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The articles published in this journal in all its issues are from mountaineering, adventure, trekking and general tourism area. The articles were assigned for peer review to the professors and practitioners in their respective fields, amendments were recommended followed by editing and corrections ensured before they were processed for publication.

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The articles have been arranged in alphabetical order of the authors' name. Researchers and readers are welcome for their any kind of scholarly inquiries and suggestions.

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Adventure Tourism Study: Implications for Nepal

Aaditi Khanal

Abstract

This study has assessed the definitions, historical development and scope of adventure tourism globally and its implications for Nepal. It is based on the secondary literature review and analysis that refers to some of the imminent textbooks and reports. Further, it has focused on the economic prospects associated with the adventure tourism activities and its benefits to the destination and nation. The study has suggested some of the essential prerequisites that are needed to be maintained for the establishment of Nepal as a destination of adventure tourism at a high ranking spot in the developing world.

Keywords: Adventure, tourism, economy, tourists, travel

Introduction

In the growing arena of niche tourism, when people want to experience new and different things which are thrilling and yet exhilarating, adventure tourism is an exponentially growing sector worldwide (WTO, 2014) and it is a segment that is highly valued in the international tourism economy sector (McKay, 2014). Also titled as the "new tourism cash-cow", adventure tourism has evolved to be one of the fastest growing sectors across the globe, attracting high valued customers, supporting local economies and promoting the environment (Global Data, 2018). Hence, the scope and opportunities of adventure tourism as a potential business and tourism promoting activities are wide ranging in the context of Nepal. The history of starting adventure tourism activities is no older than six decades. Now, it is imperative and worthwhile to also note about the scope and opportunities of adventure tourism from an economic point of view with a futuristic lens.

Defining adventure tourism

Adventure tourism is defined as travel outside a person's normal environment for more than 24 hours and not more than one consecutive year (Adventure Travel Development Index Report, 2010). The Adventure Travel Trade Association
(ATTA) defines adventure tourism as a trip that includes at least two of the following three elements: physical activity, natural environment, and cultural immersion (WTO, 2014). According to Millington, Locke and Locke (2001), adventure travel is a leisure activity that takes place in an unusual, exotic, remote or wilderness destination. It tends to be associated with high levels of activity by the participant, most of it outdoors. Previously, Sung Morisson and Leary (1997) have defined adventure tourism as the sum of phenomena and relationships arising from the interactions of adventure touristic activities with the natural environment away from the participant's usual place of residence area and containing elements of risk, the outcome is influenced by the participation, setting and the organizer of the tourist's experience. From these specific definitions, it can be understood that adventure tourism is a special form of tourism and it requires a natural setting that also includes factors of risk and also physical actions.

Further, in the year 2003, a group of scholars had made an early attempt to deviate from the conventional notion of adventure tourism that was accepted by many researchers, scholars, academicians and tourism practitioners globally. Therefore, in terms of elaborating on the concept of adventure tourism, Swarbrooke, Beard, Leckie and Pomfret (2003) have highlighted that adventure tourism involves travel and leisure activities that are contracted with the hope that they will produce a rewarding adventure experience. It will heighten the nature and involve a range of emotions and excitement. It will entail intellectual, spiritual, physical or emotional risks and challenges. Both adventure and tourism have been reflected in Figure 1 Swarbrooke et al. (2003) have put forward the newer classifications of adventure tourism elements, such as, artificial environments, urban exploration, charity challenges, conservation expeditions, hedonistic tourism, spiritual
enlightenment, virtual reality, sex tourism, round the world travel.

**New definitions of adventure tourism**

Viren and Murray (2017) have introduced a new concept of defining adventure tourism from an activity and the traveler's perspectives. The graphic below demonstrates the new definition of adventure tourism derived as a result of the recent research by Viren and Murray (2017).

![Diagram of Essential Elements and Travel Experience as Components of an Effective Adventure Trip](image)

**Figure 2**: Essential Elements and Travel Experience as Components of an Effective Adventure Trip (Source: Viren and Murray, 2017)

On the left, the components of an adventure trip from the provider perspective are elaborated: nature, culture, and activity, with experience at the core. For adventure travel providers, recognizing how the individual elements come together to deliver an overall experience underscores the importance of considering the components of a trip as individual ingredients, and of staying attuned to how they all fit together. This might mean considering carefully the sequencing of activities, the duration, and the time given for talking about or reflecting on the experience. In addition, the components of adventure travel are located within the concept of impact. For developers of adventure travel products, impact is an important consideration. Considering and planning for impact is a basic, foundational concern; all travel providers are operating in an environment in which they have impact on the places they visit.

From the activities perspective, the traveler conception of “adventure” is always shifting. A sampling of activities associated with adventure travel could include joining an archaeological expedition; backpacking; bird-watching; camping; caving; climbing; getting to know the locals; hiking; horseback riding; kayaking; whitewater rafting; learning a new language; orienteering; joining a research expedition or safari; sailing, scuba diving; snorkeling; skiing and snowboarding; surfing; trekking; and many others.

From the traveler’s perspective, on the right side of the graphic, research indicates that adventure travel is motivated by a variety of longings and desires that
influence how travelers consume and emotionally process their trip. Travelers are seeking mental and physical wellness, novel and unique experiences, challenges adventure and thrill, whether physical or cultural and often, ultimately, transformation.

Travelers are also keenly aware of their impact and have a desire to have a positive impact on the environment and communities they visit.

Finally, the definition of adventure travel, a trip must take an individual outside of his or her regular environment for more than twenty-four hours and for no longer than one year and include at least two of the following three experiences: participation in a physical activities, a visit to a natural environment, and a culturally immersive experience (Trips longer than one year are not considered “travel” in the research context).

**Categorical understanding of adventure tourism**

As from the above definitions, it has been understood that the scope of adventure tourism is far and wide. As such different scholars and researchers have made their own attempts to bring forward categories or so to say the various typologies of adventure tourism which has further been discussed in this section. As early as in the year 1999, Addison has produced a typology of adventure grid based on two axes. Along one is the level of adventure determined by the danger element and the technical skills needed and thus interpreted as the degree of challenge. The other axis is based on the level of independence i.e. the degree of participants rely on others to organize the experience, basically reflects the degree of tourists for that they are reliant on suppliers to organize and manage the experience. Each axis is also continuum, going from low to high. Figure 2 shows the four categories developed by Addison, plus some proposals as to the type of activity or product that might sit in each quadrant.

![Adventure Quadrants developed by Addison (1999) (Source: Swarbrooke et al., 2003).](image-url)
Next, the hard and soft adventure which are the often used terms by researchers who have devised a continuum to explain the diversity of behavior, beginning with mild adventure (termed as 'soft adventure') at one end of the scale and progressing to 'hard adventure' at the other extreme. This continuum, which is illustrated in Figure 3 involves differing degrees of 'challenge, uncertainty, setting, familiarity, personal abilities, intensity, duration and perceptions of control' (Lipscombe, 1995).

![Figure 4: The continuum of soft and hard adventure (Source: Swarbrooke et al., 2003)](image)

In his study of adventure tourism, Buckley in the year 2006 has discussed about the following types of adventure tourisms: river journey, whitewater kayaking, whitewater rafting, sea kayaking, sailing, expedition cruises, diving, surfing, Heli-ski and snowboard, cross-country skiing, ice climbing, mountaineering, hiking and bushwalking, horse riding, mountain biking, off-road safaris, wildlife, and Ariel adventures. Adventure tourism by Global Data (2018) has been typified on the basis of medium that are three forms of adventure activities: land, water, and air-based activities.

Furthermore, it is clear that the type of adventure tourism differs on the understanding of individuals. It is true that adventure to one traveler may seem mundane to another. Regardless of how tourism professional organize categorically the adventure tourism that will always be subjective term for travelers themselves, because it is related to one's individual experience (WTO, 2014).

Buckley, in his study of the adventure tourism management (2010) has considered wildlife, marine, board sports and heli-skiing as the representative subsectors of adventure tourism.

Holding on the two major categorical theme of hard and soft adventure, ATTA (2013) has indicated various activities and their adventure classification as shown in Table 1.
<table>
<thead>
<tr>
<th>Activity</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Archeological expedition</td>
<td>Soft</td>
</tr>
<tr>
<td>Attending local festival/fairs</td>
<td>Other</td>
</tr>
<tr>
<td>Backpacking</td>
<td>Soft</td>
</tr>
<tr>
<td>Bird watching</td>
<td>Soft</td>
</tr>
<tr>
<td>Camping</td>
<td>Soft</td>
</tr>
<tr>
<td>Canoeing</td>
<td>Soft</td>
</tr>
<tr>
<td>Caving</td>
<td>Hard</td>
</tr>
<tr>
<td>Climbing (mountain/rock/ice)</td>
<td>Hard</td>
</tr>
<tr>
<td>Cruise</td>
<td>Other</td>
</tr>
<tr>
<td>Cultural activities</td>
<td>Other</td>
</tr>
<tr>
<td>Eco-tourism</td>
<td>Soft</td>
</tr>
<tr>
<td>Educational programs</td>
<td>Soft</td>
</tr>
<tr>
<td>Environmentally sustainable activities</td>
<td>Soft</td>
</tr>
<tr>
<td>Fishing/fly-fishing</td>
<td>Soft</td>
</tr>
<tr>
<td>Getting to know the locals</td>
<td>Other</td>
</tr>
<tr>
<td>Hiking</td>
<td>Soft</td>
</tr>
<tr>
<td>Horseback riding</td>
<td>Soft</td>
</tr>
<tr>
<td>Hunting</td>
<td>Soft</td>
</tr>
<tr>
<td>Kayaking/sea/whitewater</td>
<td>Soft</td>
</tr>
<tr>
<td>Learning a new language</td>
<td>Other</td>
</tr>
<tr>
<td>Orienteering</td>
<td>Soft</td>
</tr>
<tr>
<td>Rafting</td>
<td>Soft</td>
</tr>
<tr>
<td>Research expeditions</td>
<td>Soft</td>
</tr>
<tr>
<td>Safaris</td>
<td>Soft</td>
</tr>
<tr>
<td>Sailing</td>
<td>Soft</td>
</tr>
<tr>
<td>Trekking</td>
<td>Hard</td>
</tr>
<tr>
<td>Walking tours</td>
<td>Other</td>
</tr>
<tr>
<td>Visiting friends/family</td>
<td>Other</td>
</tr>
<tr>
<td>Visiting historical sites</td>
<td>Other</td>
</tr>
<tr>
<td>Volunteer tourism</td>
<td>Soft</td>
</tr>
</tbody>
</table>

*Table 1: Adventure classification of activities by ATTA (2013) (Source: WTO, 2014)*

Therefore, the above categorical analysis of the adventure tourism clearly justify the wide ranging and the scope of adventure tourism itself. The different types and categories are proposed and verified by different experts and agencies. However, one important evidence to internalize is that adventure tourism includes various types of activities in land, water and air.

**Historical development of adventure tourism**

The history of adventure tourism dates back to many years since the human beings started in engaging in adventurous travel and different exciting activities.
It has been already high-lighted by the exploration of Marco Polo, Captain James Cook, and Sir Ernest Shackleton, who had primarily scientific, geographic, or colonial motives. Adventure tourism has always been presented in the society, even though the participants of that time did not see it as adventure tourism, it was discovery of places. For them it was a way of life, instead of a leisure activity (Van der Merwe, 2009). Tourism dates back as far as ancient Greece and ancient Rome, there are the evidence of tourism from these eras in terms of travel writing.

According to Swarbrooke et al. (2003) the groups that are seen as the pioneers of the adventure tourism industry historically are hedonists, explorers and adventurers, mercenaries, pilgrims, seasonal migrants, missionaries, romantic era mountain sports, natural historians, travel writer adventurers.

Nonetheless, the commercial modifications of adventure tourism can be considered as a new phenomenon in which the traveler pays for the tourism based experiences and avails the services. In the mid-1800s, adventurers began to push the limits of mountain climbing and river rafting, with the first ascent of the Matterhorn in 1865 and descent of the Colorado River in 1869. Shortly thereafter, two key institutions were formed. The National Geographic Society (NGS) was formed in 1888 to “increase and diffuse geographic knowledge” and the Explorers Club (EC) was formed in 1904 to “promote the scientific exploration of land, sea, air, and space”. Both institutions continue to support adventures and expeditions today. In the mid-1950s, many first ascents and descents attracted global attention and inspired many people to attempt their own expeditions. Maurice Herzog’s ascent of Annapurna in 1950, Sir Edmund Hillary and Tenzing Norgay’s ascent of Mount Everest, and others’ successes were hailed in the media around the world. The transformation from information exploring to commercial guiding in the United States can be traced back to the 1920s when Don Hatch and his brothers decided to build wooden rafts to explore the Green River in what is today known as Dinosaur National Monument. Hatch eventually formed a company, Hatch River Explorations, which was the first business to receive a national park concessioner permit for rafting in 1953. Other seminal adventure companies formed during this time, such as Ker and Downey in 1946, Abercrombie and Kent in 1962, Micato Safaris in 1966 (luxury safaris), and OARS in 1969 (river rafting). OARS led several first river descents, including Bio Bio in Chile and the Zambezi in Zimbabwe, blending exploration with commercial adventure (WTO, 2014).

**Brief history of adventure tourism in Nepal**

Nepal has a history of no more than five-decades of commercial adventure tourism. It was a British army officer, Lieutenant Colonel James Owen Merion Roberts (Jimmy Roberts), who laid the foundations of commercial adventure
tourism in Nepal. Roberts founded Nepal's first trekking and mountaineering outfit, Mountain Travel Nepal, in 1964 to offer the opportunity for wealthy travelers to enjoy the experience of trekking or climbing in Nepal without problems (New Business Age, 2017).

The history of adventure tourism in Nepal is also related to the time (around 6 decades ago) when the early attempts to ascend the world's highest peak, Mt. Everest was started. According to Shrestha (2017), it was in the year 1953 when Tenzing Norgay Sherpa and Sir Edmund Hillary became successful in ascending the Mt. Everest that the adventure tourism sector of Nepal caught a motion track. In the late 1960's and 1970's hippies had started to flow in Nepal. During those days Nepal was famous for hippies as marijuana and hashish were easily available. But in 1973, the then government of Nepal banned on the selling of marijuana and hashish which became a turning point in the tourism history of Nepal as after that time Nepal developed as a hot spot for commercial adventure seekers and cultural tourists.

**Importance of adventure tourism**

As tourism continues to occupy an important position in the global economy, it has been called the greatest voluntary transfer of wealth from rich to the poor countries (Ashley, 2009) and it is apt to remark that in both the developing and developed parts of the world, the sector commands attention as a means of sustainable economic growth. Adventure as a way of travel, appeals to travelers, allowing for the fragility of places and is more often views as a "guilt-free" holiday option that money spent can penetrate more deeply into communities, contributing to local economies (ADTI, 2010). Hence, the economic importance of adventure tourism is bringing a lot of optimism to contemplate upon Nepal which is to a large extent driven by tourism based industries towards sustaining the economy.

Going by the statistics at a global level, a 2010 study completed by The George Washington University, Xola Consulting and the Adventure Travel Trade Association (ATTA), it has been found that 26% of travelers engage in adventure activities on vacation and valued international adventure tourism as an US$ 89 billion industry (The George Washington University, ATTA and Xola, 2009). As per the information provided by the ATTA, a closer from December 2009 till December 2010 further showed that adventure tourism was accelerating out of the recession with an estimated growth rate of 17% annually.

From such statistical descriptions, it is clear that the adventure tourism industry has entered a new stage with industry participants experimenting with a range of new strategies. For instances, introducing new forms of adventure sports and brands, the travel and tour organizers to attract the adventure enthusiasts. This
will be next generation activities in future tourism in Nepal and the world. Therefore, adventure tourism relies on innovation of entrepreneurs, who are continually developing and introducing the diverse set of products and the destinations.

**Adventure tourism competitiveness**

According to the latest report published by ATDI in 2018, highlights the top ten developed and developing countries with strong potential for adventure tourism competitiveness. Rank wise they have been listed below.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Developed Countries</th>
<th>Developing Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Iceland</td>
<td>Czech Republic</td>
</tr>
<tr>
<td>2</td>
<td>Switzerland</td>
<td>Israel</td>
</tr>
<tr>
<td>3</td>
<td>Germany</td>
<td>Estonia</td>
</tr>
<tr>
<td>4</td>
<td>New Zealand</td>
<td>Slovak Republic</td>
</tr>
<tr>
<td>5</td>
<td>Norway</td>
<td>Poland</td>
</tr>
<tr>
<td>6</td>
<td>Sweden</td>
<td>Chile</td>
</tr>
<tr>
<td>7</td>
<td>Canada</td>
<td>Romania</td>
</tr>
<tr>
<td>8</td>
<td>Finland</td>
<td>Bulgaria</td>
</tr>
<tr>
<td>9</td>
<td>United Kingdom</td>
<td>Slovenia</td>
</tr>
<tr>
<td>10</td>
<td>Australia</td>
<td>Jordan</td>
</tr>
</tbody>
</table>

*Table 2: Top Ten Countries for Adventure Travel (Source: ADTI Report, 2018, pp. 9-10)*

It would have been expected for Nepal to be listed at the topmost tiers of the adventure destination, due fact that there are some extremely adventurous destinations and sports based activities that have been consumed by the adventure enthusiasts all over the world. Some of such destinations include the Everest Base Camp, the bungee jump at Bhotekoshi, Pokhara as Aerial Adventure destination and other various base camp trekking and peak climbing activities. Therefore, it is important to also gather a deliberate knowledge upon the various pillars of adventure tourism market competitiveness that enables any destination to be established as a desired spot to pursue adventure tourism developed by the Adventure Tourism Development Index (ADTI).

The ADTI’s 10 pillars of adventure market competitiveness are principles of market development that drive benefit, celebrate culture and protect the environment. It also offers practical information for global tour operators about country/regional resources attractive for adventure tour development. The 10 pillars are: government policies supporting sustainable development, safety, natural resources, health, adventure resources, entrepreneurship, humanitarian, infrastructure, cultural resources and adventure image/brand.
1. **Government policies supporting to sustainable development**

Government policies which support and foster sustainable and rural tourism development. They are crucial to adventure tourism market competitiveness. It safeguards the destination's natural, heritage and cultural resources and provide a positive investment environment to the private sector. When public and private sector actions are coordinated, the private sector flourishes, attracting investment and development to a region. One such instance for the attraction of new tourism products could be the system of tax rebate in the adventure destinations.

2. **Safety**

In the context of safety, qualitative examination of the adventure operators can provide the safety of travelers, and the existing facilities are sufficient to cope the travel-related injuries. For example, in destinations where scuba diving is a popular draw, do hyperbaric chamber facilities for decompression exist? Are rescue operations available in mountaineering? Do guides have first aid training? Generally, do safety measurements of clients meet the international standards? Therefore, briefing and pre-event training in adventure activities must be made compulsory with insurance coverage in order to ensure proper safety.

3. **Natural resources**

Adventure travelers want to enjoy in untrammeled and well-managed natural resources. The rare natural resources, unusual destination, well-managed and naturally protected destination will earn high praise from adventure travelers. These destinations will be the best product of competitive tourism market. Along with this strict regulations for conservation of nature and natural resourced should be implemented for the proper management.

4. **Health**

A healthy local population is more likely to be able to foster and nurture new businesses, and to care for its resources responsibly. Countries where healthcare is readily available are better able to support adventure travelers.

5. **Adventure resources**

Adventure sports span a range of outdoor nature-based activities: bird watching to mountaineering; whitewater rafting to rock climbing; caving to paragliding. Destinations with resources lending themselves to the development of a particular sport. For example, cliffs excellent for ice
climbing, or forests with a wealth of bird species, get the earnest opportunities of sustained and competitive advantages of tourism market.

6. Entrepreneurship

An adventure market's vitality and strength originates from the so-called "fringe" - those pioneering businesses with unusual offerings that would seem to appeal only to a small subset of niche enthusiasts. Activities which begin outside the mainstream, or which seem too eccentric to appeal to a broader adventure travel market, reliably seem to end up as mainstream activities: the surging popularity of snowboarding is a case in point. Given this reality, destinations in which entrepreneurship in the business sector is thriving more likely to become competitive in the adventure travel market.

7. Humanitarian

The Humanitarian pillar is concerned with human development in a country - the presence of basic services: for example sanitation, and with the potential for blended adventure and volunteering trips. The trend toward volunteer tourism and its appeal to adventure travelers will continue to build, find destinations that volunteering will be available competitively.

8. Infrastructure

Adventure travelers, unlike mainstream package tourists, are frequently less sensitive to deficiencies in hard infrastructure. Perhaps, more sensitive than other travelers when it comes to conservation and soft tourism infrastructure. While hard infrastructure may take substantial capital investment and years to develop, sometimes the soft infrastructure required by adventure travelers can be developed with comparatively little capital outlay.

Adventure tourism infrastructure includes:

- Hard infrastructure such as roads, airports, lodging facilities, trails;
- Soft infrastructure such as:
  - Trail maps
  - Accessible information on heritage and culture
  - Ground operators/ outfitters
  - Training programs for adventure tourism including guides/interpreters, Eco lodges, etc.
9. Cultural resources

Adventure travelers are as keen to learn about new cultures as they are to explore nature. For the adventure traveler, being able to experience local culture in an authentic way is a sought-after outcome of the travel investment.

Destinations which encourage local people to preserve their culture - even as modern influences continue to shape and evolve local customs - fare well with adventure travelers. It does not however imply the local people to become living museums to the past or actors staging outdated customs, but to acknowledge and honor their customs, recognizing their unique contribution to the world stage.

10. Adventure image and brand

A destination's image can be one of the most malleable aspects of market competitiveness. Image is also important in guiding and influencing sustainable market development. A destination's image for sustainability and adventure opportunity will attract travelers who value these aspects. Through their visitation and expenditures, these people will in turn further support the country's ongoing sustainable.

Conclusion

From the definitions, scope, economic possibilities and the pre-requisites for development of adventure tourism it has to be concluded that Nepal as a country which seeks to promote tourism with a special focus on adventure based tourism activities in the upcoming years, remarkably from the 2020 to 2030 needs to further develop its resources in this regards. Inadequate of adventure tourism based literature and authentic researches have been seen as the major issues and challenges of authentication in the adventure tourism destination. As such, the initiative took forward by the Nepal Mountain Academy under the Ministry of Culture, Tourism and Civil Aviation of the Nepal Government to lunch a university degree of Masters in Adventure Tourism (MATS) could be a milestone setting for the enhanced and assertive prospect of adventure tourism in Nepal.

References:


Adventure Travel Trade Association, The George Washington University and


High Altitude Illness in Annapurna Circuit Trek

Behrouz Moghaddasi, MD¹

Abstract

After 3-4 days at any point 1-16 days trekking in Annapurna circuit (max altitude=5416m), individual may show clinical manifestation of altitude illness. Despite a slow and gradual ascent, we recorded a wide range of clinical symptoms and signs. There is risk of developing high altitude illness especially at altitude above 1900m. The most common forms of high altitude illness are: Acute Mountain Sickness typically consists of headache variably accompanied by loss of appetite, nausea, vomiting, disturbed sleep, fatigue, and dizziness; High Altitude Cerebral Edema is likely a continuum of AMS, a potentially fatal illness characterized by ataxia and decreased consciousness; and High Altitude Pulmonary Edema a potentially fatal consequence of rapid ascent to high altitude characterized by incapacitating fatigue, dyspnea with minimal effort that advances to dyspnea at rest. We found out, High altitude illness will occur in non-acclimatized individuals not only after rapid ascent but also some times after slow ascent to high altitude. By slowing down the ascent and resting more we tried to prevent serious high altitude illness. Most of Symptoms and signs will be relieved by slowing ascent and rest. But descent is mandatory, for the treatment of the potentially fatal illnesses of high-altitude pulmonary and cerebral edema. This research provides detailed information about clinical manifestation (symptoms and signs) of altitude illnesses. After reviewing the clinical features, we will investigate the chance of occurrence of these symptoms and signs. In addition to the above, we had interesting observations and findings that we will explain.

Keywords: Acute mountain sickness, high-altitude pulmonary edema, high-altitude cerebral edema, altitude acclimatization, incapacitating fatigue, exertional dyspnea, Annapurna circuit trek.

Aims and objective

The aim of this research was to find out clinical manifestation of altitude illness

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and risk of developing high altitude potentially fatal syndromes (HACE & HAPE), during a slow and gradual ascent in Annapurna circuit trek (210km, max altitude 5416m, 16 days). The ultimate aim being, better understanding and early appropriate management of the entity.

**Methodology**

This is a field research with direct and participant observation methods. In another words this is a prospective, multidisciplinary study. 128 mountaineers were monitored in Annapurna circuit trek (nine trips 2016-2018). We focused on recording the details of clinical manifestations, symptom and signs and managing high altitude illnesses on the way. We followed a graded ascent with the planned travel itinerary in all of our trips. All mountaineers were healthy, male and female with 20–40 years old. All of them had experiences of climbing around 5000m. We evaluated them in a buddy system step by step. We were curious about any symptom and signs of high altitude illnesses. Research diagnostic instruments is Lake Louise Questionnaire Score (LLQS; score of ≥ 3) and physical examination. We completed a Lake Louise self-assessment questionnaire on a twice per day basis for each member of the expedition. In physical examination we do and look for signs that indicate a deterioration in the individual’s condition (mental status, ataxia and peripheral edema). In addition to the above respiratory rate, heart rate, and SaO2 (pulse oximetry) readings were obtained twice per day, when needed and recorded. Indeed we design an AMS & PHYSICAL EXAMINATION WORKSHEET and collect data to evaluate them.

**Introduction**

Every year greater numbers of people travel to Himalaya and Nepal. High altitude illness is common among these travelers and is sometimes life threatening. At high altitude there is a drop in barometric pressure, which causes a decrease in the partial pressure of oxygen. This hypobaric hypoxia triggers a series of physiological responses, which, in most cases, help the individual adapt to the low oxygen conditions and high altitude. However, in some cases, maladaptive responses occur, and it causes high altitude illness.

Actually, high altitude illness caused by acute exposure to low partial pressure of oxygen at high altitude. It presents as a collection of nonspecific symptoms and signs. Spectrum of illness varies from mild to severe and is inclusive of acute mountain sickness (AMS), high altitude cerebral edema (HACE) and high altitude pulmonary edema (HAPE), and several other rare forms. Slow ascent and allowing ample time for acclimatization are widely advocated and shown in practice to effectively prevent high altitude illness, but 100% is not a guarantee.

In most previous studies and researches, have talked about the incidence of high
altitude illnesses after fast ascent. The overall incidence of high altitude illness was 53% (Peter Hackett; Drummond Rennie; Harry D. Levine, 1976). In another study (Jill Jin, 2017), high altitude illness occurs in more than 25% of people traveling to above 3500m. AMS may progress from nonspecific symptoms to life-threatening high-altitude cerebral edema in less than 1% of patients (David Meier; Tinh-Hai Collet; Isabella Locatelli, 2017).

In this study, we talk about the incidence of high altitude illnesses and clinical manifestations after graded ascent with the planned travel itinerary. The purpose of this research is to answer the research questions: what is the incidence of clinical symptoms and signs of high altitude illnesses after gradual ascent? Is there any chance for the potentially fatal syndromes (HACE & HAPE) with graded ascent?

High altitude illness affects more than 18% of individuals ascending to above 1900m. More than 65% of people traveling to above 3500m have one or more of AMS symptoms. HACE occurs rarely at altitudes <3500m, and its incidence between 3500m and 5500m is estimated to be 4–5%. We found in a graded ascent with the planned travel itinerary, the likelihood of developing HAPE is less than 1% (78).

The paper has many part. In this introduction, it’s essential to know Annapurna Circuit Trek. Of course we will review the literature relevant to high altitude illness. Then the research methodology and data analysis are simply discussed. And next, the findings are discussed and summarized. The findings of this research are expected to assist high altitude medicine specialists, practitioners and mountain guides in designing and developing successful plan and increasing mountaineers awareness of high altitude illness for a safe and successful plan.

**Annapurna Circuit Trek** is one of the most popular treks in Nepal and one of the world’s popular classic walks. It is a long trek, 210 Km hike around Annapurna massif. We need average 4-6 hrs walking per day. The route allows us to design a proper plan for good acclimatization before tackling the Thorong-La-pass at 5416m, however a good basic physical fitness is recommended. We started from Besisahar (740m), then we followed a slow and gradual ascent, and on the 11th day we reached the highest point of our trek and on the 16th day we finished at Nayapul (Table 1). In all of our nine trip we had a similar plan (Figure 1), but sometimes it was necessary to make some brief changes to treat patients.

**Detail itinerary:**

Day 1: Kathmandu to Besisahar (760m) 5 hrs Drive + Hiking to Bhulbhule 2h (840m)

Day 2: Hiking up to Jajat village 5hr (1300m)
Day 3: Hiking up to Dharapani 3hrs (1900m)
Day 4: Hiking up to Danakyu 2hr (2300m)
Day 5: Hiking up to Chame 5hr (2710m)
Day 6: Hiking up to Pisang 5hr (3310m)
Day 7: Hiking up to Manang 5hr (3540m)
Day 8: Acclimatization Day at Manang
Day 9: Hiking up to Ledar 4hr (4200m)
Day 10: Hiking up to High Camp 4hr (4750m)
Day 11: Hiking up to Thorung-La pass 8hr (5416m) trek down to Muktinath
Day 12: Trek down to Jomsom 5hr (2700m)
Day 13: Trek to down to Lete 7 hr (2535m)
Day 14: Trek down to Tatopani 5hr (1200m)
Day 15: Trek to Ghorepani (2870m) 6 hr
Day 16: Trek down to Nayapul (1100m) 6h + Drive to Pokhara

Figure 1: Annapurna Circuit Trek
High Altitude Illness, every year, a big numbers of people are ascending to high altitudes for the purposes of climbing, work and other concepts. In 2013, more than 100 million people visited altitudes that could lead to altitude illness. Trekkers are generally well prepared and usually have good support from the companies they trek with; however, recent illnesses, disabilities and deaths on high altitudes remind us of the dangers of altitude illness. High altitude illness is the collective term for acute mountain sickness (AMS), high altitude cerebral edema (HACE), and high altitude pulmonary edema (HAPE) and several other rare forms.

High Altitude is used in this article to mean altitudes higher than 1500m at which significant altitude illness is unlikely below this height (Table 2). As altitude increases, among other important changes, such as decreases in temperature and ambient humidity, barometric pressure decreases and, consequently the amount of oxygen in each breath decreases (Table 3), which causes a decrease in the partial pressure of oxygen at every point along the oxygen transport cascade from ambient air to cellular mitochondria. This hypobaric hypoxia triggers a series of physiological responses, which, in most cases, help the individual tolerate and adapt to the low oxygen conditions.

