



**RESEARCH PAPER**

**Tourism and Technology: Adaptation Strategies for Sustainable Rural Development in Hunza, Gilgit-Baltistan**

**<sup>1</sup>Faheem Ullah Baig and <sup>2</sup>Zulfiqar Ali Kalhoro**

1. CEO, Civic Systems SMC-Pvt Ltd, A Research and Development Company Hunza, GB, Pakistan
2. Associate Professor, Pakistan Institute of Development Economics (PIDE), Islamabad, Pakistan

**Corresponding Author:** baigfaheem88@gmail.com

**ABSTRACT**

This study contributes the debate on the role of tourism and technology as adaptive strategies in sustainable rural development in Hunza Valley, Gilgit-Baltistan, Pakistan. Tourism growth, digital connectivity, and increased exposure to global ideas have reshaped local aspirations and development pathways in the last few years. This study employed qualitative methods, including semi-structured interviews and participant observation to collect data on tourism activities, community experiences, and their socio-economic and developmental impacts in Hunza District, focusing specifically on UDC 2 and UDC. The findings of this study show that links between tourism, technology, and rural development are not too complex to materialize for upgrading the quality of life. It is evident that the concept of rural development has evolved significantly, especially among young entrepreneurs. Moreover, nonprofit organizations (NGOs) have nurtured the ideas of self-help and participatory development among the broader Hunza population through various projects of the Aga Khan Rural Support Program (AKRSP). This study emphasizes the needs of locals, such as skill development, environmental stewardship, community resilience, and the development of entrepreneurial behavior.

**KEYWORDS** Tourism, Technology, Rural Development, Hunza, Gilgit-Baltistan

**Introduction**

Throughout the history of the anthropology of development, rural areas have long provided the atmosphere for tourism activities in both developing and developed countries (Chuang, 2011). In the era of globalization, according to the United Nations World Tourism Organization (UNWTO, 2024), tourism has experienced sustainable expansion and diversification, becoming one of the sectors across the globe to demonstrate the largest and fastest-growing development sector. The tourism industry has emerged as the world's largest sector for economic development. International tourist flows have increased from 25 million in 1950 to 278 million in 1980, 674 million in 2000, and 1.4 billion in 2024. Revenue earned by the tourism industry increased from US\$2 billion in 1950 to US\$104 billion in 1980, US\$495 billion in 2000, and US\$1.6 trillion in 2024 (UNWTO, 2024). According to UNWTO's long-term Tourism Towards 2030 report, international tourist arrivals worldwide are projected to increase at a rate of 3.3% per year between 2010 and 2030, reaching 1.8 billion by 2030 (UNWTO, 2024). In many developing countries, tourism is being recognised as a key priority for the state to work on regional and local-level projects to strengthen tourism infrastructure. Mostly, tourism leads to improvements in infrastructure, economic stability, the restoration of heritage sites and architectural monuments, and the promotion of the preservation of the natural environment (Barlayaev, Akhumeto, & Nasyro, 2009). In the 21st century, Information Communication Technologies (ICTs) revolutionized the tourism industry by changing the strategic position of organisations and destinations through enabling efficient and reliable access to information (Buhalis, 2014). The introduction of the Computer Reservation System (CRS) in the 1960s, the transition to the Global Distribution System (GDS) in the 1980s, and the

unexpected arrival of the internet in the early 1990s have posed both opportunities and challenges for the tourism industry (Xiang, Magnini, and Fesenmaier, 2014). Most tourism service providers believe that managing information technology is a key concern for managers and tourists. Selecting a viable option among multiple options is seen as risky and strategic. Adopting new technological tools and implementing new systems consistently creates new worries. In many developing countries, the tourism industry has been slow to adopt new information technologies (Conor, 2008). Despite the richness of Pakistan's natural resources and cultural diversity, and the beautiful valleys of Gilgit-Baltistan in Northern Pakistan, the tourism industry has not been fully developed due to the government's lack of interest (Rana, 2015). Since the 1970s, rural tourism has increased in most developing countries. The industry caused significant development shifts in the economic and social lives of people (Pesonen & Horster, 2012). According to Pesonen and Horster (2012), in China, tourism services generated 120 billion Yuan and created employment opportunities for 15 million people across the country's rural regions. A recent report from the Ministry of Tourism, Sports, and Culture, Government of Gilgit-Baltistan, revealed that around 1 million tourists visited the area in 2016, and it is estimated that the figures reached 1.2 million. Hunza district is among the most visited places by domestic and international tourists ("The Express Tribune," 2016). Given the prevalence of development challenges in countries like Pakistan, there is an urgent need to explore new dimensions of development. The agrarian transformation of the 1990s needs to be revised. There is a need to integrate specialisms into programmes with new, modern development themes. Tourism programmes would promote local organisations and people for sustainable rural transformation (Ling-en et al., 2013). It has been proven that the tourism industry is the world's fastest-growing sector and may continue to grow. To maintain the consistency of the tourism industry in the 21st century, there is an urgent need for a creative development model and policies that acknowledge the viable opportunities and potential issues the industry will face (Kerr, 2003). While discussing issues such as transportation, regionalism, seasonality, and fragility, one should recognise the potential to harmonise skills and resources to balance poor communication and the heavy reliance on existing communication processes. This research reveals a more thorough understanding of the phenomenon of tourism and technology in rural areas and ascertains the insight of rural people's vantage points on development, such as skills development, quality education, health, and infrastructure development, and figures out a locally comprehensible model of development based on insights from this work.

