



Assessing the Environmental Impacts of Adventure Tourism in the World's Highest Mountains: A Comprehensive Review for Promoting Sustainable Tourism in High-Altitude Areas

Zaheer AHMED^{1*}, Takaaki NIHEI²

^{1,2} Department of Tourism Science, Faculty of Urban Environmental Sciences, Tokyo Metropolitan University

Abstract

Aim: Adventure tourism is where visitors participate in challenging and exciting activities in distant or exotic settings, such as rafting, trekking, and climbing, to experience adventure and challenge. This study explores the complex and diverse field of adventure tourism, with a particular emphasis on mountainous regions. Adventure tourism in mountainous regions has experienced remarkable growth, presenting challenges in environmental conservation, infrastructural development, safety, and socio-economic impacts.

Methodology: Drawing on a comprehensive review of the literature and case studies, this study examines evolving adventure tourist preferences and activities while advocating for sustainable practices. It offers valuable insights for stakeholders to promote responsible tourism in mountainous terrains, encompassing activities like mountaineering, expeditions, and trekking. Additionally, the paper explores mountain landscapes' global significance, tourism potential, and socio-economic benefits, addressing environmental challenges such as waste management and pollution.

Findings: Emphasizing sustainable tourism's aim to balance environmental, economic, and social factors, the study underscores the importance of minimizing negative impacts and maximizing community benefits. It highlights environmental impacts like habitat disturbance and pollution, economic benefits like income generation and job creation, and social impacts like community participation and cultural preservation.

Implications/Novel Contribution: By adopting sustainable practices, tourism can contribute positively to destination development and local well-being. This study offers a deeper understanding of adventure tourism dynamics in mountainous regions and provides recommendations for sustainable development.

Keywords: Adventure tourism, Mountain tourism, Mountaineering, Expedition, Trekking, Environmental impacts .

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INTRODUCTION

The tourist industry is one of the fastest growing worldwide in the modern age, with significant economic influence (Qasim, Atta-Ur-Rahman, Hashim, & Farooq, 2023). Its significance is evident, contributing to 10% of the world's GDP, sustaining 1 in every ten jobs, and generating annual exports amounting to \$1.400 million (WTO, 2005). This export figure constitutes 7% of the global trade in goods and services, equivalent to 30% of the service sector's exports (UNWTO, 2018).

It is undeniable that tourism significantly contributes to pollution and the generation of carbon dioxide (Buckley, 2011). As an illustration, data from the European Union (EU) reveals that tourism ranks among Europe's primary sources of carbon dioxide releases, with over 20% of these pollutant emissions attributed to accommodations such as hotels and guesthouses (Sofronov, 2017). Numerous researchers worldwide have noticed and conducted investigations on various adverse effects associated with tourism. For example, crowds at tourist destinations can worsen traffic jams and lead to parking issues (Almeida-García, Pelaez-Fernandez, Balbuena-Vazquez, & Cortés-Macias, 2016; Lindberg & Johnson, 1997). These issues eventually have adverse effects on the local community. Although tourism helps create job prospects for locals, it can also lead to notable concerns over drug abuse and increased alcohol intake (Diedrich & García-Buades, 2009).

* Corresponding author: Zaheer AHMED

† Email: ahmed-zaheer1@ed.tmu.ac.jp

Air, soil, water, and local ecosystem quality can all be adversely affected directly by tourism-related activities (Aall, Klepp, Engeset, Skuland, & Støa, 2023; Charara, Cashman, Bonnell, & Gehr, 2011). Furthermore, secondary consequences are linked to the fabrication, creation, and conveyance of materials. Natural environments, such as parks and protected lands, can have adverse effects directly from the entry of garbage and pollution and indirectly via the disturbance of animals (Buckley, 2011). In addition, the growth of the tourist industry is associated with a rise in solid waste and elevated pollution, resulting in substantial damage to the local ecology. As tourism thrives in a region, local inhabitants frequently raise structures without obtaining appropriate planning authorizations, resulting in significant devastation of the natural ecosystem and depletion of essential resources such as timber, water, and soil (Kousis, 2000). These environmental alterations affect local ecosystems and the communities' livelihoods (Alshuwaikhat, 2005).

UNWTO (2014) states that adventure tourism originated as a unique form of leisure activity in the mid-nineteenth century, with notable events such as the organized climb of the Mountain in 1865 and the exploration of the Colorado River in 1869. During this period, an adventurer was often defined as a traveller primarily motivated to discover new things (Laing & Frost, 2014). In the middle of the twentieth century, adventurous tourism became strongly associated with mountainous tourism, namely the growth of alpine climbing (Beedie, 2010). In the 1990s, adventure tourism evolved into a new and distinctive form of recreational activity characterized by an intentional exposure to risk or danger in outdoor settings (Ewert & Hollenhorst, 1989). Today, mountainous areas have become appealing and significant tourist destinations (Beedie & Hudson, 2003; Río-Rama, Maldonado-Erazo, Durán-Sánchez, & Álvarez-García, 2019). The increasing popularity of outdoor recreation in adventure tourism promotes this trend. Adventure tourism, a swiftly emerging segment of the tourist industry, is recognized as one of the most vibrant components of outdoor recreation.

Adventure tourism is a developing niche in the tourist business that provides exciting guided commercial excursions focused on outdoor activities in the natural landscapes of the location. The global adventure tourism market, valued at around US\$263 billion, is projected to experience continuous growth on a global scale in the foreseeable future (ATTA, 2017). White-water rafting is used worldwide to draw adventure seekers to various locations, including the USA, Canada, New Zealand, Japan, and Australia (Japan Rafting Association, 2014).

Adventure tourism is commonly situated in natural environments, where visitor engagement can impact both the natural surroundings and the conservation of these places, alongside economic benefits (Rojo-Ramos et al., 2021). Adventure travel can be classified into three categories: conventional, demanding, and rejuvenating. Each category may include different games and physical actions, for example, expeditions, climbing, trekking, rafting, skydiving, and role-playing games. The crucial elements of an exhilarating journey encompass the surroundings, activities, task completion, stimulus, sense of danger, and overall involvement (Beedie & Hudson, 2003; Rantala, Hallikainen, Ilola, & Tuulentie, 2018).

Scope of Adventure Tourism

Assessments of adventure tourism works carried out less than five years ago (Buckley, 2006) showed that most of the 350 pertinent articles originated from tourist economics, sport and travel medicine, or gardens and restoration studies. Of them, about 27% included the environmental effects, 22% focused on the applicants' points of view, 16% examined commercial problems such as product assemblies, and 11–12% covered economic indicators, hazards, accidents, and conflicts resulting from various actions. There is a limited availability of books mainly concentrating on adventure tourism (Buckley, 2006; Swarbrooke, 2003). Additionally, there is a dearth of literature on related subjects like adventure sports (Beedie & Hudson, 2003; McNamee, 2007), adventure settings (Simon Priest, 2018), tourism under challenging environments (Moss & Godde, 2000; Prideaux, Timothy, & Cooper, 2009) and tourism in places recognized for their adventurous attributes (Baldacchino, 2006; Snyder & Stonehouse, 2007; Spenceley, 2008).