<table>
<thead>
<tr>
<th>Altitude</th>
<th>Meters</th>
<th>Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>High altitude</td>
<td>1,500-3,500</td>
<td>5,000-11,500</td>
</tr>
<tr>
<td>Very high altitude</td>
<td>3,500-5,500</td>
<td>11,500-18,000</td>
</tr>
<tr>
<td>Extreme altitude</td>
<td>above 5,500</td>
<td>above 18,000</td>
</tr>
</tbody>
</table>

In simple words, the concentration of oxygen at sea level is about 21% and the barometric pressure averages 760 mmHg. As altitude increases, the concentration remains the same but the number of oxygen molecules per breath is reduced. At
4000 meters the barometric pressure is only 475 mmHg, so there are roughly 40% fewer oxygen molecules per breath. In order to properly oxygenate the body, your breathing rate (even while at rest) has to increase. This extra ventilation increases the oxygen content in the blood, but not to sea level concentrations. Since the amount of oxygen required for activity is the same, the body must adjust to having less oxygen.

<table>
<thead>
<tr>
<th>Altitude, m (ft)</th>
<th>Barometric Pressure, mm Hg</th>
<th>Inspired Po2, mm Hg (% of sea level)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (0)</td>
<td>760</td>
<td>149 (100)</td>
</tr>
<tr>
<td>1000 (3281)</td>
<td>679</td>
<td>132 (89)</td>
</tr>
<tr>
<td>2000 (6562)</td>
<td>604</td>
<td>117 (79)</td>
</tr>
<tr>
<td>3000 (9843)</td>
<td>537</td>
<td>103 (69)</td>
</tr>
<tr>
<td>4000 (13 123)</td>
<td>475</td>
<td>90 (60)</td>
</tr>
<tr>
<td>5000 (16 404)</td>
<td>420</td>
<td>78 (52)</td>
</tr>
<tr>
<td>8848 (2 9028)</td>
<td>253</td>
<td>43 (29)</td>
</tr>
</tbody>
</table>

Table 3: Barometric Pressure and Inspired Po2 at Various Altitudes

The decreased oxygen in inspired air in places at high altitude, hypobaric hypoxia, is the central causative factor for the development of altitude illness. 3

Acclimatization to low oxygen within minutes of the trekker arriving at a place of high altitude and this process continues for weeks.

The important initial changes are: 4

- Hyperventilation
- Increased sympathetic tone causing increased heart rate, blood pressure and cardiac output
- Vasoconstriction of the pulmonary vasculature, which in the extreme situation is responsible for high-Altitude Pulmonary Edema (HAPE)
- Cerebral vasodilation caused by hypoxia, which can lead to cerebral edema.

Later changes include: 5

- Increased erythropoietin secretion, increased hemoglobin production within three days and diuresis, causing increased hematocrit
- Decreased muscle mass
- Increased vascularity.

Individual and genetic variances exist in this acclimatization response, 5 and inadequate responses lead to the pathological changes of altitude illness. Although the exact pathogenesis remains unclear, increased capillary leakage causing
cerebral edema in acute mountain sickness (AMS) and high-altitude cerebral edema (HACE), and similar pulmonary changes in HAPE, have been consistently described. The likely causes for this are hypoxia-induced blood flow and pressure increases, and capillary leakage mediated by chemicals such as bradykinin, nitric oxide, arachidonic acid and vascular endothelial growth factor.

The major cause of altitude illnesses is rapid ascending, but sometimes it happens with slow and gradual ascent too.

**Altitude illness** is a collection of different conditions that occur at high altitude: high altitude headaches (HAH), AMS, HACE, HAPE, and other less common conditions such as high altitude retinopathy, retinal hemorrhage, high-altitude syncope, cerebral venous thrombosis and cortical blindness. Altitude illness varies in severity from high-altitude headaches, mild AMS, through to more severe AMS, and possibly fatal progression to HACE. HAPE, also potentially fatal, can develop independently of the other conditions in places at high altitude.

**High Altitude Headache (HAH)** is an acute process due to acute hypobaric hypoxia caused by rapid ascending to high altitude. HAH is caused by the brain’s vulnerability to hypoxia in 25% of trekkers at 1900–3000m, up to 90% of un-acclimatized people who climbed to 5000m.

**Acute Mountain Sickness (AMS)** consists of nonspecific symptoms, it is typically headache after a rise in altitude in the past four days, and at least one of the following symptoms:

- Gastrointestinal upset (eg anorexia, nausea, vomiting)
- Fatigue or weakness
- Dizziness or light-headedness
- Difficulty sleeping

Because there is a lack of standardization in altitude, ascent rate, outcome and populations, the reported prevalence of AMS varies in different studies. The most important risk factors are how high and how quickly one ascends, the incidence of AMS is unrelated to the level of physical fitness, gender, previous altitude experience, load carried, recent respiratory infections, alcohol intake or cigarette smoking.

Acute mountain sickness is a clinical diagnosis based on symptoms in the context of ascending to high altitudes. Several questionnaire-based diagnostic tools can be used to diagnose acute mountain sickness. The Lake Louise Questionnaire Score (LLQS) is common use and valuable (Table 4). Physical examination is usually normal, but we do and look for signs that indicate a deterioration in the individual's condition (Table 5).
Table 5. Lake Louse self-assessment AMS scoring system

<table>
<thead>
<tr>
<th>1. Headache</th>
<th>None (0) to incapacitating (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Gastrointestinal symptoms</td>
<td>None (0), poor appetite or nausea (1), moderate nausea or vomiting (2) incapacitating severe nausea or vomiting (3)</td>
</tr>
<tr>
<td>3. Fatigue/weakness</td>
<td>None (0) to severe or incapacitating (3)</td>
</tr>
<tr>
<td>4. Dizziness/lightheadedness</td>
<td>None (0) to incapacitating (3)</td>
</tr>
<tr>
<td>5. Difficulty sleeping (last night)</td>
<td>None or slept as well as usual (0) to could not sleep at all (3)</td>
</tr>
</tbody>
</table>

* Each symptom is graded on a scale of 0-3; the presence of headache plus a score greater than or equal to 3 is usually considered positive for AMS.

Table 5: Physical Examination

This scoring system is not linearly correlated and do not give equivalent results; for this reason, study results are often dependent on the scoring system and cut-off points used to determine the presence or absence of AMS.

**High Altitude Cerebral Edema (HACE)** is a potentially fatal altitude illness, considered a progression from severe AMS, and is usually preceded by a further decrease in oxygenation in a person with severe AMS. Usually develops 24–36 hours after arrival at a place of high altitude. Physical examination is abnormal (Table 5). HACE Characterized by symptoms of severe AMS and cerebral symptoms, signs of impaired mental state, and the cardinal symptom and signs of ataxia. Rapidly it can leads to coma and death if untreated. Patients with AMS advised not to continue to ascend until symptoms have settled.15

**High Altitude Pulmonary Edema (HAPE)** occurs in healthy individuals at altitudes >2500–3000 m within 2–5 days after arrival16, can develop independently of AMS. It is potentially fatal and accounts for most of the deaths related to altitude illness.17 Early symptoms include excessive exertional dyspnea in relation to the patient’s companions, mild cough, chest tightness, reduced exercise performance, incapacitating fatigue. As edema progresses, cough and dyspnea worsen and orthopnea develops. Gurgling in the chest and pink frothy sputum indicate advanced cases. Examination reveals cyanosis, tachypnea, tachycardia, mildly elevated temperature and crackles upon auscultation.

**Acclimatization.** The major cause of high altitude illnesses is going too high too fast. Altitude acclimatization is the process of adjusting to decreasing oxygen levels at higher elevations, in order to avoid altitude illness. Given time, your body can adapt to altitude. This process generally takes 2-5 days at that altitude.

**Prevention of High Altitude Illness.** Slow ascent and allowing time for acclimatization are widely advocated and shown in practice to effectively prevent AMS, although the actual rate of ascent recommended varies from 300 to 500m
a day at higher than 3000m. One meta-analysis reported AMS incidences of 50–75% when ascending more than 500m a day at higher than 4000m. The Wilderness Medical Society developed the guideline that ascent should not be higher than 500m a day at altitudes of more than 3000m, and a day’s rest every three to four days should be included. Spending two or more nights at places of high altitude 30 days before ascending has been found to be protective against altitude illness. Additionally, resting in the first 48 hours after arriving at places of high altitude is advisable to prevent altitude illness. Some trekker have a higher risk of high altitude illness (Table 6).

**Table 6. Trekkers at risk of high altitude illness**

- Anyone ascending to 2800 m in one day.
- Anyone with prior history of acute mountain sickness ascending higher than 2800 m.
- Anyone ascending higher than 500 m/day at altitudes higher than 3000m.
- Anyone with a prior history of severe acute mountain sickness or high altitude cerebral edema or pulmonary edema.

**Arterial Oxyhemoglobin Saturation.** Early hypoxemia, a decrease in the SaO2 greater than that expected for a given altitude, is a risk factor for developing AMS. Individuals with early hypoxemia should be advised to avoid strenuous exercise and, if continuing to ascend, to ascend slowly. Pulse oximeters are relatively inexpensive and are commonly carried by trekking companies to monitor SaO2 in individuals with worsening symptoms of AMS, HACE and HAPE. Early hypoxemia can be monitored with a pulse oximeter (Figure 2).

![Pulse Oximeter](image)

**Study design and outcomes**

In this field research prospective study 128 mountaineers were assigned to ascent Annapurna Circuit Trek profile (Table 1, Figure 1). All ascent groups started the trek at Besisahar (870m), then slowly continued to Thorong La Pass (5416m), and to the Nayapul (1100m) within 16 days. We followed a graded ascent
according to our profile with a fluctuation 1-2hrs/d. Average trekking 4-5hrs/d rates, respectively (Fig. 1). Included were healthy, physically fit, experienced mountaineers of either gender and between 20 to 40 years of age without any disease. We completed our designed AMS & PHYSICAL EXAMINATION WORKSHEET on a twice per day basis for each member. This worksheet is a modified Lake Louise Questionnaire (Table 4)14 plus physical examination (Table 5) that we do and look for signs that indicate a deterioration in the individual's condition (mental status, ataxia and peripheral edema). In addition to the above respiratory rate, heart rate were obtained twice per day. Twice per day oximetry was performed in the morning and evening during rest in a standing position with a finger pulse oximeter. Stable values after at least 2 minutes were recorded.

Acute mountain sickness (AMS) scores were assessed daily utilizing the Lake Louise Questionnaire. A score of \( \geq 5 \) reliably identifies a person with AMS. The severe AMS score reflects symptoms of altered cerebral function in conjunction with the experience of being ill. Diagnosis of HACE was made when headache and an AMS score of \( \geq 7 \) were present either with change in mental status or with ataxia. Physical examination score of \( \geq 3 \) suggest HACE and more assessment. Diagnosis of HAPE was made clinically when excessive exertional dyspnea with others pulmonary symptom and signs in conjunction with low arterial oxyhemoglobin saturation (SaO2).

**Results**

We emphasize that all climbers had a gradual and slow ascent according to our ascent profile (Fig. 1).

- Of 128 mountaineers, 16 (12.5%) at 1900-3310m complained of a pure headache (High Altitude Headache) and resolves with a non-steroidal anti-inflammatory drug (Ibuprofen 600 mg).

- 24 (18.75%) mountaineers at 1900-3540m exhibited positive for AMS (LLQS; score of \( \geq 3 \)). They treated with slow ascending and simple medication (Ibuprofen or Acetaminophen).

- At altitudes above 3540m, 84(65.625%) mountaineers exhibited AMS (LLQS; score of \( \geq 3 \)). They treated with rest, slow ascending and simple medication. A significant number of this group develop to HACE.

The most common symptoms in order of frequency were: headache, weakness, anorexia and disturbed sleep.

- 31 (24.219%) out of 84 mountaineers with AMS, exhibited sever AMS (LLQS; score of \( \geq 5 \)) and resolves with rest, slow ascending, simple medication and acetazolamide. Of these numbers, 13 were involved
below 3500m and 18 above 3500m.

- Of 128 mountaineers, 6 (4.688%) exhibited HACE (LLQS; score of ≥7 + Physical Exam score of ≥4). One of these involved at an altitude lower than 3500m, and the rest was at altitudes above 3500m and one remarkable point was that we had a HACE after Thorong La Pass in descending time (Jomsom, 2700m). All of them show an acute progress from severe AMS (less than 24 hrs). We treated them with rapid descent + medication.

- Of 128 mountaineers, 1 (0.781%) exhibited HAPE at 3310m (Pisang). Chief complaint was excessive exertional dyspnea and incapacitating fatigue continued by pulmonary symptoms and signs. Pulse oximeter detected SaO2: 61 (Chart 1).

![Chart 1: High Altitude Illness](image)

**Our Guidelines for Field Treatment of Altitude Illness**, to manage and treat the patients we acted as follows:

**High Altitude Headache;** Non-steroidal anti-inflammatory drug (Ibuprofen 600 mg) or Acetaminophen.

**AMS;** more rest and slow ascent, symptom therapy medication, Acetazolamide 250 mg BID

**HACE;** Descent as soon as possible, Dexamethasone 8 mg load then 4 mg q6 hours, Acetazolamide 250 mg BID, symptom therapy medication.

**HAPE;** Rapid descent as soon as possible (Helicopter Rescue), Nifedipine 10 mg po then 30mgSR q12-24 hours, Acetazolamide 250 mg BID, symptom therapy medication.
Discussion

A vast majority of mountaineers, namely 78.9%, exhibited high altitude illness during the Annapurna Circuit Trek. We recorded a wide range of high altitude illness, a simple altitude headache to potentially fatal altitude illnesses such as HACE & HAPE. Our novel findings are important since they indicate that despite a slow and gradual ascent the risk of developing high altitude illness is high. Furthermore, the data suggest that the incidence of high altitude illness may have been underestimated in previous studies. Our mountaineers with delayed AMS and those who have AMS above 3500m showed more possibility of HACE throughout the trekking. This means, the higher the ascent and the longer the duration at high altitudes, the higher was the occurrence of high altitude illness. On the other hand, the chance of HACE was less in those who involved in AMS at lower altitude. The results strongly suggest a correlation between the time of exposure to high altitude with high altitude illness even with a slow and graded ascent. One remarkable point was that we had a HACE in descending time (2700m), it shows an acute progress from AMS within 6-8hrs without any findings in the previous days. Another considerable case was a HAPE at 3300m, she was a 40 years fit mountaineer without past history of high altitude illness. Her complaint was exertional dyspnea that intensified during night and we used of helicopter for rapid descending.

Conclusion

When closely observed and evaluated, a large amount of mountaineers exhibit high altitude illness during trekking to high altitudes. There are a wide range of clinical manifestations with risk of developing a potentially fatal altitude illness. The typical symptoms of AMS include headache, loss of appetite, disturbed sleep, nausea, weakness, and dizziness, beginning shortly after rapid ascent to high altitude but it’s not impossible after slow ascent. Symptoms can usually be relieved by rest, slow ascending and by delaying further ascent until symptoms have resolved; if symptoms are severe, they can be rapidly relieved by descent to a lower elevation. AMS may progress to high-altitude cerebral edema (HACE), and high-altitude pulmonary edema (HAPE) in most cases occurs in the absence of AMS. Both of these conditions are potentially fatal; if possible, initial management should include rapid descent, supplemental oxygen, and, in the case of HACE, dexamethasone. Nifedipine may be effective in the management of HAPE. A person suspected of either of these conditions should never descend alone.

Recommendation

No doubt slow ascent and allowing time for acclimatization are widely advocated and shown in practice to effectively prevent altitude illness. But if we assume
that slow and graded ascent is a guarantee for prevention of high altitude illness, it is an unforgivable sin! *We need a proper planning to climb mountains and its essential always be prepared to manage and treat high altitude illnesses.*

**References**


12. Hackett PH, Rennie D, Levine HD. (1976). The incidence, importance, and


Mountaineering and Trekking Tourism Management: A Global Perspective

Prof. Carl Cater, PhD¹ and Maggie C. Miller, PhD²

Abstract

This paper examines the commercialisation of mountains as places for tourism, and attendant impacts on host communities, the natural environments and tourists themselves. Responses to these are many, and these are examined through a framework that identifies various management strategies. Firstly, mountain awareness includes the provision of adequate training and guiding of mountaineering tourists. Secondly, attention needs to be paid to mountain livelihoods of the host communities to ensure that opportunities augment existing options available and impacts are minimised. Lastly, it is important that there is adequate mountain protection through effective management regimes. The paper includes worldwide examples of mountain tourism management, including Nepal, Azerbaijan, Indonesia, Tibet and Tanzania. The ‘seven summits’, or the highest peaks on each of the seven continents are identified with the protected area authority, number of ascents and the current permit costs.

Keywords: Awareness, livelihood, protection, recreation, hard and soft mountaineering

Introduction

The boundaries between mountaineering and tourism are increasingly blurring, contributing to the ways that mountain activities are understood and practiced. This paper critically examines these trends through a review of changes in the industry. We then present a framework that identifies various management strategies. Firstly, mountain awareness includes the provision of adequate training and guiding of mountaineering tourists. Secondly, attention needs to be paid to mountain livelihoods of the host communities to ensure that opportunities

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² Lecturer in Tourism, School of Management, Swansea University, UK
augment existing options available and impacts are minimised. Lastly, it is important that there is adequate *mountain protection* through effective management regimes.

**Literature review**

Past decades have seen a change in mountaineering from individual recreation to more commercialised opportunities, in parallel to an underlying trend of vastly increased numbers of people seeking to experience mountains. Pomfret (2006:113) has noted “previous studies on mountaineers have focused on mountaineering as a form of adventure recreation rather than adventure tourism”, with limited prior research on the tourism elements of mountaineering recreation. Indeed, it is impossible to separate mountaineering from mountain tourism more generally because the increasing commercialisation of the former has integrated it into the latter. Authors such as Varley (2006) have documented the existence of a spectrum of adventure pursuits called the Adventure Commodification Continuum, which is applicable to mountain environments and recreation. Herein, adventure activities are classified as soft tourism or hard tourism (Hill, 1995).

*Soft mountaineering* activities might include: undertaking less challenging mountain routes independently; taking part in activities led by experienced guides; or participating in a mountaineering course to develop technical skills and enable progression to greater goals. These usually entail low levels of risk, minimum commitment, and beginner level skills.

*Hard mountaineering* activities include rock climbing, mountaineering expeditions and strenuous treks (Millington et al., 2001), activities that have been dubbed SCARRA (Skilled Commercial Adventure Recreation in Remote Areas) by Buckley (2006), and are commonly motivated by, risk, challenge and exploration. While competent mountaineers may undertake such ‘hard’ activities unaided, for example in the UK mountains, logistical support and guiding is often required for higher peaks in the Greater Ranges (Huang and Talbot, 2015).

It is clear that mountaineering provides plenty of scope for participation at different levels and is growing in popularity. However, it is somewhat unhelpful to divide the ends of the spectrum as many new and existing mountain tourism practices rely on the same supporting infrastructure. For example, mountain tourists to the Himalayas all use the same airstrips, trekking routes and trail systems, teahouses and base camps, whether they are casual trekkers or committed mountaineers (Mu and Nepal, 2015). Whilst the former are partly inspired by the latter, they are all part of a commodification of mountain environments that began with the expeditions of the 20th century, and has intensified since the 1960s. Today, countries like Nepal have commodified over 150 peaks in the
Himalayas through a process of administrative control, requiring permit fees for individual ascents and trekking expeditions in more fragile environmental regions. These fees increase based on size, difficulty, and popularity of the mountain: the Nepali national treasury collects royalties as high as $70,000 US dollars per climber (Beedie & Hudson, 2003; Rogers & Aitchison, 1998).

Indeed many mountain areas are characterised by fragile economies, thus the adventure and sports associated with them have been quickly recognised as opportunities tied to potential economic gains for governments, local mountain communities, and private companies and outfitters (Buckley, 2006; Snowdon, Slee, & Farr, 2000). In turn, mountaineering can provide employment opportunities for communities through guiding and logistical support, retailing equipment, and hospitality. It can also result in development benefits, for example in the Solukhumbu of Nepal, which Hillary first passed through on his way to summit Everest in 1953, reporting high levels of poverty amongst the Sherpa and other indigenous inhabitants (cf. Rogers & Aitchison, 1998). Today, mountain tourism has not only brought many shops and lodges but also schools, sewerage, healthcare, electricity and street lighting to villages and settlements across the region.

Johnston and Edwards (1994) were perhaps the earliest commentators to foretell how the activity of mountaineering has become progressively commodified over the past decades; corporate sponsorship has shaped mountain experiences and even the fantasy of a mountain experience in order to sell commodities to a consuming culture. Many more well-equipped, stylishly dressed holiday consumers are travelling to mountain regions sent by an ever-growing legion of adventure travel companies who advertise their services in Adventure Travel’ magazines and guides. They arrive carrying clothing and equipment purchased at outdoor shops staffed by adventure enthusiasts; and they are guided through their mountain adventure by mountaineers turned tour guides (468).

Such commercialism has been propelled by both technological and organisational changes. Integral advancements, such as mechanised road networks and airline corporations, are what have brought tourism activity into the "Himalayas’ wake" (Singh, 1980: 199). Furthermore, Pomfret (2011:502) contends that "numerous factors have facilitated an increase in people doing mountaineering, including gear improvements, high-tech support systems, improved tourist infrastructure, easier accessibility and diminished risk levels". Whilst "mountains (still) represent escape locations that offer excitement, stimulation, and potential adventure" (Beedie and Hudson, 2003:625), these adventure spaces are increasingly seen as the source of business opportunities. Hereby, ecological and geographical attributes can be recognised as a destination’s ‘supply’ and contribute to the commodification and commercialisation of mountain spaces.
Bhattarai and colleagues (2005) understand this phenomenon as "geo-capital", in which tourism conducts trade through the selling of commodities – objects and activities that have been deduced to an exchange or use value – to a group of consumers.

With the rising commodification of mountains, the boundaries between mountaineering and tourism have begun to blur (Beedie and Hudson, 2003). A particular example of this has been the increased development of mountain trekking, often including the ascent of ‘trekking peaks’, which may involve the use of safety ropes and basic equipment, but does not require the more technical climbing skills that are often required by other mountain ascents. Trekking is normally a multi-day journey, undertaken on foot in areas where other means of transport are generally not available. Mowforth and Munt (2009: 216) explain that, "trekking is the visiting of off-the-beaten-track locations and involves walking, often but not always in organized parties accompanied by number of porters". Many treks take place in remote and rugged mountainous environments at high altitudes, for example in the Himalayas or Andes and can include high mountain passes and peaks. Pobocik and Butalla’s (1998) work found that the majority of those trekking for leisure in the Himalayas were from Europe and North America and were mostly older male trekkers trekking in groups. Motivation for trekking can be wide ranging. Participants trek for leisure and adventure, to experience local culture, view wildlife or to pilgrimage to sacred sites, yet a key part of the appeal is often the challenge of the activity itself. Mountain trekking has become more popular in Asian markets such as Taiwan, as detailed by Huang (2015). Mountain hikers in China have recently been dubbed ‘donkey friends’, because they walk along trails carrying provisions on their back. In Yunnan there are plans to develop historical Silk Road trails such as the Ancient Tea Horse Road as China’s first long distance trail. In Korea the 735km Baekdu-daegan long-distance hiking-trail is being established to cross the peninsula (Mason, 2009); this trail combines religious elements of temple visits with hiking activity and is being promoted as a sustainable form of mountain recreation.

Certainly, the popularity of mountain destinations have been significantly influenced by the widening range of outdoor and recreational pursuits available; however, mountains are still dangerous spaces in which risks must be recognised and managed. They are “wild rugged places that contain objective dangers, such as exposure to extreme elemental conditions and loose rock, which make mountain recreation activities inherently risky and hazardous” (Beedie and Hudson, 2003:627). Moreover, weather conditions undergo dramatic changes over relatively short periods of time in mountain regions (Pomfret, 2006). Thus many climbers, skiers and trekkers are injured whilst performing their recreational
pursuits in these environments every year, and as more and more people voyage there, the numbers are likely to only further increase. For instance, several hundred climbers now attempt to climb Mount Everest every year for example (Hales, 2007), and though it is not the most technically difficult mountain to climb, it is understood to be one of the most life threatening, known for extreme altitudes (>5500m), fatal avalanches, hurricane-force winds, and the notorious Khumbu Icefall (Apollo, 2017). Interestingly, despite greater technology and knowledge of this environment, “an analysis of the death rate on Mount Everest between 1980 and 2002 found it had not changed over the years, with about one death for every 10 successful ascents” (Sutherland, 2006: 452). Sutherland (2006) suggests that the environment itself is a major contributory factor. A significant number of deaths, and a major reason for admission to base camp medical facilities, are caused by high altitude cerebral oedema (HACE) and high altitude pulmonary oedema (HAPE) (commonly lumped together as altitude sickness), which is why these high altitude areas are often called the ‘death zone’.

Medical research shows that the incidence of acute mountain sickness (AMS) or HAPE is a likely occurrence (34%) when climbing over 5000 meters above sea-level; it accounted for 85% of all the medical diagnoses made by the Mount Everest Basecamp Medical Clinic between 2003 and 2012 (Némethy, Pressman, Freer, and McIntosh, 2015; Vardy, Vardy, & Judge, 2006). Altitude sickness can be fatal if not treated by descending to a lower altitude or increasing the amount of available oxygen (Schoene, 2008). In Apollo’s (2017) discussion around the psychophysical accessibility of mountaineering he argues that the threats of the sport are not only concerns for the high mountains, but also trekking activities. Trekking too engages unpredictable circumstances and rough trails, which are often located at relatively high altitudes (Burke and Walker, 2014). Ironically, two tourists died in 2010 whilst visiting the recently erupted Eyjafjallajökull volcano in Iceland, not from extreme heat, but from hypothermia caused by extreme cold (Heikkinen, 2011). In Tanzania, 77% of tourists climbing Kilimanjaro suffered from AMS during their trek, and in extreme cases this has led to 16 altitude related tourist deaths between 1996 and 2003 (Davies et al., 2009). Furthermore, there are eleven trekking deaths in Nepal per one million days of exposure, a statistic that is nearly five times greater than the total death rate on peaks in England and Wales, and two times greater than total deaths associated with climbing the Alps (Burtscher, Philadelphia, Nachbauer, & Likar, 1995; Mu & Nepal, 2015).

While mountaineering can be a low-impact activity, in areas such as the Khumbu which attracts large numbers of mountaineers on multi-day commercial expeditions, it can have a negative impact on the mountain environment, particularly littering and human waste. In recent years, action has been taken to
address these problems and the situation has somewhat improved. For example, there are organised clean-ups on major peaks retrieving rubbish from past expeditions; expeditions are now fined if they do not carry out their rubbish; and local environmental non-governmental organizations are campaigning for the installation of toilets at Everest base-camp. In recognition of the impacts that mountain-based tourism can have on mountain environments and communities there are global campaigns for improved management of mountain areas. One example is The International Climbing and Mountaineering Federation’s (UIAA) ‘Mountain Protection Award’. The award recognises best practice in mountain tourism in ways that offer long-term benefits to the global mountain tourism industry as well as to the local mountain people and their environment particularly in less-developed countries (Huang and Talbot, 2015).

The aforementioned risks and impacts to mountain tourists, mountain communities and mountain environments, require active management. Indeed, responses to these are many, however we use the remainder of this paper to examine some of the various mountain responses and management strategies. Firstly, we identify the importance of mountain awareness, including provision of guides for mountaineering tourists and adequate training for such guides; this includes building indigenous mountaineering skills in mountain areas. Secondly, attention should be paid to the livelihoods of the communities that host mountain tourism to ensure that opportunities augment existing options available, and negative impacts are minimised. Lastly, it is important that the natural ecology of mountain environments are protected through effective management regimes.

**Mountain awareness**

Guides are clearly very important in mountain areas, and can be central to the safe completion of the experience. According to the 2013 Adventure Travel and Trade Association (ATTA) market study, adventure travellers are more likely to use guides and instructors, than non-adventurers. Guides are understood to be responsible leaders, guardians, and trustees of clients’ safety (Beedie, 2003; Carnicelli-Filho, 2013). In her study of package mountaineering tourists, Pomfret (2011: 508) notes “Guides are an essential element of the package mountaineering holiday... they are renowned for their expertise in the mountains and have substantial knowledge and experience in mountaineering... Essentially, guides know how to cope in the mountains and how to look after their clients.”

Despite the obvious economic opportunity, increased guiding has not been without controversy. For example Everest has remained both the pinnacle of mountaineering experience and attendant commodification, with guided trips for wealthy, although not necessarily able clients, being the norm. On May 19th 2012 a record 234 people summited the mountain in one day, and images of huge
queues on the slopes circulated in the worlds media (BBC News, 2013). In 2013 there was controversy as two talented western climbers clashed with Sherpas laying ropes for the seasons paying clients. This high altitude mountaineering tourism industry has become dominated by handful of very successful high-end operators, such as IMG (International Mountain Guides), or Jagged Globe. The latter, originally set up in 1988, conducted the first UK commercial trip to Everest in 1993. The company has approximately 1000 clients a year and included adventure skiing in its portfolio, which is focused on exclusive mountain experiences. The delivery and marketing of the trips has emphasis on an expedition approach, and whilst staff are highly trained, clients are not ‘guided’ in a traditional package format.

However, one problem in guiding is the continued dominance of western guides over locally trained personnel. Many developing countries have a limited mountaineering skills base with which to support the rapid and continuous development of mountaineering tourism. Accordingly, Miller’s (2017: 250) field work from the Khumbu indicates, "contrary to what one might expect when considering the integral role of Sherpa and Nepali people as guides in the Himalayas, their career trajectories did not always include a great deal of formal training"1. In some cases international mountaineering tourists have begun to support skills development. One positive example of this is in Azerbaijan, where a small facility was set up by western individuals to teach climbing skills. Azerbaijan Mountain Adventures runs a small climbing wall in the town of Sheki, nestled at the base of the greater Caucasian range (Cater and Huang, 2015). This was in response to two independent trends, the first of which was an increasing interest from western tourists to explore the Caucasian peaks. The second was a recognition that Azerbaijan had a large number of IDP (internally displaced persons) following the conflict in the southern region of Nagorno Karabakh. This put pressure on many northern towns such as Sheki which had limited community and sports facilities to provide for these migrants. Thus a climbing centre was set up in 2011 to fulfil both the need for a community centre and to build climbing skills, and to provide guiding services to western clients. Arguably the former has been most successful to date, with the centre being used as a multifunctional space for community based meetings and other activities including table tennis and dancing and classes on debating, English and computing. Along with these positive community benefits, the centre has also nurtured home-grown climbing talent and supported the development of a National Climbing Federation. Specific female only climbing sessions have allowed women and girls to develop their climbing skills in a traditionally

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1 Editors note: Fortunately, since past couple of years Nepalese mountain guides now little over 60 have been taking the lead in all major expeditions. On top of that each year 10 more trained mountain guides enter in the market. So the dependent on western guides is quite less in this field.
patriarchal society, and allowed them to compete in national competitions.

Similarly, Nepal has begun to foster national and indigenous guiding talent with the opening of the Nepal Mountain Academy in 2002, and the Khumbu Climbing Centre in 2003. At present, there are 13831 trekking guides registered in Nepal in 2017 (NTA, 2017), and many younger Sherpa and Nepali mountaineers have indicated technical skills and mountain training from organisations like NMA and the KCC (Miller, 2017).

