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Adapting to Change: The Impact of Climatic Shifts on Tourism Destinations and Tourist Mobility in Northern Pakistan

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Abstract
Pakistan aims to showcase its authenticity, pristine nature, and unique cultural heritage from its northern valleys. Mountain tourism in Pakistan is popular during the summer, with tourists enjoying pleasant weather and scenic landscapes. The northern valleys of KP, GB, and AJK are favored destinations, as visitors generally have positive impressions of their interactions with the mountains and local people. Pakistan, an agricultural country, has tourism as a growing sector with significant economic potential. However, both agriculture and tourism are heavily affected by climate change. However, in the past decade, climate change has led to increased natural hazards such as floods, rockfalls, debris flows, rockslides, and avalanches specifically in northern areas of Pakistan. These events frequently cause road blockages and trap tourists, especially during the monsoon season. Such extreme conditions not only endanger local communities but also disrupt transportation infrastructure and damage tourist facilities. The resulting communication network disruptions and road blockages increase tourists' anxiety and fear, leading to unpleasant experiences. This study examines how climate change affects tourist mobility and hinders the tourism industry. It explores how increasing natural hazards, such as floods and landslides, disrupt travel, damage infrastructure, and create safety concerns, ultimately impacting tourist experiences and industry operations.
Keywords: Climate Change, Tourism Destinations, Tourist Mobility, Tourophobia, Travel Risk

1. Background

According to the WTTC's 2024 annual review, Pakistan's travel and tourism industry generated 5.8% of the GDP in 2022.8.7% increase from 2022 and a significant 17.5% increase from 2019 levels. In addition, the industry provided 4.73 million jobs in 2023, or 6.7%. According to the Pakistan Tourism Barometer (2023–24), this number shows a notable 19.7% progress from 2019 levels and a 5.4% rise from 2022. Tourism is essential for enhancing people's quality of life. Recognized as the top "happiness industry," it plays a pivotal role in satisfying the growing desire for better living experiences (Ma, H., Chiu, et al. 2020).

One significant change in recent years has been the rise of tourism as a major socio-economic activity. This has shifted the concept of tourists from mere visitors to hosts and guests within the communities they visit. As a result, the idea of tourist flows has emerged, driven by factors such as income, policy, and global influences that shape the geographical, social, and economic aspects of the experiences. This evolution has resulted in a sequence of journeys and visits, forming a totality of induced phenomena related to spending, leisure, health, and personal growth. Climate change pertains to notable, enduring alterations in climate parameters, such as temperature, precipitation, and wind patterns, spanning several decades or more. Climate change is certain and has a differential impact across different regions of the world as well as Pakistan (Shahzad, Laila et al. 2019). The UNFCCC defined it in 1994 as changes that are either directly or indirectly induced by human activity, in addition to natural variability. It was first defined in the late 1980s as changes resulting from both natural causes and human activities. This covers both natural and man-made variations, as well as the consequences of global warming and cooling. Concern over the effects of rising greenhouse gas emissions on the environment has been increasing significantly. Due to its increased visibility and resource usage, the tourist industry's contribution to climate change has grown more apparent. As a result, increasing amounts of research are being done on how tourism may both contribute to and adapt to climate change, showing that it can be a force for good in addressing these problems.

The magnificent northern region of Pakistan is the most fabulous realm due to its stunning rugged and spectacular mountainous topography in the world for tourists and mountaineers. They are allured by a series of the world's highest mountains including eight thousand meter Necklace Mountain, e.g. K-2 (8616 meters above sea level), Nangaparbat (8126 meters), Gashibram-1 (8080 meters), Gashibram-2 (8035 meters), Mashabrum (7829 meters), Rakaposhi (7788 meters), TrichMir (7780 meters), and Hispar Pass (7647 meters) to discover the long icy border line region between Pakistan and China. The Kaghan Valley is one of the picturesque valleys. The snow-covered peaks during winter from the valley still enchant the valley. In the summer, the tourists are attracted to the exotic culture and the melody of the twinkling brooks of the valley. The valley is located within the bounds of the Khyber Pakhtunkhwa Province about 160 kms north by northwest of the provincial capital, Peshawar. The area served as a niche for trekking and other tourism activities.