## **Literature Review**

Rural development is a multidimensional process that is designed to envisage a variety of improvements needed for the betterment of rural life and may refer to the process of improving the quality of life and economic well-being of the people living in suburban areas on a sustainable basis (Moseley, 2003). The term rural development is most often used in reference to developing countries, and it implies a process that aims to enhance production capacity and improve the standard of living in suburban areas. Rural development is traditionally based on the exploitation of natural resources such as agriculture and forestry; however, globalization and increased urbanization have changed the basis of rural development (Waheed & Kalhor, 2023). Tourism, niche manufacturers, and recreation have also contributed to rural development as dominant economic drivers (Johnson & Snepenger, 1994). The end of colonialism in most developing countries after the Second World War increased hopes for development, especially in newly independent countries. In most developing countries, a larger number of people live in rural areas dependent on agriculture. In the 1960s, these underdeveloped regions began industrializing and adopting the 'Green Revolution' in agricultural methods (Kalhor, 2021). The intention was to increase the production of goods using the latest technologies, which became key priorities in most Asian countries. Unfortunately, the outcomes of these approaches failed to please the larger population living in rural areas (Muyeed, 1982). In India, problems of 'Green Revolution' areas are widespread due to the prevalence of the

bureaucratic structure of extractive programs of British rule and exploitation of tenants, and the social and economic disparities were also increased within most of the villages across all provinces of the country (Deva, 1984). Rao (1983) argues that, since the emergence of rural development as a new priority in less privileged areas of developing countries five decades ago, it has undergone significant shifts in approaches and paradigms. The frequency of development issues, such as poverty, has again opened new avenues for examining modern approaches to understanding rural progress. Most rural development projects and Green Revolution technologies were tested in Pakistan during the 1950s and 1970s to accelerate transformation and innovation in the manufacturing and agricultural sectors. These efforts achieved some success in increasing agricultural productivity but failed to address innovative organisational performance (Rahman, 1977). Interestingly, the concept of rural development of the post-80s changed significantly. In the 70s, rural development was closely linked to agricultural development. The modern concept of rural development is not only about increasing production and output, but also about improving the quality of life, including standards of health, the reliability of education, environmental quality, food safety, gender inequalities, and income inequalities. In 2000, the United Nations formulated the Millennium Development Goals (MDGs) to address global development issues, spanning social sciences to natural phenomena. Rural development was given priority in the international development agenda (Adisa, 2012). Unfortunately, at the global level, most developing and underdeveloped countries failed to meet many targets. Therefore, it is commonly believed that the development of rural areas requires deliberate planning and execution of wide-ranging activities and programmes that are based on the needs of rural people. Irvine and Anderson (2008) highlight the condition of being rural in the 21<sup>st</sup> century; what are the key differences that define rural areas? They define rural as physical distance from urban space and limited access to modern amenities. To address rural development issues in the 21<sup>st</sup> century, Barlayaev, Akhumeto, and Nasyro (2009) argue, there is an urgent need to examine new dimensions of development. The agrarian transformation of the 1990s needs to be revised. There is a need to incorporate specialisations into programmes with new, modern themes of development and integration. They further identify that tourism services would promote local organisations and people for sustainable rural transformation. Similarly, Irvine and Anderson (2008) explain that, around the world, many physical and cultural elements make rural areas ideal for specific purposes of visitation and authenticity, and that traditional industries in rural communities have been fairly compensated by tourism. Furthermore, the authors recommended growing and sustaining rural economic activities and addressing existing challenges. The local tourism industry has to adapt its structure to prevailing technologies and strategic issues.