Adventure tourism's breadth has often been emphasized via compilations of different outdoor activities. Buckley (2006) Documented 35–40 of these initiatives, some of which were classified into more general categories. The activities listed below are arranged in alphabetical order: caving ballooning, water rafting, diving, aircraft flights, snowboarding, downhill skiing, boat trips, hang gliding, trekking, riding horses, ice climbing, jet boating, flying kites, bicycle riding, climbing mountains, paragliding, climbing rocks, sail boarding, boating, paddle boarding.

Skiing, whale watching, whitewater floating and kayaking, rafting on whitewater, and watching wildlife.

Problem of Statement

Expanding adventure tourism in mountainous areas yields considerable economic advantages, but also presents notable environmental and socio-cultural difficulties. The natural landscapes and ecosystems that attract visitors are in danger from issues such as pollution, habitat degradation, and resource depletion. In addition, socio-cultural effects such as overpopulation, uncontrolled urbanisation, and heightened strain on local infrastructure worsen the difficulties experienced by local populations. Although adventure tourism is becoming more popular, there is a significant lack of research that properly combines the economic advantages of this industry with sustainable tourism practices. Many current studies do not have comprehensive strategies that effectively combine environmental protection with socio-economic benefits. Hence, it is imperative to devise and execute practical and enduring strategies to regulate the expansion of adventure tourism, while mitigating its adverse effects and optimising its advantages for sustainable development.

Significance of the Study

This study seeks to address the research gaps by conducting a thorough examination of the environmental and socio-economic effects of adventure tourism in mountainous areas. It suggests sustainable approaches that can improve the development of destinations and the well-being of local communities. This research presents a comprehensive framework for promoting sustainable adventure tourism by combining theoretical knowledge with practical suggestions. The results of this study are anticipated to make a substantial contribution to the scholarly discussion on sustainable tourism and offer practical guidance for stakeholders in the tourism sector. By addressing these critical issues, the study aims to support the sustainable development goals (SDGs) related to responsible consumption and production, climate action, and life on land. It emphasizes the importance of adopting sustainable practices in adventure tourism to ensure the long-term preservation of natural environments and the prosperity of local communities.

Research Purpose

This study examines the current activities and issues related to adventure tourism in mountainous areas. The study aims to ascertain the changing preferences of adventure tourists and the activities they engage in inside mountainous areas. The study aims to concurrently tackle difficulties such as environmental preservation, infrastructure advancement, safety regulations, and the socio-economic impacts of adventure tourism in mountainous regions. This study aims to provide significant insights to industry stakeholders, policymakers, and scholars, enhancing their knowledge of the dynamics involved in promoting sustainable and ethical adventure tourism practices in mountainous areas.

METHODOLOGY

This review paper systematically analyses existing research on adventure tourism. A comprehensive literature search should be conducted first, with an emphasis on articles, reports, and book chapters. The search analysis was focused on prior research about "adventure tourism," "environmental impacts," "socio-economic impacts," "sustainable tourism," and "tourist motivations." After conducting an in-depth assessment for both quality and relevance we carefully chose the relevant literature. The selected literature was then categorized into themes, and each theme was systematically analyzed to identify major trends, common findings, and research gaps.

Table 1: Related Case Studies

No.	Year	Theme	Authors	Methods	Results
1	2010	Demand indicators for adventure tourism packages	(Villalobos-Céspedes, Galdeano-Gómez, & Tolón-Becerra, 2010)	combinatory analysis with probability measures	The results demonstrate the preferred combinations of various adventure tourism activities and guide industry professionals in enhancing their management practices.
2	2011	A GIS-based proposal for evaluating the territory's potential for ecotourism and adventure tourism activities.	(Cerezo Medina, 2011)	GIS and SWOT analysis	The findings show that Geographic Information Systems (GIS) is a reliable instrument for tourist planning and its execution.
3	2012	An autoethnographic analysis of mountaineering	(Houge Mackenzie & Kerr, 2012)	robust psychological framework (i.e., reversal theory) & The author suggested that autoethnography is a valuable approach to enriching the discussion on adventure tourism and deepening our comprehension of unique tourist experiences.	
4	2013	The Impact of Motivations and Enduring Involvement in an Adventure Tourism Setting	(Beckman, 2013)	Structural equation modeling	The findings indicate that an effective reaction influenced the connection between lasting participation (enjoyment component) and location attachment.
5	2014	Analysis of adventure tourist motivation: the case of China-born international students in New Zealand universities	(Lou, 2014)	Exploratory factor analysis and one-way ANOVA	The primary determinants impacting the inclination of Chinese students to participate in adventure activities in New Zealand were identified as "enthralling encounter," "self-enhancement," "attainment and willingness to take risks," and "exploration of novelty and acquisition of knowledge."
6	2015	High Mountain Adventure Tourism: Trekkers' Perceptions of Risk and Death	(S. K. Nepal & YANG, 2015)	Face-to-face interviews with trekkers & The results suggest that pedestrians demonstrated an understanding of the differences between the dangers associated with hiking and climbing and were motivated by the narratives shared by mountaineers on their willingness to take risks.	
7	2016	Motivations, perceived risk and behavioural intentions in complex adventure tourism. A Natural Park Case Study	(Mason, Gos, & Moretti, 2016)	Factor analysis, regression, and ANOVA	The article demonstrates that the primary driving force behind adventure tourism is "nature."
8	2017	Sustainability and Mountain Tourism: The Millennial's Perspective	(Bonadonna, Giachino, & Truant, 2017)	Pilot tests, Chi-squared tests, post-hoc and non-parametric	The study's results suggest that Millennials' perspectives are notably influenced by their gender and the specific geographical setting they are familiar with, either mountains or metropolises. The results directly impact the administrators of mountain institutions from a management standpoint since they may implement appropriate measures to adapt Millennials to mountain activities effectively.
9	2018	Mountain-route tourism and sustainability.	(Mutana & Mukwada, 2018)	Using discourse analysis & The findings show that most studies on mountain-route tourism focus on the characteristics, promotion, and effects of mountain tourism.	
10	2019	Risk reduction and adventure tourism safety: An extension of the risk perception attitude framework (RPAF)	(Wang, Liu-Lastres, Ritchie, & Pan, 2019)	Interviews Cluster analysis Mediation analysis	The study revealed a relatively low level of risk assessment (i.e., perceived seriousness and susceptibility) throughout the group. This implies that most Chinese citizens who participate in tide-watching do not see it as dangerous and lack awareness of its possible risks.
11	2020	Adventure tourism activities as a tool for improving adventure tourists' wellness	(Lötter & Welthagen, 2020)	Dimensional Model of Wellness & The results indicated that participation in adventure activities positively impacts overall health, and there is a significant association between traits associated with well-being and the practice of adventure tourism.	
12	2021	Idealizing adventure tourism experiences: Tourists' self-assessment and expectations	(Ponte, Couto, Sousa, Pimentel, & Oliveira, 2021)	Statistical analysis	The results show that tourists usually imagine their perfect vacations based on six main factors: being physically active, interacting with nature, living in a dream world, being independent, not knowing what will happen next, and being ready.
13	2022	The internal competitive advantage of adventure tourism operators: An exploratory approach	(Rosa, Bento, & Teotónio, 2022)	Resource-based view (RBV) approach	The findings indicate that ATOs acknowledge some elements that give them a competitive edge. However, these variables mostly rely on resources and operational competencies that are neither scarce nor difficult to replicate.