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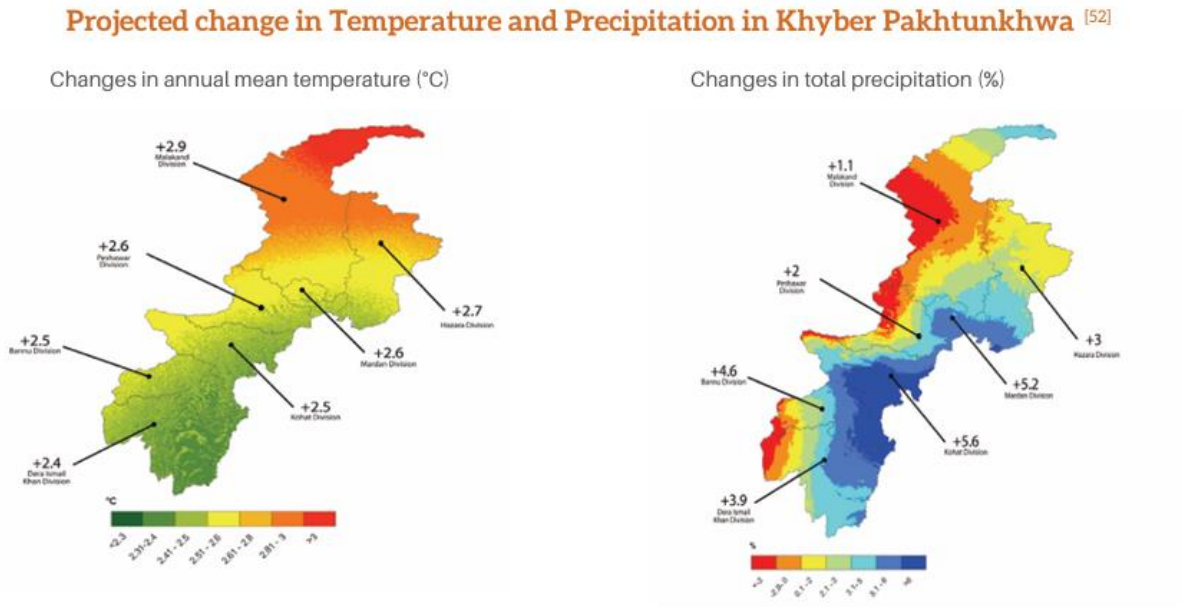

Figure 1. Projected changes in annual mean temperature (ΔT) and total annual precipitation (ΔT) in Khyber Pakhtunkhwa by 2050 for RCP 4.5 scenario.

Source: Changes in the annual Temperature in KP, Miller, V., et al (2021). Climate-smart agriculture in Khyber Pakhtunkhwa.

The government of Pakistan has taken several steps to address climate change, including establishing the Ministry of Climate Change (MOCC) and implementing relevant acts and regulations. It is promoting clean energy sources such as wind, solar, and hydropower, with a focus on increasing renewable energy production. Reforestation efforts like the Billion Tree Tsunami aim to enhance forest cover, while climate-resilient agricultural practices, including drought-resistant crops and efficient water use, are being encouraged.

The Ministry of Climate Change (MoCC) developed the National Climate Change Policy of 2012, which offers the broad framework for the creation of national action plans. Provincial implementation committees are responsible for providing further details, carrying out the plans, and monitoring their execution. The Framework for Implementation of Climate Change Policy (2014–2030) provides additional specific goals for adaptation and mitigation, notably in the agriculture sector, in support of the NCCP. Under the direction of the National Climate Change Policy (NCCP), the MOCC has created sector-specific action plans. Examples of these include the Geomatic Center for Climate Change, which focuses on digital data collection for various industries, encourage ecotourism and create policies to stop waste materials, and other unwanted materials from building up in popular tourist destinations like hill stations. Increase awareness of and participation in local communities for ecotourism, the utilization of renewable energy sources (Chaudhry, Q. U. Z. 2021; EPAKP, 2022).

Numerous sites in Kaghan Valley and Northern Areas are also recognized globally that are most visited and popular, from a tourism point of view. The area possesses many unique historical and culturally significant sites. However, the rapid increase in tourist numbers in Kaghan Valley forces an excessive burden on its physical environment and cultural heritage. The resultant proliferation of unmanaged and disorderly constructed buildings and infrastructure development work-threatening environmental damages have reached a saturation point. The trend of swelling tourist inflow in the area seems set to continue over the foreseeable future, primarily spurred by increasing populations. The steep slope, topographical exposure, increasing tourist activities, and escalating human encroachments, flooding is inevitable in the area.