### **Advent of Rural Development In Gilgit-Baltistan**

In 1980, the Aga Khan Rural Support Programmer began operations to address the social and economic hardships of people living in remote mountain areas in the Northern part of Pakistan. These programs were initiated with financial support from the Aga Khan Development Network (AKDN); later, many development funding agencies from the developed world participated to accomplish the mission of removing natural and man-made hurdles to development. After successful interventions, government arms also participated in some villages to serve people. The AKRSP adopted the strategy of developing village and women's organizations to promote its development objectives. Successfully, AKRSP engaged 94000 individuals in 2371 village organizations and 47000 women in 1397 women organizations (Rehman, 2007). Throughout this process, AKRSP has implemented several irrigation, microfinance, skills development, and savings programs. According to Gartner (2002) and Jianchao, Xinge, Qinqin, and Nan (2015), the rise of regional integration in Hunza has not yet reached a level that minimizes dependence on subsistence farming. The local population's decision-making is also limited. Major interventions in the Hunza region are based on donors' interests and hamper the transformation process. The misuse of the human and natural environment has increased due to improved infrastructure and communication. The inflow of tourists and development projects has to be assessed in terms

of their impact on local social life and ecology. Unfortunately, the fruits of rural success have failed to reach the doors of people at the bottom. Centralized planning, low participation of civil society organizations, and minimum representation of the target population block the diversification of development motives. Failing to recognize the specialties of rural regions, e.g., entrepreneurial skills and infrastructure development, in Pakistan has led to a reliance on obsolete livelihood techniques.

### **Nexus between Tourism and Information Technology**

Information technology has been transforming the tourism industry worldwide. The introduction of information technologies has generated a new shift in the workplace, creating a wide range of opportunities and uncertainties (Cornor & Buhalis, 2005). Information technologies empower tourists and service providers to identify and utilize tourism products, enabling access to global recreational activities. Around the globe, the use of information technologies has become widespread in services, mainly in the hospitality industry, and it helps provide solutions for the dissemination of organizational products, quality services, profitability, and the protection of heritage products (Conor, 2008). According to Buhalis (2014), it is commonly believed that organizations that fail to take advantage of recent technological tools will lose market share and possibly face competitive uncertainties. In a single case, Marriott (marriott.com) expanded its capacity online, achieving 13,000 visits per day and earning US\$1.5 million in monthly revenue (Buhalis, 2014). According to the United Nations Conference on Trade and Development (UNCTAD 2005), ecotourism and related segments are growing in developing and underdeveloped countries. Local people are receiving financial and social benefits; therefore, protecting unidentified natural and cultural resources could help target destinations diversify local offerings by using information technologies (Anwar, Carmody, Surborg, & Cocoran, 2014). It is further stated that tourist activities have been considered dependent on information technology and the information-intensive service industry. While discussing the importance of information technologies, McCabe, Sharples, and Foster (2012) stress the appropriate engagement with technology, while keeping the socio-cultural and economic advantages of stakeholders in mind. According to them, tourism is becoming increasingly mediated through modern technologies. In rural parts of the world, the tourism industry is gaining momentum, reaching maturity, and keeping pace with economic and competitive challenges. To sustain its growth, the local industry has to innovate its work environment technologically and strengthen its strategic position (Irvine & Anderson 2008). Similarly, information technologies provide rural businesses with conveniences to manage internal organizational structures, improve market effectiveness, and address awareness and training gaps. Networking and information sharing in rural areas are weak. This information gap can be overcome by access to tools and modes that facilitate the acquisition, spread, and mobilisation of resources. The failure to relate information technology and tourism can harm the stakeholders on both sides. This kind of networking is also very critical for attracting tourists, coordinating with investors, and supporting rural societies.

### **Tourism and Global Phenomenon**

According to the United Nations World Tourism Organisation (UNWTO, 2024), an estimated 1186 million tourist movements and US\$1260 billion in earnings are clear signs of high growth. The tourism industry is among the fastest-growing in the world. This global trend has coincided with the expansion of the international tourism industry. In this regard, tourism has become a key priority for every nation, aimed at fostering economic and social potential. Similarly, Barlayaev, Akhumeto, and Nasyro (2009) found that tourism is the third-largest development trend in developing countries, following oil trade and arms trade. An average gross revenue reaches 7% per year, 10% of worldwide investment, and every 11<sup>th</sup> job and 8% of gross domestic product. Further evidence from across the developing regions of the world shows that a single tourist can employ 10-20 people in the service industry, for example, in hotels, manufacturing, and entertainment. The rapid growth of

