism and agriculture in sustainable development: A case study of Kagbeni VDC, Nepal* (Master's thesis). Lincoln University. Lincoln University Digital Thesis.

Guest, G., Bunce, A., & Johnson, L. (2006). *How many interviews are enough? An experiment with data saturation and variability*. *Field Methods, 18*(1), 59–82. https://doi.org/10.1177/1525822X05279903

Harold, R., & Wiroto, D. W. (2023). Dampak sosial ekonomi pembangunan Gorontalo Outer Ring Road bagi petani di Desa Talulobutu Selatan. *Dynamics of Rural Society Journal, 1*(1), 20–31. https://doi.org/10.37905/drsj.v1i1.8

Hussain, A. (2019). *Transport infrastructure development, tourism, and livelihood strategies: An analysis of isolated communities of Gilgit-Baltistan, Pakistan* (Doctoral dissertation, Lincoln University).

Hussain, A., Fisher, D., & Espiner, S. (2017). Transport infrastructure and social inclusion: A case study of tourism in the region of Gilgit-Baltistan. *Social Inclusion, 5*(4), 196- 208. https://doi.org/10.17645/si.v5i4.1084

Hussain, A., Mandić, A., & Fusté-Forné, F. (2024). Transforming communities: Analyzing the effects of infrastructure and tourism development on social capital, livelihoods, and resilience in Gilgit-Baltistan, Pakistan. *Journal of Hospitality and Tourism Management, 59*, 276-295. https://doi.org/10.1016/j.jhtm.2024.04.017

Hussain, K. (2016). Experience and status of tourism in Gilgit-Baltistan. Tourism, Youth Affairs, Sports and Culture Department Government of Gilgit Baltistan, Aga Khan Rural Support Program Skardu, Baltistan Division.

Hussain, W., & Khan, M. A. (2024). Climate change-induced Glacial Lake Outburst Floods in Hunza Valley of Pakistan: an assessment of indigenous farming community perceptions and adaptation. *Environment, Development and Sustainability*, *26*(5), 11515-11539. https://doi.org/10.1007/s10668-023-03396-6

Iqbal, K., Hongcheng, S., & Liang, H. (2025). Conflict-induced displacement in Pakistan: a sociological study of lived experiences of involuntary migration among Afghan immigrants. *Discover Social Science and Health, 5*, Article 6. https://doi.org/10.1007/s44155-025-00147-y

Iqbal, K. (2025). *Multifaceted roles of Afghan women immigrants in Peshawar beyond their precarious legal and social status*. *Discover Global Society, 3*, Article 90. https://doi.org/10.1007/s44282-025-00241-1

Karim, R., Muhammad, F., Salman, A., Shah, A., Qureshi, J. A., & Nilofer, M. (2020). *Impact of China–Pakistan Economic Corridor on local economy and tourism development: Case of Hunza, Gilgit-Baltistan, Pakistan*. *International Journal of Economic and Environmental Geology*, *11*(4), 14–17. https://doi.org/10.46660/IJEEG.VOL11.ISS4.2020.509

Karrar, H. H. (2020). In and out of the shadows: Pakistan–China trade across the Karakoram Mountains. In *Shadow exchanges along the New Silk Roads* (1st ed., pp. 22–43). Routledge. https://www.taylorfrancis.com/chapters/edit/10.5117/9789462988934_ch03/shadows-hasan-karrar

Karrar, H. H. (2022). *The geopolitics of infrastructure and securitisation in a postcolony frontier space*. *Antipode, 54*(5), 1386–1406. https://doi.org/10.1111/anti.12828

Kumari, R., Boerma, B., Ahmed, R., Suman, S., Sharma, S., & Dhawan, S. (2025). Assessing economic and livelihood impacts of water hyacinth utilisation in rural India: A mixed-methods study. *Dynamics of Rural Society Journal*, *4*(1), 60–69. https://doi.org/10.37905/drsj.v4i1.96

Ahmad-Khan, A. (2022). *Geography, accountability and capital: An ethnography of ecological accountabilities in Gilgit-Baltistan* (Doctoral dissertation). University of Glasgow. https://doi.org/10.5525/gla.thesis.83259

Kreutzmann, H. (1990). Tourism in the Hindukush-Karakoram: a case study on the valley of Hunza (Northern Areas of Pakistan). In Proceedings of the Second International Hindukush Cultural Conference (pp. 27-37).