In recent years, the northern mountainous regions of Pakistan have come into sharp focus as a tourist destination in international travel documentaries and magazines. This has resulted in growing interest among Pakistani tourists wishing to visit their own northern areas, including the Kaghan Valley. Unfortunately, the available hotel accommodation capacity of Kaghan Valley is relatively far behind the demand. Thus, residents aggressively pursue short-term gains by selling intrinsic environmental resources, including the scenic views, natural beauties, cultural assets, and sports opportunities. Since the capital necessary to construct the initial facilities in the dwellings is limited, the quantity and quality of existing facilities is also relatively low

1.1. The discussion will cover;

- Climate change and its impact on tourist destination selection
- Tourist mobility and flow restrictions
- Tourism development to reinterpret local resources

2. Literature Review

2.1. Climate change, a global concern

Understanding climate change's impacts on mountains is crucial. Mountains cover 20% of the Earth's surface, are home to 10% of the world's population, and provide 50% of the freshwater. Mountain tourism is a significant part of global travel, accounting for 9% to 16% of international tourist arrivals. In 2019, this translated to an estimated 195 to 375 million mountain tourists worldwide, according to the United Nations World Tourism Organization (UNWTO) and the Food and Agriculture Organization (FAO). Mountains and Hills are vulnerable to landslides, debris flows, and flash floods, high mountains are more vulnerable to avalanches and floods caused by glacial lake outbursts and floods occur often.

The global temperature increased by 0.76°C in the 20th century, and by 0.6°C in just the first ten years of the 21st, with the top 9 warmest years out of the 16 warmest years ever recorded occurring between 2000 and 2010. Mountainous areas around the globe have seen an increase in tourism since the 1960s (Md. Mahbubur Rahman, et al (2023). Over the past 30 years, maximum temperatures have risen throughout the year, especially in the high mountain region. Winter temperatures and rainfall have also increased in both sub-mountain and high-mountain regions (Hussain, et al, 2005). Floods occur when water overflows its usual limits, affecting normally unaffected areas. They have caused over 30% of natural disasters in the last century, with developing countries particularly vulnerable. Pakistan, despite its minimal carbon footprint, ranks 8th in climate change effects and 7th in vulnerability (Waseem, H. B., & Rana, I. A. 2023).

During the last century, only one major flood occurred in 1929. Since then, people have occupied the riverbed for living, farming and tourism superstructure. Due to climate changes, heavy rainfall, cloud burst, and glaciers melting, the river reclaimed its traditional bed and damaged the structures near the river course. As glaciers retreat, they leave unstable moraine deposits and glacial lakes behind, raising the risk of dangerous glacial lake outburst floods (Rasul, G., & Ahmad, B. 2012).

2.2. Impact on Tourism

According to the Global Climate Risk Index, Pakistan was most affected country by climate change over the past two decades, with the economic losses associated with the devastating floods that occurred between 2010 and 2014 amounting to a staggering $18 billion and directly impacting the lives of 38 million people (Imran et al., 2019). Featuring some of the highest peaks in the world, the Pakistani Himalayas and Hindu Kush are undergoing major changes because of climate change. The region's delicate ecosystems and communities are facing difficulties as a result of rising temperatures, melting glaciers, and extreme weather events (Hussain, et al, 2005). Trend analyses from 1971-2000 show that winter temperatures have increased in both submountain and high mountain regions over the past 30 years, with a higher rise in maximum winter temperatures (abid).

Renowned tourist spots like Swat, Chitral, and Kaghan were severely damaged by the exceptional torrential rainfall and protracted floods that befell the Pakistani Himalayas and Hindukush Mountain during the monsoon seasons. Strong thunderstorms and rainstorms had a devastating effect on these destinations, causing extensive damage to residential buildings, tourism superstructure, attractions, landscapes, and agricultural land. The crises that have been set off in these areas have made life more difficult for the locals, requiring quick action and rehabilitation measures. Tributary debris flows resulted in increased sediment transport, blocked rivers, degraded banks and beds downstream, and destroyed homes, hotels, roads, and bridges. Climate change poses significant challenges to tourism in northern Pakistan, particularly in the Chitral, Gilgit-Balitistan, Swat, and Kaghan valleys, which are prone to severe flooding events. The vulnerability of these regions is intensified by their geographic features, such as limited accessibility, environmental fragility, and marginality, factors that exacerbate the impacts of climate-related hazards on the tourism industry (Nyaupane & Chhetri, 2009).The widespread disruptions to Pakistan's agricultural sector caused by climate change, including the heightened uncertainty surrounding the availability and quality of crucial natural resources, have had profound ramifications for the tourism industry in the country's northern regions, as the sector is closely intertwined with the agricultural economy (Imran et al., 2019).