tourism worldwide is driven by modern technologies, such as the internet and online booking. These changing patterns have both positive and negative implications for local communities. The main concerns experienced in both developing and developed countries are economic uncertainties, environmental issues, and socio-cultural changes (Chuang, 2011). In contrast to the above achievements of the tourism industry, Parhad, De-Gang, & Xiao-lie (2005) argue that the tourism industry is very fragile, with frequent job losses, little financial incentives for bottom-level employees, and a strong tendency to reduce to the very lowest level. It is often unsustainable due to its high vulnerability to natural and human-made disasters, such as terrorism and earthquakes. Therefore, Barlayaev, Akhmeto, & Nasyro (2009) suggest that there is a need for a political, legal, and methodological framework for tourism development, mainly in developing countries. Access to finance, information technology, roads and infrastructure, and public-private partnerships are key to promoting sustainable tourism.

### **Tourism and Rural Development**

Tourism has been used many times as an alternative development option, whether a country is developing or developed, to help the development process move smoothly. It is evident from the success of the tourism industry in rural areas of China. According to statistics from the China National Tourism Administration (2012, US\$34.9 billion in revenue was generated, 720 million tourist arrivals were recorded, and 85,000 villages were engaged throughout 31 provinces (Rui-Ying, Jian-Caho, shou-kun, Xin-ge, & Quan-sheng, 2015). Similarly, McLeod, Lewis, & Spenser (2016) note that Caribbean tourism activities have become the main economic drivers, shifting from a sugar-based economy to a rural tourism industry. The annual report of the Caribbean Tourism Organization 2016, which shows an approximate flow of 28.2 million tourists and revenue of US\$34.3 billion in a single year of 2015. At the same time, safety, community housing issues, socio-economic conditions, and environmental concerns must be considered amid the increased flow of tourists. Parhad, De-Gang, & Xiao-lie (2005), while studying rural tourism in Turpan, China, find that tourism can boost local retail businesses and increase employment for hospitality workers, promote socio-economic development, and provide opportunities to share cultural heritage; these factors serve to improve the natural environment. According to Ling-en et al. (2013), the mass tourism activities in China and other developing economies are now facing challenges of infrastructural disorder, unbalanced service provision, unnecessary urbanization, and environmental degradation. The authors further summarized that there is a need for partnerships at the national and regional levels for the growth of the tourism industry. Exploring, planning, and defining resources at the local level is very important.

### **Conceptual Framework**

Our research spans three domains: tourism, technology, and rural development. To answer our first research question, which is to find the status and linkages between tourism and technology as tools for rural development. To understand these domains, we refer to Bock (2015), who argues that information technology has had a significant impact on the tourism industry. Kenteris, Gavalas, & Economou (2015) believe that information technology has been transforming tourism globally and has generated a paradigm shift in the economic and social structures of local communities. Irvine & Anderson (2008) suggest that, around the world, many physical and cultural elements make rural areas ideal for specific purposes: to visit and experience authenticity. To cover our second question, we refer to Irvine and Anderson (2008), who are sure that the progress achieved by the tourism industry is due to the adoption of information technology in small and large-scale businesses; and Bourgouin (2002) suggests that the use of information technology is key for the economic development of rural societies. To understand our third question, I refer to Barlayaev, Akhmeto, and Nasyro (2009) and Jianchao, Xinge, Qinqin, & Nan (2015). They argue that tourism leads to improvements in infrastructure, the restoration of heritage sites

and architectural monuments, and the promotion of the preservation of the natural environment. To understand socio-economic conditions of local people I refer to the concept of rural development defined as “Rural development as a process of developing and utilising natural and human resources, technologies, infrastructural facilities, institutions and organizations, and government policies and programs to encourage and speed up economic growth in rural areas, to provide jobs and to improve the quality of rural life towards self-sustenance” (Singh, 1986).