Founded by the Alex Lowe Charitable Foundation, the KCC’s mission is to increase the safety margin for Nepali climbers and high-altitude mountain workers. The KCC is understood as a vocational program for indigenous and local climbers, whereby students travel to Phortse for two weeks in the winter to develop technical climbing skills, mountain safety, rescue and first aid, as well as English language skills. Over the past fifteen years, the school has grown with its first official brick and mortar headquarters currently under construction and due to open in June 2019. Although in the beginning the KCC’s instructors were qualified Western climbers and guides who had experience in the Himalayas, the majority of the KCC’s instructors and teachers are now local Nepali (Alex Lowe Charitable Foundation, 2017).

Nevertheless, it is not just local skills that are important, but also the skills and aptitude of the tourists are imperative, particularly as the trend has been towards lower skilled individuals being commercially guided through mountain environments. As mountain pursuits are increasingly commercialized, risk, or at least the perception of risk, is marshalled by the presence of strong and capable guides and presumptions about the touristic nature of such mountaineering endeavours (Miller, 2017). One issue of particular importance in mountainous areas is avalanche awareness and preparation. Between 2012 and 2013, there were a number of fatal avalanche incidents in the Scottish mountains, including three individuals who were killed in a multiple burial incident. These individuals were part of a mountain skills training group from Glenmore Lodge, Scotland’s National Mountain Training Centre. A subsequent review and investigation led to the centre deciding to implement mandatory avalanche safety equipment and training for all students and staff engaged in their winter mountain courses. Personal avalanche safety equipment includes a transceiver, shovel and probe (or TSP), which can be used to quickly locate and dig out any avalanche victims. Use of avalanche safety equipment in mountaineering contexts has been the subject of debate, since it complicates the alpine approach to mountaineering prevalent in mountain culture (Varley, Taylor, and Johnston, 2012).

Mountain livelihoods

One of the principal concerns of management of mountaineering tourism is how
to ensure that the industry contributes sustainably to the livelihoods of mountain communities. It is clear that activities such as mountaineering and trekking do have the potential to bring benefits to local communities. For example in Nepal, in the past two decades, the numbers trekking and mountaineering grew from 42,308 in 1991 to 75,217 in 2017 (NTA, 2017). The impact of this is that the trekking industry of Nepal provides over 24,000 full time jobs, and approximately 70,000 people are employed as porters on a freelance basis (Mowforth and Munt, 2009), providing incomes in areas where there are limited alternative economic opportunities. However, trekking can also bring negative impacts as large numbers descend on fragile mountain environments, which normally sustain only small populations. Key impacts on the environment include littering, human waste disposal and excessive fuel wood consumption. Despite the benefits brought, lowland porters carry extreme loads and are often ill equipped to deal with extreme weather conditions at higher altitudes. In worst cases they may suffer frostbite and injury jeopardizing their ability to make a living from tourism in the future, which prompted action by Tourism Concern under the Trekking Wrongs: Porters’ Rights campaign.

This campaign was developed to improve working conditions for mountain porters in trekking destinations. In contrast to their well-heeled clients, porters often face lack of shelter, inadequate clothing and food, and low pay. Nepali porters, who are often poor farmers from lowland areas, and are unaccustomed to high altitudes and harsh mountain conditions, are four times more likely to suffer accidents and illnesses than Western trekkers, facing frostbite, altitude sickness and even death (Tourism Concern, 2011). There are many reports of porters being abandoned by tour groups when they fall ill or being abandoned in life-threatening blizzards, while trekkers who have the money to dispose, are quickly rescued by helicopter. In April 2014 twelve Nepalese guides were killed in an avalanche on Everest whilst preparing the route for commercial clients. Many porters and guides feel that the highly physical nature of the job and the menial task makes operators and tourists treat them as ‘beasts of burden’, with limited rights. Tourism Concern sought to address this issue by working with the trekking industry and tour operators to address porters’ rights and working conditions. This included developing a code of practice with minimum standards of working conditions that could be used as a basis for policies on porters’ rights. They also campaigned publicly on this issue to raise awareness amongst trekkers and mobilise their support for improved industry practice, and by 2009 forty-nine out of 79 UK operators had policies on porters.

Similarly, in Tanzania, the code of conduct has been used by the Kilimanjaro Porters Assistance Project (KPAP) to develop its own Guidelines for Proper Porter Treatment. In addition KPAP has provided proper mountain climbing gear
for 4,782 porters and has sponsored classes in first aid and HIV/AIDS awareness (Tourism Concern, 2011). In Peru there is now a US$8 a day minimum wage for porters and tighter control over agencies that fail to comply with the regulations. More recently, Tourism Concern (2017) has screened Australian documentary, Jenifer Peedom’s film “Sherpa: Tourble on Everest” to continue to advocate for ethical mountain tourism work practices. Tourism Concern (2017) proclaims, “...for real change, tourists need to demand higher standards and vote with their feet if they find that companies they are using are not implementing improved porter conditions” (para. 4). Indeed, these responsible behaviours may only transpire through increased education, and thus access to research outputs must be shared more broadly, as educational resources, to consumers and tourists, perhaps via social media platforms (e.g., Facebook, Vimeo, Youtube) and company webpages (Miller, 2017).

Tourism contributions to mountain livelihoods can be assessed using the Sustainable Livelihoods Framework. This framework enables us to “understand and analyze the complex livelihoods of rural people” (Lee, 2005:216), through assessing the context, livelihood resources, livelihood strategies and institutional processes inherent in a development situation (Scoones, 1998). The Sustainable Livelihoods Approach (SLA) has been particularly applied in sub-Saharan settings, particularly by the UK Department for International Development (DfID), especially those deemed to have a high degree of vulnerability, but can be equally applied to mountain communities. At the core of the framework are community resources or “the basic material and social, tangible and intangible assets that people have in their possession...such livelihood assets may be seen as the ‘capital’ base from which different productive streams are derived, from which livelihoods are constructe” (Scoones, 1998: 7). These were placed broadly into categories of natural, economic, human, and social assets, with later refinement in DfID models of physical and financial descriptors in place of economic capital. Although not specifically focused on tourism, the model has proved useful in evaluating baselines and changes to community assets caused by tourism development (Lee 2005; Tao and Wall, 2009), adding to other conceptual models of fractions of capital in tourism studies such as that by Hampton and Christensen (2007). However, there has been some further degree of refinement; for example in the context of coastal tourism, cultural capital was added to the SLA framework due to “the cultural resources (heritage, customs, traditions) [being] very much a feature of local livelihoods” (Cater and Cater, 2007: 114), as well as being seen as central to the tourism product. Further, Wang and Cater (2014) identified the importance of political capital in a mountain community in Taiwan seeking to use ecotourism as a recovery tool following a major earthquake.
The vulnerability of mountain communities in Western Nepal led to the establishment of the Annapurna Conservation Area Project (ACAP) to address environmental problems and promote sustainable community development in the Annapurna area of Nepal. Livelihood protection has been a foundation of their management approach over nearly three decades. The Annapurna Conservation Area (ACA) was established in 1986 in response to deforestation that was generally attributed to tourism development and was integrated within the ACAP, run by the non-governmental organisation, the King Mahendra Trust for Nature Conservation now re-named the National Trust for Nature Conservation (NTNC). Aiming to integrate sustainable development, emphasis is placed upon the participation of village peoples in development decision-making and capacity building to realise self-directed opportunities and eventual self-management of ACA. Partnerships between ACAP and village representatives have subsequently been established, for example with village development committees (VDCs), lodge management committees (LMCs) and women’s development committees (WDCs). Alongside sustainable tourism management, ACAPs activities include: forest and wildlife management; the promotion of alternative energy sources to relieve the pressure on the forests (for example solar power and backboilers); strategies to minimize littering (for example encouraging tourists to use refillable water-bottles and village clean-up campaigns); conservation education and training for trekking lodge operators (Visit Nepal, 2013). One of the most successful of the alternative energy sources has been the introduction of backboilers, which has increased energy efficiency and was subsidised 50% by ACAP. Instead of using a separate fireplace for heating water, this fuelwood-saving device feeds water pipes connected to a tank (frequently a disused oil drum) into the cooking hearth. The water, thus heated, returns through convection to this back boiler. This simple, appropriate technology fix means that during cooking, water can be simultaneously heated for showers and other purposes. Its introduction resulted in a 675kg reduction per month per lodge of fuelwood consumption during the tourist season. Mountain tourism has a specific economic role in contributing to the financing of these programmes such as these, raising monies from entry permits into ACA (see below) and through direct tourist expenditure in the area. The Annapurna Conservation Area (ACA) has been acknowledged from different sources (including winning the British Airways ‘Tourism for Tomorrow Award’ in 1991 and the World Wide Fund for Nature (WWF) Conservation Merit Award in 2000), as an exemplar of how tourism can be used for nature conservation and community development in mountain regions. The principles of the ACAP have been applied to other trekking destinations throughout the world, for example the Rinjani ecotrek program (Cater, 2012). Respecting local communities and being environmentally friendly benefits trekkers, local residents and the environment. This is a win-win situation for humans and ecosystems and makes trekking activity more sustainable in long term.
Mountain protection

A further mechanism to ensure the sustainability of increasing mountaineering tourism is to develop effective protection regimes through protected area management. Mountain areas are vital components to the ecosystem, often influencing more populated lowland areas in significant ways, for example in vital water and sediment transport. For example, 3700m Mount Rinjani, a popular mountain trekking destination on the Indonesian island of Lombok, provides approximately 70% of the island’s population (approximately 3 million people) with water for drinking and agriculture, especially rice cultivation. Therefore the vast majority of mountain regions popular for mountaineering tourism are located within protected areas. Ensuring protection may involve working with a wide range of stakeholders. In the UK, the British Mountaineering Council (BMC) works with stakeholders such as landowners and conservationists to address climbing related issues. For example, the BMC works with the Royal Society for the Protection of Birds (RSPB) to impose climbing bans during nesting periods on rock faces where rare birds breed. Management agencies and protected area authorities are often responsible for enforcing such management.

Table 1 lists the protected area authority, number of ascents and the permit costs for the ‘seven summits’, or the highest peaks on each of the seven continents. This has become an increasingly popular bucket list for dedicated mountaineers, echoing the enduring popularity of lesser heights (but perhaps equal feats) of the Munroes of Scotland or the 100 mountains of Taiwan described in the next case study. Over 350 people had completed the list of the seven summits by 2012. The allure of completing this list has led to the emergence specialist tourism operators catering specifically for achieving all of the peaks, often in a given timeframe. All of the peaks in the list bar Mt. Vinson in Antarctica are contained within a protected area. The latter is undeniably unusual as it is not located within a territorial entity. However, all tourism activities in Antarctica are governed by the International Association of Antarctic Tourism Operators (IAATO), who have noted the increase in adventure tourism (including mountaineering) on the continent in recent years. All of those peaks within protected areas fall into the IUCN category II of national park, except for the huge areas of Denali national park and Qomolangma National Nature Preserve (QNNP). Denali is listed as category VI which is a protected area with sustainable use of natural resources. Qomolangma National Nature Preserve is a vast area of the Tibetan plateau, which has a mosaic of various levels of protection. QNNP is distinctive because no warden force protects its natural and cultural resources. Management is instead enforced by local communities, especially the governments of the four counties that comprise the preserve (Tingri, Dinjie, Nyalam and Kyirong) with a Management Bureau in Shigatse, the prefecture headquarters. However this
leads to exploitation of the lax tourism management by operators who often recirculate permits with different groups of mountain tourists, as was our experience in 2007.

Table: Protected areas, fees and ascents of the seven summits

<table>
<thead>
<tr>
<th>Mountain</th>
<th>Height</th>
<th>Protected area, date established and size</th>
<th>IUCN category</th>
<th>High season Climbing Fee</th>
<th>2013 attempts (and successful summits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sagarmatha/ Mt Everest, Nepal/ Tibet</td>
<td>8848 metres</td>
<td>Sagarmatha National Park (1976) 1,148 km²</td>
<td>II</td>
<td>Fee $11,000 (reduced from $25,000 in 2014)</td>
<td>800 (658)</td>
</tr>
<tr>
<td>Aconcagua, Argentina</td>
<td>6980 metres 22,902 feet</td>
<td>Aconcagua Provincial Park (1983) 710 km².</td>
<td>II</td>
<td>$5500 ($6500 without a guide)</td>
<td>3500 (1000)</td>
</tr>
<tr>
<td>Denali Alaska, North America</td>
<td>6194 metres 20,320 feet</td>
<td>Denali National Park and Preserve (1917) 24,500 km²</td>
<td>VI</td>
<td>$365</td>
<td>1151 (783)</td>
</tr>
<tr>
<td>Kilimanjaro, Tanzania, Africa</td>
<td>5896 metres 19,340 feet</td>
<td>Mount Kilimanjaro National Park 753.5 km²</td>
<td>II</td>
<td>$70/day+huts Approx $525/trip</td>
<td>Approx 30,000</td>
</tr>
<tr>
<td>Elbrus, Russia</td>
<td>5642 metres 18,513 feet</td>
<td>Prielbrusie National Park (1986) 1014 km²</td>
<td>II</td>
<td>€25</td>
<td>N/A, but up to 100 climbers/day in peak season</td>
</tr>
<tr>
<td>Mt. Vinson, Antarctica</td>
<td>4897 metres 16,067 feet</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>640 total climbing activities in Antarctica in 2012/13</td>
</tr>
<tr>
<td>Carstensz Pyramid, West Papua, New Guinea</td>
<td>4884 metres 16,023 feet</td>
<td>Lorentz Nature Monument (1919) Lorentz National Park (1997) 25,056 km2</td>
<td>II</td>
<td>Multiple permits required from different levels of government, total expedition cost about $18500</td>
<td>Very low due to inaccessibility. Estimated &lt;500 total</td>
</tr>
</tbody>
</table>

Permits are the principal method for managing mountaineering access and are widely used, particularly in less developed countries to maximise revenue from their mountain resources. It is not known how much of this revenue goes towards mountain protection, although this is often used as a justification for charging mountaineering tourists. Nepal for example earns nearly $4 million annually from climbing permits, of which ¾ are permits to climb Sagarmatha/Everest (NTA, 2017). Interestingly Argentinian authorities charge more for a permit to climb Aconcagua should climbers be climbing without a locally certified guide. This is to disincentivise independent climbers due to the higher incidence of accidents and consequent costs of rescue for these climbers. As the easiest of the
peaks, Kilimanjaro permits are much lower, with many more tourists ascending the peak than the others. However, here permits are charged by the day, which some commentators believe has contributed to rushing the easiest of the seven summits, leading to an estimated 10 deaths a year on the mountain. Given the potential revenue, permitting is usually heavily policed, with Cartenz Pyramid being notorious for the difficulty of collecting a plethora of permits required to climb the mountain. In Tibet, Chinese authorities threaten a fine of $200 should tourists venture beyond the limits of the base camp for Everest on the North side.

**Mountain management or managing mountains?**

This paper illustrates the growing importance of mountain regions for tourism, while also emphasising that management of these environments and their recreational activities is ever important for their viability and sustainability. Management of mountainous regions can thus be understood in three forms; mountain awareness, in the form of guiding and training; mountain livelihoods, for recognising and supporting mountain communities; and mountain protection for managing these fragile environments. Although the latter often predates the two prior themes, experience has shown that protection and management cannot be successful without attention to the needs of both tourists and host communities. It is undeniable that mountains will only further cement their allure for tourism and recreation, as the commercialisation and access continues to accelerate. Indeed, one only needs to examine the ‘virtual’ popularity of mountains in adventure film making. Mountain film festivals are becoming increasingly popular with a wide audience, and one of the longest established, the Banff Mountain Film Festival, now embarks on an annual world tour with stops in around 285 communities and 30 countries. Despite such drivers, attitudes from mountaineering tourists will inevitably have to change, particularly in regard to the previous trend towards first ascents. In common with polar tourism, mountains are places that, once conquered, no longer meet the wilderness criteria of ‘treading where no human has done so before’ (Stonehouse and Crosbie, 1995). Of course this concept, which has dominated some sectors of mountaineering tourism to date, is a false and inherently unsustainable one promoted by Western attitudes towards these regions.

The greatest threat to mountain environments is, however, not the tourism that takes place within them, but our unsustainable practices below them. It is widely recognised that climate change will bring dramatic changes to high altitude regions, with retreating glaciers, reduced snow cover, and a host of attendant ecosystem changes. The International Year of the Mountains in 2002 was an initiative to increase international awareness of the global importance of mountain ecosystems, (UNSA, 2002). Indeed the IYM was partially a response to the Intergovernmental Panel on Climate Change study on the threat posed by global
warming to alpine glaciers. As ‘water towers’ of the world, mountains are essential to life on earth. Yet, globalization, urbanization and tourism (both mass and mountain-based) pose a threat to mountain communities and their natural resources that many rely upon in order to sustain livelihoods both there and in the lowlands (UNEP, 2012).

References


About the author

IAN WALL worked at Plas-y-Brenin the National Mountaineering Centre (UK) in the late 1960s and early 1970s, and admits that his friendship with John A. Jackson, a leading Himalayan climber of that period, shaped his future life. Ian has climbed extensively throughout the UK, the Alps and in Norway. He has led treks in Africa, Ladakh, Tibet and in Nepal where he now lives. Ian is an international advisor to the Kathmandu International Mountain Film Festival and CEO of the Kathmandu Environmental Education Project. With a background of mountaineering and education Ian has been involved in developing training opportunities and has delivered training courses for the Nepal Mountaineering Association, The Nepal Mountain Academy, Indian
Mountaineering Foundation Mountain Leader programs, the Trekking Agents Association of Nepal as well as many of Nepal’s trekking agents. He is also the Nepal correspondent for the Alpine Journal and contributes to several other travel magazines. In his spare time he’s out exploring his ‘back-yard’ of Nepal.

Introduction

From the earliest of times Nepal has always conjured up images of a romantic Himalayan destination. Little was known about the country or even the Himalayan mountains that form the back bone of the country and protect northern border. To the south the Ganges and the densely wooded Tarai region again provided an almost impenetrable southern border. The early migrants from both the northern and southern plains rotated into Nepal - to the east the people from the north arrived and to the west those from the south. As in most migration circumstances these people were looking for a better life and or escaping famine or religious or political persecution. By the 16th century other adventurous travellers were eyeing Nepal for other reasons, then came the Pundits, the British Residents, the scientific explorers (flora and fauna) the anthropologists and then eventually the adventurous ‘travellers’ and tourists.

The political turmoil in Tibet was part of the catalyst that persuaded the Nepal Monarchy to open the borders to the French in 1950 and the mountaineering industry developed. The Hippy Trail provided adventure tourism of a different sort in the 1960s and white-water rafting and trekking started to develop. With a change of the monarchy in 1972 Adventure Tourism was given another boost.

By the mid-1990s ‘Adventure Travel and Tourism’ was a fully commercial operation producing millions of dollars of foreign revenue for the Nepal Government. Things started to change when the political situation played a major role in the governance of Nepal. Since then adventure tourism has never been the same. Today there are many underlying and potentially disturbing issues having a negative impact on Nepal tourism, in some quarters trust has been lost in Nepal’s tourism industry by international operators.

At one time Nepal was the Premier Adventure Tourism Destination but now many other countries have followed Nepal’s lead and are rapidly developing their own adventure tourism destinations, all in competition with Nepal. While adventure tourist numbers are increasing Nepal seems reluctant to embrace new ideas, technologies and potentially lucrative opportunities are being missed, client expectations are not being fully understood or addressed.

The disastrous earthquake of 2015 provided an unwelcome break in the flow of tourists but at the same time it was an opportunity for the industry to address some concerns and future policies, but again the opportunities slipped by.
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For Nepal to keep its grasp on the Premier Adventure Tourist Destination crown and its potential for increased generation of foreign income it must revisit its tourism policies and bring them into line with client expectations and modern thinking.

In this article I have tried to write a short history of ‘foreign visitors’ coming to Nepal and their effect on Nepal’s tourism industry while concluding with some ideas as to how to meet certain client expectations in the mountain tourism industry.

**From the early dawn of adventure and exploration in the Himalaya to 1950**

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<tr>
<th>Image</th>
<th>Description</th>
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<td><img src="image.jpg" alt="Image" /></td>
<td>A historical photo representing the early dawn of adventure and exploration in the Himalayas.</td>
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The saying goes; 'beauty is in the eye of the beholder' and Nepal has 'beauty' in abundance but maybe now we should reconsider the definition of 'adventure' in the context of Nepal. 'Nepal has adventure in abundance but adventure is in the mind of the visitor' - I say this because the definition of *adventure*, according to the dictionary is *'the involvement, willingness or participation in things that involve uncertainty and possibly physical risk with unknown outcomes'*.

In todays adventure industry in Nepal the elements of *'uncertainty, possibly physical risk and unknown outcomes'* have to a greater extent been virtually eliminated in all but the mind of the activist.
The history of Nepal began in, and generally centred on the Kathmandu Valley. Over the last two centuries Nepal's boundaries have been extended to include huge tracts of neighbouring India which was at that time ruled by the British East India Company on behalf of the British Empire, and then contracted to little more than the Kathmandu Valley and a handful of nearby city-states. To the very few that had even heard of Nepal the territory was considered to be only that area of land known as the Kathmandu Valley, beyond that few had little idea of the country or its natural wealth and beauty. Though it has ancient roots, the modern state of Nepal emerged only in the 18th century.

Foreigners have been visiting the land we now call Nepal since ancient times. Some of the most famous visitors from a bye-gone era (between 1,500 and 2,000 years ago) included a Chinese monk called Huyen Shang (who wrote a description of the Kathmandu Valley), the Indian Emperor Ashoka (who erected a tower in Lumbini), and his daughter Charumati (who reputedly built Buddhist shrines in Kathmandu). However, there is no record of any Europeans arriving in Nepal until the first quarter of the 17th century. In 1628 AD, a Portuguese Jesuit called Father Juan Cabral arrived in Kathmandu. He was received by the then King Laxminarasing Malla, who awarded him an auspicious copper plate and allowed him to preach Christianity and so Juan Cabral and his team of Jesuits were most probably the first known and recorded Europeans to visit Nepal.

The British had a history of mountaineering and exploration in the European Alps and Norway and by the fact that they were the rulers of India under the British Empire they soon developed a keen interest in the Himalaya, but at that time not for mountaineering purposes but for the study of flora, fauna and culture. The first British citizen to arrive in Nepal was probably William Hunter Douglas Knox, a Resident
(emissary) of the British Empire. He arrived in Kathmandu in 1802 but then left a year later. He was followed by John Peter Bolleau and then Edward Gardener. Brian Houghton Hodgson became, up to then, the longest serving First Resident staying in Nepal over the period 1829 – 1843. Hodgson was a pioneer naturalist and ethnologist working in Nepal where he was a British Resident. He described numerous species of Himalayan birds and mammals and several birds were named after him by others such as Edward Blyth. Hodgson was a scholar of Newar Buddhism and wrote extensively on a range of topics relating to linguistics and religion. For these travellers a visit to Nepal certainly encompassed the adventure elements of uncertainty and possibly physical risk.

During this time Nepal was under-going a radical change and King Prithvi Narayan Shah was successful in bringing together diverse religious-ethnic groups under one nation. He was a true nationalist in his outlook and was in favour of adopting a closed-door policy with regard to the British. Not only his social and economic views guided the country's socio-economic course for a long time but his use of the imagery, 'a yam between two boulders' in Nepal's geopolitical context, formed the principal guideline of the country's foreign policy for future centuries. The combination of a closed borders and national turmoil made Nepal very much off limits for many explorers and travellers at that time.

However, 'adventure' in and 'exploration' of the unknown have always been a key driving force of humanity and on a September day in 1863, a Moslem named Abdul Hamid entered the Central Asian city of Yarkand. Disguised as a merchant, Hamid was actually an employee of the British Survey of India, and he carried concealed instruments to enable him to map the geography of the area. He was the advance guard of the elite pundit group of Indian trans-Himalayan explorers and adventurers recruited, trained, and directed by the officers of the Great Trigonometrical Survey of India who were to traverse much of Tibet and Central Asia during the next thirty years. Babu Sarat Chandra Das was an Indian of a different order from the other pundits of the Survey of India team; he was a highly-educated and sophisticated man, who has been accurately described as a "traveller, and explorer, a linguist, lexicographer, an ethnographer and an eminent Tibetologist". Das also played an important diplomatic role during the Macaulay mission of 1885-86. When, in 1901, Kipling immortalized the pundits in his famous work it *Kim*, the character of the secret agent Huree Chunder Mookerjee was most probably based on Das and *Kim* became a 'must read'
adventure story reaching far beyond the readers within its own generation. There was a natural desire on the part of the personnel of the British Survey of India to obtain as much credit as possible from the exploits of their trans-Himalayan adventures and exploration. Men such as Montgomerie, Trotter, and Walker naturally wanted to publicize their own adventurous achievements and those of the pundits, particularly through the meetings and publications of the Royal Geographical Society. These lectures and presentations all went to give southeast Asia and in particular Nepal a high public profile. Thirty years then elapsed between the first experimental pundit dispatches of 1863 when Montgomerie sent Abdul Hamid off to Yarkand, and the pundits’ last known exploration when Hari Ram and his son travelled in Nepal and Tibet in 1892-93.

These pundits were adventurers and explorers in the true sense of the definition and their expeditions had all the ingredients of true adventure and exploration literally having to find their way from one valley to the next and from one community to the next using stealth and survival skills to avoid detection and capture, yet mixing with the local people enough to be able to sustain themselves. There were no maps or guide books, no internet or telephone; they had to be self-reliant, independent and resourceful. Yet they had a mission to accomplish, to gain knowledge of the geography of Nepal, Tibet and Central Asia since adventure tourism was their 'occupation'. However, from the late 1890s to 1950 there was little to report in terms of foreign travellers in Nepal.

The first recorded Himalayan expedition was that of Scottish mountaineer, Alec Kellas along with Sherpa Sony and ‘Tuny’s’ brother succeeded on Pauhauri, stated as being the source of the Teesta River on the border of Tibet, China, Sikkim and India.

All pre-World War II Himalayan mountaineering expeditions had avoided entering Nepal due to the closed border situation and had travelled via Tibet or India, but in 1949, alarmed that the communist regime in China seemed to be gaining momentum, Tibet expelled all Chinese officials and closed its borders to foreigners. In October 1950 Tibet was occupied by the People’s Republic and its borders remained closed indefinitely.

For over one hundred years Nepal, ruled by the Rana Dynasty, had not allowed explorers or mountaineers into the country. However, by 1946 the possible communist-sponsored revolution in Tibet was considered even less welcome than Western influences in Nepal so the latter opened diplomatic discussions with the United States that privately hoped to be able to use Nepal as a Cold War launching point for missiles. Scientific expeditions became permitted but two requests in 1948 from Switzerland and Britain for purely mountaineering expeditions were refused. However, a year later mountaineers were allowed to
The British had a long history of attempting Everest all-be-it from the Tibetan side and in 1953 they successfully summated, subsequently Everest has become one of the most sought after destinations for 'adventurers' since its discovery as the highest mountain during the Great Trigonometrical Survey of India in 1856.

With the French success on Annapurna and the media hype associate with it, the first of its kind, a truly adventurous mountaineering expedition and the recognition of the romance that it entailed in a magical Himalayan Kingdom fired the imagination of many who saw themselves as potential adventurers in this Himalayan Kingdom.

Despite the fact that there have been foreign travellers in Nepal for many years from the early Jesuit Priests, the pundits, the early British Residents and naturalists their travel and exploration was by default 'an adventure', there was little or no information on travelling in Nepal. The first focal point for actual mountain generated tourism, a specific mountain attracting real traveller’s attention was in fact Kanchenjunga. The third-highest mountain in the world which was, at that time believed to be the highest mountain once Dhaulagiri had been rejected as such. The enormous mass of Kangchenjunga lies on the border of Nepal and Sikkim. Rising straight up out of the eastern plains of India and being in the east of Nepal it is the first of the mighty Himalayan peaks to catch the early sunrise and in certain conditions as the Sun hits the summit ridge the snow glows in a fine golden yellow light as if a golden thread was floating high in the dark sky. With Darjeeling developing as a British Hill Station in 1835 visitors were soon arriving with the sole intention of witnessing the wonders of this great giant. Even in the mid-nineteenth century it was quite possible to make a one week tour from Calcutta travelling by train from Siliguri and then by 'gharry' to Darjeeling. Many inspiring works across all artistic genres were produced about Kanchenjunga during the nineteenth century, poems, paintings, travel accounts and reports on the flora and fauna of the region. All these formed the initial foundations of mountain tourism in the Himalaya which was accessible to the masses, all-be-it the financially well-established masses.

In 1851 a small company was established in the UK by Thomas Cook who initially dealt with a domestic market but by 1855 he had organised his first tours

enter Nepal if they were accompanying scientific travellers.
to Europe and then in 1866 to the USA. Thomas Cook had acquired business premises on Fleet Street, London by 1865 and the office contained a shop which sold travel accessories, including guide books, luggage, telescopes and footwear. In 1866, Thomas Cook organised the first escorted tours of the United States for British travellers, picking up passengers from several departure points. They then introduced the first escorted round-the-world tour which departed from London in September 1872. It included a steamship crossing of the Atlantic, a stage coach across America, a paddle steamer to Japan, and an overland journey across China and India. The tour cost around £300 and lasted 222 days. By 1888, the company had established offices around the world, including three offices in Australia and one in Auckland, New Zealand, and in 1890, the company sold over 3.25 million tickets. A husband and wife might, for example, pay £85 for a Thomas Cook tour of Germany, Switzerland, and France over six weeks. While expensive enough the trip would likely be the only once in a lifetime adventure, the company would arrange for a variety of activities new to the middle class including museum visits, the opera, and mountain climbing. Access to romantic and adventurous parts of the world had suddenly become a lot easier and with the new ‘package’ deals the numbers of adventurous travellers and explores travelling the world looking for adventure rose dramatically.

**Introducing modern adventure tourism in Nepal 1950 – 1992**

Boris Lisanevich (1905-1985), was a Russian émigré to Nepal, he was a ballet dancer, an hotelier and a restaurateur, but above all he was an entrepreneur and the father of the mass adventure tourism industry in Nepal. He opened Nepal’s first hotel, the Hotel Royal in 1951, a converted Rana Palace, and later he created the Yak & Yeti Hotel and The Chimney Restaurant. At that time, 1951, visas were difficult to obtain for Nepal but in 1955 in an attempt to reform this process, Lisanevich convinced a group of 20 tourists from his ‘Club 300’ based in Kolkata (Calcutta), mostly women, to come to Nepal, he then proceeded to have an intense discussion with the newly crowned King Mahendra about granting them a 15-day visa. Boris convinced the king that people would like to visit Nepal and would actually pay for the experience, citing to the King that the country could make profit from these visits. Finally the king relented, the guests arrived and Boris held the country’s first handicraft exhibition. The Royal Hotel and the Yak and Yeti bar went on to become the meeting place for climbers from the 1950s right up to 1971 when the Royal Hotel was closed.