Table 2: Cont.....

No.	Year	Theme	Authors	Methods	Results
14	2023	Factors Affecting Adventure Tourist Satisfaction	(Nasution, Pohan, Ramadhan, Limbong, & Harahap, 2023)	Structural Equation Modeling-Partial Least Square (SEM-PLS)	The findings suggest that individuals who engage in non-extreme adventure tourism do not consider skill a significant driving element for their overall satisfaction. On the other hand, extreme adventure travelers get satisfaction from using their skills and abilities.

ADVENTURE TOURISM ACTIVITIES

Many academics (Pomfret, 2006) and Pomfret and Bramwel (2016) link adventure tourism and outdoor recreational or adventurous activities. Outdoor adventure tourism, adventure tourism, and adventurous restoration are all closely connected terms. In all these manifestations, the common thread is their occurrence in outdoor environments, providing an escape from daily routines and incorporating elements of studying nature, engaging in recreation, and promoting personal well-being (Palacio, 1997; Tangeland, 2011). Adventure tours are guided expeditions primarily focusing on outdoor activities utilizing the local terrain. These activities often require specialized athletic or specialized equipment and provide adventure tourists with exhilarating experiences, often accompanied by associated hazards and risks (Bentley, Page, & Macky, 2007; Buckley, 2018). Adventure tourism is commonly situated in natural environments, and the level of visitor engagement can impact both the natural surroundings and the conservation of these places while aiming for financial benefits (Rojo-Ramos et al., 2021).

Examining the typology and varieties of adventure tourism enhances our comprehension of current trends within this tourism category. Researchers introduced the concepts of "hard" and "soft" adventure tourism to categorize the range of behaviors within this sector. Soft adventures are located at one extreme of the spectrum, whereas dangerous or challenging adventures are at the opposite extreme (Muller & Cleaver, 2000; Swarbrooke, 2003).

The following activities are included in the categorization: hard and soft adventure tourism (McKay, 2018).

Table 3: Hard Adventure Activities And Soft Adventure Activities

Hard Adventure Activities	Soft Adventure Activities
The activities available include water rafting, kayaking, diving, multi-day hiking, riding horses, snowshoeing, hanging, jumping off cliffs, biking, hiking, sand boarding, and paddle boarding. Canyoning, climbing rocks, gliding, jet boating, swimming, dune skiing, climbing mountains, cable sliding, cable skiing on the water, sky snorkeling, ice climbing, riding a kite, walking on the ocean floor, rap jumping, caving, bicycle riding trips, hang gliding, and climbing.	Activities available include sailing, hiking through the forest, scenic flights, zip lining, snorkeling, hot air ballooning, yachting, trekking, walking on an elevated boardwalk, traversing a cable trail from the air, riding in a biplane, taking canopy tours, helicopter flights participating in dragon boat racing, going on foot safaris, exploring nature on guided walks, engaging in hang gliding, flying in gyrocopters, climbing in ravines or gorges (known as kloofing), and experiencing the thrill of rolling down a hill in a giant transparent ball (known as zorbing).

According to (Pomfret, 2006), travel industry entrepreneurs now provide a diverse range of adventure activities to supply the demands of tourists seeking thrilling experiences like mountaineering, hiking, fishing, and jet boating (Coble, Selin, & Erickson, 2003). Adventure tourism operators have managed to decrease the consequences of their behaviors while skillfully packaging and marketing the excitement and fears involved (Palmer, 2002).

MOUNTAINOUS LANDSCAPE AND ADVENTURE TOURISM

Mountain landscapes are vast geographical expanses with elevated landforms like towering peaks, deep valleys, rugged slopes, and distinct ridges shaped by geological processes like tectonic activity, erosion, and weathering, creating a rich array of climates and ecosystems that support diverse flora and fauna adapted to different elevations, creating beautiful and captivating mountainous regions (Strahler & Strahler, 2003). Mountains, renowned for their secluded and awe-inspiring beauty, are unquestionably one of the most popular tourist attractions. Notably, mountain areas have constantly been recognized as the subsequent most popular global tourist destinations, following coastal areas (Beedie & Hudson, 2003; Mieczkowski, 1995; Ryan, 2003). The number of tourists visiting mountain environments is steadily on the rise, primarily due to the significant attraction of these areas (S. K. Nepal

& Chipeniuk, 2005). Mountain paths provide distinct and breathtaking experiences, which might be regarded as some of the first tourism methods (UNEP, 2007). The rise of tourism in recent decades has tired the consideration of stockholders and promoters towards mountainous regions, recognizing their considerable potential for driving successful economic activities (Lun, Pechlaner, & Volgger, 2016). The consequential effects of mountain tourism development are crucial in the economic and social spheres (Briassoulis & van der Straaten, 2000).

Mountainous regions worldwide are prominent locations for the growth of adventure tourism. Gilgit Baltistan, a region characterized by its rugged terrain, is renowned in Pakistan and globally for its adventure tourism industry (Qasim et al., 2022). The region possesses significant tourist potential due to its awe-inspiring alpine landscapes. Based on the figures from the GB Tourism Department, there is a significant yearly increase in tourists to GB, with roughly 200,651 people coming from different regions of the nation (us Saqib et al., 2019). Due to the region's distinctive alpine landscape, which includes base camps, elevated areas, tall peaks, immense glaciers, and tight passages, adventure travelers from all over the world come here alone or in groups (Qasim et al., 2022). As per (IUCN's 2003) report, the Northerly regions of Pakistan are a captivating blend of natural and cultural heritage, making this region an especially significant tourist attraction. Nevertheless, the progress of tourism in this area has been hindered due to the absence of clear policy directives, limited investment, insufficient tourism infrastructure, a lack of human resource growth, and ineffective marketing efforts.

Over the past decade, Nepal has experienced remarkable development in mountaineering and trekking tourism (S. Nepal, 2010). Consistently, many adventure-oriented travelers are attracted to renowned Himalayan locales, including Nepal's Annapurna and Everest regions. The presence of high-altitude climbing and trekking activities in the Mt Everest region has profoundly impacted the adventure tourism business, resulting in considerable socio-economic and environmental effects (S. K. Nepal, 2016). New Zealand is renowned globally for its adventure tourism and sports. It is a country where a substantial number of both locals and tourists participate in activities such as horse riding, tramping, and mountain biking, as well as paragliding and hang gliding, parasailing, and boating jets (Bentley et al., 2007).

Mountainous regions hold global significance due to their ability to sustain large populations and foster biodiversity. Additionally, these areas exhibit heightened susceptibility to human-induced pressures and demonstrate a heightened sensitivity to the impacts of climate change (Shahgedanova et al., 2021). According to Grêt-Regamey, Brunner, and Kienast (2012) Mountain landscapes are crucial in preserving biocultural diversity, ensuring food and energy security, promoting tourism and restoration, and upholding fundamental and spiritual values. These landscapes encompass various natural and human-managed classifications, including agricultural land (Mengist, Soromessa, & Legese, 2020).

Tourism along mountain routes offers a realistic solution for reducing poverty, particularly in areas with high poverty rates, commonly in mountainous regions (Anderson, 2015; Chirenje, 2017; Hottola, 2009). According to (Anderson, 2015), there is a high need for labor in the tourist industry, which is closely linked to many other sectors (Cole, 2008; von Dach, Ott, Klaey, & Stillhardt, 2006).