In addition to the direct impacts on the tourism industry, climate change has also been linked to a range of adverse health consequences in Pakistan, including the increased incidence of waterborne diseases, vector-borne illnesses, and malnutrition

2.3. Tourist Mobility & tourphobia Challenges

Climatic shifts also impact tourist mobility within the region. Increased landslides and flooding can lead to road closures and hinder access to key tourist sites. For example, popular routes to destinations like Naran and Gilgit can become impassable during the monsoon season, forcing tourists to alter their travel plans or cancel trips altogether. The perception of safety is crucial for tourist mobility. As extreme weather events become more common, potential visitors may be deterred from traveling to the region, fearing for their safety and the reliability of infrastructure. This shift in perception can lead to a decrease in tourist arrivals, further impacting local economies that depend on tourism.

Çakar, K. (2021) describe tourophobia, the fear of travel due to man-made or natural disasters, can significantly impact the tourism sector in crisis-affected destinations. This fear can lead to decreased touristic activity, with

travelers opting for alternative locations and adjusting their plans to avoid perceived dangers. Due to heavy rain, storms, flooding, the communication moods are disrupted or some time the tourist trapped in destinations which cause anxiety and depression, worries and concern that lead to a fear which prevails among the tourists. Different cultures and environments draw tourists looking to escape their routine. While sun, sand, sea, and sex are key attractions, security has become crucial. Today, a destination's appeal largely depends on its ability to ensure tourist safety and security (Fletcher, J., & Morakabati, Y. 2008). To ensure tourist mobility and safety organizations usually issue alerts through travel advisory, which lower the risks and result in tourist flow.

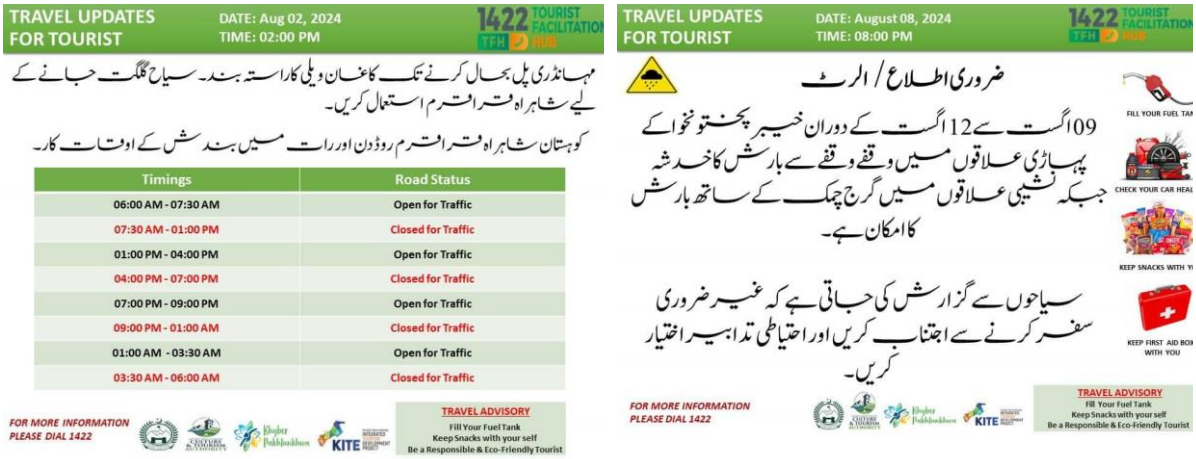

Figure 1: Travel advisories by KPCTA-KITE

Table 1: E-NEWS; Reported Headlines

E-News paper	Date	News Headlines	The Lede
The News international	May 13, 2024	Landslides block Kaghan valley road	The heavy landslides blocked the Mansehra-Naran-Jalkhad Road to traffic, leaving hundreds of motorists and passengers stranded in the Ghanool area of Balakot on Sunday morning.
Daily Pakistan	30 Jul, 2024	Heavy rains wash away Mahandri Bridge in Kaghan Valley	Torrential rains across northern Pakistan have caused widespread devastation, notably washing away the Mahandri Bridge in Kaghan Valley, leaving between 10,000 and 15,000 tourists stranded. The catastrophic weather event has severely impacted infrastructure, isolating local communities and disrupting daily life in the region.
HUMenglish.com	May 13, 2024	Kaghan highway blocked for over 30 hours; tourists, locals stranded	For over 30 hours, the Kaghan Highway, a crucial route connecting the picturesque tourist spot of Kaghan Valley, has been impassable due to substantial landslides triggered by heavy rains in the Ghanol Valley.
Pakistan Today	22,July 30, 2024	Tourists trapped in Kaghan valley as heavy rains cause landslide, bridge collapse	Hundreds of tourists hailing from different cities across the country were stranded in Kaghan valley as due to landslides and flashfloods causes by heavy rains.
DAWN	August 2024	Flash floods continue to batter Kaghan, Manor valleys.	Rains and flash floods continued to batter Kaghan and Manor valleys on Friday as torrents in the Mahandri area swept away eight more shops.