In 1950 the French got permission from the Nepal Government to undertake an expedition to Dhaulagiri, at one time thought to be the highest mountain in the world as the mighty south face viewed from the plains of India rose in one unbroken 7000m leap to the summit, or failing that, Annapurna which was considered at the time to be of lesser importance. This was the first expedition to
attempt an 8000m peak and the first permitted to undertake a mountaineering expedition in Nepal in over a century. After failing to climb Dhaulagiri I at 8,167m the team attempted Annapurna I, 8091m with Herzog and Louis Lachenal reaching the summit on 3rd June 1950. The expedition was a great achievement for French mountaineering and caught the public’s imagination with front-page coverage in a best-selling issue of the magazine the Paris Match. Herzog wrote the immensely popular book ‘Annapurna’ which was full of vivid descriptions of heroic endeavour and the anguish suffered on the expedition. The region had only previously been casually explored and the mountain heights had been determined by surveyors with precision using theodolite technology based far away in India as part of the Indian Survey. Other nations felt that they should have been given priority but Nepal had favoured France. The Maharajah of Nepal appointed G. B. Rana as the local liaison, translation and general organisation officer to accompany the expedition.

But it was not until the French gained permission from the Nepal Government for Annapurna in 1950 that the tide of Himalayan 'adventurous' mountaineering and exploration really started. Within four years 1953 – 1957 Everest, Cho Oyu, Chomo Lonzo, Makalu, Kanchenjunga, Ganseh I, Lhotse, Manaslu, and Machhapuchhare had all been climbed.

All these expeditions were undertaken in the true sense of the word 'adventurous' mountaineering tourism, there were no paths, hotels or lodges, no domestic flights, maps or other technologies and no other services that we now take for granted.

The 'adventure tourism industry' was born. After the initial rush of expeditions in the early 1950s people got to learn of the treasures and natural beauty of Nepal. Books were being written, lectures were given and Boris had opened the first hotel and restaurant for tourists and companies like Thomas Cook were facilitating more accessible travel arrangements. But there were still adventures to be had.
The Hippy Trail was conceived!

The hippy trail (also called the Overland Trail) was the name given to the overland journey taken by young adventurers from the hippy subculture from the mid-1950s to the late 1970s. These overland journeys occurred between Europe, the USA and South Asia travelling mainly through Iran, Afghanistan, Pakistan, India and Nepal. The hippie trail was a form of adventure tourism, and one of the key elements was travelling as cheaply as possible, mainly to facilitate and extend the length of time away from home for these tourists, there was little planning and the return 'tickets' were often the last thing on the hippies' mind. The term "hippie" became current in the mid-to-late 1960s and lead to the prosperity, in relative terms, of the old marijuana shops, lodging, rented rooms and cafe businesses of Jhocchen, (Freak Street) Kathmandu.

In every major stop along the hippie trail, there were hotels, restaurants and cafés for Westerners, who networked with each other as they travelled east and west. The hippies tended to interact more with the local population than the traditional middle or upper class sightseers of the day did. However, these adventure travellers didn’t spend all their time in a marijuana haze and at some point went seeking out other opportunities for adventure and the white water rafting sector was born as an alternative way of spending time outside of the valley but still involving a low-cost adventurous past-time.

The hippie trail largely ended in the late 1970s after the Iranian Revolution and the Soviet invasion of Afghanistan closed the route to Western travellers. But this chapter was another defining factor in establishing Adventure Tourism in Nepal.
One of the early travel guides to Nepal was the BIT Guide. This recounted the collective experiences of travellers and was then reproduced at a fairly low cost as little more than a duplicated stapled-together bundle of foolscap sheets with a pink cover providing information for travellers. It was updated by those on the road warning of pitfalls and places to see and stay. The 1971 edition of The Whole Earth Catalogue devoted several pages to the "Overland Guide to Nepal".

Many of these overland travellers arrived in Nepal and headed to Kathmandu initially staying in the Freak Street locality, but in 1968 a Sakya family opened a guest house - Kathmandu Guest House - offering 13 rooms for rent at a maximum rate of 5 US $ per night, the KGH herald another chapter of 'Adventure Tourism in Nepal'.

Up to this point the history of adventure tourism in Nepal was based on two factions, the mountaineering expeditions and well-heeled travellers who tended to stay in the old Rana Palaces with large gardens suitable for preparing and packing expedition equipment and logistics on the one hand while the hippies and overland travellers focused on the small private Newari houses where they could rent very cheap rooms in private quarters on the other. There was little mid-way accommodation available.

In the 1950s the Nepalese government allowed only one expedition to attempt Everest in any one season. But in 1965 Colonel Jimmy Roberts (1916–1997) recognised the potential of developing adventure tourism in Nepal and introduced the idea of 'trekking'. Jimmy Roberts was one of the greatest and most prolific mountaineer explorers of the twentieth century; a highly decorated British Army officer who went on to be acknowledged as "The Father of Trekking". His idea, innovative at that time, was to take the adventurous mountaineering experience and adapt it making it a bit easier and more assessable for those looking for adventure in the Himalaya. His ideas included providing tents to the hikers and having them readily available, paired together with the Sherpa, for guidance in the wild and remote terrain of the high Himalaya. The focus of his idea became a huge success and was embraced by many, which then gave direct access to the mountaineering field to a wide and varied sector of the travel market. To say the least, his
pioneering activities within this new field of mountain tourism became a great success and went onto become an absolute crowd-puller. Jimmy Roberts had spent years in Nepal attached to the British residency and accompanied Tilman on his first trek. In 1965, Roberts founded "Mountain Travel" in the Kali Gandaki area, the first of Nepal’s trekking companies and the embryo for the adventure travel industry of today.

While the 1950s saw the first ascents of the 8000m peaks the 1970s witnessed a new mountaineering dawn – true adventure was alive and kicking. Chris Bonington (now Sir Chris Bonington) established a new 'extreme' genre. His vision of climbing steep, committing and technically difficult Himalayan faces opened with his audacious ascent of the South Face of Annapurna in 1970, he followed this in 1975 with another mind-boggling expedition that put Doug Scott and Dougal Haston on the summit of Everest by a new route on the Southwest Face of Everest. Reinhold Messner raised the bar in another direction in 1980 with his truly solo and supplementary oxygen free ascent of Everest. At the time no one knew of the impact of attempting such challenging feats or even if they would come back alive and without brain damage. These truly adventurous and challenging expeditions that ended successfully created a lot of media attention, books were written and lectures given, all stimulated adventurous mountaineering exploits in the Nepal Himalaya.

With the death of King Mahendra in 1972 the newly crowned King Birendra took a more proactive role in developing Tourism with one of his main goals being to rid Nepal of its 'freak and drug heaven' image and to replace it with 'adventure tourism'. Within a very short period of time Nepal established its first Ministry of Tourism, its first National Park and Wildlife Preserve and its first Cultural Zone. Jimmy Roberts’ trekking initiative got a boost from the Nepal Government as it began to promote Nepal as an 'Adventure Tourism' destination. Up to this point tourism in Nepal had more or less developed accidentally. From 1973 all that changed.

With improved logistics and transport infrastructure the tourism focus was again shifting from the high-on-time-low-on-cost philosophy of the hippies to the high-on-cost-low-on-time philosophy of the middle-class adventure tourist market.

From 1973 through to the mid-late 1990s the adventure travel and tourism market of Nepal flourished. In 1973 Nepal received 68,047 tourists with an average stay of approximately two weeks (14 days) by 1999 this number had risen to 491,504 tourists but again the duration of their stay was approximately still only two weeks.

In 1988 Tek Chandra Pokharel and the Trans-Himalayan Tours organisation was handling the formal arrangements required to undertake any form of expedition
in Nepal. He did not operate as an agent but merely as a facilitator to the rapidly growing groups of tourists visiting the country and over the next 50 years he made major contributions to develop Nepal’s tourism sector and became an icon of the diversification of Nepal’s tourism industry.

In the early 1970s he was a Founding President of many tourism related associations of Nepal including Nepal Association of Tour and Travel Agents, Trekking Agents Association of Nepal and the Himalaya Rescue Association. Being well versed in tourism he was involved in Nepal’s Tourism Master Plan. With a view of attracting the high end of the adventure tourism market Pokharel paid particular attention to developing high mountain luxury tourism and was closely associated with the Everest View Hotel in Sayangboche, at one time known as the highest luxury hotel in the world!

It is obvious through analysing the data available to recognise that although more travellers and adventure tourist were visiting Nepal the length of stay was remaining static. If Nepal was to capitalise on tourism then there would need to be a bit of fine tuning of the ‘adventure experience’.

All the early 1950 - 1990 mountaineering expeditions were undertaken in the true sense of the words ‘adventurous mountaineering’, there were no paths, hotels or lodges, no domestic flights, maps or other technologies and services that we now take for granted weren’t even thought of. However, international travel agents were not allowed to directly operate in Nepal, they were not familiar with developing trekking holidays nor did they understand Nepalese administration. With a new-found enthusiasm for adventurous travel there now developed an opportunity for a new business operation in Nepal, the Nepalese Trekking Agent and in 1974 TAAN was established.

For the next 20 years or so adventure tourism steadily developed in Nepal and as the numbers of adventure tourists increased so did the tourist facilities with the honey pot areas, specifically Annapurna and Everest not only taking the lion’s share of business but also leading the way in developing tourist infrastructure. Annapurna received particular attention when ACAP was formed under King Birendra.

By the early 1990s two companies, Mountain Madness and Adventure Consultants, started as a result of
experienced mountaineers deciding to become guides to lead people to reach the top of Everest. This provided the founders of these companies with not only a good opportunity to earn money, but also the chance to help people who wanted to summit Everest and to make their dreams come true. The first commercial expedition to Everest in 1992 was a raging success with Hall, Ball and Cotter reaching the summit with six of the clients and four Sherpas.

Hall and Ball had proved their ability to pull together a successful expedition with attention to detail that was the envy of the other 'start up' guided expeditions that were beginning to stamp their mark at the same time. There were many firsts to the summit that day, first Israeli, first Belgian woman, first from Hong Kong.

Since the early 1990s there have been no limits on the numbers of expeditions attempting Everest each season. In place of the national teams of leading mountaineers that long dominated Himalayan climbing, commercial operators put together ad hoc groups of clients who now pay £25,000-£50,000 and in many cases more, each to ‘bag’ the world’s greatest trophy peak.

**How would the fathers of the Nepal tourism industry view the 'developments' of the present generation?**

Although today 'Adventure Tourism' contributes around 7.5% to the national GDP its potential is far from exhausted. The grass-root operators see the value of tourism as supporting their financial sustainability but in the vacuum created by a lack of direction from Government level they are taking things into their own hands. Development is taking place in the mountain regions that is not always conducive with the expectations of visitors and trekkers, buildings are being constructed that do not represent cultural traditions and design and new roads are becoming intrusive in the remote and so far untouched areas. The Khumbu and the valley areas of Everest are now the direct flight paths for a new breed of high-end tourist with many helicopter companies offering several fixed time departures a day creating a constants buzz of noise from these air borne tourist flights. In line with policies outlined
in the Constitution the Zonal Development has created a rift between local and national administration which again is causing a great deal of confusion for the trekker tourists and indeed local agents. As ever politics play a major role in Nepal with just about every citizen holding strong political views and while this is a major element in establishing ‘inclusion’ it can also be seen as a disruptor to sustainable development. Although there are systems in place which were established during the early days of adventure tourism in Nepal to manage positive development a lack of transparent monitoring by some of the major players of today has also allowed some dubious practice to enter into the industry and in many areas this is having a negative impact on Nepal reaching its tourism potential.

Adventure tourism is based on the premise of 'adventure', 'exploration' and 'travel' that may also hold a 'perceived or actual, risk' potentially requiring specialized skills, physical exertion and possibly experienced leadership to help develop the specialised skill base required to meet certain assessed risks that might jeopardise the outcome (not having the right technical skills to meet the challenge).

Adventure tourism has grown world-wide in recent decades, an estimated 65% from 2009 to 2012 – the most recent year for which data is available.

Tourists are seeking many different kinds of 'adventure' based experiences, but the measurement of market size and growth is hampered by the lack of a clear operational definition, especially here in Nepal.

In a country like Nepal there are so many unknowns but as a result of a modern time-constrained life-style and the imposition of so many restrictive regulations and permits, certain elements of ‘adventure’ have been removed from the travel packages offered in Nepal. Itineraries are planned to fit with flight schedules thus removing the element of the unknown time away from home experience and risk assessments are developed to avoid any element of possible danger and the failure of clients to meet their overall expectations of a trip to Nepal in the old-fashioned sense of the word ‘adventure’. Having said that every trekker, mountaineer or adventure tourist has his or her own threshold of what they perceive as adventure and comfort zones. According to the U. S. - based Adventure Travel Trade Association, adventure travel may be any tourist activity, including at least two of the following three components; physical activity, cultural exchange or interaction and engagement with nature. It is estimated that four out of ten international travellers incorporate some
adventure activities into their travel plans. With such rapid growth, greater numbers of businesses and guests are entering the marketplace, and the industry needs clear guidance with respect to adventure travel guide qualifications and performance.

It is interesting to note that the Mount Everest Foundation (UK) issued 26 financial grants for expeditions in 2017, however only six of those grants were for expeditions to Nepal the rest were for the Antarctic (1), Arctic (2), North America (1), South America (4), Pakistan (5), Nepal (6), Central Asia (3) and East Asia (1). Although Nepal had the single biggest number of MEF sponsored expeditions there was a lot of competition from expeditions going to other adventure tourism destinations around the world. Maybe if Nepal wants to retain the crown of the 'Premier Adventure Tourist Destination' then it needs to check out the competition!

**The adventure tourist guide**

Today the dynamics of the adventure tourism industry have radically changed from the perceptions and expectations of the bye-gone era. In those times a guide was a local community member with local knowledge of the paths, trails and valleys. Today all visitors without exception will have done some form of research before coming to Nepal and with so much information out there the work of the adventure guide is demanding and the expectations of clients are very high.

Nepal has excellently qualified guides in many different disciplines with internationally recognised qualification and many with Nepali qualifications who are working towards their international qualification. Nepal is the mother of trekking, an adventure tourism activity copied by just about every other adventure tourism destination in the word. It is quoted that in Nepal the trekking industry has a short fall off approximately 1000 trekking guides at the present time and that does not take into account future demand through initiatives like the 2020 Tourism Year yet it’s been nearly 60 years since Jimmy Roberts arranged the first trek in Nepal and Nepal has only just started running training courses that touch on Intermediate Level training, let alone Advanced Level training for trekking guides. (Need to be clarify again)

It would greatly enhance the adventure industry in Nepal if the Tourism Ministry
were to consider a policy to initiate a national training program for all Adventure Activities so that within, for example 5-years Nepal could boast that all Adventure Tourism Guides in all disciplines held a national qualification of intermediate level (a level and standard above the nationally recognised entry level training and licensing level that is now the legal requirement for trekking guides).

A guide with a good general knowledge of a variety of skill competencies (i.e. skill based, leadership, eco-issues, first aid, cultural, interpretive and mountain knowledge etc.) is essential to facilitate a group of guests through a variety of terrains, environments and locales in a safe, manageable and respectable manner. At present, visitors do not know of the standard or experience of the guides leading them, whether they are qualified and attached to an agency or experienced freelance guides or whether they are just students on vacation from college looking to make a bit of extra pocket money during their vacation.

For visitors adventure travel guides are at the crux of the adventure travel experience. They provide safety for trekkers, valuable and interesting information and stories about the landscapes, the culture and the way of life in the hill districts of Nepal and ensure the overall quality of the experience, and ultimately deliver and safeguard the adventure travel company and Nepal’s reputation. Still further, an excellent guide in one destination can raise the bar for the industry, while less competent administration in another can just as easily set the industry back decades. A trekking guide should be viewed by the visitor as being an added value to the Nepal experience; the guide should not be legally imposed on trekkers who wish to go solo. This legal requirement will only lead to tension and a further tarnish Nepal’s premier adventure destination title.

Despite the recognised value and importance of quality adventure tourism travel in Nepal the Tourism Ministry has so far not taken on the responsibility of raising quality standards and implementing a vigorous monitoring system. There is an international ISO for adventure tourism ISO 21101 and ISO/TR 21102, although this standard and quality assurance mark does not cover all the aspects necessary for excellent adventure
travel guiding it does provide a starting point, a model upon which further policies can be built.

In an effort to support the adventure travel industry as it continues to expand and professionalize, the Adventure Travel Trade Association (ATTA) has initiated an Adventure Travel Guide Qualification and Performance Standard. The standard was developed between the months of November 2014 and July 2015, by a group of 17 sector professionals organized by the ATTA. The working group participants came from 15 countries and included guides, business owners and industry partners. Nepal has only one company registered with ATTA.

Adventure Travel is an extremely diverse sector within Nepal’s tourism market. Diverse in terms of geography, with adventure travel businesses specialising in specific locations and diverse in terms of activities, with a constantly evolving list of new activities and products for adventure travel guides to introduce to guests. If Nepal wants to keep attracting repeat visitors then it needs to develop new 'adventure' activities, after all if you are stuck in Kathmandu due to poor weather and flight delays visitors can only visit the temples so many times before tourists become bored. This developing diversity has resulted in a multitude of approaches for incorporating standards into training schemes. Government involvement, through laws and regulations also impacts the enactment of standards. Despite this diversity, universal qualifications have emerged for Adventure Travel Guides (ATTA), regardless of the activity or destination, a nationally recognised or internationally recognised professional qualification is essential as an element of a hallmark quality standard that is internationally recognised and respected. The role of an adventure travel guide is generally deemed to encompass areas of due care and attention with the specific remit of meeting client expectations. Additionally, a guide is responsible for relationship management with both guests and local people, monitoring impacts on the environment, they must be able to communicate in the relevant local language(s) or through interpreters, and possess intercultural communication and interpersonal skills.

Guides must be trained with an emphasis on customer service. A core value of the Adventure Travel sector is sustainability, including environmental, economic and social sustainability. The way guides interact with local partners, and share local cultures and history is central to ensuring a positive impact that adventure
tourism can have on communities. Guides contribute to sustainability by operating in such a way that environmental and cultural impacts are minimized and sustainability practices are focused on meeting client expectations.

As a result of the political instability at the turn of the century tourist numbers began to decrease dipping to as low as 275,468 in 2002. This had serious financial implications not only for the benefit of greater Nepal but right across the tourism spectrum affecting not only the agents but also the trekking staff right down to the grass-root level. In a bid to attract business many Nepalese operators were looking at a variety of ways to gain an advantage over the competition. Many of the methods employed left clients confused as to what was a 'good deal' and as a result of the under-cutting process by some agents and the lack of understanding on the clients' part as to exactly what was involved in organising a trek many looked upon those agents charging as higher tariff as being out to 'cheat' clients of additional funds. In fact it was the reverse, those agents charging a lower tariff could be accused of under-paying their trek and expedition staff and of providing a lesser quality service to clients.

As the tourism industry developed the supply increased and there was an upsurge of 'Agents' in the developed world looking at engaging with potential clients with a certain amount of disposable income. They created itineraries and travel packages to meet their client needs and expectations and in turn looked to the Nepalese Agents with the skill and man-power to deliver them. At the same time the Nepalese Agents were developing their own products and looking to sell them to the foreign market. Both elements were considering client expectations with specific regard to fitting into the two week average time frame for a visit to Nepal. From the high-on-time-low-on-cost philosophy of the hippies to the high-on-cost-low-on-time philosophy of the middle-class adventure tourist itineraries had to be strictly managed and the risk of not meeting deadlines or goals was a critical issue resulting in - Arrive, have an adventure and Depart, on time. To this end the critical element of an adventure, that of an unknown
outcome had to be managed, there was no room, or at least very little for the unexpected, outcomes had to be guaranteed and achieved. In mountaineering terms this went right across the board from short low-altitude treks to Everest summit attempts. For some an adventure is simply the flight to Lukla while for others it is a multi-day expedition on a challenging steep and technically difficult 8000m mountain face with many different levels in between.

The large commercial operators are not only crucial to today’s Everest economy but also the economy of Nepal. These companies employ a large local workforce that play a critical role, preparing the route and supporting clients of variable technical skill and experience. They put up fixed ropes and prepare the way for their clients, most of whom would be unable to climb the mountain without such help. Almost all use bottled oxygen for the final stages, which means they require even more manpower to get them up the mountain. Unsurprisingly, the commercial guiding companies do not want anyone to interfere with the smooth progress of their operations, and nor do their Nepalese employees.

In general terms the costs for a major 8000m summit expedition would cost at least $30,000 but most people pay about $45,000 and some as high as $130,000! This all takes time to raise and at the end of the day some clients ‘demand’ a summit for those sums of money. Failure is not often an option. Similarly, sometimes within the trekking industry clients expect to complete their trek successfully and on time, weather, domestic flights and other potential delays often cause stress for all concerned, clients and Nepalese staff and in some cases death. These unknowns are all part of the adventure but for some clients they are just not acceptable, they want their 'soft' adventure in tightly packaged compartments.

Again in the context of adventure tourism in Nepal and in the Himalaya there is an inherent risk and clients need to accept personal responsibility and to take appropriate and due care.

However, for various reasons Nepal and several adventure associated organisations seem to want to take all 'adventure’ out of adventure tourism all in the name of 'safety', job creation or increasing income/profit margins. Mountain expeditions are one thing and I believe the majority of those wanting to climb Everest or any other of the 8000m peaks realise they could not do it without Nepalese help. But within the trekking arena many clients want to trek
independently and without a guide yet there are forces at work trying to make taking a guide a legal requirement. In many cases the clients have a far broader mountain experience than the guide does and by imposing such policies often creates conflict. Surely, it is not up to Nepal to take responsibility for the safety of all visitors, providing the trekkers are made aware of their role in their own safety then it is up to individual choice, a guide or not? In my opinion Nepal should develop a national and professional adventure guide work force that is not only respected but deemed to be essential by the visitor as one element that will enhance their stay in Nepal. Nepal should not be looking at ways to make, by law, it a legal requirement to travel with a guide. This, in some instances takes away the very last elements of ‘adventure’ and turns potential visitor away, often to focus their attention and finances on other destinations with less restrictive practices.

Although I have focused very much on the mountaineering and trekking forms of adventure tourism in this article there have been of course many other forms of adventure activities developing in Nepal over the last decade: mountain biking, trail running, paragliding, white water rafting, skiing and heli-skiing is now beginning to develop as a mountain sport.

However, the core principles of adventure tourism remain the key to a valued experience as perceived by the visitor and if Nepal wants to retain its crown as the Premier Adventure Destination then there should be a professional administration body, maybe under the Ministry, tasked with the remit of developing a robust adventure tourism plan that not only meets the expectations of the adventure tourist of today but is also transparent and able to monitor and maintain professional standards within the industry. Nepal needs to regain the confidence and trust from its foreign partners.

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Trekking in Nepal: Cross-cultural Behavior of the Hosts and Guests

Khadga Narayan Shrestha, PhD

Abstract

This paper discusses some of the trekking processes in Nepal. It has focused on the cross-cultural behavior of the guests, the hosts and the agents in various situations during the trekking in Nepal. The hosts, guests and the agents are culturally different and thus heterogeneity is ever present in their encounters. But their encounter in the trekking is not simply determined by their cultural differences; there is a heavy influence of power. The cross-cultural behavior of the guests, the hosts, and the agents are dependent upon the exercise of power and authority during the period of trekking in Nepal.

Keywords: Tourism, trekking, anthropology, power, acculturation, guests, hosts, agents, cross-culture

Introduction

This paper is about the interaction of tourists within tourists themselves and with Nepali staff in the process of trekking in Nepal. The paper analyzes the ways of interaction among tourists, trekking leaders, trekking guides and other staff during the period of trekking. The paper also highlights on trekking culture, cross-cultural behavior, communication, and miscommunication between the guests and the hosts during trekking in Nepal. This study excludes the individual trekker and backpacker tourists because the application of power can better be understood in interaction with group activities rather than in individual activities.

The article aims at locating the situation of the tourists and their interactions and interrelationship with fellow tourists in trekking. This interaction is not a simple encounter among the tourists but is based on the power relations of various levels which influence and determine the relationships and behavior pattern of the people involved in the trekking. It focuses on the tourists’ behavior and the ways of constructing knowledge about the people, place and objects.

Trekking is simply walking on the trails for four to eight hours in a day. Slow but

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gradual walk, taking photographs, having a meal in the allocated time, rest time and reaching to the destination is basic nature of trekking in Nepal. But these activities are guided and influenced by both trekking leader and trekking guide. The trekking leader and the trekking guide exercise their power on tourists in many cases and events and vice-versa. Hence, in group trekking freedom of individual and decisions are restricted in most of the cases.

When people talk about tourism in Nepal, they simply involve on the socio-economic interaction between the tourists and the locals. Even the academicians analyze both positive and negative impacts of tourism on local culture and communities. But tourism is not limited within these spheres of society and culture, and interaction is not limited within the guests and the hosts. There are guests to guests' interaction along with hosts to hosts' interaction in the tourism destinations.

The paper is theoretically framed by ‘anthropology of power’, fundamentally based on the Foucauldian approach of power and knowledge. Power is omnipresent in human society and tourism is not an exception. The exercise of power and authority by the trekking leader and the trekking guide determines the activities and behavior of other tourists in the group trekking. The trekking leader and the trekking guide not only apply their power onto other tourists but also help to construct the knowledge of tourists about people, places, and objects. Hence, knowledge of the tourists is constructed by their surroundings such as the trekking leader, the trekking guides, other staff, travel books and so on.

The general perception of people is that the tourists are rich and powerful and have a greater influence on others in the trekking. Dependency theorists argue about the unequal exchange of power and economy between the ‘First’ and the ‘Third World’ in which the ‘Third World’ is made dependent towards the ‘First’ (Lea, 1988). But I argue that the tourists of the ‘First World’ are made dependent on the leader and guide of the Third World, with heavy influence on their day to day activities during the period of group trekking in Nepal.

This is anthropological research on tourism in which I have applied ethnographic research method. Ethnographers usually use more than one method, given the advantage of multi-dimensional data (Mason, 2002) which includes participant observation, interviews and a diary of personal reflections.

A primary field study was conducted in Khumbu and Mustang from August 2013 and continued till October 2017. I have participated in trekking in both Khumbu and Mustang with European tourists. I have interacted with trekking leaders (both foreigners and Nepalese), trekking guides and trekking company owners who are major parts of trekking in Nepal for in-depth interviews to obtain the information.
Anthropology of power in tourism study

The guest-host relationship and their behavior can best be understood through the lens of power in tourism studies. Although power has various meanings and forms in the different fields of human life; it is the ability of a person or social unit to influence the conduct and decision-making of another through the control over energetic forms in the latter’s environment (Adams, 1977: 388). In the trekking, the conduct and decision of the guest, the host, and the agent are influenced by the exercise of power and authority. So, the behavior of the concerned segments should be analyzed in the frame of the power structure and power dynamics in tourism study.

Anthropologists are basically interested in micro-level power circulation rather than a total politics of a nation. However, historically, anthropologists were interested in the issues of acculturation between dominant and subordinate culture focusing on the changes in native, indigenous or subordinate culture (Lett and Nunez, 1989). The early writing in the anthropology of tourism was focused on the negative consequences of tourism on local culture such as ‘Culture by Pound; Tourism as cultural commoditization’ by Greenwood (1989) and ‘Tourism as a form of Imperialism’ by Nash (1989). At the same time anthropologist like Graburn (1989) was interested in exploring culturally defined meaning in the interaction between the guests and the hosts. It shows that anthropology uses multiple lenses to study tourism.

In tourism study, power approaches can be useful to examine the strong linkage between economic and political interests because “power inheres in social relationships and relations of power are aspects of social relationship” (Cohen, 1976:23). Of talking about the application of power theory to study in tourism, Hall (2010) has focused on the elements of culture such as production and reproduction along with the direct exercise of power by individuals and in the shaping of institutions. Hall further states:

This is regarded as being significant for the inter-relationships between tourism, culture, and power, because of the exercise of power is witnessed not just in the production and reproduction of elements of culture, but also in the very direct exercise of power by individuals and in the shaping of institutions and the rules of the game. (p.199)

In tourism study tourist is at the center of power whose visit keeps not only economic power but also social power in the Third World countries. The decision of the tourist determines others’ role and relations in the destination. However, the situation cannot be generalized in all time and place because the decision is based on the knowledge of the tourists i.e., how tourist is informed. The
knowledge and level of information depend on the agents such as guides, travel books and so on.

Nader (1977) states that “feeling of powerlessness is closely allied with a sense of injustice, with what people think they can do and what they do when they believe themselves to have been wronged” (p, 309). The concept of power is understood in relation to one’s awareness with regard to power. If one has an idea of power, one would have a sense of powerlessness. Foucault’s concept of power was minutely analyzed by Dirks, Eley, and Ortner, (1994). Foucault (1980) takes power as a cultural construct and tries to relate it with the knowledge. Foucault (as cited in Dirks, Eley and Ortner, 1994:4) states:

> All the relations of everyday life bear a certain stamp of power. People acting like men and women, parents and children, teachers, and students, doctors and patients, priests and penitents, can no longer be regarded simply as performing functionally defined roles, rather these terms define relations in which the parties, whether else they may do are constantly negotiating questions of power, authority and the control of definition of reality.

Here, I argue that the guests, the hosts, and the agents are inter-related to each other in their everyday life in the tourist destinations. These people and institutions also bear a certain stamp of power as stated by Foucault. The concerned segments in the trekking are not simply performing their functionally defined roles but they are negotiating the questions of power, authority and the control of definition of reality.

Cheong and Miller (2000) highlighted the power approaches of Foucault and its’ application on tourism. They stated that “Foucauldian power elucidates a multiplicity of power relationships involving targets and agents in every social situation. Each case entails a specific mixture of productive and repressive strategies and techniques exercised by the agents over targets” (p. 378).

Here, the tourist is the ‘target’ and the agents refer to the public/private sector brokers, locals, academics, market researchers, travel writers and so on. Again Cheong and Miller (2000) describe four features of Foucauldian power which can be applied in tourism a. the omnipresence of power in tourism, b. power in tourism networks, c. the touristic gaze, and d. repressive and productive touristic power. Bourdieu (1994) argues that power is reproduced through the relations of individuals in society. Basically the systems of classification, for example, the divisions by age, sex, or position in the relations of production that make their specific contribution to the reproduction of the power relations. The behavior of the host-guest and the agents are also determined by their social position such as age, sex and so on as stated by Bourdieu in the trekking in Nepal. As Bourdieu
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(1994) states “economic power lies not in wealth but in the relationship between wealth and a field of economic relation. Just as economic wealth cannot function as the capital until it is linked to an economic apparatus” (p.179).

Fanon (1968) describes the strong and dominating power of guest. Fanon stated that the hosts and the guests treat them with each other not only as strangers but also as objects. Fanon also discusses the issue of power disparities and discrimination lead by the prejudice of the guests and hosts. Similarly, Orlove’s (1977) study has focused on the decline of local elites and changing the structure of power in Canchis, Peru and raises the questions of power. The prevalent literature would provide a clear idea of analyzing power relations and dynamics between the guests and hosts in the trekking of Nepal.

In regard to power conceptualization and its application, Hall (2010: 202) raised some key questions with respect to power structure research, they are; 1. What organization, group or class in the social structure under study receives the most of what people seek and value (who benefits?) 2. What organization, group or class is over-represented in key decision-making position (who sits?) 3. What organization, group or class wins in the decisional arena (who wins?) and 4. Who is thought to be powerful by knowledgeable observers and peers (who has a reputation for power?) These research questions may be significant for studying tourism in the particular community to analyze the pattern of rights on the resources like land, water, and its distribution.