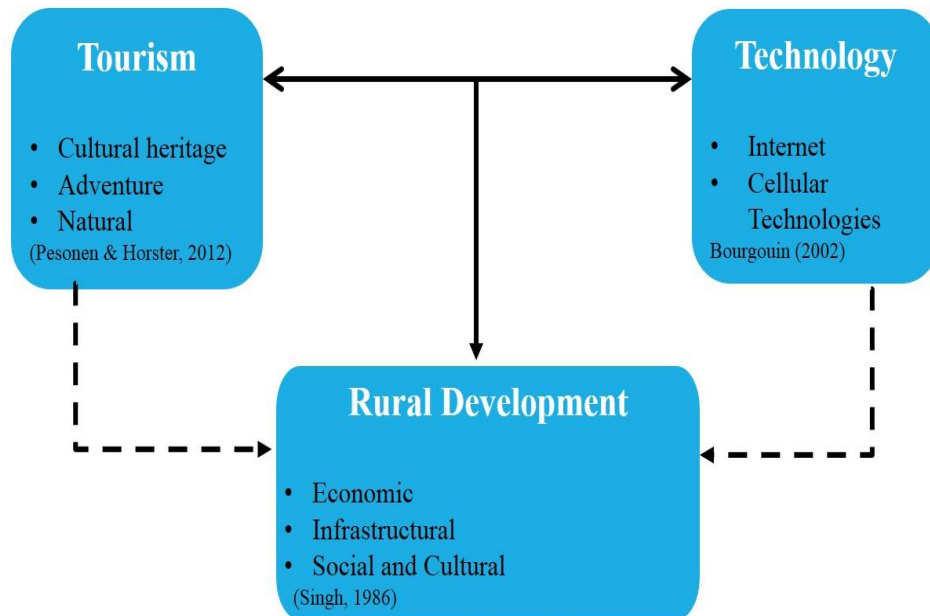


Figure 1: Diagrammatic Representation

This diagrammatic framework presents three main domains of our work and the way we will analyse our field data. The dark black lines indicate the linkage between tourism and technology, the combined effect on rural development, and the correlation between the two. The other outer dotted lines show the singular relationship between tourism and rural development and how technology and tourism affect the rural development process. The results are generated from these linkages, which will produce answers to my research questions and guide us in meeting the research objectives.

## Material and Method

This study employed a qualitative research strategy and an explanatory case study design. We conducted fieldwork from June 2016 to June 2017. The following units of data collection (UDCs) were identified across the Hunza District.

- Managers of heritage sites and hotels providing food and accommodation in the district of Hunza.
- Tour operators running offices in Hunza.
- Representatives of a local support organization working on development projects in Hunza.
- Officials of NGOs who are directly working on development events and programs promoting tourism and technology as a strategy for development.
- Government officials are directly involved with the tourism industry.

The data were collected through semi-structured and unstructured interviews and participant observation. We conducted unstructured interviews during rapport-building and continued them throughout fieldwork with UDC 2 and UDC 3. This allowed us to build rapport with respondents; secondly, it was easy to get information from UDC 2 and UDC 3 about the general pattern of tourism activities and their impact on the development process in Hunza. This technique also proved helpful for cross-checking information gained from other types of interviews. Notably, all replies were recorded through a voice recorder, and notes were taken. Secondly, the researchers used semi-structured interviews with UDC 1, UDC 2, UDC 4, and UDC 5. These techniques enable researchers to obtain bottom-level information on linkages and the roles of tourism and technology in the rural development process. Participant observation is a strategy for gathering information about a social interaction or a phenomenon in qualitative studies. This is usually done by developing close interaction with members of a group or by living in a situation being studied (Kumar, 2011). The main advantage of participant observation is that, as you spend sufficient time with the group or in a situation, you gain much deeper, richer, and more accurate information; the main disadvantage is that, if you are not very careful, you can introduce your own bias (Kumar, 2011). This technique was employed throughout the fieldwork. It enabled us to fill the information gap between each domain of the study, tourism, technology, and rural development, which would not have been possible to fill during the interviewing processes. According to Burns (1997; 305), in a case study, the focus is on the case in its idiosyncratic complexity, not on the whole population of cases when selecting a case; therefore, one usually uses purposive sampling techniques (Kumar, 2011). The intention behind choosing this sampling technique in most research is to work with a very small population and select cases that are particularly informative. For this study, we used a purposive sampling technique across all units of data collection (UDCs). The reason for choosing this sampling procedure is the very little diversity among UDCs and the small population size of each UDC. Throughout this study, thirty-five individuals were interviewed from all units of data collection, UDC. Researchers in the social sciences use several approaches to analyze qualitative data, depending on their research questions and objectives. Ritchie and Lewis (2003) argue that, in most research analytical approaches, identifying themes and concepts under which the acquired data will be labeled, sorted, and compared is essential for uncovering hidden meanings. In the same way, thematic analysis is the approach that involves analysing data, identifying commonalities, relationships, and differences within each data set (Gibson & Brown, 2009). In this study, we used a thematic analysis tool. The aim is to identify themes and patterns throughout the data and relate the meanings of each theme to the research questions.