Lasibey, A. A., Flora, V. A. S. M., & Taimenas, E. (2023). *Analysis of digital media literacy among tourism stakeholders in the coastal area of Kupang City*. In A. Azizah et al. (Eds.), *Proceedings of the International Conference on Applied Science and Technology on Social Science 2023 (iCAST-SS 2023)* (*Advances in Social Science, Education and Humanities Research*, Vol. 817). Atlantis Press.

Magaldi, D., & Berler, M. (2020). *Semi-structured interviews*. In V. Zeigler-Hill & T. K. Shackelford (Eds.), *Encyclopedia of personality and individual differences*. Springer. https://doi.org/10.1007/978-3-319-24612-3_857

Marwat, S. U. K., & Faryal, A. (2022). *Ecotourism and its socio-economic impact on Hunza Valley in Pakistan*. *Pakistan Languages and Humanities Review, 6*(2), 1192–1204. https://doi.org/10.47205/plhr.2022(6-II)100

Mbaiwa, J. E., & Stronza, A. L. (2010). The effects of tourism development on rural livelihoods in the Okavango Delta, Botswana. *Journal of sustainable tourism, 18*(5), 635-656. https://doi.org/10.1080/09669581003653500

Moazzam, M. F. U., Rahman, G., Ali, K. S., et al. (2023). *Spatio-temporal snow cover change in the early twenty-first century using improved MODIS dataset: A case study of District Hunza, Pakistan*. *Climate Dynamics, 60*, 3417–3433. https://doi.org/10.1007/s00382-022-06498-5

Mwongoso, A. J., Sirima, A., & Mgonja, J. T. (2023). Impacts of tourism development on residents' quality of life: Efficacy of community capitals in gateway communities, northern Tanzania. *Applied Research in Quality of Life*, *18*(5), 2511-2539. https://doi.org/10.1007/s11482-023-10196-7

Muhammad, P. (2011, January 30). *Hotel industry: Tourists needed, no bookings necessary*. *The Express Tribune*. https://tribune.com.pk/story/111030/hotel-industry-tourists-needed-no-bookings-necessary

Qutoshi, S. B., Ali, A., Shedayi, A. A., & Khan, G. (2023). *Residents' perception of impact of mass tourism on mountain environment in Gilgit-Baltistan, Pakistan*. *International Journal of Economic and Environmental Geology, 12*(4), 11–15. https://doi.org/10.46660/ijeeg.v12i4.68

Rana, A.U.R. (2014). Position paper for draft tourism policy: Gilgit-Baltistan. Washington, DC: USAID FIRMS PROJECT.

Ritonga, A. K. (2023). An Analysis of English for Tourism, Digital Literacy, and Business Success to A Tourist Destination Promotion. *Jurnal Iqra': Kajian Ilmu Pendidikan*, *8*(2), 325–339. https://doi.org/10.25217/ji.v8i2.3377

Robinson, O. C. (2023). Probing qualitative research interviews: Theory and practice. *Qualitative Research in Psychology, 20*(3), 382-397. https://doi.org/10.1080/14780887.2023.2238625

Rubin, H. J., & Rubin, I. S. (2005). *Qualitative interviewing: The art of hearing data* (2nd ed.). SAGE Publications. https://doi.org/10.4135/9781452226651

Shah, A., Ali, K., & Karim, R. (2024). *Assessment of peri-urban land dynamics using GIS remote sensing: A case study of Hunza City in Northern Pakistan*. *Modern cartography series*, *11*, 315–328. https://doi.org/10.1016/B978-0-443-15832-2.00013-7

Shen, F., Hughey, K. F., & Simmons, D. G. (2008). Connecting the sustainable livelihoods approach and tourism: A review of the literature. *Journal of Hospitality and Tourism Management, 15*(1), 19-31. https://doi.org/10.1375/jhtm.15.19Get rights and content

Suntikul, W., & Dorji, U. (2016). Tourism development: the challenges of achieving sustainable livelihoods in Bhutan's remote reaches. *International Journal of Tourism Research*, *18*(5), 447-457. https://doi.org/10.1002/jtr.2062

Yang, J., Zhang, T., & Zhang, L. (2024). Research on the influence of digital penetration on the entrepreneurial behavior tendency of rural residents in tourism. *Environment, Development and Sustainability*, *26*, 25549–25567. https://doi.org/10.1007/s10668-023-03695-y