Similarly, Ortner (1999) raises many serious questions about studying cultural encounters. She has focused on the asymmetries of power relations in tourism of Khumbu. She has analyzed the power relations between the dominant and the dominated, i.e. the Sahib and the Sherpa. For studying cultural encounters between guests and hosts, she further states:

It is essential to situate both sahibs and Sherpa’s within the specific contexts from which they come. The context of sahibs and Sherpa’s are totally different. Sahibs are largely from educated upper middle classes, and that Sherpa’s come mostly from less privileged positions within their own society. Their encounter is not only a simple encounter between two culturally different groups; each group, in turn, is the embodiment of other forms of difference, differences that they bring with them and that shaped the enactment of difference between them. (p. 22)

Unlike her findings between Sahib and Sherpa I argue about the dominance of host and agents on guests during the trekking in Nepal.

The application of power in studying tourism is important for exploring and analyzing the social and cultural relations among people and power structure of
the society which is determined by the resources gained through the tourism activities. But the application of power in tourism study may explore only about power relations, power structure and power dynamics in the tourists’ destination and unable to address the issues of cultural commoditization, authenticity and other forms of peoples’ in day to day activities.

**Tourism culture and tourist behavior**

Trekking in Nepal and elsewhere in the world includes the guests, the hosts, and the agents. The guests incorporate all types of tourists who visit the destinations. The hosts are local people engaged to provide various services to the tourists in the destinations. The agents are neither guests nor hosts. They are like middlemen. The trekking leaders, guides, porters and other supportive staff come under this category. The agents are employees whose duty is to serve the tourists and make trekking successful.

These three different parties, directly involved, have greater roles and responsibilities in trekking. The guests, the hosts, and the agents are culturally different and so are their roles and status. The tourists’ behavior is influenced by their own national culture i.e. tourist culture. The tourist culture represents to their country and national character that the tourists exhibit during their visits. The host culture is the culture of the host country. It is reflected through local people and service providers with which tourists come to encounter during their visit. The agents may be included under the host culture but they play dual roles of both hosts and guests.

The concerned parties develop a tourism culture during trekking. Jafari (as cited in Reisinger, 2009) states tourism culture as “the outcome of the behavior of all participants involved in the tourism process, that is, the behavior of tourists and those who offer tourism and hospitality products and services” (p. 104). In this section of the paper, I will analyze the various encounters among the guests, the hosts and the agents who create a trekking culture during their visits.

**Trekking, tourists, and trekking companies**

Trekking begins when the trekking company and the tourists interact with each other. Some trekking companies would have international trekking organizations in contact that connect the tourists in local Nepali trekking companies, and sometimes the individual contact between the company and the tourists also make the tour get fixed in Nepal. The company proposes the package of trekking including their food and accommodation. In agreement on payment of the package from both sides, the trekking is determined. When both sides agree upon the payment on the package, the trekking starts at the fixed date.

The company does carry the necessary preparation for the trekking before the
arrivals of the guests. The preparation includes the management of food and accommodation in Kathmandu and in the trekking trails. The company should also manage domestic flights, bus, trekking leader or guide, staff, porters and so on. There are some administrative processes such as taking trekking permission from the government of Nepal.

The trekking company receives the guests at Tribhuvan International Airport (TIA) in Kathmandu and takes them to the already booked hotel. On the other hand, the company manages all the necessary equipment including food and other logistics. These things are based upon the nature of their trekking and the number of guests visiting in the trekking. In regards to preparation for the trekking Mr. Chhetri, a director of trekking company in Kathmandu, tells:

The staff, equipment, food and logistics depend upon the nature of trekking. If the trekking is based on ‘tea house’ (generally called tea house trekking where tourists stay at the hotel for the night for food and other logistics) we require few staff and food but in the camping trekking (tourists stay at the camp at night and food, drinks and other have to be managed by the trekking staff in the tent) we need to carry many things so that we require more manpower and other essentials (personal communication with Mr. Chhetri in October 2017).

The amount that the tourists pay also differs on the basis of the nature of their trekking and the services provided to them in the trekking. It seems that the interaction between the tourists and companies are economic in nature - just service provider and receiver, but such an interaction determines the structure of trekking, decision-making process, the exercise of power and authority among various segments in the trekking because of the economic exchange between these two segments further determine the other aspects of trekking such as nature of food and other facilities.

**Cross-cultural interaction between the tourists and supportive staff**

“Ye bhai Aja khaire lai k Khuwaune ho?” "Hello brother, what food do we serve to tourists today?" Mr. Shrestha, a guide, asked to his staff. A lady hotel owner speaks; *(dai dherai item nadinuhos hai, menu ma bhako sabai paidaina bhannu hos)*" Brother do not offer multiple items to tourists. Tell them that some of the items that are enlisted in the menu may not be available". This conversation among guide, staff, and hotel owners were frequently heard in the Everest and Mustang treks. This conversation is one of the examples of power application in the trekking in Nepal. In the group trekking selection of food items depend upon not only on the tourists’ choices but also in the guides, staff and hotel owners. Food options depend upon the budget of the trek. But, the story does not go like this. I observed that European tourists were very fond of tea and coffee. A tourist
could have more than two glasses of tea in one sitting. The more glasses of tea that the tourists drink, the more money should the guide pay. If the tourists choose the expensive menu (food or drinks), the result is reflected in the guide's face because the guides always try to save some extra amount beside his/her salary. This is why there is politics in the food and drinks in the trekking.

But this cannot be generalized in all the cases. The tourists get least options or sometimes no option in lunch because it would take much time to cook multiple food items for (a larger group) many people. During my both Everest and Mustang trekking, I observed the tourists had noodle soup at lunch every day. It is not because of saving politics but because of the time-saving. To reach the fixed destination the group cannot spend more than an hour at the lunch. Whatever the reason may be, the tourists may not decide themselves about the food items in the trekking.

When the tourists reach at the hotel for night stay, the guides distribute the rooms to the tourists. In the trekking trails, the hotels and rooms vary from place to place. The rooms are not similar in the same hotel too. This is why the guides cannot afford the same types of room for all the guests. It is the guides’ decision to provide a particular room to particular tourists and the guests would accept it. The tourists do not choose a particular room. In Namche Bazaar, a female tourist of 57 years of age took permission for sharing the room with a male tourist. “May we sleep together tonight?” She asked. I was surprised to hear this but the guide said, “Ok ok, no problem.” The exercise of power and authority of the guide is not restricted into the bedrooms too.

The tourists take permission from the guide about food or drinks they want. But if the tourists should pay themselves they will not ask their guide. When we were walking nearby Namche, a tourist asked the guide. “Mr. K., may I have an apple?” The apples were kept on the way to be sold to the tourists. Whether to take permission or not in regard to food or any other things it depends upon the mode of payment i.e. who pays? The tourists do not always follow Nepali guides and staff if they pay personally.

The tourists resist to guides and staff if they do not like their activities. On the way to Lomangthan of Mustang, a male tourist complained against our conversation. Our guide and I were walking at the end of the tourists’ row with frequent conversation with each other in the Nepali language. The male tourist was getting trouble in walking and told, “Two people at the distance of two meters speak frequently in the language that I do not understand. Do you think about me, how boring is it for me? Please, go ahead and talk”. He compelled us to shut our mouth up. The guide turned red to his ears. The guide might have felt guilt and shame but I was shocked. Mr. Chhetri, a trekking guide from lower
Solukhumbu also has a similar experience. He tells:

Once I was in Annapurna trekking as a guide. I wanted to take better care of my guests always and follow them while walking, eating, buying and so on. One day in the trekking, a female tourist shouted, ‘What do you mean? Why always you follow me?’ Her anger did not become calm until we arrived at Kathmandu and complained to the company against me (personal communication with Mr. Chhetri; June 2014).

The tourists are not passive recipients and the application of power is not always asymmetric. Complaining, criticizing, giving little ‘tips’ and satire are the processes of their resistance but as they do not have much of an upper hand in the trekking, they would have no more options, rather than to follow their guides.

**Trekking culture and exercise of power**

The role of a leader is prominent and decisive in the trekking. A leader is a powerful person who decides almost everything during the period of trekking. The leader is very much responsible for other guests. The success and failure of any trekking mostly depends upon the leaders’ leadership. Leader ‘leads’ the group every day in trekking. He/she always walks at the front but is supported by one trekking staff called ‘Sherpa’ (assistant guide may not necessary to be an ethnic one like the Sherpa). The trekking company decides a Nepali or a foreigner lead the trek. The leader is not actually a tourist but an agent, doing his/her duty as a profession.

The leader decides the trekking routes should occur any problem on the way. Sometimes the condition of weather and the health of the tourists compel to change the trekking route. But, to change or not to depends upon the leader. The leader consults with the tourists but this consultation does not make a difference in his/her decision. During Khumbu trekking, our destination was to go to Kalapaththar crossing two different passes, Renzola and Chola. We passed the Renzo-la (a pass at the height of 5200m) and reached Gokyo Lake in the evening. We had a plan to pass Chola (a pass at the height of 5400m), rather harder way to Renzo-la pass. The weather was not so bad but all the places were snow covered. The leader with the consultation of the guide decided to change the route. Instead of going uphill to Chola, we stepped downhill from Gokyo. Some tourists agreed and others argued but the leader did not change his decision. It is not compulsory that the leader should agree on what the tourists say but the tourists must follow the decisions made by the leader.

In Mustang trekking, some of the tourists proposed to change the route from Muktinath to Jomsom. Instead of going directly Jomsom from Muktinath they had proposed to visit one village but the leader rejected it. This is how a leader
exercises his power on the tourists.

There is another case of power exercise of the leader on the tourists in regards to route selection. In Lomangthan, the leader with the consultation of the guide made a plan to visit ‘Korala’, the border with Tibet which was not in our package. The border ‘Korala’ is 25 kilometers far from the Lomangthan and it required 50 Euro for each tourist to visit the border. The next case of the visit was that we took a bus from Muktinath to Jomsom that was not in our package. The tourists paid an additional amount for both border and Jomsom trips. These events justify how the leader exercises power on the tourists and how tourism culture is formulated in the trekking.

Food is a basic means of survival for any living beings. The choice of food differs culturally and individually. An individual is free to choose the food he/she likes. It is very general and common for people. But, in trekking food is somehow controlled by the leader and the guide. The tourists get a few food options. The guide with the consultation of the hotel owner prepares the available menu for dinner. After that, the leader and the guide consult with each other. Then, the leader asks the tourists to choose one among the three dishes that they have already listed. For example, the tourists are told to choose a type of soup among tomato, potato or garlic. The leader announces the particular dish and orders to raise hands to the tourists for counting. In every evening the leader decides about the dishes of breakfast for the next morning. This process would continue until the trekking comes to an end. But, this rule is not applicable to those tourists who want to pay themselves that is added to his/her contract.

The tourist told the guide that he would eat local food like other staff in the trekking. The guide consulted with the leader but the leader rejected. The leader tells:

If all guests propose to eat rice and curry (daal and bhat) every day, it takes much time to prepare. We could not reach at the destination in time spending much time on food. So, the individual choices of food are almost not possible (personal communication with Mr. G. a trekking leader, October 2017).

Of course, the tourists have given some options for choosing foods but these options do not include the tourists’ choices. The tourists are compelled to choose among the dishes that the leader prepares. Sometimes the leader imposes his/her decision on minor events such as the selection of place for lunch or dinner. There are multiple dining halls in hotels in both Khumbu and Mustang. The management of multiple dining halls symbolizes their good business because multiple dining halls help to keep the tourists for a longer time. Longer the tourists stay at the dining, the more amount the tourists tend to spend. The leader selects a particular
dining hall for their lunch or dinner. In Charang of Mustang, some tourists wanted to have their lunch at an open place at the Sunshine but the leader rejected of doing it. Lower emanates in various ways.

The events are examples of the omnipresence of power in trekking. The application of power is not limited to these stories. The leader not only decides about the resting time while walking but also about the time for lunch. “You finish your lunch within 40 minutes; after 5 minutes we leave the place,” I heard this direction every day in the trekking. I also observed the leader’s decision for visiting the cultural sites and events in the trekking. There are many monasteries on the trekking trails in both Mustang and Khumbu. Visits in cultural sites promote cultural tourism in Nepal. Each monastery has its own story relating to different sects of Buddhism. There was a Lama to describe it. The tourists generally offer some amount to every monastery they visit. But there is a fixed amount to pay for observing such cultural sites. For example, in Chhosar of Mustang tourists pay Rs. one thousand each to enter and observe the monasteries. It is the leader who decides about the monasteries to visit. I heard several times that the leader was telling his guide not to take the tourists in Gumba.

But, the leader’s duty is not only to impose his/her decisions every time but also to look after the tourists. The leader slows down his/her steps if any tourist cannot follow. I observed that the leader carried a bag of a tourist when the tourist could not walk. It is a reciprocity of power.

**Tourists’ behavior with fellow tourists**

Before my Khumbu trekking I thought that the tourists who come to trek in a group are either their own kids or friends who know each other. I also thought that they were from the same village or city. But, it was not just the same. Some tourists belong to the same family and city and others are unknown among themselves. They also get interacted when they come to Nepal. Although they travel together in a group, they are not equal in their status. They are diverse in terms of occupation, age, sex, and education. But the diversity makes no difference in trekking for the leader, the guide, and the staff of hotel owners and so on. The level of education or occupation does not create any hierarchy during the period of trekking.

But, extra expenses, the tourist makes in trekking keeps the importance of their economic well-being. The tourists stay in a group, have lunch together, talk, play, and enjoy together but pay separately. This is the fundamental difference that I observed between Nepali domestic tourists and foreign tourists to Nepal. Nepali tourist either sponsors for the lunch, breakfast, dinner, buy some drinks to fellow tourists or they collect money prior to their visit, pay together and calculate the amount later on. But sharing some foods such as chocolates on the way is
common.

The tourists were not busy in talking on the way. They did not make their family matters as the subject of the day. They all have at least interacted with each other. Their interaction is mostly limited to their own relatives and friends. But, making fun to each other, satire and joking on the way and especially in the evening at the dining hall is common ways of their interactions.

The trekking process runs by the amount the tourists pay but the tourists are the less powerful people in the trekking. They are at the bottom of the power structure. Their decisions are least applied in the trekking.

**Tourists and knowledge construction**

In trekking, the tourists can have any queries about the people and place they encounter. They ask many questions to guide and staff about the flora and fauna they see on the way. The most frequently asked questions in both Khumbu and Mustang trekking were about the names of peaks and mountains. It is really hard to recognize each peak and tell names to tourists because the structures of the mountains seem different from place to place. I recognized Mt. Everest from Everest viewpoint at Syangboche but failed to know from other places and so as the case about Mt. Nilgiri and Mt. Dhaulagiri from Mustang. I also asked the guide every day about them. The ordinary guides and staff cannot truly orient about them. The frequent visits to the places and knowledge to read the map make the recognition possible. But it is not sure that every trekking company can manage a perfect guide to them. I observed the guides and the staff discussion for the recognition of the mountains to answer their guests. A hotel owner Sherpa in Machhermu tells:

> Sometimes guide comes earlier than a tourist and ask me about the name of the mountains. When I answer then he becomes ready to brief the tourists. In many cases, the guide gives wrong information to tourists. The trekking company and government should think about it (Personal communication with Mr. Sherpa, October 2013).

It is compulsory for guides and staffs to know about the place and the route to trek. Sometimes, the guide and staffs do not have knowledge about the route. They ask local people if they meet. But, at the high altitude where there is no human settlement they cannot get information and get many problems at night. Mr. Shrestha, a trekking guide shares his experience:

> I was unknown about the route of Dolpo trek. I informed the company about it. But the company enforced me to go because it was the main tourists’ season and there was no extra guide in the company. One day I missed the route. I was afraid and walk fast of fearing if the tourists ask me
anything about the route. When tourists met me, he scolded a lot, and then I spoke the reality (personal communication with Mr. Shrestha, November 2017).

A similar experience was shared by another guide about Dolpo trekking. He told me that, “because of the lack of knowledge on the route we traveled up to 7 o’clock in the evening. It was dark. I arranged to sleep in tents. But we found a hotel near our tent the next morning.”

The success and failure of the trekking depend on the knowledge of the leader, guides and trekking staffs. And the interactions of the guides and leaders with the tourists depend upon their knowledge about the trekking routes, people and culture of that area. It is uncertain that the tourists are well informed. The knowledge of tourists is constructed by these people. Language as a means of communication is another factor for the knowledge variation. It is not sure that all tourists understand English and guides may not communicate in tourists’ language. In Marpha village of Mustang, a tourist asked the name of a crop to an assistant guide. He told that ‘I do not know in English but it is called Fapar (buckwheat) in the Nepali language’. The tourist just nods his head. I was not sure if he understood it.

Sometimes the foreign leader also gives wrong information to the tourists. A Sherpa guide in the Mustang trekking told us that “I saw a female leader showing Mt. Manaslu from Syangboche of Mustang”. I told her, we cannot see Mt. Manaslu from here. She got angry and told the tourists not to believe me. “Can we see Mt. Manaslu from here?” he asked his fellow guide but all agreed on her.

The tourists also ask many questions about the culture and religion of the people they encounter on the way. In both Khumbu and Mustang trekking, the tourists asked many questions about Buddhism. The structure of the statues of Lord Buddha is different in different monasteries in both Khumbu and Mustang. The tourists have queries to know about it. The structure of monastery at Khumbu is different from the monasteries of Mustang. The simple observation and little knowledge in regard to Buddhism cannot define the real meaning. At such a moment, the guide and staff interpret the meanings and symbols by their own limited ideas which may not represent the actual symbols and meanings. In Mustang, there is a Gumba in a cave called Cave Gumba. The statue of Buddha and Rimboche were well decorated. There were many Khada around it. On the ceiling of the cave, things were hanging everywhere. A tourist asked me what the things. I was unknown and the same question forwarded to the staff but he failed to answer. Later, the guide told that it was nothing, only paper patching for decoration. The paper was dark because of the smoke coming from laps, which were offered to the statues. The immediate answer of the staff and guides help to
construct knowledge of the tourists which may not be reliable and true. In Muktinath, there was a big statue of Buddha with a finger touching towards the earth. That was not common to other statue found elsewhere in Nepal. A female tourist asked the meaning of pointing the fingers down. The guide was unable to answer and so was I. The tourists laughed and lashed a satire, “what a guide!” Such situations created the guides and staff to interpret the objects in their own way. Such interpretation may satisfy the tourists at that moment but provides false knowledge about people, places and objects.

The main issue is the valid knowledge construction of the tourists in the trekking. The knowledge about the people and place is a by-product of narratives made by others in the trekking. The knowledge of the tourists is also depend on the travel books and other literatures.

**Reciprocity of power among service providers and receivers**

There is a direct relationship between hotel/lodge owner, airlines and other service providing agents with the tourists. These agents always give priority to the tourists rather than any other people such as guides, staff, and porters. The ordinary Nepali people do not get a chance to eat before the tourists. I observed several cases in Mustang that the domestic tourists were kept in the second category. The guides and staff who associated with the tourists are at the bottom of the priority. The domestic tourists can have food after the international tourists are done. The turn of guides and other staff comes after the guests.

In Syangboche of Mustang, I was mighty hungry and I requested the hotel owner to give me dinner with domestic tourists but the owner rejected. I had to wait until the domestic tourists were through. In Khumbu, I was made to wait until midnight to have dinner. My own observations and experiences reveal the exercise of power among various segments in the trekking. The main question is why hotel/lodge owners behave like that. The easy answer is that there is the reciprocity of power between guests and hosts. This reciprocity is based on the economic transaction between them. Keeping the ordinary people at the least priority and the tourists at the top is because of the unequal economic transactions in the trekking. The hotels owners sometimes charge only little amount and sometimes do not charge to the guides and other staff; this condition has kept these people at the bottom of the power.

The priority is not only limited to food service but also in room selection. The good rooms, attached bathrooms are only for the tourists. In Lomangthan, a hotel owner wanted to take back the key of a room that we were provided. He told me that “the key was mistakenly given to you. It is attached and not for Nepali. This room is for the tourists”. But I rejected. I told him, “Who brought 14 tourists to your hotel? You can charge us as tourists,” and he agreed. Generally, the guides
get good rooms. I have observed that all the trekking staff sleep in the dining hall during the trekking in Khumbu and Mustang regions.

The power and politics in food and bed should be analyzed through the economic relationships between the service givers and takers. The power in trekking is not static, it is dynamic. The identity of the tourists should be defined differently in relations to the other segments. The hotel/lodge owners’ behavior differs among the tourists, leaders and guides of the same group. The behavior pattern is different along with their knowledge and perceptions. The each segment has their own knowledge and perception about each other which regulates power and authority.

The airline services of tourists’ destinations also give preference to the tourists rather than local people and other staff in trekking. The preference is determined not because of the color of the tourists but because the dollars they pay to the airlines. The weather of Lukla and Jomsom is uncertain at the day time. And every airline flies the tourists first because the cancellation of the flight may minimize their profit. In the trekking season, it is very hard to get the air-ticket for these destinations.

In 2013, I had a flight from Kathmandu to Lukla along with twenty tourists along with one guide and one staff and myself. We were in the runway at TIA after getting the boarding pass. All of sudden, an airline staff called me. He kept me out from the scheduled flight. I waited more than three hours in Kathmandu domestic airport for the next flight. This was the exercise of power by airlines services. The airline had taken one more tourist in my seat. The power of the dollar compelled me to wait more three hours at the airport.

**Tourists and resistance**

Resistance is a form of protest against unwilling activities. Although tourists must obey the leader and guide during the trekking but they protest while they feel imposition and excessive domination by the leader and guide. I observed ‘frustration’ as a form of resistance by the tourists in trekking. The facial expressions could be read to their responses in many matters. The tourists are not passive objects. They do not follow or accept whatever comes ahead. The tourists also make complains if they do not enjoy the events. The tourists had also filled the case at a court in 2011 against the trekking company for canceling their visit up to Gorakchhep in Khumbu.

**Conclusion**

Trekking is not only a visit to the destinations but it incorporates cross-cultural interaction among the guests, the hosts, and the agents. The behavior of tourists, guests and agents are fundamentally based on the power relationships. It is not
easy to behave with culturally distinct people due to the differences in national culture which is reflected through an individual’s behavior. There is a lot of miscommunication and misunderstanding due to differences in language and variations in the level of knowledge and understanding of the guests, hosts and the agents. Such a problem has an influence on the knowledge construction which is reflected through the concerned segments in the trekking.

Tourism is a leisure activity and entertainment is the main focus of trekking. In such a case, tourism culture may not represent the national culture and the guests, the hosts, and the agents do not show their usual behavior. However, the activities of the trekking company are depended upon the economic power of the guests. Management of the staff and other logistics are influenced by the economic exchange between the guests and the trekking company. Hence, the behavior of the tourists with supportive staff in the trekking is based on the social, economic and cultural aspects.

The exercise of power and authority is vital in cross-cultural interaction in the trekking. The tourists must follow the decisions made by the leader and the guide. Although some tourists resist, it keeps no meaning at all because the decisions are seldom changed. The only way of resisting by the tourists is criticizing the leader or guide, showing frustration or anger, making jokes and satires.

Tourism is a service-oriented activity. There is a reciprocity of power among service givers and takers. The service providers such as hotels, lodges, airlines and so on keep the tourists first. It is not because of ‘Atithi Debo bhaba’ or the Guests are the Gods but because of the economic power of the guests.

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Cultural Heritage Tourism Activities in Pashupatinath Area

Pashupati Nyaupane¹

Abstract

Pashupatinath area, as a cultural heritage site, commands immense attractions and the interests of the religious and pilgrimage tourists. It is one of the national identities and pride, enlisted in the world heritage site. As a symbol of national pride, this area showcases enormous potential for multifaceted growth, however, there are various activities and structural development remained to be done. Lack of properly developed tourism guidelines and implementations mechanism seem obvious to discerning eyes. This study tries to explore on the significance and importance of Pashupatinath heritage site and its vicinity in terms of tourism. In this regard, this study tries to observe and highlight some of the recent activities geared to uplift the hitherto less focused areas with a hope to attract some concerned stakeholders’ and authorities’ due attention.

Keywords: Shaivism, Hinduism, Yagyā, myths, culture, heritage, religious, pilgrimage

Introduction

The Pashupatinath temple and its area is mostly visited by religious devotees, common people, researchers and cultural heritage tourists. The core temple complex area of the Pashupatinath is restricted for non-Hindus or foreign visitors. However, it is observed that the large number of tourists are interested in visiting its vicinity area. According to the unpublished record of Pashupati Area Development Trust (PADT) the number of tourists have been increasing continuously since 2013 and it is recorded 1577992 in 2013, 148923 in 2014, and 141953 in 2018 (PADT, 2018). So as per the increasing trend of the non-Hindu tourists, restricted yet from entering into the main temple zone in Pashupati area, new planning and activities need to be developed and let them to have the unique experiences of about religious aspects.

Pashupati area is a very rich and resourceful site for the study of religion, culture,

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spirituality, history, economy, archaeology, art and architecture. Based on these aspects of knowledge, different studies have been carried out in this area. Pashupati area has already been enlisted in world heritage in 1979 by UNESCO (Jenkis, Selter and Subba, 2006:2). However, enough studies have not been carried out from the perspective of cultural heritage tourism. The aim of this research is to explore and identify the prospects of cultural heritage tourism.

The study is limited within Pashupatinath and its closest periphery. Regarding the primary data collection, the researcher has interviewed with 100 concerned persons in Pashupatinath. The interviewees were 40 foreign visitors, 40 Indian pilgrims and tourists, 10 local stakeholders and 10 PADT officers. While finding the data, most of the respondents agreed that numerous new cultural heritage tourism activities need to be planned, created, improved and developed. The promotion of all these things enable to the increment in the number of visitors and their satisfaction level. Furthermore, quality tourism can be developed, it definitely helps to enhance the job opportunities and to publicize world widely.

**History of Pashupatinath**

The Pashupatinath temple is solely devoted to Lord Shiva. The devotees and followers of Shiva believe and practise on Lord Shiva's preaching which is known as *Shaivism*. It is one of the oldest religions in the world. Shiva is one of the prime deities among the large number of gods and goddesses of Hinduism. Actually, there are four most prominent religious cult in the philosophy arena of Hinduism, i.e. *Shaivism, Shaktism, Vaishnavism*, and other minor cults (Koirala, 2051BS: 316). Though the four religious cults are fundamentally different in terms of spiritual ideologies, among them worshipping the Pashupatinath glorifies as one of the highest spiritual offering to the devotees. Regarding these deities, the holy Hindu trinity compromising of *Brahma, Bishnu* and *Maheshwor* are considered as the fundamental mechanism of nature. Brahma is understood as the emblem of creation whereas Bishnu as sustenance and preserver. Similarly, Shiva is regarded as a destroyer. The term Rudra was the terrible form of the Shiva used in Vedic Period. He has been referred to the names of *Shankar, Pashupati, Bholanath, Mahadev* in *Upanisad* and *Sutrasahita*. The antiquities of worshipping of Shiva dated back to prehistorical times with
evidences from the Indus Valley civilization as well as Vedic period. *Shivalinga* and *Seals* representing Shiva, have been excavated in Indus Valley Civilization (Tandon, 2058 BS).

Pashupati area is a composite destination of historic monuments in green lush of forest, culturally rich *Ghats* along the holy river, intangible heritage within the ancient settlement. It is really convertible to abundant activities to activate the premises with full joy, curiosity, creativity. The area has large number of cultural heritage resources and attractions stretched over 264 hecter (Nyaupane, 2018:3). These resources and attractions can be used to generate different activities adding numerous facilities and services. These increase the length of stay as well as add value to the tourists’ visit. New created activities will add to the economy in the long run that makes it a sustainable cultural heritage destination.

Through interview with elder generation as well as observation of photographs of 1950s and 1960s provide information about lots of agricultural land in northern side, dense forest, clean Bagmati River, open field and less encroachment. Thus, the cleanliness was maintained. At that time very few pilgrims visited from different parts of the world. After 1980s excessive migration, urbanization and political impact population increased rapidly in Kathmandu Valley. Due to that there were haphazard constructions. Cultural heritage site and pilgrimage destination can be developed by maintaining the originality and authenticity.

**Cultural heritage**

The term heritage has broader meaning which is generally associated with the word ‘inheritance’. It means something transferred from one generation to
another. The cultural heritage has been transmitted from one generation to another generation. Heritage is the legacy left behind by the generations that came before us. (Gupta, 2002:60) Heritage is defined as natural, cultural and built environment of an area. Heritage is understood from a broader concept, it includes all the tangible-intangible components of the past that are of universal value. Heritage can be broadly divided into natural and cultural heritage.

Cultural heritage is an expression of the ways of living developed by a community and passed on from one generation to another generation. These are all including customs, practices, places, objects, artistic expressions and cultural values. Cultural heritage incorporates tangible and intangible remnants of the past (Park, 2014:12). Intangible cultural heritage is a collection of beliefs, faiths, habits, practices, customs, traditions, moralities, skills, thoughts, religious practices, values, attitudes, perceptions and so on. Similarly, the tangible form of cultural heritage refers to the productive forces to support human life such as museums, arts, architectures, paintings, monuments, structures, heritage buildings, forts, ancient cities and so on. Heritage works as a guideline that represents the ideology and authenticity of the past (Smith, 2006:12). Hence, heritage is the identity and symbol of a particular community in general and of a state in global context that has been developed over a course of time, in a certain civilization.

Cultural heritage tourists

Cultural heritage tourists are motivated and inspired to explore different cultures and heritage. They want to investigate and experience the diverse cultures of destinations. Taylor (1993:35) mentions serious heritage tourists are often well educated and have good socio-economic backgrounds. Therefore, they prefer to stay longer and have in-depth experience and knowledge of both the tangible and intangible cultural heritage. Hence, the interpretation, representation and overall management strategies are made up for the promotion of cultural heritage tourism. He, further, mentions that heritage tourists are more interested in the heritage sites in comparison to other general tourists. Therefore, they seek to get maximum information about their destinations, increase academic interest and emotional connections for the appreciation and have personal valuable relations with heritage sites (Park, 2014:44).

Cultural heritage tourism

Cultural heritages have long contributed to attract the cultural heritage tourists in the socio-cultural, religious, archaeological sites. In recent years cultural heritages have been rediscovered as an important marketing tool to appeal those travelers, with special interest in heritage sites. People visiting cultural, historical, archaeological and religious resources are one of the largest and fastest growing sectors of the tourism industries in modern day (Timothy and Nyaupane, 2017:3).
The National Trust for Historic Preservation defines that "Cultural heritage tourism is traveling to experience the places, artifacts and activities that authentically represent the stories and people of the past and present. It includes cultural, historic, and natural resources" (NTHP, 2014:17).