Mountaineering

The term "mountaineering," known as "Bergsteigen" in German and "Montañismo" in Spanish, has undergone a transformation in its meaning over the past few decades (Beedie & Hudson, 2003; Ion, 2010; Rotillon, 2006). Mountaineering involves rock and ice climbing, trekking, and negotiating rugged terrain at high altitudes, requiring technical skills, physical fitness, and adaptability to harsh mountain environments. Mountaineers often embark on expeditions to conquer peaks, immersing themselves in adventure, exploration, and personal challenges (Nowacki, 2023). In the current epoch, the domain of mountaineering has experienced a nuanced transformation involving its subdivision, reinvention, and redefinition (Beedie & Hudson, 2003). During the early 20th century, mountaineering was seen as a privileged activity that emphasized direct engagement between persons and mountains without the use of artificial tools or the assistance of experts (Holt, 2008). However, today, mountaineering and tourism peculiarities have gradually distorted across mountainous regions worldwide. Mountaineering used to be a specialized sport reserved for the privileged, but diversification, commodification, and commercialization has made it more accessible and inclusive mass tourism (Beedie & Hudson, 2003; Johnston & Edwards, 1994).

Based on the above knowledge, it is no longer true that only experienced mountaineers may reach high-

mountain places (S. K. Nepal & YANG, 2015; S. K. Nepal, 2008). Mountain-based adventure tourism has significantly grown during the past few decades (Marek & Wieczorek, 2015; S. K. Nepal, 2000; Zurick, 1992). Three crucial factors contribute to this significant advancement: the enhancement of mountaineering proficiency, the heightened ability to exercise, and the commercialization of climbing pursuits (Apollo, 2017). The number of mountaineers is likely far higher than the recorded counts. For example, the United States has an estimated 2,571,000 individuals who engage in mountaineering. The American Alpine Club members are 16,500, members around 150 times lower than this number. A similar situation occurs in Poland, where (Jodłowski, 2011) estimates that there are between 50,000 and 80,000 climbers. This estimation surpasses the number of members of the Polish Mountaineering Association (3,170 people) by 15–25 times. Undoubtedly, these statistics underscore the considerable potential of mountaineers in the context of tourism.

Expedition

Expeditions, often involving a group of people, are planned, prepared, teamwork, and the navigation of remote or unexplored regions to achieve scientific research, geographical exploration, or environmental challenge (Krishnan, Gangwani, Reddy, Rama, et al., 2023). Annually, many visitors, explorers, climbers, and hikers venture to the expedition and trekking zones in mountainous regions. Unfortunately, these groups often leave substantial waste behind, contributing to environmental challenges (Naithani, Nainwal, Sati, & Prasad, 2001). The absence of approved disposal places in specific excursion and hiking zones significantly contributes to solid waste buildup. The lack of a proper waste management authority in these areas, coupled with insufficient infrastructure to handle the carrying capacity, exacerbates litter issues in the Himalayan trekking areas (Bedi & Pattnaik, 1999; Jain & Kuniyal, 1994; Jain, Kuniyal, & Shannigrahi, 1996; Jain & Kuniyal, 1995). A parallel situation may be witnessed at Mount Everest, among the most regularly climbed peaks globally.

Similarly, those who often go to Chitral and the northerly territories of Pakistan often emphasize contamination and waste as the primary challenges they face throughout their journeys. The necessity for recycling and garbage disposal facilities is particularly underlined in specific adventure tourism destinations such as Gilgit, Hunza, and Skardu (Mock & O'Neil, 1996).

Trekking

Trekking is the thrill of going on a long, exciting walk through complex and varied landscapes like mountains, forests, or wilderness areas. It combines hard physical work with exploring beautiful natural areas, which helps people feel deeply connected to nature. Trekking involves traveling a great distance over several days or weeks, typically through isolated and thinly populated areas, while independently transporting belongings on one's back (Böhmer-Bauer, 2012). Trekking is a modern kind of adventure tourism and tourism which has become a popular trend in worldwide tourism (Różycki & Dryglas, 2014). Trekking is a type of adventure tourism that requires specific gear, supplies, and clothes to go through challenging terrain and temperatures. Adventure tourism is frequently associated with peril, hazard, and remote natural environments (Gyimóthy & Mykletun, 2004; Weber, 2001).

The Gilgit Baltistan region's mountainous terrain attracts diverse types of tourists with distinct preferences. Visitors come to witness high mountains, observe snow-covered peaks, enjoy distant views of eight-thousanders from viewpoints, and explore mountainous tracks. Additionally, trekking parties choose this region, known as the "home to the world's three great mountain ranges comprising Himalayas, Karakoram, and Hindukush," specifically for challenging treks, such as those leading to the base camps of prominent eight-thousanders like K-2 and Nanga Parbat (Qasim et al., 2022).

Table 4: Tracking and Expedition Peaks

Sr.no	Expedition Peak	Height (m)	Mountain Range	Country
1	Mount Everest	8,848 m	Himalayas	Nepal
2	K2 (Godwin-Austen)	8,611 m	KaraKoram	Pakistan
3	Nanga Parbat	8,126 m	Himalayas	Pakistan
4	Gashebrum I	8,080 m	KaraKoram	Pakistan
5	Broad Peak	8,051 m	KaraKoram	Pakistan
6	Gashebrum II	8,034 m	Karakoram	Pakistan
7	Mount Kilimanjaro	5,895 m	Eastern Rift mountains	Tanzania
8	Matterhorn	4,478 m	Alps	Europe
9	Mount McKinley	6,190 m	Alaska Range	Alaska

SUSTAINABLE TOURISM

The development of sustainable tourism addresses the requirements of present tourists and host communities and ensures the protection and optimization of prospects for future expansion. The principles include resource management, which allows humanity to meet its economic, social, and artistic needs. This includes the preservation of essential ecological processes, biological variety, life-sustaining systems, and the cultural integrity of many countries and ethnic groups (Dávid, 2011). The United Nations World Tourism Organization (UNWTO) asserts that sustainable tourism involves several stakeholders, including travelers, the travel industry, the environment, and local communities. This approach considers the present and future economic, social, and environmental consequences (UNWTO, 2022). The travel and tourism sector is one of the major industries globally. The adverse effects of tourism must be expeditiously addressed since they have emerged as a substantial issue. Considering this, sustainable tourism has emerged as a means to mitigate the adverse impacts of tourist activities. This approach has been widely recognized as a favorable and politically viable strategy for advancing tourism. Most scientists agree that "sustainable tourism development" refers to tourism developed economically, socially, and environmentally to continuously improve visitor experiences. Sustainable tourism aims to achieve a harmonious equilibrium by safeguarding the environment, preserving cultural authenticity, promoting social justice, and generating economic benefits. In both developed and developing countries, it also aims to meet the needs of the local people by improving living conditions in both the short and long term (Wang et al., 2019).

Environmental Impacts

Tourism is acknowledged in many developing countries as a means of stimulating local economic progress by providing infrastructure and employment opportunities and generating external income (Brohman, 1996; Gurung & DeCoursey, 2000; WTO, 2005). Tourism in developing areas is often linked to environmental degradation, a drawback frequently cited (Brohman, 1996). This is attributed to various factors, including poverty leading to challenges in finding alternative livelihoods, inadequate infrastructure, and ineffective strategies and planning. Tourism policies in developing nations often need to be revised, completed, or implemented more strictly (S. Singh, 2002). Popular tourist locations like natural parks often require more appropriate land use planning or management (S. K. Nepal, 2000).