## **Results and Discussions**

With the evolution of rural development approaches, Hunza's socio-economic landscape is undergoing rapid urbanization. The findings reveal that urbanization and technological advancement have emerged as key adaptation priorities for local communities. Individuals increasingly strive for upward social and economic mobility, seeking improved access to education, housing, healthcare, and essential IT infrastructure. However, despite this collective push for transformation, limited policy frameworks and inadequate regional planning continue to restrict access to affordable economic resources and basic services, particularly for residents of remote villages. Tourism, while offering new livelihood pathways, has simultaneously created a growing dependency on external actors. As an industry that is highly vulnerable to natural and human-made shocks, tourism exposes communities to economic uncertainty. In Hunza, expectations of high financial returns from tourism have encouraged many families to convert cultivable land, including wheat fields and orchards, into hospitality infrastructure. This shift represents not only an economic adaptation strategy but also a structural risk, as the reduction of agricultural land threatens long-term food security and ecological balance. The long-term future of rural development is completely linked to the sustainable management of the available human, natural, economic, and heritage resources. Therefore, to sustain the development process or to

search for alternative development options, tourism development has been considered a suitable strategy in rural areas of underdeveloped and developing countries (Rui-Ying et al., 2015). This study highlights the structural transformation of local settlements in prominent villages, including Karimabad, Aliabad, Haiderabad, Altit, and Gulmit. Traditionally defined by their cultural heritage, these settlements are increasingly reshaped by tourism-driven economic growth and infrastructural development. While this process fosters urbanization and commercial expansion, it simultaneously contributes to the commodification of local culture and the erosion of historical and social authenticity. These changes highlight the need for integrated policy interventions that balance economic development with cultural preservation, promoting sustainable tourism and inclusive planning strategies to safeguard the long-term identity and resilience of these communities.

### **The Rise of the Services Industry**

In the 21st century, mountainous regions like Hunza, which are highly vulnerable to natural disasters and heavily reliant on other provinces for daily livelihoods, face an urgent need to explore new dimensions of development and resilience. Traditional agrarian transformation systems of the 1990s are no longer sufficient and require substantial revision. There is a critical need for specialized programs that integrate contemporary development concepts, strengthen local organizations, and enhance human capital and resilience. The findings indicate the need for a comprehensive master plan for tourism development and related infrastructure, aimed at engaging youth and cultivating potential soft skills to mitigate adverse social, cultural, and economic impacts. Hunza's natural and cultural environments are central to its tourism potential, offering significant aesthetic and recreational value. However, these resources are highly susceptible to degradation from human activities, particularly in the absence of adequate planning and information sharing. To capitalize on these opportunities while preserving local assets, the community must equip itself with modern soft skills, including e-marketing, AI applications, hotel management, and technical trades such as carpentry.

Standing from the services industry standpoint, a respondent in lower Hunza described the options of sustainability in the growth tourism industry and technological sector in the following sentence:

***".....God has gifted us natural resources, and we have to prepare human skills to utilize the resources for our betterment."***

### **The Rich, Poor, and the Growing Gap**

Without hesitation, it is evident that most individuals in Hunza have been exposed to development interventions and have benefited from both domestic and foreign-funded projects. However, the fulfillment of basic human needs remains unevenly distributed, and the economic and social gains from development are not equitably shared across the population. Economic benefits from tourism are largely concentrated in the hands of hotel owners and tour operators serving foreign visitors, while technological profits are primarily captured by cellular companies and service centers, with only a minimal portion reinvested in local markets. This situation has contributed to growing concerns among residents about an expanding income gap. It is therefore imperative for both the local administration and the community to systematically analyze the costs and benefits of tourism and technological services. Categorizing commercial activities by service type, such as hotels, restaurants, and heritage sites, can enable stakeholders to monitor and regulate business practices more effectively. The findings indicate that most hotels and guesthouses in Hunza operate without formal policies, often charging high room rates and service fees, which underscores the urgent need for regulatory frameworks and equitable practices. A member of a local support organization in central Hunza commented on the activities of local businesses and tour operators in the following words:

***“.....Hamy tourists k any say koe faida nae, Hotel waly kamaty hai or wahi sehrun mai jaky kharch karty hai. (We have no benefits from tourists; hotel owners earn their money and spend it in cities)”.***