Cultural heritage tourism is a complex form of tourism in comparison to other forms of tourism (Macchnnell, 1979). At the heritage sites, tourists come with various motivations and demands. Various factors have to be considered for conservation and preservation of the sites, maintaining the authenticity and commodification, presentation and interpretation, the heritage diversification and marketing, infrastructure development, visitor's management, and human and hospitality aspects (Park, 2014:44). Meanwhile, visitor's satisfactions, trails management, products development, products diversify, modern facilities, establishment of research centers, accessibilities, accommodations, interpretations, ethical issues etc. are the major issues in and around the heritage sites. Hence, it has serious challenges to cope with the visitors' expectation and the ethical issues in heritage site. Notably, despite these issues in the postmodern period of tourism, cultural heritage tourism is generating more attention and attraction.

Present situation of the Pashupati area

The Pashupatinath is a cultural heritage tourism destination. People have gained experience of past tangible intangible heritages as well as experience the lived cultural activities. It is one of the famous pilgrimages to the Hindus, Buddhists, and Kirats in the world. So, cultural heritage tourism has high potentialities due to its ancient history, living heritages, majestic arts and architectures. The area has negligible development in cultural heritage tourism; in the matter of tangible or intangible heritage development. The preservation, promotion, interpretation, product diversification, product development, visitors' management, infrastructure development, service and facility, accommodation sector or smooth operation and coordination of overall destination are some of the major aspects of tourism development necessary needed to be considered. Natural heritages in the area like Holy River Bagmati, Sacred forest, Caves, Gorges, *Kunda*, too are to be taken care of.

Pashupati area is a cultural heritage pride of Nepal. It is the responsibility of the nation to develop this area as a destination, where interested people can get easy access to understand, observe and experience. As per the observation and discussion with many stakeholders like PADT staff, local people, politician, traders, pilgrims and cultural heritage tourists during the field study, it has been observed that some related activities and tasks need to be carried out for the promotion and development cultural heritage tourism. Basic requirements like
information boards, interpretation panels, sanitations, infrastructures, routes and other necessary activities are still needed to be properly developed, managed and displayed. Similarly, tourism packages and programmes are also required to be developed. However, despite having abundant cultural resources, only few activities are prioritized for tourists' attractions. For the non-Hindu tourists, the tourism products are comparatively less. Therefore, most of the non-Hindu tourists seem engaging in observation of the crematorial activities or processes.

However, PADT has developed the master plan in three different tiers since 2053 BS for the development, promotion and preservation. These three tiers are core, consonant, and continuum. While developing and improving the infrastructures and other facilities, the originality, authenticity and identity of these traditional monuments are to be highly considered. These monuments preserve the history and Shaivism culture.

A destination has definitely unique activities to activate and participate certain visitors for engaging, recreating and attracting them towards the destination (Ghosh, 1998:25). These activities involve and engage the visitors and add up value of the products. There are numerous randomly scattered resources in the periphery of Pashupati area, those resources can be converted, transformed and modified into different attractive activities. Then, it will be the final cultural heritage tourism products to consume, utilize and experience. Many activities are just created to enhance the access to destination but some are created with activities to make it more salable. That's why, all of these help to boost the economy and touristic environment of the destinations. It also helps to extend the length of stay and generates economy in an around the destinations (Bhatia, 1997: 57).

**Present tourism activities in the Pashupati area**

The Pashupati area is undoubtedly a major tourism destinations in Nepal. It has been functioning, operating and organizing various tourism activities. These activities can be broadly distinguished to four major types.

**Activities in the Pashupatinath core temple complex**

The Pashupatinath area is the most important religious, cultural, historical site
for Hindus. This religious and sacred destination is considered as the primary pilgrimage destination for Hindus globally and is also the identity and image for the nation (Michaels, and Tandon, 1917:20). Due to its popularity, a number of visitors, devotees and pilgrims have been visiting regularly with their intended internal satisfaction. Mostly, they have the common objectives and beliefs to pray and worship Lord Shiva. It is regularly visited by the residents in and around Kathmandu valley, whereas occasionally by the national, and international religious devotees too.

**Activities during festivals and procession**

Many festivals and processions are celebrated in the Pashupati area, namely *Balachaturdashi, Teej, Mondays of Shrawan, Maha Shivaratri, Trishul Jatra, Gangamai Jatra, Guweshwori Jatra, Vatleshwori Jatra* and so on. These occasions are especially famous for cultural practices (Tandon, 2053BS:53). However, the participants to conduct and observe these cultures, especially the festivals and processions, are largely limited to the local residents in Kathmandu valley and its periphery. They perform various forms of cultural and religious activities.

**Activities for pilgrims**

A pilgrimage is a journey or search of moral, spiritual and religious significance. The Pashupatinath is one of the biggest pilgrimages or religious destinations for Hindus from all over the world (Kunwar, 2006:440). The temple is one of the most sacred temples, located on the banks of Bagmati River. The pilgrimage tourism is commonly referred to as devotion, faith tourism where people travel individually, in family or in a group for religious, missionary or special purpose (Gurung, 2067BS:5). Hindus from many countries visit the Pashupati area for various purposes. The Pashupati area is visited largely by pilgrims from India in
comparison to other South Asian countries. They specially visit for their faith and understanding of glories of the Pashupatinath. Besides that pilgrims from different parts of Nepal also prefer to visit and worship as the glory of Lord Shiva in the Pashupatinath.

Activities for non-Hindus

The Lord Pashupatinath is the guardian deity of the predominantly Hindu nation of Nepal. The Pashupatinath, as the most popular shrine of Hindus, has remained a part of life of the Hindu communities since primitive period of history (Regmi, 2001:20). It has been a popular destination for Santas devotees, pilgrims, traders, scholars, and common people. A number of objects of religious and archaeological importance are found in its vicinity prove its antiquity (Dangol, 1993:13). The Pashupati area has more value and significance than being just a pilgrimage site for Hindu. Besides being a sacred site, it is a melting pot of arts, architectures, socio-economic environment, political contribution and intangible cultural heritage. Pashupati area is enlisted as a World Heritage Site in 1979 by UNESCO and as bearing a unique testimony to a cultural tradition that reflects the living and outstanding example of monuments. Finally, all these prospects, the non-Hindu tourists presently visiting the Pashupatinath have been limited to their activities observing the crematorial processes in Pashupati Aryaghat.

Prospects of cultural tourism activities in the Pashupati area

Heritage trail

The Pashupatinath area provides extremely rich ground for tangible and intangible cultural heritage tourists that one could observe the outstanding universal value of UNESCO. Thus, it is not only attractive for religious and cultural pilgrimage site of Hindus, but also the most attractive cultural heritage site for the people of whole world. Hence, it needs to be developed in such a way that visitors can perceive the right reflection of its religious, socio-cultural, spiritual and philosophical values. For this reason, the whole Pashupati area should be marked with heritage trail, with standard packages and programs for experiencing religious and cultural activities therein. The trail enables people to connect and link the tangible and intangible cultural heritage aspects. The heritage trail of the Pashupatinath covers Tilganga area, Bagmati River, Rajrejeshworighat, Bhasmeshworighat, Aryaghat, Suryaghat, Kailash, Gaurighat, Kirateshwor, Guhyashwori, Gorakhnath, and Ram Mandir.

Revitalization of pilgrimage route

The Pashupati area is an extremely sacred space. Most of the devotees and pilgrims from all over the world come regularly over here to visit and worship. In terms of pilgrimage and heritage walk, the area has tremendous sites and
These routes are under practice since ancient times and defined by various ancient scriptures. The main temple of the Pashupatinath is surrounded by many temples, *Kundas, Samadhis*, idols and open spaces. Performing circumambulation of all these, the main temple is considered to be very meritorious. Just in front of the western gate of the Pashupatinath temple lies *Dakshina Murti* temple.

This temple is worshipped as the Guru of the Pashupatinath. The *parikrama* of the Pashupatinath temple can be initiated from this temple, 100m north of this temple lies *Unmatta Bhairav*. Walking further ahead, one reaches to *Umakanda, Gaurighat, Kirateshwor* and then to *Guhyeswori, Uttarbahini, Gorakhnath, Tribikram Baman, Pingalasthan, Bankali, Bhuvaneshwor* from where one finally comes to the Pashupatinath temple and ends the *parikarma* (Tondon, 2053 BS: 20). Until few years back, this circumambulation path was actively being used. However, now its usage has been stopped completely. The infrastructure facilities and quality upgrading of important sites on the route are to be further improved and constructed. Furthermore, interpretation panels, all the necessary signs, and symbols should be managed (Nyaupane, 2018:52).

Most importantly, PADT should develop better relationship and coordination among different local, national and international tour operators for successful trail project development in the Pashupatinath. This trail is known as the very ancient and sacred trail path followed by devotees, Monks, nuns, *Santas*, scholars, and traders visit here for religious merits and heavenly pleasure. It can be developed as a cultural heritage trail for cultural heritage tourists.

**Museum**

The Pashupatinath area is a living museum within itself. The idols of gods and goddesses are spread around in various courtyards, by large number of people worship with great love and devotion. Similarly, various festivals too become part of this living museum. The museum serves the purpose of in-situ conservation and preservation of the live cultures of the Pashupatinath area. A well facilitated, advanced and well equipped museum can be built close to the entrance gate of the Pashupatinath that could display the archaeological fragments scattered around the Pashupati area, and artifacts obtained out of excavation works. The various jewelries, jewels and other precious offering made by devotees in various
time from past generation can be put into display in this museum. Moreover, the historical documents issued especially by past rulers of Nepal can be put into this museum. The ancient coins related to the Pashupatinath, ancient religious books, manuscripts can be made accessible for visitors.

**Festivals, rites and rituals**

Festivals, rites and rituals are an organized set of special events, such as musical performances or plays, usually happening at one place on a special day or period of time for religious, social and cultural purposes. These festivals have their own place of celebration, socio-cultural activities, food and ceremonies. There are about twenty festivals celebrated over a year; namely, *Balachaturdashi, Maha Shivaratri, Teej, Trishul Jatra* and so on. These festivals can be chariot processions or processions of humans along a predefined route (Tandon, 1953BS:505). These processions also include several activities; for example: dance, chants, and stunts and so on. Apart from these, there are several other kinds of festivals which can be summarized as ritualistic activities performed by priests and backed by certain set of beliefs and ideas. Festivals also involve feasts on each festival, there are typical foods specially prepared for the festival. Visitors have enjoyed observing these activities. Once tourism operators set updated schedule of such cultural activities they can arrange tourists’ visits.

This will help them to arrange their tourists’ itinerary focusing on the cultural activities of the Pashupatinath. The PADT needs to provide proper information with details about the festivals, fairs and processions. The volunteers and guides, certified by PADT, need to be involved in these festivals and programs. These coordinated efforts can attract tourists from across Nepal and all over the world.

**Yoga and meditation**

The Pashupati area, being a spiritual area, establishing Yoga centers would add value to this already valuable space. From the past few decades, there has been a growing trend of westerners come to learn various Yogas and fulfill their inner search for spirituality (Bishudeva, 2004:15). Yoga is one of the spiritual
disciplines, includes breathing control, simple meditation and adoption of various postures performed in order to make one calm, healthy, and relaxed. Whereas, meditation is one of the practices to self-regulate the body and mind in order to bring mental processes, under great voluntary control, and thereby foster general mental well-being, and development of special qualities like - calmness, clarity, and concentration.

Furthermore, while developing Yoga centers, whereby tourists can come and learn about all types of Vedic Yoga, observe the practitioners, hear their realizations, and learn throughout the session. They would truly be the treasures of Pashupati area where they would realize that no other schools of Yoga disciplines could be better than this to eternalize the spiritual reality. This historical Yoga center can be developed and extended as an international center of Yoga, and meditation through which peace and spirituality can be spread to all over the world. Yoga teaching and learning, in these centers can be developed as a package for single day or few days, week/s or month/s. Sometimes Yoga exhibitions, Yoga talk shows and seminars can be conducted for the promotion and development of its importance in international arena. Mythically, it is claimed that Lord Shiva was first and foremost practitioner of Yoga and meditation, who came to the valley and entertained himself practice in this sacred place (Bishudeva, 2004:15).

The Pashupati area is considered to be a shelter ground for gods, sages and other personalities for their meditations (Bishudeva, 2004:15). Notably, the Shleshmantak and Mirgasthali area are quite remarkable place for Yoga and meditation to most of the spiritual followers. Amongst them, the Vishworoop Temple (can be brought into function after its reconstruction) is considered to be one of the suitable place to perform such Yoga and meditation. Located far from the hassle and bustle of the core city area, this temple is inside the jungle, the environment is tranquil, pure and suitable for learning daily teachings of Yoga and meditation practices. The Yoga center can be formed, developed and environmentally beautified for these spiritual activities. For the promotion, visitors' experiences and facilities, a library can be built at the premises of Yoga and meditation complex.

**Traditional musical performance**

The Hindu mythology and philosophy believe and practise Aarati worshiping to Gods and Goddesses twice a day: in the morning and evening supported by musical instruments. It is known as the traditional musical performance that has been practiced since historical period. Regarding the musical performance, there are various religious musical bands performing regularly now a days; some are the Dafa Bhajan Mandalis of Newar community, musical artists of religious
organizations, and other socio-cultural musical communities participate in the Pashupatinath with their musical presentations as offerings to Lord Shiva. Lord Shiva is known as *Nataraj* Lord of Dance and *Damaru* is the musical instrument of his choice (Dongol, 1993:29).

In the Pashupati area, several caste and ethnic groups have been singing and playing musical instruments as offerings of prayer to Lord Siva since historical period. However, these activities can be made further attractive to the tourists by enhancing the professionalism with befitting stage setup in these daily musical performances, by fitting defining a particular time and date. The indigenous musical performances need to be well preserved and presented by PADT. There should be enough space for visitors to observe and enjoy as well as for opportunities to participate if they want to present their musical skills and knowledges. Such traditional, professional musical show will delight the visitors. The expertise of the organization should also be utilized in training and development of musicians who perform in the Pashupati Temple and vice-versa. Furthermore, the expertise can be used by PADT in other events or festivals.

Presently, the Old Age Home resident in *Panchadewal* is re-located elsewhere. This place would be suitable location for the performance and practice of traditional musical programs because it has huge courtyard and less disturbed area.

The *Lok Baja Sangrahalaya*, located at Tripureswar is a museum where most of the different traditional musical instruments are also collected, documented, displayed and preserved for the education entertainment proposes. These musical instruments carry the long history and traditional skills of indigenous communities of Kathmandu valley. If the PADT would establish such a musical instruments museum in this particular area that could help to invite number of special interest visitors and enhance the cultural heritage tourism. This may equally well tell the stories of Lord Shiva.

**Story telling**

From ancient time people have been told interesting stories of Lord Shiva and Pashupatinath area in various ways. The story telling activities can be conducted for children and students which could be collected and displayed in various books, objects, paintings, images, etc. For adults, an audio visual room equipped with latest technologies can be organized. Many stories related to religion ad mythology can be presented that help to carry and deliver the historical message of cultural heritage.

The beautiful stories of *Himavat Khanda* and Nepal *Mahatmaya* tell about how the Himalaya was formed and how in one of its valley Lord Pashupatinath came
and stayed, along with other gods. There are many such remarkable stories significantly relating to Lord Shiva and his pastimes. These kinds of stories need to be collected, compiled and translated in English and other required languages; as these stories can captivate the interested visitors of religious merits. There are numerous Dharmsala in Gorakhnath temple complex. A remarkable and convenient center can be selected, restored, maintained and operated for the purpose of storytelling.

Theatrical performance and living the Shiva Myth

Nepal is a mythical and mystical land. Regarding the establishment of various land forms, the first emergence of people is explained through myths. There are also several myths about how the Lords of heaven came and settled inside this beautiful valley (Kaimrish, 1976:23). In the same way, there are several myths about Lord Shiva and his divinely visit to the valley for the first time during the Satya Yuga. There are several stories relating to the existence of Himalayas in Himavat Khanda and related to Lord Shiva in Nepal Mahatmaya, Shiva Purana and various other religious text books and mythological books. All of these stories were written by various ascetics and saints. The literatures show concern on the theatrical transformation of various kinds of myths and stories relating to Lord Shiva.

Theatrical plays can be orchestrated visual to appeal the visitors. Theatre schools like Gurukul can lead friendly hands to this purpose. To create a play as realistic as possible, costumes, makeup, decoration of the stage, background of the stage, and over all theatrical setting should also be created as per the demand of the play and stories to make it as a naturalistic play. All these props are to be used in the play, it should be created another new kind of product. After the completion of the performance, facilities for visitors to take photos with the characters and have photographs in traditional and character costumes in realistic backgrounds should be made available. These photos will obviously be a great memory of Nepal and of the Lord Pashupatinath for the visitors.

Light and sound shows

Kathmandu valley is the paradise for many natural and manmade touristic activities. Entertainment and touristic activities are ample for the day time in Kathmandu. These activities like heritage sites visit, pilgrimage tour, nature walk, and hiking can be found in and around this beautiful area. However, entertainment and tourist activities are very limited for the evening besides live music at restaurants, pubs, clubs and occasional concerts. Light and sound shows related to the various legends myth and mythologies about Lord Pashupatinath and temple itself can be arranged and presented at the temple premises that helps to enliven the evening entertainment opportunities in the Pashupatinath.
light show should have special effect to create a visual and imaginary of ancient
with narration of mythologies and legends to enthral and delight the audience.

Various kinds of similar shows are popular in several other destinations in the
world and they can be replicated in the cultural heritage site like Pashupatinath.

**Tandav dance show**

Lord Shiva is recognized as *Nataraja*: meaning the supreme Lord of Dance.
*Tandava* is the divine dance performed by Lord Shiva. *Tandava* is described as
vigorous dance that is the source of cycle of creation, preservation and dissolution.
There are two kinds of *Tandava* dance, one is *Rudra Tandava* and another is
*Ananda Tandava*. Among these, the former depicts his violent nature and the
latter one he seems to be enjoying the dance.

When Lord Shiva’s first wife Sati gave up her life by throwing herself on the fire,
Lord Shiva performed *Rudra Tandava* to express his grief and anger. *Tandava* is
also one of the most recognizable forms of dance and song among Hindu people
(Dongol, 1993:18).

*Tandava* dance can be performed with the combination of music and light to
create a surreal effect. This dance does not have live dancers but is created by
special light effects. Water and its droplets sprinkled on the air will act as a
medium in which the light collides and forms a beautiful shape of dancing Shiva.
Tandava show is combined with two other shows, Dance of Ganas and only light
show. On the dance of *Ganas*, Lord Shiva and Parvati rest and watch the dance
of *Ganas*.

**Yagya center**

The Pashupati area is purely a spiritual space surcharged with special spiritual
energies. Establishing large *Yagyā Shalas*, following Vedic rules and regulations
enhances the spiritual potency at this area. The *Yagyā* center should be able to
provide qualified professionals Brahanan priests, necessary ingredients for
*Yagyās*, so that, followers, devotees and religious organizations can come to this
spiritual space and peacefully conduct their desired *Yagyās*. Mythically, it is
believed that the *Yagyās* carried out in the Pashupatinath were incomparable and
most valuable to the ritualistic performance and earn religious merits.

**Research center**

The Pashupati area is an ancient religious, historical, cultural, archaeological and
geographical site having an amalgamation of Hindus and other religions. Aspects
of *Tantra, Yoga*, spirituality, festivals, and beliefs are depicted through various
temples, water spots, idols, ritualistic performances in the Pashupatinath. Hence,
the Pashupati area is a highly potential area for opening research centers. These
centers should provide building spaces wherein access to learning about past research reports, future research possibilities, new schemes, presentations, ongoing researches, all should be easily accessible to the research enthusiasts of the Pashupati area.

According to the Central Bureau of Statistics (CBS, 2011), there are 15% followers of Hinduism in the world and 81.3% people are Hindu in Nepal. In today's world, a race for power, politics, and economy can be witnessed leaving behind religion and cultural belief, spiritualism and its value (Dongol, 1994:10). In such a scenario, talk programmes, short term Hinduism classes and its teaching can help people understand the value of religion and bring them close to humanity, spirituality and gods. Pashupati is rich with many Dharmashalas and other simple public rest houses. The spaces can be properly utilized by developing them as spaces for conducting various discourses, seminars, regarding basic knowledge of Hinduism. Religious priests, scholars, saints can be invited to conduct this kind of program. This enhances the religious, cultural atmosphere that Pashupati area has endowed with. The Pashupati area being a center of attraction for Hindus all over the world, it becomes extremely important to transfer this rich intangible cultural understanding to the new generations by organizing various programmes and projects related to cultural heritage tourism.

**Conclusion**

Finally, the Pashupati area has been developed as highly important Hindu religious pilgrimage area. Daily large numbers of national and international visitors enter into this area for various purposes like worship of deities, ritualistic performances, study and sightseeing. Continuous flow of many Hindu pilgrims and devotees from various part of Nepal and India can be observed. Similarly, non-Hindu tourists are (to get) attracted towards this cultural, religious and spiritual site. The PADT is the most responsible prime authoritative institution for the development, preservation, promotion and management of Pashupati area. Besides PADT, there are many other stakeholders and are also involved for the development of Pashupati area like Department of Archeology, Culture Ministry of Nepal, local government, and local organizations, religious and social organizations. Better management and enhancement of tourism development is to be done through better coordination and collaborations among these stakeholders in Pashupati area. Thus, the prospects of cultural heritage tourism in this area helps to increase the length of stay of tourists, quality tourism, product diversifying, product development, utilization of resources, increment of local employment opportunities are lying ahead and can be harnessed.
References


Study of the Bagmati River in Nepal as Religious Tourist Attraction: Quantile Regression approach for Assessment of Rainfall pattern over it

Rajendra Man Shrestha¹ and Ebha Shrestha²

Abstract:

Quantile regression is an emerging statistical tool used to explain the relationship between response and predictor variables. It provides more robust and efficient estimators, on the conditional median or other quantiles of the response variable, compared to OLS. This study aims to establish relationship between monthly rainfall data in the Bagmati River and some large-scale climate predictor variables using this technique over the period 1981-2000. Quantile regression model reveals the relationship between the monthly rainfall and each of seven predictor variables. Geopotential height 1, Mean sea level pressure 1, Precipitable water 1 showed a greater effect ranging from $q = 0.25$ to $q = 0.950$. Each of these seven predictor variables has tendency to affect the rainfall uniquely to each other. Impact of climate change on these predictors may adverse effect on water tourism and religious tourism along the Bagmati River. Thus, the use of quantile regression is very important to determine the effect of the above seven predictors in a model to explain the monthly rainfall behavior over the river.

Keywords: Quantile Regression, conditional quantile plots, relationship, robust, climate predictor variables, rainfall

Introduction

Nepal is rich in natural beauty. She possesses ecological diversity along with different traditional as well as cultural values, customs and rituals. Nepal is also famous as a country of temples. Hinduism and Buddhism are main religions of Nepal. Because of these attractions, tourists visit Nepal with increasing rate every year. Therefore, tourism have been developing in several facets like mountaineering, trekking, Site-seeing, water tourism, nature walks, study and

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religious tourism, etc. Water tourism is flourished by rafting, canoeing and kayaking in different rivers of Nepal.

Figure 1 displays Lord Pashupatinath temple at Bagmati River bank. Hindu pilgrims appear as the religious tourists at the same temple (Figure 2).

The topic of this paper mainly discusses to the Bagmati River along with its cultural and religious values of Pashupatinath temples and other historical monuments and temples with traditional customs. If the Bagmati River has run off with sufficient water, there is possibility of water tourism too. From many years to present, the river has been facing with water scarcity and severely affected by untreated sewage and solid waste. Its main source of water is rain and then a few natural springs. But natural springs are gradually decreasing due to rapid urbanization and high population, buildings and loss of forest and cultivated lands. Further the problem is aggravated by the impact of ever increasing climate change. It has been experienced by extreme climatic events that cause flash floods or severe drought in this river.

The Figure 3 depicts drought situation of the Bagmati River at Winter season.

Therefore, this paper attempts to study the rainfall pattern, which is the main source of water to the Bagmati River using quantile regression approach.
Although the rainfall may be affected by natural climate variables, this study observes only main seven climate variables.

**Climate variables**

The seven climate variables are Geopotential height (GPH) (m) at 850 hpa, Relative Humidity (RH) in (%) at 850 hpa, Air Surface Temperature (AST) in Kelvin, Mean sea level pressure (pa), U-component of wind (Zonal wind) (UW) (m/s) at 850 hpa, V-component of wind (Meridional wind) (VW) (m/s) at 850 hpa and Perceptible water (PW) (mm). These variables are expected to affect the magnitude of the rainfall in atmospheric and oceanic circulation system.

Atmospheric as well oceanic circulations and their combinatorial systems are the complex natural system on the Earth. Weather and then climate of a region are cause of such system and further regular and periodic in nature in normal condition despite the fact that there are gradual natural changes taking in climate pattern ever since the evolution of the Earth (Shrestha et al., 2015a, 2015b, 2017). Precipitation or more precisely rainfall is very important hydrological phenomenon on the local region. It is globally accepted that the role of the rainfall is very important in maintaining and regulating the ecosystem as well as environment on the Earth. From the past few decades, the issues are raised on the impact of climate change on the rainfall pattern of the local region, the hemisphere and the world as a whole due to the effect of global warming. Burning of fossil fuel, pollution, forest fire, deforestation, other human activities are some causes for the global warming as they have been producing excessive greenhouses gases (IPCC, 2000, 2001). The Intergovernmental Panel on Climate Change and other previous researches have shown that climate hazards, including changes in precipitation cycles, reduced crop yields due to extreme weather event and changing local temperature are likely to decrease the food security of vulnerable population (IPCC, 2013). In Nepal, there was huge fluctuation in river run-off from season to season (Alam, 2004). Seasonal prediction of the rainfall becomes very important in Nepal for mitigating potential hazards due to landslides, flashfloods, droughts or water shortage at local regions (Sharma and Shakya, 2006). So the change in rainfall pattern may bring severe adverse effect in the river hydrology of Nepal. This paper intends to study about the rainfall pattern of the Bagmati River Basin in Nepal.

**Statistical models used**

To understand or identify the possible impact of climate change on the precipitation or rainfall, many papers have shown that General Circulation Models (GCMs) are currently the most credible tools and also provide estimation of climate variables (for example, air temperature, precipitation, relative humidity, etc.) on a global scale. But the direct use of GCM outputs is not suitable
to assess the climate change at local region due to its course resolution in finer scale (Tareghian, R., and Rasmussen P. F., 2013). To study at the local level, several types of techniques are found to use in downscaling the GCM outputs at the local regions (Fealy, Sweeney, 2007). One of them widely used is Regression based Statistical Downscaling Model under several key assumptions (Fowler, H. J., and Wilby, R. L. (2007). Statistical Downscaling Model (Wilby et al., 2002) and Automated Statistical Downscaling are some examples of conventional regression models. Despite their popularity, these regression based conditional mean models have some limitations. If one takes interest in the quantiles of the conditional distribution rather than mean, the standard regression model becomes weak to provide the desired information. This is because the assumption of homogeneous variance may not be justified. Further, it is common practice that the regression residuals assume normal distribution. But this may not be valid assumption even after application of some normalizing transformation. This model is also very sensitive to outliers. Under such adverse as well as desired condition, the quantile regression is widely preferred by the researchers. Bremnes (2004), Friederichs and Hense (2007), Friederichs (2010), and Cannon (2011) are found to apply quantile regression for downscaling precipitation. But they have focused on the capability of quantile regression for forecasting and relationships with large-scale variables. Some more examples are also available. Weerts et al. (2011) used the quantile regression in analysis of annual streamflow distributions change over time of annual rainfall in Zimbabwe. Further, Tareghian and Rasmussen (2013) applied it for analysis of Arctic and Antarctica sea ice extent and for statistical downscaling of precipitation at five location in central and western Canada for the winter and summer seasons. Thus the present study is motivated by the importance of providing accurate estimates at the quantiles of the distribution of the rainfall amount determined by some large-scale climate predictor variables using NCEP/NCAR outputs (Kalnay et. al., 1996) over the Bagmati River Basin in Nepal. The following section deals with the materials and methods, results and discussion and finally conclusion.

**Materials and methods**

**Study area**

The Bagmati River basin (Figure 1) originates from the Shivapuri hills of the Mahabharata range and drains out of Nepal (Jha, 2002). Its main tributaries are Manohara, Bishnumati, Kulekhani, Kokhajor, Marin, Chandi, Jhanjh and Manusmara-located within the middle mountain of Nepal (26045’- 27049’ N-8502’- 85027’ E).They occupy an area of 3,604.44 km (referring to 25 stations). Babel et al. (2013) has mentioned that the elevation of the Bagmati River basin ranges from 80 m in Terai in the southern part of Nepal to 2900 m in the Mahabharata range in the north. Its length is about 51 km.
Data

The present study has considered only 25 meteorological stations located in different parts of the basin for rainfall data. The data are obtained from the Department of Hydrology and Meteorology, Kathmandu, Nepal only for the time-period of January 1981-December 2008. As the study does not take consideration of spatial variation of the rainfall during these periods, the daily rainfalls of 25 stations are attempted to be aggregated into single time-series of the daily rainfall by incorporating all the stations. This single series is achieved using a weighted mean in Statistics, the weight being an area for each station demarcated within the basin using Thiessen polygon method in ArcGIS (ESRI, 2011). Therefore, the single series of the rainfall so obtained, named as area weighted daily rainfall (AWDR) is considered to represent the daily rainfall pattern of the Bagmati River basin during the mentioned periods. The daily data were aggregated to monthly data to study the monthly variation of the rainfall.

Climate predictor variables

A rainfall phenomenon is very complex system on the Earth and it is usually mentioned in several climate related papers. However, there are several potential climate variables considered as responsible for rainfall happening in nature. This paper has considered only seven climate predictors, which are supposed to be more responsible for the rainfall and commonly used in the papers. They are Geopotential height (GPH) (m) at 850 hpa, Relative Humidity (RH) in (%) at 850 hpa, Air Surface Temperature (AST) in Kelvin, Mean sea level pressure (pa), U-component of wind (Zonal wind) (UW) (m/s) at 850 hpa, V-component of wind (Meridional wind) (VW) (m/s) at 850 hpa, and Precipitable water (PW) (mm). They were obtained from NCEP/NCAR reanalysis products source (Kalnay et. al., 1996) with spatial resolution of 25° N - 30° N in latitude.
and 82.5° E – 87.5° E in longitude for the period 1981-2008. Their grids encapsulate the Bagmati River basin. So, each predictor variable consists of 9 gridded monthly data for that period. Principal Component Analysis (PCA) was used to transform the seven predictors into respective nine principal components. They are Geopotential height1 (GPH1), Mean sea level pressure1 (MSLP1), Relative humidity1 (RH1), Relative humidity2 (RH2), Precipitable water1 (PRECIP1), U-component of wind1 (UWIND1), V-component of wind1 (VWIND1) and Air temperature at surface1 (TEMP1). All these components are measured in monthly basis and there were monthly data on them for the period of 1981-2008.

Methodology

Quantile Regression

Quantile regression extends ordinary least-square regression to quantiles of the response variable. In addition, it is an extension of median regression based. It was proposed by Koenker and Basset (1978). In quantile regression, a regression model is developed for selected quantiles of the conditional distribution of the response variable. It is a very flexible regression as it is not required to assume homogenous residual variance and to make any assumption about the error distribution like conventional linear regression. Further the quantile regression is also more robust to outliers.