Adventure tourism has a wide range of effects on the environment, both positive and negative. It affects ecosystems, biodiversity, and overall environmental sustainability regarding recreational activities in natural and frequently remote environments. Positive effects include raising awareness of conservation issues and providing economic benefits to local communities; adverse effects include habitat disturbance, pollution, and overuse of natural resources (Buckley, 2012).

Tourism in mountainous places has a significant environmental impact, further intensified by the causes. Mountainous regions frequently exhibit comparatively lower levels of economic prosperity when compared to their lowland equivalents, and destitution persists in numerous mountainous regions, even in wealthy nations (Moss & Godde, 2000). Accessibility and extreme weather hinder infrastructure development (R. Singh & Mishra, 2004). Mountainous regions have historically received less attention from decision-makers and have been mistreated regarding development goals; thus, strategies and programs might be more effectively formulated there (S. K. Nepal

& Chipeniuk, 2005). In addition, the proximity of mountain areas to national and international boundaries sometimes leads to political instability, which hinders the execution of programs (S. K. Nepal & Chipeniuk, 2005).

Mountain climbing, hiking, and trekking are activities under mountaineering, a specific subset of adventure tourism. This subgroup is seeing an increasing level of popularity annually (Apollo, 2017). Tourism in mountainous regions across the globe has experienced substantial growth in recent decades (Moss & Godde, 2000). Thus, it should come as no surprise that mountain tourism is becoming a more significant environmental problem in developing countries. This information has been well-documented in the scientific literature (Saffery, 2000; Tonderayi, 2000). Recent research in recreational ecology has demonstrated that mountain tourism may negatively impact developing nations' wetlands, protected areas, and natural ecosystems (Buntaine, Mullen, & Lassoie, 2007; Stevens, 2003). For example, in Nepal, where tourism has increased dramatically over the last 25 years, the consequences of tourist expansion on biodiversity in mountain vegetation and forest resources have been well-documented (Stevens, 2003). According to (Shah, Nagpal, & Brandon, 1997), the impact of tourism in Nepal has been noticed in terms of high levels of both air pollution and noise. Typically, mountain restoration efforts in developing countries involve hiking, mountaineering expeditions, cultural excursions, whitewater rafting, and birding. In particular, during the past ten years, there has been a noticeable growth in the number of trekkers due to the growing popularity of high-altitude mountain trekking (Chatterjea, 2007; S. K. Nepal & Nepal, 2004).

Economic Impacts

Sustainable tourism aims to visit destinations without causing damage to the environment while positively influencing the country's environment, society, and economy (Tang, 2011). Tourism is a significant global driver of sustainable socioeconomic development (Hwang & Lee, 2019; Wakimin, Azlinaa, & Hazman, 2018). It contributes to national economies via income generation, tax revenue, foreign currency, job creation, and area development (Li, Jin, & Shi, 2018)). According to the World Travel and Tourism Council (2020), the Travel and tourism industry grew by 3.9%, surpassing the global economy's growth rate of 3.2% for the eighth year (Grasso & Schilirò, 2021). In the last five years, the travel and tourism sector has generated around 20% of employment opportunities, making it a suitable collaborator for governments seeking to foster job creation. In the last five years, the travel and tourism sector has generated around 20% of employment opportunities, making it a very suitable collaborator for governments seeking to foster job creation (Streimikiene, Svagzdiene, Jasinskas, & Simanavicius, 2021). Therefore, Tourism is a substantial economic industry globally, sustaining 319 million people, one in 10 employments worldwide, and contributing to 10.4% of the global GDP (Godara, Fetrat, & Nazari, 2020). The tourism market relies on health and the natural environment, yet it often negatively impacts both. Environmental challenges related to tourist development deserve particular consideration and have been the focus of numerous significant studies (Lu & Nepal, 2009; Pjerotic, Delibasic, Joksiene, Griesiene, & Georgeta, 2017).

In the context of globalization, developing nations have undertaken the initiative of tourism to bolster their economic growth, promote peace, nurture human capital, and mitigate poverty (Richards & Hall, 2002). Sustainable development aims to enhance the overall welfare of the local community by maximizing local economic advantages, safeguarding the natural and built environment, and delivering an exceptional tourist experience (Park, Yoon, & Lee, 2008; Park & Yoon, 2009). Tourism increases job possibilities and income, which may significantly impact the local community (Durberry, 2004).

Social Impacts

Social effects in sustainable tourism emphasize balancing economic growth with social and cultural well-being, intending to improve residents' and tourists' overall quality of life while conserving the diversity of destination communities. Sustainable tourism programs have shown substantial beneficial social effects on destination communities. Community participation and empowerment are essential components of sustainable tourism, allowing local inhabitants to be involved in decision-making and creating a feeling of ownership over tourist operations (Mak, Cheung, & Hui, 2017). Furthermore, sustainable tourism helps to alleviate poverty by creating jobs and promoting local entrepreneurship, especially in rural and underdeveloped areas (Anderson, 2015). Sustainable tourism methods prioritize the conservation of cultural heritage by appreciating and promoting local culture, conserving intangible cultural assets, and generating community pride (McKercher & Du Cros, 2002). Sustainable

tourism often leads to investments in infrastructure and public services, which may enhance people's quality of life and make the destination more desirable (Buckley, 2012).

CONCLUSION

This comprehensive study underscores the multifaceted nature of sustainable tourism, which encompasses economic prosperity, environmental conservation, and social equity. Despite the undeniable economic benefits of tourism, particularly in generating income, creating jobs, and bolstering national economies, its unchecked growth can lead to adverse environmental and social impacts. These impacts can be particularly pronounced in mountainous regions, where tourism is often concentrated due to their scenic beauty and adventure opportunities.

Environmental degradation, including habitat disturbance, pollution, and overuse of natural resources, poses significant challenges to the sustainability of tourism in mountainous areas. Nonetheless, sustainable tourism initiatives aim to address these challenges by promoting conservation awareness, implementing responsible waste management practices, and supporting ecosystem protection efforts.

Moreover, sustainable tourism endeavours to increase residents' and tourists' quality of natural life by fostering community participation, preserving cultural heritage, and investing in infrastructure and public services. Sustainable tourism benefits destinations and enriches visitors' travel experience by empowering local communities and promoting cultural pride.

Sustainable tourism represents a holistic approach to improving tourism, balancing economic growth with environmental conservation and social well-being. Through collaborative efforts among stakeholders, including governments, local communities, tour operators, and tourists, sustainable tourism performances can be implemented to ensure the long-term feasibility of tourism purposes while preserving their natural and cultural heritage. By embracing sustainability principles, the tourism industry can continue to thrive while minimizing its negative impacts and maximizing its benefits for present and future generations.

Limitation

This study offers valuable and extensive insights into adventure tourism in mountainous regions at high altitudes. However, a limitation of this research may be the absence of comprehensive strategies that effectively balance the economic advantages with sustainable tourism practices in these high-altitude areas. While it acknowledges adventure tourism's rapid growth and economic benefits in mountainous regions, it also highlights significant environmental and socio-cultural challenges, such as pollution, habitat destruction, and overcrowding.