### **Awareness and Understanding**

The literature and empirical findings indicate that modern infrastructure and mass tourism have profoundly altered the lives and living patterns of local communities. While modern development techniques are largely unavoidable, many residents express concern over the potential loss of local culture, traditions, norms, and environmental quality. They advocate for the internalization of modern skills to raise awareness of both the potential benefits and uncertainties that may impact social life, economic activities, and ecological systems. Key priorities for sustainable rural development, as identified by the community, include access to quality education, improved healthcare, reliable electricity, paved roads, and technical skill development. Importantly, residents perceive the China-Pakistan Economic Corridor (CPEC) as a transformative factor with far-reaching implications for Hunza's socio-economic structure. Accordingly, it is critical for both the local community and administration to understand the long-term impacts of this mega-project and to educate, particularly the youth, on its potential opportunities and risks. Comprehensive development guidelines are therefore essential for implementing tourism and technological initiatives that genuinely serve local interests. These guidelines should encompass awareness programs on water management, land carrying capacity, waste management, technological innovation, mitigation of adverse social impacts, and the promotion of effective public-private partnerships.

### **Conclusion**

This study has investigated the promotion of tourism and adoption of the latest technological improvements as a modern strategy for rural development in Hunza. Traditional models of rural development failed to recognize the unexplored dimensions of the field. The conclusion of this study identifies that rural development is a multidimensional phenomenon and process. It takes into account multiple perspectives and aspects based on untapped potential. The meaning of development varies among villages and people. For wiser utilization of tourism resources and technological opportunities, quality education, technical skills, infrastructure, and well-organised policy will play an important role for all people in Hunza. Early studies and field surveys show the growing socio-economic problems, such as income inequality, environmental degradation, and poor infrastructure, which will hamper development interventions by individuals or public departments. No doubt, income is considered one of the variables used to measure poverty. Still, other variables, such as participation in decision-making, the role of government departments, policies for the use of natural resources, and other cultural attributes, are missing across Hunza. It is also concluded that the local community's participation in development interventions is essential. The absence of policy in administrative offices to monitor the infrastructural development, such as the construction of hotels and restaurants, roads, electricity, water, and sanitation, preservation of local culture, and security measures, has created fear of loss of village beauty, destruction of local culture, and the creation of urban centers. The conclusion of this study also identified the importance of valuing local culture and traditions to create a sense of responsibility among youth to initiate development projects without compromising the needs of future generations.

### **Recommendations**

Without a doubt, the monthly income of local residents in Hunza is relatively substantial. However, other essential aspects of modern life—such as infrastructure, healthcare, entrepreneurial skills, quality education, and the preservation of natural and cultural resources—remain inadequate and should be prioritized at the policy level by local

administrations and community development organizations. To effectively integrate tourism and technology as a strategy for rural development, detailed studies of each sector are necessary to inform sustainable development policies that actively involve the local community and relevant stakeholders. The conclusions of this study may also serve as a reference for similar research in other rural areas of Gilgit-Baltistan. While Hunza has transitioned from traditional development approaches toward modern strategies, further exploration of technological opportunities and natural resource management is required to develop a sustainable, contemporary model of development that leverages mega-projects such as the China-Pakistan Economic Corridor (CPEC). The study emphasizes the need to establish limits on the exploitation of local cultural values, traditions, and natural resources, and to manage urbanization, in order to reflect the needs and preferences of the local population and mitigate the adverse effects of globalization and modernization. Moreover, it is evident that the development projects implemented by NGOs are largely short-term and primarily focused on awareness creation. For long-term sustainable development, the active involvement and empowerment of local communities in policy-making processes is imperative.