Quantile regression deals with the determination of models for user-selected quantiles in the conditional distribution of the dependent or response variable. So, the linear quantile function used in this study is in the form of:

$$ Q_{\tau}(y|x) = x^T\beta_{\tau} \rightarrow [1] $$

where $x$ is a vector of predictor variables and $\beta_{\tau}$ is a vector of parameters related to the $\tau^{th}$ quantile regression. The parameters may include an intercept or constant for the regression model such that the first element of $x$ is 1. Now for a given set of observations $(x_i, y_i)$, $i = 1, 2, 3, ..., n$, the parameter vector $\beta$ is estimated by minimizing the loss function

$$ \hat{\beta}_{\tau} = \underset{\beta}{\arg \min} \sum_{i=1}^{n} \rho_{\tau}(y_i - x_i^T\beta) \rightarrow [2] $$

Where the function $\rho_{\tau}(\cdot)$ is defined as

$$ \rho_{\tau}(z) = |z|I(z > 0) + (1 - \tau)I(z < 0), \rightarrow [3] $$

where $I(\cdot)$ is the indicator function, which is one when the argument is true and zero otherwise. The loss function is non-negative taking a minimum value of zero only when $z = 0$.

In other words, if the model fits well, a plot of fitted versus actual values will show that $\tau$ percentage of observed values should be less than the fitted values,
with $1 - \tau$ percentage of the observed values greater than that of the fitted values (Yu et al., 2003)

The equation [2] is solved using most commonly preferred method, simplex algorithm in linear programming method and standard error of the estimates are calculated by inverse-rank method (Barrodale and Roberts, 1973, 1974). Data for 1981-2000 were considered for building model and data for 2001-2008 were taken for the model validation. Models were developed with selection of predictors based on AIC and BIC criteria.

Results and discussion

First of all, exploratory data analysis was performed to examine whether a dependent and all the independent variables fit to a Normal distribution. The results are displayed in Table 1.

Table 1: Preliminary Quantile Regression and Ordinary Regression Models with normality test

<table>
<thead>
<tr>
<th>K-S Test Statistics</th>
<th>Variables</th>
<th>Spearman's rank correlation</th>
<th>OLS regression</th>
<th>Quantile regression at quantile</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.28*</td>
<td>Rainfall</td>
<td>0.10</td>
<td>0.25</td>
<td>0.50</td>
<td>0.75</td>
</tr>
<tr>
<td>1.65**</td>
<td>GPH1</td>
<td>-0.80*</td>
<td>-59.42</td>
<td>-106.95**</td>
<td>-145.63**</td>
</tr>
<tr>
<td>1.76**</td>
<td>MSLP1</td>
<td>-0.82*</td>
<td>74.29</td>
<td>30.72</td>
<td>123.33</td>
</tr>
<tr>
<td>1.65**</td>
<td>RH1</td>
<td>0.51*</td>
<td>1.98</td>
<td>-25.35</td>
<td>-17.99</td>
</tr>
<tr>
<td>2.32*</td>
<td>RH2</td>
<td>0.79*</td>
<td>1.19</td>
<td>-16.40</td>
<td>-7.94</td>
</tr>
<tr>
<td>2.87*</td>
<td>PRECIP1</td>
<td>0.88*</td>
<td>199.47*</td>
<td>123.20*</td>
<td>144.88*</td>
</tr>
<tr>
<td>2.179*</td>
<td>TEMP1</td>
<td>0.75*</td>
<td>-18.92</td>
<td>-23.09</td>
<td>6.29</td>
</tr>
<tr>
<td>0.839</td>
<td>UWIND1</td>
<td>-0.22*</td>
<td>-4.47</td>
<td>-4.224</td>
<td>-0.499</td>
</tr>
<tr>
<td>1.568*</td>
<td>VWND1</td>
<td>0.84*</td>
<td>-12.58</td>
<td>6.08</td>
<td>-3.13</td>
</tr>
<tr>
<td>0.553</td>
<td>VWND2</td>
<td>0.27*</td>
<td>-4.49</td>
<td>-2.12</td>
<td>-4.13</td>
</tr>
<tr>
<td>Constant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-statistic</td>
<td></td>
<td>112.76*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R square</td>
<td></td>
<td>0.815</td>
<td>0.404</td>
<td>0.518</td>
<td>0.635</td>
</tr>
</tbody>
</table>

Note: Standard error estimated by bootstrapping method with 1000 replications in quantile regression

*Significant at 1%, ** significant at 5% and *** significant at 10%.

Spearman’s rank correlation is between the rainfall and each predictor.

According to the Kolmogorov-Smirnov (K-S) Test, all the variables did not fit to the normal distribution as the test-statistics possessed the significant p-values at 5% level besides UWIND1 and VWND2. These results indicated not to apply the Ordinary least regression to model weighted monthly rainfall on GPH1, RH1, RH2, PRECIP1, TEMP1, UWIND1, VWND1 and VWND2. However, for the comparison purpose and to compute the multi-collinearity statistics, the OLS regression was run. Spearman’s rank correlation analysis depicted that weighted
monthly rainfall was positively and significantly correlated with RH1, RH2, PRECIP1, TEMP1, VWIND1 and VWIND2 but negatively correlated with GPH1, MSLP1 and UWIND1. In addition, the strength correlation was varying across them. It was observed that some predictor variables had opposite sign in the OLS regression like MSLP1, TEMP1, VWIND1, etc. This was mainly due to severity of collinearity effect in the model. For example MSLP1 has VIF of 1375.5. Besides UWNID1 and VWIND2, all have the VIF more than 10. Because of this situations quantile regression model have also adverse effect in the sign of the coefficients of the predictors at the quantiles of 10, 25, 50, 75 and 95. Further, all the models have most of the regressor possessing the insignificant effect. Thus, the models presented at Table 1 became unsuitable to determine the real effect of the predictor variables in the weighed rainfall. The following steps display the quantile regression model with selected predictor variables.

There are two types of final quantile regression models presented in Table 2.a and Table 2.b. Table 2.a includes precipitable water1 along with other predictors but Table 2.b has excluded it. This is done because of similar effect of precipitable water and Relative humidity.

Table 2.a: Final Quantile Regression Models at 5 different quantiles

<table>
<thead>
<tr>
<th>Variables</th>
<th>Validated Quantile regression model with inclusion of precipitable water1 at quantile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfall</td>
<td>0.10 0.25 0.50 0.75 0.95</td>
</tr>
<tr>
<td>GPH1</td>
<td>-11.85* -73.30* -75.07* -73.41* -70.05*</td>
</tr>
<tr>
<td>MSLP1</td>
<td>68.86* 70.37* 75.12* 85.51*</td>
</tr>
<tr>
<td>RH1</td>
<td>-7.03*</td>
</tr>
<tr>
<td>RH2</td>
<td></td>
</tr>
<tr>
<td>PRECIP1</td>
<td>101.78* 118.04* 140.84* 197.48* 277.37*</td>
</tr>
<tr>
<td>TEMP1</td>
<td>-24.52*</td>
</tr>
<tr>
<td>UWIND1</td>
<td></td>
</tr>
<tr>
<td>VWIND1</td>
<td>-4.77*</td>
</tr>
<tr>
<td>VWIND2</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>67.45* 101.74* 120.74* 187.62* 251.26*</td>
</tr>
</tbody>
</table>

*Significant at 1%, ** significant at 5% and *** significant at 10%.

Table 2.a revealed that GPH1 has gradual decrease in effect on the rainfall while going from quantile 10 to 95. But Precip1 has, in contrast has a rapid increase in effect on the rainfall while going from quantile 10 to 95. MSLP1 has similar behavior but with slow rate than Precip1. RH1 and TEMP1 were only included in the 10th quantile model. Uwind1 and Vwind1 were included in the 95th quantile regression model. They have moderate opposite effect on the rainfall. The scenario effect has a little different in Table2.b as shown below.
Table 2.b: Final Quantile Regression Models at 5 different quantiles

<table>
<thead>
<tr>
<th>Variables</th>
<th>Validated Quantile regression model without inclusion of precipitable water1 at quantile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfall</td>
<td>0.10</td>
</tr>
<tr>
<td>GPH1</td>
<td>-30.57*</td>
</tr>
<tr>
<td>MSLP1</td>
<td>270.74*</td>
</tr>
<tr>
<td>RH1</td>
<td>45.75*</td>
</tr>
<tr>
<td>RH2</td>
<td>49.26*</td>
</tr>
<tr>
<td>TEMP1</td>
<td>98.29*</td>
</tr>
<tr>
<td>UWIND1</td>
<td>-33.20*</td>
</tr>
<tr>
<td>VWIND1</td>
<td>-33.20*</td>
</tr>
<tr>
<td>VWIND2</td>
<td>-33.20*</td>
</tr>
<tr>
<td>Constant</td>
<td>67.25*</td>
</tr>
</tbody>
</table>

*Significant at 1%, ** significant at 5% and *** significant at 10%.

Table 2.b revealed that GPH1 has more severe decrease in effect on the rainfall while going from quantile 10 to 95. But this time MSLP1 has a more rapid increase in effect on the rainfall while going from quantile 10 to 95. Similarly RH1 and RH2 have positive effect with slow rate in all quantile level than Precip1. TEMP1 has also positive effect with higher rate in all quantile level. VWIND1 has less negative impact on the rainfall at 75th quantile.

The different sign for some predictors may be due to collinearity effect. These two tables have thus presented that the rainfall may increase or decrease at 5 quantile level or lower level, medium level or higher level due to effect of several climate predictors. If there is impact on climate change on these predictors, there will be either drought situation of the river, or may show heavy flood in the river.

Figure 5: Flood in the Bagmati River in Monsoon season
Figure 4 reveals the flash floods in the Bagmati River. This flood can damage settlements in its banks and many villages and their settlements may come under inundation in the Terai region. However, the tourism is mainly focused at Pashupatinath Temple and its territory. This seems independent of floods and drought events. If the water tourism is to be developed along with the religious tourism, the river will be the main attraction. So, the river should be full of water at normal level without any pollution. Many devotees also take bath in the river for their religious rituals and customs. Climate change may affect the river making unbalanced river situations, i.e.; sometimes huge floods or sometime severe droughts.

Conclusion

Quantile regression models are more robust models compared to the ordinary least square (OLS) models. They do not consider several assumptions of the OLS regression. The models possessed the varying effect of 7 predictors on the monthly rainfall. Specially, GPH1, MSLP1 and PRECIP1 have shown such pattern. The change due to global warming on those predictors may bring drought or flash floods in the Bagmati River. Either situations may be very serious in tourism development regarding the religious as well as cultural and water tourism on this river. So actions should be taken on time for the River making important tourist attractions both as a religious tourism and water tourism.

In order to revive the Bagmati River, the government has already started different projects. One of them is The Bagmati River Basin Improvement Project.
According to the Bagmati River Basin Improvement Project, it has plans to construct two artificial dams in the upper stretch of the Bagmati. The Dhap and Nagmati dams will be built in the Shivapuri National Park. They will collect rainwater in the monsoon and release it in a controlled manner in the dry season. The construction of the Dhap dam (See Figure 6) began in April. Covering an area of around 13 hectares, it will hold 850,000 cubic metres of water and release it at a rate of 40 litres per second during the dry season. The larger Nagmati will hold 8,000,000 cubic metres of water and release it at a rate of 400 litres per second. This activity expects the Bagmati River will gradually take its original shape. Then religious may flourish soon along with water tourism.

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Economic Impacts of Small Tourism Enterprises: A Case Study of Kaulepani Community Homestay

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Abstract

Kaulepani is one of the most beautiful tourism destinations, popularly known as the homestay village. It has created its identity as a cultural homestay tourism on the way to Annapurna circuit. The community homestay tourism has contributed a remarkable footstep in the local tourism arena. This study has tried to put some efforts on the homestay sector that could play pivotal roles for the further researchers, scholars and students of tourism discipline. It has tried to identify the changes brought in economy in the community by homestay tourism promotion. It focuses on the impacts of homestay by analyzing the factors viz. employment opportunities, changes in income, development of infrastructures, fund generation for communal activities and micro-entrepreneurship. These factors are considered as the variables for the study. Further, it tries to establish a comparative relationship between establishment of homestay as a cause and women empowerment as the effect.

Keywords: Kaulepani, homestay, micro-entrepreneurship, women empowerment

Introduction

Nepal has been gaining and developing as a tourism hub and destination in the South Asian continent, especially in mountaineering and trekking and homestay are strongly following the footsteps. In the recent context, homestay is most

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preferable place to stay for the domestic tourists in tourism area and try to enjoy the local culture. The tourists and visitors want to enjoy with local communities not only for organic food facilities and services, but they try to understand different cultural aspects also. Homestay means the venues as private homes in which unused rooms are rented for the purpose of supplementing income and meeting people (Lanier & Berman, 1993). It is mostly practiced in rural community for the promotion and development of local community: economically, socio-culturally, and environmentally.

Local people provide accommodation facilities at their own residence by utilizing their unoccupied rooms. They use available natural and cultural resources to satisfy the needs of tourists. The Merriam Webster Dictionary (2013) defines homestay as a stay at a residence by a traveler and especially by a visiting foreign student who is hosted by a local family. Homestay gives the platforms and opportunities for the interaction among the hosts and guests to exchange the cultural practices. Hosts provide services like accommodations, food facilities as well as comfortable and natural environment by the availabilities in the particular rural community. Guests and visitors enjoy traditional hospitality in natural settings at affordable cost. Therefore, homestay offers visiting tourists a unique local experience.

Regarding the homestay, Ministry of Culture, Tourism and Civil Aviation (MoCTCA, 2010) states that homestay is an accommodation where host provides food, accommodation and other related services and facilities to their guests and operates it individually or in community groups. In homestay, tourism services are provided to guests by individual family as well as community of particular area. Thus, the homestay directive has accepted it as managed by individual or community (Timalsina, 2010). Acharya and Halpenny (2017) discussed the other popular term used for homestay in various literatures are ‘home-based enterprise’, ‘commercial home enterprise’ and ‘commercial home’.

In homestay tourism, guests get ample opportunities to interact with the host, their culture and even participate in their cultural activities. Homestays are regarded as the alternative accommodation facilities. These facilities are provided by the people in rural villages, communities to the visiting guest. Thus, homestay attracts people from crowded urban areas. It offers them the chance to experience new and untapped places which has enabled the government to popularize new tourist destinations, and provide an alternative source of income to rural folks (Gangotia, 2013). It provides financial reward to the local indigenous community for conservation of the environment and their culture (Laurie & Radcliffe, 2005). It integrates all activities of tourism such as trekking, cultural tourism, agro-tourism, health tourism, and eco-tourism (Devkota, 2010). It may also provide new markets for local people to sell their products, such as agricultural products,
livestock and others (Budhathoki, 2013). Thus, homestay tourism has become very popular in developing countries like Nepal as it is regarded as the activity for employment opportunity, poverty alleviation and sustainable community development. Subedi (2016) remarks that in the year 1997, Sirubari village of Syanja district introduced homestay for the first time in Nepal. It was initiated by the retired soldiers who felt need of an innovation as well as environmental cleanliness. Soon after the initiation, Sirubari village homestay became very popular destination and turned at tremendous success. Thus, it influenced the establishment of other community based homestays and even private homestays resulting into the Ghalegaun, Kaulepani, sort of homestay destinations.

Kaulepani is located at 28°12’32.1” N latitude to 83°55’1.6” E longitude in Lamjung district of the Gandaki province of Mid-Western Nepal. Lamjung is a hilly district situated at the geographical center of Nepal. The head-quarter of Lamjung district is Besisahar Municipality. Kaulepani is situated 7 km further uphill from Besisahar at an altitude of 1600m thus falling on a sub temperate warm climatic condition. The average rainfall of Kaulepani is noted to be 100-200 cm per year. The summer temperature lies within 20-26°C while the winter temperature falls to approx. ~10°C.

The topological structure is relatively diverse with flat land on the bank of Marshyangdi while stepper on the upper part of the Mahabharat range. Kaulepani has a rich natural integrity with a diverse wildlife and vegetation. There are historical sites like the 15th century Lamjung Durbar built by Kulmandan Shah, the first king of Lamjung, Kaulepani Devi temple and the Lamjung Kalika temple. This area has...
become a popular tourist destination due to its own natural scenic beauty, the indigenous cultural taste and pretty fascinating medieval Nepal's memories. It is remarkable for ecotourism as well. Sightseeing, trekking, photography touring, taking photographs, pilgrimage tours, village tours are major tourist activities of Kaulepani. Besides these activities, Kaulepani is famous for the community based homestay. The Kaulepani homestay was established in 2011 AD. It was awarded as the best homestay achievement award of the year 2016 by VTOF and NTB (The Himalayan Times). Kaulepani village exhibits a diverse ethnicity with Gurungs in the dominance. Along with that, it integrates Brahmans, Chhetris, Newars and Dalits who all work together creating a well harmonized mountain community. It also has been a remarkable socio-cultural well-being of the homestay area.

According to Nepal Tourism Statistics (2017), there are only 217 registered homestays across the country. Out of which, one hundred seventy four are community and forty three are private homestays. Five hundred fifty four numbers of rooms are available in these homestays having nine hundred eighty eight numbers of beds in total for one night. Considering the Vision 2020, the number of beds available for accommodation seems insufficient.

Objectives

In the context of Nepal, many research studies have been carried out on community based homestays. These research studies have been focusing on the impacts of homestay on economy, socio-cultural and environmental aspects of the community. However, the existing research study about the destination was not found and documented. The aim of this research is to study the effects brought into micro economy by small tourism enterprise in the form of homestay and the relationship of women empowerment in it.

Study materials and research methods

The study is limited within Kaulepani community running homestay program. Regarding the methods for data collection, the study is based on descriptive as well as exploratory research design for the analysis of economic contribution of homestay as well as the relationship of women empowerment in the study area. The total numbers of homestays in the study area were 14. Data was collected from 14 homestay houses in Kaulepani. One member from each homestay was chosen using purposive sampling method for the survey. Fourteen in-depth interviews were conducted using structured questionnaires. One focus group discussion was conducted during the welcome program. Also, on-site observation was the primary tool for data collection. The quantitative data were analyzed and presented using the statistical tools viz. bar diagram and trend line.
Homestay and economy

MoTCA (2008) as cited in Acharya and Halpenny (2017) discusses that Nepal Government has been prioritizing a pro-poor approach of tourism development by considering small tourism business such as homestays to be effective tools to contributing to poverty alleviation in rural destinations. “Community involvement in homestay operation provides a job opportunity and improves the local quality of life” (Bhuiyan et al., 2011). Through homestay, rural community has gained economic benefit. As a result, homestay programs have started to offer better services to the visiting guest and gain maximum economic profit utilizing their local products and services. According to Lbrahim and Razzaq (2011), homestay has become an additional source of income for the community since they often take on other forms of employment. For example, “After the implementation of homestay in Malaysia the handicraft industry of the village has grown up and the local community has started to use the local hand-made materials such as rattan basket, similarly women and youth are generating money by offering local cultures and traditions to their guest” Ebrahim and Razzaq (2011). In the context of Nepal, the rural communities are generating income by demonstrating traditional culture and selling souvenirs. Basically, these literatures reveal that community based homestay has helped in economic growth of the community providing employment opportunities, generating funds for communal activities and raising per capita income of the local people. This research seeks to determine whether similar outcomes of community based tourism were achieved in Kaulepani of Lamjung, Nepal. To analyze economic impacts of homestay in Kaulepani, data was collected from 14 homestay houses. The results are discussed next.

Economy impacts

![Fig. 1: Dynamic economic impacts of homestay in micro-level](image-url)
All the respondents agreed that tourism had increased income and created job opportunities to them. The 14 houses directly involved in the homestay were making nearly Rs. 30,000 monthly from the homestay services. Also the ones not connected directly were earning by supplying necessary logistics to the homestay houses. The homestay houses serve with local food products (as per availability) to the guests and when the primary homestay houses run out of materials, the non-homestay houses support them with the available materials such as local rice, chicken, dairy products, vegetables and generate income through it. Thus, a mutual benefit sharing phenomenon between the homestay and non-homestay houses could be seen at Kaulepani.

*Kaulepani* homestay has setup their own policy of income distribution. Out of the total amount, 50% of the total income is provided to the homestay host family, 30% is retained to *Shir Khola Aama Samuha* (local mothers’ committee) and 20% is retained to homestay committee. Establishment of homestay has not only improved the locals' family income but aided a lot in communal development tasks and infrastructures. Recently, with the financial help of Lamjung Chamber of Commerce and Nepal Tourism Board (NTB), the *Aama Samuha* constructed a 30m high view tower at a cost of 1 million rupees. The retained income of the Homestay i.e. 0.6 million rupees was used to buy a telescope for the view tower. Similarly, the committee hall, rooms for guests with modern beddings, lamp, towel, study table were the results of better income of the homestay. The income from homestay was also found to be utilized for communal activities like welcoming the visitors, loans for the homestay members and for other purposes. Hence, the establishment of homestay has empowered the locals economically.
One of the major benefits of homestay in Kaulepani was found to be the development of micro-entrepreneurship in the locals (esp. women). The establishment of homestay has led the women of Kaulepani to learn culinary activities on their own. Kaulepani homestay welcomes guests with a beautiful flower blended token, a colorful badge of Gurung culture and locally fermented beer as a gesture of warmth and appreciation all prepared by themselves with locally available resources. At present, the women of Kaulepani provide trainings to the other hospitality learners and enthusiasts. In case of Kaulepani, the women have been found to be in charge of both households and homestay business. The local mothers’ committee namely has been playing a vital role in the establishment and operation of homestay. The mothers’ committee allocates the houses for guests’ accommodations and income distribution.

**Homestay and women empowerment**

“The impacts of tourism and their potential to enhance the lifestyle of community have rarely been analyzed from a gender perspective” Scheyvens (2000). Wilkinson and Pratiwi (1995) have represented some useful discussions about the impacts of tourism on village women and Swain (1993) stressed about women’s involvement in ethnic tourism, mountain based tourism and the benefits they are receiving. In the context of Nepal, Acharya and Halpenny (2013) found patriarchy being culturally supported; the role of women in a community’s improvement is rarely explored as an option for development. Poverty, in particularly in female-headed households, is a more pronounced problem in the rural and mountainous regions of Nepal because of these areas’ inaccessibility, fragility, marginality and relatively sparse population. “Homestay programme has become the noticeable source of income for indigenous women in Lwang” (Thapaliya et al., 2012). In Nepal, homestay program is mostly managed by women of local community. Across many homestays from rural community, women undertake all the responsibilities of providing food, accommodation facility, performing cultural programs which includes cultural dance, songs. Women are the one who create souvenir stores. Women run the tea shop in their community or nearby. “The homestays appear to be a tourism product that will be helpful in addressing socio-economic, political, ethnic and gender disparities”
Acharya and Halpenny (2013). Their study was primarily focused on the role of women and their management as well as leadership skills. Also how they were able to be economically strong by successfully running community based homestay program. According to the research study conducted by the Nepal Rastra Bank (2015) in Dallagaon homestay, there were 22 households included in the homestay, providing employment to 72 members, and women as major stakeholders. Thus, it has emerged as a sample of female-led and female-managed homestay in Nepal. This is the perfect example for women empowerment that can be achieved through community based homestay. These studies reveal that women empowerment is achieved through homestay. In fact rural tourism has been seen as the domain of Nepalese women. This study seeks to determine whether similar outcomes of community based tourism were achieved at Kaulepani.

A comparative relationship between the establishment of homestay and changes brought in the lifestyle traits of women is sought to be established. On studying the participation of women in these fields, a general trend is calculated on the base on time frame. Here’s the trend line showing the above mentioned relationship as establishment of homestay as the cause and aspects of women empowerment as effect.

![Women empowerment](image)

Fig. 2: Trend line showing the changes in lifestyle traits of women as the effects of homestay

Four issues were taken as effects so as to establish the above mentioned relationship.

1. **Involvement in agriculture**

   Being a hilly, rural area villages like most of the villages of Nepal, the natives of Kaulepani were entirely based on agriculture and livestock farming as their major occupation. Most of the Kaulepani men have left for foreign employment whose remittance has supported the family economy. There seemed to have no options for women other than
agriculture considering the geographically complex terrain and distance from the HQ. The main cereal crops include millet, paddy, buckwheat and maize which used to fulfill the needs of family and fodder for livestock. Despite being the major occupation, it yielded very poor returns. This trend continued till 2010. In 2011, the establishment of homestay showed the women a new way of living. In the beginning, agriculture was still considered the major occupation but as the guests’ inflow kept increasing, the women could afford the packed rice and other daily household materials from Besisahar which led to decline in involvement in agriculture. While conducting an interview with one of the homestay host families, a woman stated, "I don’t get much time for the fields now. The income from homestay is enough to buy packed rice and other stuffs. We mostly cultivate millet now as we don’t have much people to work in the fields". This gradually caused decreasing trend in agricultural involvement. At the present time, the women mainly cultivate paddy and millet. The Gurung community is predominantly involved in producing fermented beer for which millet is required as the raw material. This general reduction of involvement in agriculture is the effect of establishment of homestay and one of the aspects of women empowerment.

2. Social empowerment

Talking about the social status, the trend shows that establishment of homestay caused an increase the status of women. In 2016, Kaulepani won the best Homestay Achievement Award by NTB and VITOF which really pumped up recognition in national level. Even before homestay, the women of Kaulepani had maintained a social standard without much of male supporters and were living in a disciplined social system. The treasurer says that, "the women of Kaulepani today held culinary trainings for other hospitality enthusiasts and are taken as the icon of women empowerment".

3. Economic empowerment

The Aama Samuha has determined the rate of homestay package and additional services costs along with the income distribution to the involved host families. The homestay charges NRP. 950 for dinner and breakfast package and NRP 1350/- with lunch included. For visitors this rate does not seem expensive compared to the hotels at Besisahar which costs more than Rs. 1500 and above. The homestay would provide intangible benefits like cultural exploration, music, dance and panoramic views of the nearby snowcapped mountains which fills the visitor with an authentic feeling of exploration and obviously enhances the local income.
This income from the homestay not only has improved the quality of life of the locals but allowed them to invest in children’s education and financial assurance. Due to the earthquake of 2015, the tourist inflow has slowed down according to an old native which caused decrease in revenue but it didn’t take long to recover. In this way, the women have become financially independent with homestay activities.

4. Leadership roles

As the males were out for employment, the women and children were left at Kaulepani. Since then, the women took their part in everything. The mothers’ group has played a crucial role in operation of the homestay which is the outcome of a good leadership. The women are very benevolent yet perfectly disciplined and time oriented. The guests are provided tasty local foods and get allocated with rooms by the evening and one must go to bed by 9 pm. Establishment of homestay has not primarily initiated leadership quality in women but rather acted as the catalyst of change thus training themselves to become capable of handling necessary tasks and logistics and empowering them.

Analyzing the above trend and through direct observation, it won’t be incorrect to say that Kaulepani homestay functions under a strong and dedicated women leadership. The women’s dedication to work and mutual coordination was found to be immensely powerful. Hence, this resulted in the proper functioning of the homestay which eventually led them to economic sustainability and winner of the Best Homestay Achievement Award of 2016.

Conclusion

Analyzing the variables, it has been found that establishment of community homestay has caused a drastic improvement in micro-economy and women empowerment in Kaulepani. In the case of Kaulepani, within the time period of
7 years, lot of dynamic changes like infrastructure development, micro-entrepreneurship and increase in social status of the women were observed. Homestay has not only caused an increase in economy but allowed the locals to grow and develop themselves in terms of skills and abilities. Another major change was observed in the empowerment of women. The women of Kaulepani have proven themselves to be economically, socially and psychologically empowered.

While talking about the changes brought into the micro-level by the homestay, it should not be forgotten that, tourism has also caused a darker aspect in many parts of the world. The ethnic village of Mexico was found to be destroyed by tourism eventually due to acculturation (Nunez, 1963). This case may happen in Kaulepani if the principles of sustainable development are not applied. It was found that Kaulepani homestay at the present time has not much adverse effects in the environment but as the volume of tourist increases, the level of environmental exploitation is sure to increase. The locals of Kaulepani use timber wood and fodder for livestock from the local forest. As the involvement of homestay houses increase, there may arise problems of plastic disposal, waste management and even cultural acculturation which are the critical topics to focus upon.

For the purpose of preserving the ethnic values and cultural intactness, the natives of Kaulepani have not allowed their homestay members and villagers to sell their lands to the dominant business people from outside. Thus it could be said, the natives of Kaulepani are equally considered about sustainability of the homestay and the village as well.

At the present time, the tourism industry is a trillion dollar business out of which nearly 40% tourists prefer to visit cultural destinations. Nepal being not just the home of Himalayas but an integration of diverse culture, ethnicity and heritages have a huge possibility of growing at the global tourism market. In this regard, Kaulepani could be seen as a small destination with a huge possibility.

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Business Model Innovation in the Context of Sustainable Tourism

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Abstract

In this study, the impact of business model innovation on the sustainability of tourism activities is discussed in detail. The methodology of the paper is literature review based on previous investigation in the domain of business model innovation and the critical evaluation of the findings. The manuscript starts with brief information regarding to previous findings in the existing literature, then the relationship between business model innovation and sustainability of tourism activities is investigated with a specific focus on rapidly changing dynamics of world and therefore the transformative aspects of business strategies are the main objective of the study. Next, the manuscript suggests a model where the effect of business model innovation is modeled in a mathematical form, pertaining to several variables including technological development, total revenues, and the degree of environmental degradation. Finally, the manuscript concludes that the innovation-based nature of tourism sector requires firms to constantly innovate their business models so that they can arrange themselves according to necessities of rapidly changing business environment, in order to preserve their competitiveness and maintain their business activities to keep making profits.

Keywords: Business model innovation, tourism, sustainability

Introduction

By definition, business model innovation (BMI) refers to a principle where companies innovate by leveraging their internal capabilities and resources, hence it is related to a number of innovation strategies such that knowledge management, exploration, cooperation and entrepreneurship (van Baardwijk & Reinmoeller, 2005; Amit & Zott, 2010; Carayannis et al., 2015). Other than improving the firm performance as a strategic asset, business model innovation ensures long term competitive advantages, as opposed to other strategies such as product or process

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innovations (Schaltegger et al., 2012). The long term effects are particularly important, given the increasing focus on environmental sustainability in business world, where sustainable business practices are considered as a part of business ethics (Crane & Matten, 2016).

As opposed to limited focus of traditional business models which have been dealing with value creation at firm level, the transformative and innovative business models yield to an extended elaboration through capturing the novelty in customer value proposition, along with logical reframing and structural reconfigurations of the firms (Spieth et al., 2014). For that reason, business model innovation requires both modification of existing models and development of new ones to the extent that environmental and social issues gain relevance in the strategy of the companies (Schaltegger et al., 2012). Regarding to the sustainability performances of the firms, the improvement of such performance essentially depends on the change of business model (Schaltegger et al., 2012). In other words, transforming entire business logic through innovative business models, which target to create value for many stakeholders while protecting the natural surroundings, is vital for companies to achieve sustainability (Abdelkafi & Täuscher, 2016).