Future Direction

This article proposes significant directions for future study and growth. It highlights the need to implement sustainable tourism practices, promote responsible behaviour among tourists, consider the cultural effects, prioritise health and safety, and find sustainable ways to manage the enhancement of adventure tourism while mitigating its adverse consequences.

Recommendation

- Utilize Geographic Information Systems (GIS) and data collected by sensors to consistently and persistently monitor the impacts on the natural environment.
- Apply adaptive management techniques according to the results of the evaluation.
- Implement a trash disposal tracking system using blockchain technology to ensure accurate and transparent waste management.
- Involve community members in the process of planning and carrying out sustainable tourism initiatives.

REFERENCES

- World Travel and Tourism Council. (2020). *Travel & tourism economic impact 2020*. Retrieved from <https://shorturl.at/ssQ0a>
- Aall, C., Klepp, I. G., Engeset, A. B., Skuland, S. E., & Støa, E. (2023). Leisure and sustainable development in Norway: Part of the solution and the problem. In *Leisure and the politics of the environment*. Routledge.

- Almeida-García, F., Pelaez-Fernandez, M. A., Balbuena-Vazquez, A., & Cortés-Macias, R. (2016). Residents' perceptions of tourism development in benalmádena (spain). *Tourism Management*, 54, 259-274.
- Alshuwaikhat, H. M. (2005). Strategic environmental assessment can help solve environmental impact assessment failures in developing countries. *Environmental Impact Assessment Review*, 25(4), 307-317.
- Anderson, W. (2015). Cultural tourism and poverty alleviation in rural Kilimanjaro, Tanzania. *Journal of Tourism and Cultural Change*, 13(3), 208-224.
- Apollo, M. (2017). The true accessibility of mountaineering: The case of the High Himalaya. *Journal of Outdoor Recreation and Tourism*, 17, 29-43.
- ATTA. (2017). Adventure tourism market study 2013.
- Baldacchino, G. (2006). *Extreme tourism: Lessons from the world's cold water islands*. Elsevier.
- Beckman, E. (2013). *The impact of motivations and enduring involvement in an adventure tourism setting*.
- Bedi, D., & Pattnaik, S. (1999). Environmental conservation in India. *Employment News-Weekly*, 5-11.
- Beedie, P. (2010). *Mountain based adventure tourism: lifestyle choice and identify formation*. Lambert Academic Publishing.
- Beedie, P., & Hudson, S. (2003). Emergence of mountain-based adventure tourism. *Annals of Tourism Research*, 30(3), 625-643.
- Bentley, T. A., Page, S. J., & Macky, K. A. (2007). Adventure tourism and adventure sports injury: The New Zealand experience. *Applied Ergonomics*, 38(6), 791-796.
- Böhmer-Bauer, K. (2012). Trekkingtouristen-gottlose pilger oder gläubige wanderer. *Wirtschaftsfaktor Spiritualität und Tourismus. Ökonomisches Potenzial der Werte-und Sinnsuche*, 215-242.
- Bonadonna, A., Giachino, C., & Truant, E. (2017). Sustainability and mountain tourism: The millennial's perspective. *Sustainability*, 9(7), 1219.
- Briassoulis, H., & van der Straaten, J. (2000). Tourism and the environment: An overview. *Tourism and the Environment: Regional, Economic, Cultural and Policy Issues*.
- Brohman, J. (1996). New directions in tourism for third world development. *Annals of Tourism Research*, 23(1), 48-70.
- Buckley, R. (2006). Adventure tourism. cab international. Wallingford, UK.
- Buckley, R. (2011). Tourism and environment. *Annual review of environment and resources*, 36(1), 397-416.
- Buckley, R. (2012). Sustainable tourism: Research and reality. *Annals of tourism research*, 39(2), 528-546.
- Buckley, R. (2018). Tourism and natural World Heritage: A complicated relationship. *Journal of Travel Research*, 57(5), 563-578.
- Buntaine, M. T., Mullen, R. B., & Lassoie, J. P. (2007). Human use and conservation planning in Alpine areas of Northwestern Yunnan, China. *Environment, Development and Sustainability*, 9, 305-324.
- Cerezo Medina, A. (2011). A gis-based proposal for evaluating the potential of the territory for ecotourism and adventure tourism activities. an application to sierra de las nieves (málaga, spain).
- Charara, N., Cashman, A., Bonnell, R., & Gehr, R. (2011). Water use efficiency in the hotel sector of barbados. *Journal of Sustainable Tourism*, 19(2), 231-245.
- Chatterjea, K. (2007). Assessment and demarcation of trail degradation in a nature reserve, using GIS: Case of Bukit Timah Nature Reserve. *Land Degradation & Development*, 18(5), 500-518.
- Chirenje, L. I. (2017). Contribution of ecotourism to poverty alleviation in Nyanga, Zimbabwe. *Chinese Journal of Population Resources and Environment*, 15(2), 87-92.
- Coble, T. G., Selin, S. W., & Erickson, B. B. (2003). Hiking alone: Understanding fear, negotiation strategies and leisure experience. *Journal of Leisure Research*, 35(1), 1-22.
- Cole, S. (2008). Living in hope: tourism and poverty alleviation in flores? In *Tourism development: Growth, myths and inequalities*. CABI Wallingford UK.
- Dávid, L. (2011). Tourism ecology: Towards the responsible, sustainable tourism future. *Worldwide Hospitality and Tourism Themes*, 3(3), 210-216.
- Diedrich, A., & García-Buades, E. (2009). Local perceptions of tourism as indicators of destination decline. *Tourism Management*, 30(4), 512-521.