## References

- Adisa, R. S. (2012). *Rural Development In the 21st Century as a Global Necessity*. (R. S. Adisa, Ed.) Rijeka, Croatia: InTech.
- Anwar, M. A., Carmody, P., Surborg, B., & Cocoran, A. (2014). The Diffusion and Impacts of Information and Communication Technology on Tourism in the Western Cape, South Africa. *Urban Forum*, 25, 531-545.
- Barlayaev, A. A., Akhmeto, V. Y., & Nasyro, G. M. (2009). Tourism as a Factor of Rural Economy Diversification. *Studies on Russian Economic Development*, 20(6), 639-643.
- Buhalis, D. (2014). Tourism and Information Technologies: Past, Present, and Future. *Tourism Recreation Research*, 25(1), 41-58.
- Chuang, S.-T. (2011). Residents' Attitudes Toward Rural Tourism in Taiwan: A Comparative Viewpoint. *International Journal of Tourism Research*, 152-170.
- Conor, O. P. (2008). Managing Hospitality Information Technology in Europe: Issues, Challenges and Priorities. *Journal of Hospitality and Leisure Marketing*, 59-77.
- Cornor, P. O., & Buhalis, D. (2005). Information Communication Technology Revolutionizing Tourism. *Tourism Recreation Research*, 30(3), 7-16.
- Deva, S. (1984, Mar). Problems of Rural Development in " Green Revolution" Areas. *Social Scientist*, 12(3), 52-59.
- Gartner, W. C. (2002). Trends in Rethinking Tourism Education. *Acta Turistica*.14, pp. 13-21. Faculty of Economics and Business, University of Zagreb.
- Gibson, W., & Brown, A. (2009). *Working with Qualitative Data*. London: SAGE.
- Irvine, W., & Anderson, A. R. (2008). ICT (information communication technology), peripherality, and smaller hospitality businesses in Scotland. *International Journal of Entrepreneurial Behavior & Research*, 14(4), 200-218.
- Jhonson, J. D., & Snepenger, D. J. (1994). *Residents' Perception of Rural Development*. Annals of Tourism.
- Jianchao, X., Xinge, W., Qinqin, K., & Nan, Z. (2015). Spatial Morphology Evolution of Rural Settlements Induced by Tourism: A Comparative Study of Three Villages in Yesanpo Tourism Area, China. *Journal of Geographical Sciences*, 25(4), 497-511.
- Kalhor, Z. A. (2021). Cultural Commodification and Tourism in Kalash Valley: A Case Study of Bumburet Village, District Chitral. *Journal of Asian Civilizations*, 44(2), 229-253.
- Kerr, W. R. (2003). *Tourism Public Policy, and the Strategic Management of Failure* (First ed.). UK: Elsevier Ltd.
- Kumar, R. (2011). *Research Methodology: A step-by-step guide for beginners* (3rd ed.). SAGE Publications Ltd.
- Ling-en, W., Sheng-Kui, C., Lin-Sheng, Z., Song-lin, M., GC, D. B., & Guo-Zhu, R. (2013). Rural Tourism In Development in China: Principles, Models, and the Future. *J.Mt.Sci*, 10, 116-129.

- McCabe, S., Sharples, M., & Foster, C. (2012). Stakeholder Engagement in the Design of Scenarios of Technology-enhanced Tourism Services. *Tourism Management perspectives, 4*, 36-44.
- Mcleod, M., Lewis, E. H., & Spenser, A. (2016). Re-inventing, Revolutionizing, and Transforming Caribbean Tourism: Multi-country Regional Institutions and a Research Agenda. *Journal of Destination Marketing and Management*.
- Moseley, M. (2003). *Rural Development Principles and Practices*. SAGE.
- Muyeed, A. (1982). Some Reflections of Education on Rural Development. *International Review of Education, 28*(2), 227-238.
- Parhad, K., De-Gang, Y., & Xiao-lie, Z. (2005). Study of Rural Tourism in Turpan, China. *Chinese Geographical Science, 15*(4), 377-382.
- Pesonen, J., & Horster, E. (2012). Near Field Communication Technology in Tourism. *Tourism Management Perspectives, 4*, 11-18.
- Rahman, M. (1977). Rural Development Planning in Pakistan. *GeoJournal, 27*-32.
- Rana, A. U. (2015, October). Promotion of Tourism in Pakistan. *Background Paper*. Islamabad, Punjab, Pakistan: Pakistan Institute of Legislative Development and Transparency.
- Rao, V. M. (1983, Jul). Barriers in Rural Development. *Economic and Political Weekly, 18*(27), 1177-1190.
- Rehman, F. (2007). The Role of AKRSP in Rural Development in the Karakoram, Hindu Kush, and Himalayan Region. *Mountain Research, 4*(4), 331-343.
- Ritchie, J., & Lewis, J. (2003). *Qualitative Research Practice: A Guide for Social Sciences Students and Researchers*. London: SAGE.
- Rui-Ying, Z., Jian-Caho, X., Shou-kun, W., Xin-ge, W., & Quan-sheng, G. (2015). Village Network Centrality in Rural Tourism Destination: A case from Yasanpo Tourism Area, China. *Journal of Management Science, 12*(3), 759-768.
- UNWTO. (2016). *Tourism Highlights*. UNWTO.
- Xiang, Z., Magnini, V. P., & Fesenmaier, D. R. (2014). Information Technology and Consumer Behavior in Travel and Tourism: Insights from Travel Planning using the Internet. *Journal of Retailing and Consumer Services*.
- Waheed, A., & Kalhor, Z. A. (2023). Cultural Tourism Management in Pakistan: Issues and Challenges. *Journal of Development and Social Sciences, 4*(1), 786-799.