The Express Tribune	July 30, 2024	Mahandri Bridge washed away by heavy rains, leaving tourists stranded in Kaghan Valley	Torrential rains have wreaked havoc across the upper parts of Pakistan, washing away the Mahandri Bridge and leaving many tourists stranded in Kaghan Valley.
DAWN	July 16,2024	Tourist trapped in Chitral valley as heavy rain and landslide, and road blockage.	Flash floods triggered by torrential rains wreaked havoc in the lower parts of the Chitral valley. Due to the flash flood closed the Chitral-Peshawar Road early in the morning in Broze village.
DAWN	August 08 ,2024	Flash floods have washed away most bridges in region	The Yarkhoon valley in Upper Chitral is the worst affected where both the jeepable and the pedestrian bridges connecting with other valleys.
DAWN	August 19, 2024	Karakoram Highway blocked as flood ravage GB	According to authorities, the KKH has been blocked at multiple locations from Gilgit to Khunjerab. In Gilgit's Jaglot and Hunza's Shishkat village, the highway has been blocked due to mudflow. Subsequently, thousands of passengers, including foreign and local tourists, had been stranded due to the road closure.

Source: web search/ e-newspapers

3. Data Collection

This study is descriptive, the initial phase of data collection focused on conducting field studies specifically addressing tourist crises and disasters. This involved identifying and sourcing relevant papers published within the tourism and hospitality sectors. The data collection included the empirical components of qualitative research obtained from reputable travel publications. All things considered, most of the data was acquired from published scientific journals featuring both theoretical and empirical research. This comprehensive approach ensured a robust and well-rounded collection of information for the study. Articles were selected using keywords such as "climate change," "climate changes & tourism," "visitor risk," "travel fear," and "tourism mobility." The e news was search on the "recent flood in Kaghan valley".

4. Conclusion

Climate change is impacting the tourism industry in several significant ways. Shifts in weather patterns have led to more frequent and severe extreme weather events, such as floods, droughts, and heatwaves, which can deter tourists due to safety concerns and disruptions in travel plans. Additionally, natural disasters like floods and landslides can cause extensive damage to infrastructure and tourist attractions, resulting in decreased tourism. The degradation of natural environments, including deforestation and the deterioration of coral reefs, further affects tourism, as visitors are less inclined to travel to areas suffering from environmental damage. Moreover, the increased prevalence of climate-related health risks, such as dengue fever and malaria, poses additional concerns for tourists, potentially impacting their travel decisions.

The effects of global warming and climate change are having a profound impact on the tourism industry in Pakistan. The melting of glaciers in Pakistan's mountain ranges, including the iconic Karakoram and Himalayas, poses a significant threat to tourism. These glaciers are not only a source of awe-inspiring beauty but also vital for sustaining river systems that support local communities and ecosystems. As glaciers recede, they affect water availability, altering river flow patterns and impacting activities like rafting, fishing, and hydropower generation. According to the Pakistan Glacier Inventory, the country has lost nearly 1,209 square kilometers of glacial ice area from 1999 to 2018.The impact on natural attractions, biodiversity, and local communities is already being felt, and urgent action is needed to mitigate these effects. By taking steps to reduce greenhouse gas emissions and promote sustainable tourism practices, we can help to protect the tourism industry in Pakistan and ensure a sustainable future for generations to come.

Climate change is transforming the Pakistan mountain destinations, with significant implications for the region's tourism industry. The frequency and volume of floods increased which caused heavy damage to the infrastructure, superstructure of the destination and community livelihood. The tourism stakeholders should adopt the sustainable practices, green tourism concepts through integrated tourism. We should play our share to reduce the negative effect on the environment by adhering low impact tourism, control tourism, green hospitality concepts through sustainable approach. Adapting to these changes will require collaboration between government, the private sector, and local communities to ensure the long-term sustainability of this vital economic sector. To mitigate the effects of climate change on tourism in Pakistan, a multi-pronged approach is necessary. This includes improving early warning systems for natural disasters, investing in climate-resilient infrastructure, and promoting sustainable

tourism practices that minimize the environmental impact. Diversifying tourism offerings beyond traditional tourism approach can also help reduce the sector's vulnerability to climate change.

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