- Durberry, R. (2004). Tourism and economic growth: The case of Mauritius. *Tourism Economics*, 10(4), 389-401.
- Ewert, A., & Hollenhorst, S. (1989). Testing the adventure model: Empirical support for a model of risk recreation participation. *Journal of Leisure Research*, 21(2), 124-139.
- Godara, R. S., Fetrat, D. J., & Nazari, A. (2020). Contribution of tourism industry in Indian Economy: An analysis. *International Journal of Recent Technology and Engineering*, 8(6), 1994-2000.
- Grasso, F., & Schilirò, D. (2021). Tourism, economic growth and sustainability in the Mediterranean region. In *Tourism in the Mediterranean Sea: An Italian Perspective*. Emerald Publishing Limited.
- Grêt-Regamey, A., Brunner, S. H., & Kienast, F. (2012). Mountain ecosystem services: who cares? *Mountain Research and Development*, 32(S1), 3.
- Gurung, C. P., & DeCoursey, M. A. (2000). Too much too fast: Lessons from Nepal's lost kingdom of Mustang. In *Tourism and development in mountain regions*. CABI Publishing Wallingford UK.
- Gyimóthy, S., & Mykletun, R. J. (2004). Play in adventure tourism: The case of Arctic trekking. *Annals of Tourism Research*, 31(4), 855-878.
- Holt, L. W. (2008). *Mountains, mountaineering and modernity: A cultural history of german and austrian mountaineering, 1900-1945*. The University of Texas at Austin.
- Hottola, P. (2009). *Tourism strategies and local responses in Southern Africa*. Cabi.
- Houge Mackenzie, S., & Kerr, J. H. (2012). A (mis) guided adventure tourism experience: An autoethnographic analysis of mountaineering in Bolivia. *Journal of Sport & Tourism*, 17(2), 125-144.
- Hwang, J., & Lee, J. (2019). A strategy for enhancing senior tourists' well-being perception: Focusing on the experience economy. *Journal of Travel & Tourism Marketing*, 36(3), 314-329.
- Ion, L. (2010). Mountain climbing-teaching and definition. *Studia Universitatis Babeş-Bolyai, Educatio Artis Gymnasticae*, 55(3), 9.
- Jain, A., & Kuniyal, J. (1994). Environmental Impact Assessment (EIA): A tool for effective management and decision making for tourism development in the Himalayan region of India. *Himanchal-India. Souvenir of 7th Himalayan Tourism Advisory Board, Department of Tourism, Shimla*, 28-30.
- Jain, A., & Kuniyal, J. (1995). Environmental assessment in and around valley of flowers. *ENVIS Bulletin-Himalayan Ecology & Development*, 3.
- Jain, A., Kuniyal, J., & Shannigrahi, A. (1996). Solid waste management in mohal. *WEDC, LOUGHBOROUGH UNIVERSITY, LEICESTERSHIRE LE 11 3 TU(UK)*, 328-331.
- Jodłowski, M. (2011). *Zasady dobrej praktyki w zarządzaniu ruchem wspinaczkowym na obszarach chronionych*.
- Johnston, B. R., & Edwards, T. (1994). The commodification of mountaineering. *Annals of Tourism Research*, 21(3), 459-478.
- Kousis, M. (2000). Tourism and the environment: A social movements perspective. *Annals of Tourism Research*, 27(2), 468-489.
- Krishnan, T., Gangwani, K. K., Reddy, P., Rama, A., et al. (2023). Barriers to sustainable waste management in mountain tourism: Evidence from India. *Tourism: An International Interdisciplinary Journal*, 71(2), 252-269.
- Laing, J., & Frost, W. (2014). *Explorer travellers and adventure tourism*. Channel View Publications.
- Li, K. X., Jin, M., & Shi, W. (2018). Tourism as an important impetus to promoting economic growth: A critical review. *Tourism Management Perspectives*, 26, 135-142.
- Lindberg, K., & Johnson, R. L. (1997). Modeling resident attitudes toward tourism. *Annals of tourism Research*, 24(2), 402-424.
- Lötter, M. J., & Welthagen, L. (2020). Adventure tourism activities as a tool for improving adventure tourists' wellness. *African Journal of Hospitality, Tourism and Leisure*, 9(1), 1-10.
- Lou, J. (2014). *Analysis of adventure tourist motivation: The case of China-born international students in New Zealand universities*. Auckland University of Technology.
- Lu, J., & Nepal, S. K. (2009). Sustainable tourism research: An analysis of papers published in the Journal of Sustainable Tourism. *Journal of Sustainable Tourism*, 17(1), 5-16.
- Lun, L.-M., Pechlaner, H., & Volgger, M. (2016). Rural tourism development in mountain regions: Identifying

- success factors, challenges and potentials. *Journal of Quality Assurance in Hospitality & Tourism*, 17(4), 389-411.
- Mak, B. K., Cheung, L. T., & Hui, D. L. (2017). Community participation in the decision-making process for sustainable tourism development in rural areas of Hong Kong, China. *Sustainability*, 9(10), 1695.
- Marek, A., & Wiczorek, M. (2015). Tourist traffic in the Aconcagua Massif area. *Quaestiones Geographicae*, 34(3), 65-76.
- Mason, M. C., Gos, L., & Moretti, A. (2016). Motivations, perceived risk and behavioural intentions in hard adventure tourism. A natural park case study. *Sinergie Italian Journal of Management*, 34, 181-199.
- McKay, T. (2018). An analysis of the South African adventure tourism industry. *Anatolia*, 29(4), 529-539.
- McKercher, B., & Du Cros, H. (2002). *Cultural tourism: The partnership between tourism and cultural heritage management*. Routledge.
- McNamee, M. J. (2007). *Philosophy, risk and adventure sports*. Routledge London.
- Mengist, W., Soromessa, T., & Legese, G. (2020). Ecosystem services research in mountainous regions: A systematic literature review on current knowledge and research gaps. *Science of the Total Environment*, 702, 134581.
- Mieczkowski, Z. (1995). *Environmental issues of tourism and recreation*.
- Mock, J., & O'Neil, K. (1996). Survey of ecotourism potential in the biodiversity project area. *IUCN, Pakistan*.
- Moss, L. A., & Godde, P. M. (2000). Strategy for future mountain tourism. In *Tourism and development in mountain regions*. CABI Publishing Wallingford UK.
- Muller, T. E., & Cleaver, M. (2000). Targeting the CANZUS baby boomer explorer and adventurer segments. *Journal of Vacation Marketing*, 6(2), 154-169.
- Mutana, S., & Mukwada, G. (2018). Mountain-route tourism and sustainability. A discourse analysis of literature and possible future research. *Journal of Outdoor Recreation and Tourism*, 24, 59-65.
- Naithani, A. K., Nainwal, H., Sati, K., & Prasad, C. (2001). Geomorphological evidences of retreat of the gangotri glacier and its characteristics. *Current Science*, 87-94.
- Nasution, A. P., Pohan, M. Y. A., Ramadhan, D. A., Limbong, C. H., & Harahap, N. J. (2023). Factors affecting adventure tourist satisfaction: Evidence from Indonesia. *Innovative Marketing*, 19(2), 51.
- Nepal, S. (2010). 13 tourism and political. *Tourism and political change*.
- Nepal, S. K. (2000). Tourism in protected areas: The Nepalese Himalaya. *Annals of Tourism Research*, 27(3), 661-681.
- Nepal, S. K. (2008). Tourism-induced rural energy consumption in the Annapurna region of Nepal. *Tourism Management*, 29(1), 89-100.
- Nepal, S. K. (2016). Tourism and change in Nepal's Mt Everest region. In *Mountain tourism: Experiences, communities, environments and sustainable futures*. CABI Wallingford UK.
- Nepal, S. K., & Chipeniuk, R. (2005). Mountain tourism: Toward a conceptual framework. *Tourism Geographies*, 7(3), 313-333.
- Nepal, S. K., & Nepal, S. A. (2004). Visitor impacts on trails in the Sagarmatha (Mt. Everest) national park, Nepal. *AMBIO: A journal of the Human Environment*, 33(6), 334-340.
- Nepal, S. K., & YANG, S. M. (2015). Mountaineering, commodification and risk perceptions in Nepal's Mt Everest region. In *Mountaineering tourism*. Routledge.
- Nowacki, M. (2023). Mountaineering in the Himalayas: A comprehensive analysis through a literature review and research profiling. *Polish Journal of Sport and Tourism*, 30(4), 3-12.
- Palacio, V. (1997). Identifying ecotourists in Belize through benefit segmentation: A preliminary analysis. *Journal of Sustainable Tourism*, 5(3), 234-243.
- Palmer, C. (2002). 'Shit happens': The selling of risk in extreme sport. *The Australian Journal of Anthropology*, 13(3), 323-336.
- Park, D.-B., & Yoon, Y.-S. (2009). Segmentation by motivation in rural tourism: A Korean case study. *Tourism Management*, 30(1), 99-108.

- Park, D.-B., Yoon, Y.-S., & Lee, M.-S. (2008). Rural community development and policy challenges in South Korea. *Journal of the Economic Geographical Society of Korea*, 11(4), 600-617.
- Pjerotic, L., Delibasic, M., Joksiene, I., Griesiene, I., & Georgeta, C. P. (2017). Sustainable tourism development in the rural areas. *Transformations in Business & Economics*, 16(3), 6.
- Pomfret, G. (2006). Mountaineering adventure tourists: A conceptual framework for research. *Tourism Management*, 27(1), 113-123.
- Ponte, J., Couto, G., Sousa, Á., Pimentel, P., & Oliveira, A. (2021). Idealizing adventure tourism experiences: Tourists' self-assessment and expectations. *Journal of Outdoor Recreation and Tourism*, 35, 100379.
- Prideaux, B., Timothy, D. J., & Cooper, M. (2009). Introducing river tourism: physical, ecological and human aspects. *River tourism*.
- Qasim, M., Atta-Ur-Rahman, Z. A., Hashim, M., & Farooq, M. U. (2023). Perception of tourists towards sustainable tourism development and green hospitality management in Gilgit Baltistan. *Journal of Positive School Psychology*.
- Qasim, M., et al. (2022). Trends and patterns of temporal tourism growth in Gilgit Baltistan region, Pakistan. *Journal of Development and Social Sciences*, 3(3), 524-537.
- Rantala, O., Hallikainen, V., Ilola, H., & Tuulentie, S. (2018). The softening of adventure tourism. *Scandinavian Journal of Hospitality and Tourism*, 18(4), 343-361.
- Richards, G., & Hall, D. (2002). The community: A sustainable concept in tourism development? In *Tourism and sustainable community development*. Routledge.
- Río-Rama, M., Maldonado-Erazo, C., Durán-Sánchez, A., & Álvarez-García, J. (2019). Mountain tourism research. A review. *European Journal of Tourism Research*, 22(2019), 130-150.
- Rojo-Ramos, J., Vidal-Espinoza, R., Palacios-Cartagena, R. P., Galán-Arroyo, C., Manzano-Redondo, F., Gómez-Campos, R., & Adsuar, J. C. (2021). Adventure tourism in the Spanish population: sociodemographic analysis to improve sustainability. *Sustainability*, 13(4), 1706.
- Rosa, P., Bento, P., & Teotónio, T. (2022). The internal competitive advantage of adventure tourism operators: An exploratory approach. *Journal of Outdoor Recreation and Tourism*, 39, 100555.
- Rotillon, G. (2006). 43 extreme sports (climbing and mountaineering). *Handbook on the Economics of Sport*, 411.
- Rózycki, P., & Dryglas, D. (2014). Trekking as a phenomenon of tourism in the modern world. *Acta Geoturistica*, 5(1), 24-40.
- Ryan, C. (2003). *Recreational tourism: Demand and impacts*. Channel View Publications.
- Saffery, A. (2000). Mongolia's tourism development race: Case study from the Gobi Gurbansaikhan National Park. In *Tourism and development in mountain regions*. (p. s). CABI Publishing Wallingford UK.
- Shah, J. J., Nagpal, T., & Brandon, C. (1997). *Urban air quality management strategy in Asia: Guidebook*. World Bank Publications.
- Shahgedanova, M., Adler, C., Gebrekirstos, A., Grau, H. R., Huggel, C., Marchant, R., ... Vuille, M. (2021). Mountain observatories: Status and prospects for enhancing and connecting a global community. *Mountain Research and Development*, 41(2), A1.
- Singh, R., & Mishra, D. (2004). Green tourism in mountain regions-reducing vulnerability and promoting people and place centric development in the Himalayas. *Journal of Mountain Science*, 1, 57-64.
- Singh, S. (2002). Tourism in India: Policy pitfalls. *Asia Pacific Journal of Tourism Research*, 7(1), 45-59.
- Snyder, J., & Stonehouse, B. (2007). *Prospects for polar tourism*. Cabi.
- Sofronov, B. (2017). Impact of sustainable tourism in the travel industry. *Annals of Spiru Haret University. Economic Series*, 17(4), 85-94.
- Spenceley, A. (2008). *Responsible tourism critical issues for conservation and development: Earthscan*. London.
- Stevens, S. (2003). Tourism and deforestation in the Mt Everest region of Nepal. *Geographical Journal*, 169(3), 255-277.
- Strahler, A. H., & Strahler, A. N. (2003). *Introducing physical geography*. J. Wiley.
- Streimikiene, D., Svagzdiene, B., Jasinskas, E., & Simanavicius, A. (2021). Sustainable tourism development and competitiveness: The systematic literature review. *Sustainable Development*, 29(1), 259-271.

- Swarbrooke, J. (2003). *Adventure tourism: The new frontier*. Routledge.
- Tang, C. F. (2011). Is the tourism-led growth hypothesis valid for Malaysia? A view from disaggregated tourism markets. *International Journal of Tourism Research*, 13(1), 97-101.
- Tangeland, T. (2011). Why do people purchase nature-based tourism activity products? A Norwegian case study of outdoor recreation. *Scandinavian Journal of Hospitality and Tourism*, 11(4), 435-456.
- Tonderayi, D. (2000). Amenity migration and tourism in the Eastern Highlands Bioregion of Zimbabwe: Policy planning and management considerations. In *Tourism and development in mountain regions*. CABI Publishing Wallingford UK.
- UNWTO. (2022). *Un tourism*. Retrieved from <https://shorturl.at/FgBiD>
- us Saqib, N., Yaqub, A., Amin, G., Khan, I., Ajab, H., Zeb, I., ... others (2019). The impact of tourism on local communities and their environment in Gilgit Baltistan, Pakistan: A local community perspective. *Environmental & Socio-economic Studies*, 7(3), 24-37.
- Villalobos-Céspedes, D., Galdeano-Gómez, E., & Tolón-Becerra, A. (2010). Demand indicators for adventure tourism packages in Costa Rica: An exploratory analysis. *Tourism and hospitality research*, 10(3), 234-245.
- von Dach, S. W., Ott, C., Klaey, A., & Stillhardt, B. (2006). Will international pursuit of the millennium development goals alleviate poverty in mountains? *Mountain Research and Development*, 12, 4-8.
- Wakimin, N., Azlina, A., & Hazman, S. (2018). Tourism demand in Asean-5 countries: Evidence from panel data analysis. *Management Science Letters*, 8(6), 677-690.
- Wang, J., Liu-Lastres, B., Ritchie, B. W., & Pan, D.-Z. (2019). Risk reduction and adventure tourism safety: An extension of the risk perception attitude framework (RPAF). *Tourism Management*, 74, 247-257.
- Weber, K. (2001). Outdoor adventure tourism: A review of research approaches. *Annals of Tourism Research*, 28(2), 360-377.
- WTO. (2005). *Making tourism more sustainable guide for policy makers (english version)*. in: *World tourism organization*. Retrieved from <https://shorturl.at/IJByP>
- Zurick, D. N. (1992). Adventure travel and sustainable tourism in the peripheral economy of Nepal. *Annals of the Association of American Geographers*, 82(4), 608-628.