On the other hand, sustainability is crucial for the development of economic activities, particularly those which are dependent on natural environment to a large extent, such as tourism (Saarinen, 2014). Studies showed that existing business model in a particular tourism company has a significant influence on the level of innovation (Souto, 2015). Therefore, business model innovation plays a key role in organizational sustainability, which in turn assures the environmental sustainability through business model innovation (Carayannis et al., 2015). Despite its growing importance, the literature relevant to business model investment is claimed as limited. For instance, the study of Foss and Saebi (2016) summarizes the fifteen years development of business model innovation literature, and they conclude that the existing literature still has a gap regarding to the impact of business model innovation in ever-changing world dynamics characterized by rapid development of technology and globalization. Moreover, Schaltegger et al. (2012) underline that business model innovation has been neglected both by academic field as well as practitioner-oriented literature on corporate sustainable and corporate sustainability management.

In order to fill this gap, the impact of business model innovation will be analyzed throughout this paper. The next section will provide a brief discussion on the role of business model innovation in sustainable tourism, and then a model will be suggested which would state the relationship of several variables with business model innovation, such as technological advancement, total revenues and environmental regeneration.
The role of business model innovation in sustainable tourism

Traditionally, the main goal of firms is assumed as to make profits for the stakeholders and therefore social and environmental issues are less valued than major business goal. In the age of globalization where consumers are more conscious about the goods and services that they want to buy, and the impact of their consumption on the environment. In her study on the perceptions of tourists for the value of environmentally responsible innovations, Andereck (2009) found that tourists acknowledge the importance of innovations, and therefore they expect tourism companies to structure their business models accordingly. However, from the part of tourism suppliers, the value of nature seems to be underestimated. Especially after 1970s, tourism renders pressure on natural environments along with social and cultural aspects (Mihalič et al., 2012).

Although tourism activities rely heavily on environmental assets such as natural sights, clean water, and so forth, the activity itself is generally characterized by being addressed to satisfaction of consumer needs, increase of market share and competitiveness instead of reducing the burden on environment (Jacob et al., 2003). For instance, the study conducted by Mihalič et al. (2012) on the hotel sustainability business models in Slovenia documented that acknowledging the importance of environmental performance including environmental education, awareness building, biodiversity and establishment of partnerships with stakeholders in order to implement sustainable tourism development, account for the 28% of total respondents, whereas economic performance was monitored by 66% of participants and social performance regarding to human capital was considered by 42% of stakeholders in the hotel industry.

There is also a discrepancy among the segments of tourism in terms of the applicability of new business models. According to Hjalager (2010) some of the segments of tourism are more open for new business to easily enter the market whereas in many segments entrepreneurs may fail and instability of market might challenge long-term consolidation and achievements regarding to experience of their existing business models. For instance, Mair and Jago (2010) investigated the applicability of greening business models to business events tourism and they concluded that sustainable business models are currently neglected in business tourism despite lack of regulations in the context of business events as well as limits of time and resources.

Depending on the sustainability strategies, the degree of business model innovation may also vary. For example, the categorization by Mitchell and Coles (2003) suggest that defensive sustainable strategies targeting at easily obtainable cost and efficiency-oriented measures are more likely to consist of business model adjustment or business model adoption, whereas accommodative sustainable strategies referring to renewing production process, changing value
network partners or approaching new market segments are generally subject to business model improvement. Finally, proactive sustainability strategies challenging the core business logic of a company in a radical sense require business model redesign (Mitchell & Coles, 2003). In the context of tourism, tourism activities have been always associated with innovativeness (Hjalager, 2010), and therefore proactive sustainability strategies with innovative business model redesign would be a best fit not only for the organizational but also for the environmental sustainability of firms. As Schaltegger et al. (2012) claim, companies have a large influence on economy and society in today’s world, therefore a sustainable development will not be achievable without the sustainable development of corporations through innovative business models. A systematic approach to business model innovation is beneficial for identifying new business models which would assure the sustainability for the use of products and services, and make it easier for new environment-friendly technologies to be adapted (Girotra & Netessine, 2013).

The next section will provide a model to represent the impact of business model innovation based on technological development, the increase in total revenues through innovative business models and the decrease in the level of environmental damage.

The model

The impact of business model innovation on sustainable tourism can be investigated regarding to three main variables, namely technological advancements, total revenue increase of businesses and the level of environmental regeneration. To begin with the effect of technological improvements, they account for an important portion of the change in business models. As Chesbrough (2010) indicates, technological developments cause change in the organizations, and therefore business models should be adapted according to the dynamics of the industry. On the other hand, technology transfer agents appear as an important factor for transforming the scientific knowledge into marketable products. Considering the case of tourism, the study conducted by Peeters et al. (2006) on the role of innovation in aviation sector for reducing the impact on environmental damage suggests that significant reductions on the level of environmental degradation had been achieved through technological improvements. This is particularly because outdated transportation methods are effectively replaced by environmental-friendly applications at considerable prices both for the firms and for the customers. The results of this study can be also generalized to all business models of firms operating in tourism sectors and technological advancements will facilitate the applicability of environmentally sustainable business models through innovation. The impact of technology will be considered as time-dependent which would develop over time in an exponential manner with an
acceleration for doubling itself, as famously stated by Gordon Moore (1965) in his works with integrated circuits, and the phenomenon is also known as Moore’s Law.

Furthermore, total revenues appear as a significant indicator of business model innovation in a particular tourism destination. The success of innovation has been predominantly measured with respect to economic gains, such as market success (Hansen et al., 2009). This stems from expectations of stakeholders for financial returns as they engage in financial investments for the business. Therefore, sum total of economic revenues with respect to the change in a particular innovative business model can be considered as a variable while explaining the effect of business model innovation. The business model innovation of tourism firms eventually raises the competitiveness in the tourism market since they facilitate accommodation, transportation and other tourism-related services. In other words, ever-changing market structure requires firms to innovate their business models, which would lose their efficiency after a time and no longer become profitable. In order to stay in the competition and maintain their profitability, firms need to actively innovate in their business models according to the requirements in the market. For that reason, total revenues gained by firm, which undertake business model innovation, would signify the impact of business model innovation in tourism sector, as successful strategies keep bringing revenue to the destination while firms with outdated strategies lose their edge and hence would face a significant drop in their financial gains.

Finally, the evaluation of innovation pipeline regarding to environmental criteria has long been used by firms (Hansen et al., 2009). Replacing the burden on environment with innovative methods will be not only beneficial for increasing the quality of tourism activities at a given time, but it will also ensure the sustainability of tourism activities in future periods by protecting the environment in which tourism activities take place. Business model innovations aim to decrease the use of materials and resources which previously dominate the tourism service, and economize the natural resource consumption by relying on alternative sources and methods. As new innovative business models are being adopted by firms in the tourism market, there will be a possibility to provide services with less environmental damage, and tourism activity will be more environmentally sustainable. Therefore, the impact of business model can be measured through the degree of environmental regeneration with respect to the outcomes of business model innovation, which is subject to time. Furthermore, the degree of regeneration will be assumed as increasing exponentially over time, such that, enabling the regeneration of natural environment faster with a doubling acceleration, similar to the development of technology.
Hence, the model can be written as:

(1) \[ \text{BMI} = \beta_0 + \beta_1 \cdot (TD)t + \beta_2 \cdot TR + \beta_3 \cdot (ER)t + \epsilon \]

and,

(2) \[ t \in \mathbb{N} | t = \{0, 1, 2, \ldots\} \]

where,

- BMI implies the impact of Business Model Innovation
- TD implies Technological Development
- TR implies Total Revenues
- ER implies Environmental Regeneration
- \( \beta_0, \beta_1, \beta_2 \text{ and } \beta_3 \) imply coefficients,
- \( t \) implies Time
- \( \epsilon \) implies residual (i.e. the impact of other variables).

Based on this model, the influence of business model innovation can be measured with respect to three main variables, such that technological development, total revenues and environmental regeneration. The two variables, namely technological development and environmental regeneration have been constructed regarding to time, since they are assumed as growing exponentially over the years. Besides that, the time frame enables more realistic comparison between two specific years, hence showing the impact of business model innovation in a more efficient manner. Besides that, there might be other variables that are capable of explaining the variance in the impact of business model innovation, which the suggested model fails to capture. For instance, the reflection of business model innovations on the life quality of tourists and local residents might be also considered as an important outcome, since innovative business models are likely to bring sustainable and efficient tourism development, which directly and indirectly affects all individuals in a touristic destination, regardless of their involvement in tourism. Therefore a residual is given in the model that indicates the variance which cannot be explained by the three main variables.

It should be also noted that, the model is appropriate for any kind of numerical data, as the objective of this model is to provide a tool for the analysis of business model innovation in a quantitatively measurable manner. However, numerical expression of these variables may change from one study to the other, depending on the focus of the studies. Instead of offering a suggestion regarding to numerical expression of aforementioned variables, the model allows future researchers to specify their own numerical calculations, and to investigate accordingly the
effect of business model innovation with these numerical data, through statistical analysis and modeling the main variables in a mathematical framework.

**Concluding remarks**

In conclusion, business model innovation plays a key role in terms of sustainability especially in the context of tourism. Engagement to business model innovation results in maximization of the use of full potential for business success and contributes to the sustainable development for all (Schaltegger et al. 2012). Considering the interrelation of economic sectors in global market, achievement of sustainable practices through innovating in the business models in a given sector, namely tourism, will eventually boost the development in other sectors, since the revenues received by tourism will be allocated in the community in a direct or indirect manner. Besides that, environmental sustainability increases the service quality provided for tourist as well as ensuring the maintenance of tourism activities for future generations.

In order to stress on the impact of business model innovation in sustainable tourism, this manuscript suggested a model where the development of technology, total revenues in a specific tourism destination and the degree of environmental regeneration was mathematically modeled. However, there might be some limitations regarding to the suggested model. For instance, the impact of technology and environmental regeneration were assumed to be subject to same degree of change at a given time. In reality, there might be practical differences with respect to advancement of technology based on existing technological developments and regeneration speed of nature, where one of these impacts are easily realized whereas the realization of other may take extra time. Moreover, the suggested model has not been tested by empirical results and assumptions regarding to capacity for variables to explain the variance in the effect of business model innovation may appear to be wrong. Nevertheless, the study provides an important basis for the future investigation of business model innovation and its impact on sustainable tourism practices. All in all, none of the business models have so far been capable of providing humanity another planet to live, therefore existing business models should be redefined by companies in order to ensure sustainability in tourism, as well as any other sectors.

*References*


Climate Change and Mountaineering in Nepal: Issues and Challenges

Sudeep Thakuri, PhD and Sujata Koirala

Abstract

Mountaineering is an adventure tourism that has a significant economic contribution to Nepal. The mountain environment, especially the high altitude (>3000m) areas where major mountaineering activities happen, is considered to be highly impacted by current and emerging issues of climate change through different types of natural hazards. Climate change has direct and indirect impacts on the mountain environment. The glaciers are shrinking (nearly by 15% in the last half a century), and the glacial lakes are increasing (25% from 1970s-2017). The number of snow and rock avalanches are also increasing with the increase in intensities of the one-day rainfalls and increasing temperature. The rock falls, avalanches, GLOFs, and permafrost degradations are the potential threats for the mountaineering activities that can destroy the infrastructures, trekking trails, and resulting the demise of mountain climbers. The unpredictability of weather has cost a lot of lives of tourists. We underline a need of effective planning and perspectives for upscaling the mountaineering business with consideration of climate change.

Keywords: Avalanche, glacial lakes, periglacial environment, mountaineering

Introduction

Mountains have been a major attraction of tourists in the world. In 2016, 8,176 climbers were given permission by the Department of Tourism and Nepal Mountaineering Association (MoCTCA, 2018) in Nepal. The mountains, however, have been extremely vulnerable to a changing climate and extreme events in recent decades. Recently, Ballesteros Cánovas et al. (2018) have presented evidences that the warming observed in recent decades has been accompanied by increased snow avalanche frequencies in the Western Indian
Himalaya. They observed a very high activity from 1970 to 1977 and 1989 to 2003 (with occurrence rates >0.875 yr-1). Accelerated melting of snow and glaciers in the Himalaya reduce the number of trekkers and mountaineers. Considering the average vertical lapse rate of 6.0 °C km-1, the present glaciarized area above 5,000 m is likely to be free of snow with an increase in temperature of 1 °C in the next few decades. Similarly, an increase in temperature of 3-4 °C could result in the loss of 60-70% of snow-cover from the Himalaya (Alam & Regmi, 2004). This will make the major cause of mountain landscapes losing their beauty that will adversely impact the tourism industry.

Tourism sector along with the environmental resources in which tourism directly depends on is most likely be impacted by the climate change (Scott, 2003). Mountaineering is a popular form of adventure tourism, which basically includes ascending a mountain. It further includes activities like skiing, trekking, hiking, and climbing (Apollo, 2017). Climate has the major influence in any kind of tourism, especially mountaineering and trekking expeditions (Scott et al., 2008).

The high altitude areas (>3000 m), especially the glaciers and periglacial environment, where major mountaineering activities happen, are a very important part of Nepal Himalaya. These areas are providing an attraction for the tourism, particularly for mountaineering. Periglacial environment includes a perennially frozen ground with freeze-thaw oscillation. Every year, thousands of people try to summit a peak, and trek along the snowcapped Himalaya. Studies have suggested that the high mountain regions are adversely impacted by climate change, though the concern on the ecosystem services along with some economic and livelihood impacts seem to be disorganized in the literatures (Nepal, 2011; Palomo, 2017). Especially climate change can cause disastrous impacts on the countries, which depends mainly on natural resources for the economy and livelihoods (Shrestha & Aryal, 2011).

In the greater Himalaya, the prominent impacts are seen in glaciers and runoff response due to precipitation and temperature changes (Xu et al., 2009). Further, elevation dependent warming has a prominent effect on the mass balance of the cryosphere, associated runoff and other ecological changes making mountain
regions more sensitive towards climate change (MRI, 2015). Nepal is highly dependent on agriculture and tourism sectors, which are very sensitive to climatic variability (World Bank, 2002). Mountain tourism plays an important role in tourism development (Figure 1). Nepal Himalaya has pleased a significant number of tourists every year since 1951 (Nepal, 2003).

Since 2000, a huge growth in trekking and mountaineering has been observed in Nepal (Nepal, 2010). According to MoCTCA (Ministry of Culture, Tourism & Civil Aviation), out of 2,277 persons 1,225 succeeded summit to various peaks composed by 692 foreigners and 533 Nepalese in 2017 (MoCTCA, 2017). Climate change disasters in high mountains are very specific and most likely to trigger the rates and intensity of natural hazards like snow avalanches, rock falls, GLOFs which severely impact the mountaineering sites (Bhandari, 2014). We need to explore how glacial and snow cover changes, and climate-induced disasters impacts the mountaineering in direct and indirect ways. In this paper, we present the potential and realized impacts of climate change on the mountaineering and challenges of mountaineering in future with examples from Nepal Himalaya based on the review of the existing scientific publications.

Glaciers, glacial lakes, and snow cover

The Himalayan region has the largest number of glaciers (Bolch et al., 2012), glacial lakes (Gardelle et al., 2011; ICIMOD, 2011) and snow cover besides the polar region. Changes in snow cover and snow cover duration can visibly be seen in comparison to today’s climatic condition (Laternser & Schneebeli, 2003). Alam and Regmi (2004) estimated that increase of 3-4 °C temperature, about 60-70% of snow cover will be lost forming a large number of glacial lakes. A recent remote sensing-based analysis of the glaciers in Nepal Himalaya, by the author of this article, suggests about 15% glaciers shrinkage in the last fifty years. Thakuri et al. (2014) showed that the glaciers in the Southern part of Everest region are shrinking by 13% in last 50 years and the debris-covered area has increased due to the increasing temperature as well as the weakening Asian monsoon in the last decades. Changes in the snow cover due to climate change results in socio-economic and environmental implications (Harrison et al., 2001).
Figure 2: Upper part of Lobuche Glacier (a) Lobuche Glacial Lake, located on the Khumbu valley, near Everest Base Camp, (b). Glacial ice melt, (c) are producing and enlarging the glacial lakes- (Photos by S. Thakuri)
Moreover, glacial lake has shown more than 25% of expansion in their surface areas from 1987 to 2017 (Khadka et al., 2018). The glacial lakes on the surface of glaciers are resulting accelerated mass loss of glacier ices. In Everest region, the reduction in glacial mass due to climate change has caused the thinning of the glaciers and induced the formation of large supraglacial lakes (Figure 2; Salerno et al., 2012; Thakuri et al., 2014). It has prohibited the mountaineers to access the trekking routes and mountaineering activities (Watson & King, 2018). The local communities and tourists are likely to be impacted by the lack of accessibility of mountaineers to trekking routes.

**Unpredictable weather and climate extremes**

Climate extremes are found to be increasing with climate change, causing disruption in weather pattern, landslides, floods and drought. Nepal is very much vulnerable to such climate extremes. Precipitation extremes lead to many natural disasters especially in Himalayan region, causing impacts to the mountaineering business (Karki et al., 2017). Mountain region depends mainly on orographic precipitation. These kinds of extremes result in an unpredictable weather. Weather forecast sensitivity is a big issue for mountaineering business, so detailed and accurate climate information is required to minimize the associated risks of unpredictable weather and extremes (Scott & Lemieux, 2010). The snow characteristics of the Himalaya are complex and require a denser network and assessment of snow conditions for effective forecasting. There are only a few stations in upper Himalaya for weather forecasting that sometimes can result in poor forecasting. However, avalanche forecasting in the Himalayan region is biased towards a conventional knowledge-based approach. The Pyramid lab (5500m) was established in 1990 in the middle of the Lobuche and Khumbu glaciers just a few kilometers away from the Mount Everest. This station provides the meteorological data like air temperature, wind speed and direction, relative humidity, precipitation, and barometric pressure at 2-hour intervals. Such weather stations are very important in predicting the approaching storms and avalanches (Huey et al., 2001).

Extreme one-day rainfall has been found to be increasing from 1871-2007 in the Himalaya resulting in cloudbursts, landslides, and erosion (Nandargi & Dhar, 2011). The risk of slumps, landslides, and debris flow occur if the daily rainfalls exceed more than 144 mm in a day in the Himalaya (Dahal & Hasegawa, 2008). In the southern Himalaya including Nepal, the deaths due to extreme events were more in pre-and - post monsoon when good climate and weather was expected. So, the uncertainties in weather in good climatic condition can result in more casualties of mountaineers (McClung, 2016).
Avalanches (snow and ice)

The northern part of the country, particularly the higher-Himalaya is prone to avalanches because of the thick snow cover on the steep slopes (Figure 3). The avalanche of November 1995 killed 43 people, including some foreign trekkers at Khumbu and Kanchanjungha areas. On 2nd January 1999, 5 people were swept away by the avalanche that occurred in Chunchet Village Development Committee- 8 of Gorkha district (MoHA & DPNet, 2015).

Mountaineering is considered an adventure sport, but the risks of death while climbing the summit is very high. Snow avalanche has caused a lot of deaths in the Himalaya as well as have destroyed many infrastructures. The avalanche causes the rapid flow of snow down the mountain or hillside. On 18 April 2014, an incidence of a snow-ice avalanche in the Khumbu Icefall area of Mt. Everest region draws an attention of the world. The event brought a tragic death of 16 climbing staff heading to the Everest summit. That was the largest disaster in the history, resulting huge numbers of human casualties. It is expected that the climate change may lead to disasters, but it is not fair to link every single event
to the climate change. Avalanche is generally triggered by the increasing temperature and slope. In colder temperature, the snow sticks to the surface and does not fall, but when the temperature increases the snow sluffs and takes a form of avalanche. So, the gradual increase of temperature due to climate change causes disastrous avalanches.

Nepal Himalaya is characterized by having rugged terrain and the slope instability and failures on the rugged terrain gives rise to rock avalanches (Figure 3). The freeze-thaw mechanism in mountain areas gives rise to instability of the rock materials. The expedition of mountaineering more than 7000m has caused 4% of death rate only by avalanches. With the increasing elevation the risk of avalanche also increases. Annapurna, Dhaulagiri and Manaslu, which are the peaks of Nepal Himalaya, exhibit very high avalanche risk to climbers (McClung, 2016). Changes in solar radiation are an attribute that is brought about by the climate change. Solar activity is presented at higher levels in comparison to the historical record of the past 8,000 years (Gil et al., 2018). The increase in solar radiation tends to trigger the avalanche on the Himalaya on clear weather. Also, the increasing temperature and precipitation changes on the mountain region disrupt the mass balance of the glaciers. In 1995, 28 people died in tourists locations due to avalanches in the Gokyo valley (Nepal, 2011).

In 2014, Nepal experienced worst series of avalanche causing death of more than 43 people in the Annapurna circuit (BBC, 2014). Manaslu Avalanche in 2012 killed 9 mountaineers due to the snow avalanche at 7,300m (Horrell, 2013). In Khumbu, 23 deaths caused from 13 accidents on the northern side since 1992 and 7 deaths seem to be avalanche prone. The Annapurna massif has experienced 54 avalanche deaths and the area south of the Annapurna massif has higher precipitation rate. The avalanche death rate is more concentrated in the Central Himalaya range rather than other part of the world (McClung, 2016).

Climate change is foreseen to increase the frequency of avalanches in such high elevations. Studies indicate that an increase in temperature, changes in the precipitation form (solid or liquid), and precipitation quantity may increase the likelihood of avalanches. Unfortunately, no recorded data exist on the frequency of occurrence (increased or decreased) of such events in this region to attribute scientifically to the climate change, but continuously increasing debris coverage on the glacier surface has been recorded since the 1960s (Thakuri et al., 2014). This indirectly provides hints on such avalanches could have increased in the region because avalanches and rock falls deliver the debris to the glaciers.

**Landslide and rockfalls**

In high altitude, the mountain slopes are very steep (Figure 4). Mass movement (e.g., landslide and rock fall) downward under the influence of gravity is very
common. Everyday small and large mass fall occurs hundreds of times. In most instances, such phenomenon is not noticed as they do not have economic and livelihood impacts. The geographic location with distinct characteristics of the very steep sloped mountain even more favors for the movement of mass downward under the influence of gravity. Earth, itself is a dynamic and changing continuously.

Figure 4: Rocky mountain peaks are increasing in the Himalaya (Photos by S. Thakuri)

Glacial Lake Outburst Floods (GLOFs)

On April 20, 2017, a GLOF hit the Barun River valley, a tributary of the Arun River, due to blockage by debris, forming a lake up to 3 km long and 500 m wide. The flood source was small Langmale Glacial Lake that had undergone a rapid change. It resulted a great concern and required emergency response (Byers et al., 2018). On May 25, 2015, an outburst flood was resulted from a lake in Lhotse Glacier, adjacent to the Imja Glacier and Glacial Lake (Thakuri et al., 2016). The outburst flood appeared from the same glacier again on 12 June 2016 through the drainage of glacier water through englacial conduits (Rounce et al., 2017). Both events have resulted turmoil in this region of the high tourists destination. On September 03, 1998, a GLOF of Tam Pokhari (lake) in the Hinku valley of the
MBNP toll death of several human lives and loss of more than NRs 156 million properties (ICIMOD, 2011). These are some of the recent cases of the GLOFs in the region. Several GLOF events have already been experienced in the Nepal Himalaya (Osti & Egashira, 2009; ICIMOD, 2011) with a loss of lives and properties and affecting the tourism. Several lakes in the region are emerging as a Potentially Dangerous Glacial Lakes (Bolch et al., 2008).

In Nepal, climate change is considered to have triggered many high mountain avalanches and GLOFs (Nepal, 2011). The GLOF events are common in the High-mountain areas, as there are large numbers of glacial lakes. Among the glacial lakes existing in Nepal, 32 are considered to be potentially dangerous. The historical GLOF events in Nepal reportedly occurred about 450 years ago. A total of 24 GLOFs event has been reported in Nepal, originating 14 GLOFs in Nepal Himalaya itself and another 10 GLOFs originating in the Tibetan part of China (ICIMOD, 2011). Moraine collapse has been the major reason of GLOFs in Nepal (Mool, 1995). On the basis of probability index, the Tsho Rolpa and Imja Tsho were identified for continuous and intensive study (ICIMOD, 2011).

Table 3.17: GLOF events recorded in Nepal

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Date</th>
<th>River basin</th>
<th>Lake</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>450 years ago</td>
<td>Seti Khola</td>
<td>Machhapuchhre</td>
</tr>
<tr>
<td>2</td>
<td>3 Sep, 1977</td>
<td>Dudh Koshi</td>
<td>Nare</td>
</tr>
<tr>
<td>3</td>
<td>23 Jun, 1980</td>
<td>Tamor</td>
<td>Nagma Pokhari</td>
</tr>
<tr>
<td>4</td>
<td>4 Aug, 1985</td>
<td>Dudh Koshi</td>
<td>Dig Tsho</td>
</tr>
<tr>
<td>5</td>
<td>12 Jul, 1991</td>
<td>Tama Koshi</td>
<td>Chubung</td>
</tr>
<tr>
<td>6</td>
<td>3 Sept, 1998</td>
<td>Dudh Koshi</td>
<td>Tam Pokhari</td>
</tr>
<tr>
<td>7</td>
<td>15 Aug, 2003</td>
<td>Madi River</td>
<td>Kabache Lake</td>
</tr>
<tr>
<td>8</td>
<td>8 Aug, 2004</td>
<td>Madi River</td>
<td>Kabache Lake</td>
</tr>
<tr>
<td>9</td>
<td>NA</td>
<td>Arun</td>
<td>Barun Khola</td>
</tr>
<tr>
<td>10</td>
<td>NA</td>
<td>Arun</td>
<td>Barun Khola</td>
</tr>
<tr>
<td>11</td>
<td>NA</td>
<td>Dudh Koshi</td>
<td>Chokarma Cho</td>
</tr>
<tr>
<td>12</td>
<td>NA</td>
<td>Kali Gandaki</td>
<td>Unnamed (Mustang)</td>
</tr>
<tr>
<td>13</td>
<td>NA</td>
<td>Kali Gandaki</td>
<td>Unnamed (Mustang)</td>
</tr>
<tr>
<td>14</td>
<td>NA</td>
<td>Mugu Karnali</td>
<td>Unnamed (Mugu Karnali)</td>
</tr>
</tbody>
</table>

Source: ICIMOD (2011); NA= Not Available

Glacial lakes formed when the waters hemmed in by rock, ice, or any debris barriers when snow and ice melts in high altitude. The meltwater is accumulated in loosely consolidated end moraine dams. A large glacial lake gets enlarged through coalesce of the small water ponds. With the presence of a large number of increasing glacial lakes the Himalaya of Nepal is very prone to outburst of lakes and the glacial lakes being very much sensitive to the increase in temperature.
Basically, two types of GLOFs exist in the Nepal Himalaya i.e., overtopping or collapsing of the moraine or ice dams on the glacier itself and another one is the one which occurs when there is fast draining of or from lakes formed on the lower surface of glaciers (supra-glacial lake) or between the end moraine and the terminus of a retreating glacier (moraine dammed glacial lake), however ice dammed lakes are also present in very small numbers in Nepal (ICIMOD, 2011).

Dig Tsho Lake is situated on the Langmoche Valley sub-basin of the Nangpo-Tsangpo area in the Bhothe Koshi valley at an altitude of 4365 m and is fed by Langmoche lake situated at an altitude of 5400m. The snout of the glacier is exposed to solar radiation, which has contributed to the rapid retreating. Before the burst the 1985, the Dig Tsho lake had a depth of 20 m and 60m high moraine. The GLOF of Dig Tsho was triggered by ice avalanche on Langmoche lake, causing the ice mass of 100 to 200,000 m3 dislodged itself from the overhanging glacier tongue and plunged into the lake. The outburst of Dig Tsho (Moraine-dammed lake) in 1985 in the Everest region damaged the infrastructures and killed 5 people (Vuichard & Zimmermann, 1987). The oubrust of the Dig Tsho had not only affected the people socially, but also impacted the tourism industry very badly. The destruction of trails and bridges affected the reach of the mountaineers as well as the sudden bursts of the glacial lake increased the risk of fatalities among mountaineers.

Imja Tsho, a moraine-dammed lake, is another potentially dangerous glacial lake of Nepal, which is one of the six dangerous glacial lakes (Thulagi, Tsho Rolpa, Lumding, Imja Tsho, Lower Barun, and West Chamjang) of Nepal (ICIMOD, 2011). The Lake is situated in the northeastern part of the Dudh Koshi basin and lies on the South of the Mount Everest (8,848m). It lies at the terminus of Imja glacier. This lake showed very rapid growth 0.03 km2 in 1962 to 1.35 km2 in 2013 (Thakuri et al., 2016). Water draining from the lake through its natural outlet runs over the end moraine called as the Imja Khola. Since this, the lake is growing at an alarming rate, it can possibly cause a huge damage to the infrastructures and 87,782 people living downstream with a loss $11 billion, and the trekkers and mountaineers are also at a huge risk as it threatens to destroy the trekking trails, settlements and tourist destinations (Bajracharya et al., 2007; Mool, 1995; ICIMOD, 2011). Hence the increase in number of glacial lakes due to climate change and the resulting GLOFS will immensely impact the mountaineers and the tourism sector of Nepal.

**Permafrost thaw**

Permafrost is a frozen rock and snow, which is at a temperature of below 0 °C for a period of more than two years. Ground ice may or may not be presented and the permafrost is generally found in higher altitude. The surface layer that thaws in
Climate

The thawing of permafrost is directly affected by changing climate and being a consequence of climate change, it will have social, biological and economic impacts on the fragile ecosystems of mountain regions (ICIMOD, 2016). Mountain permafrost degradation is an important indicator of the climate change, however, not distinct studies on the permafrost and periglacial environment of Nepal are available (Chahuhan & Thakuri, 2017). Permafrost is not visible at the surface so it makes the mapping and inventory of the permafrost region more difficult. Permafrost influences a wide range of systems, including the hydrology, landscape and vegetation. Permafrost stabilizes the rock slopes, moraines and debris-covered slopes through cohesion and decreasing the hydrostatic pressure. So the permafrost thawing has its own consequences.

The glacial lakes or hydropower dams near the permafrost can trigger rock falls and flood hazards. The permafrost holds the sediments due to cohesion. With increasing temperature, the sediments might be lost in sediment loads in torrents and rivers, debris flows and rock falls. It can destroy bridges and trekking trails of the tourists carrying out mountaineering activities (ICIMOD, 2017). Two studies done so far show the impact of climate change on permafrost (Chahuhan & Thakuri, 2017). Fukui et al. (2007) studied the Lower Limit of Permafrost (LLP) of Khumbu Himal between 1973-2004. The study was done by measuring the ground temperature lapse rate at 50 cm depth. The LLP of 5200–5300m a.s.l in 1973 increased by 100–300m between 1973 and 1991 followed by a stable limit of 5400–550 m a.s.l. over the last decade. The study explains that the climate change impact on Khumbu region is more severe than Tibetan plateau. Another study done by Mayer et al. (2012) in a permafrost change in the Gokyo valley by applying the temperature rise based on the IPCC (Intergovernmental Panel on Climate Change) scenarios in the Perma-map model showed that the LLP would rise by 188 m between 2009 and 2039. These two studies prove that there are some changes going on the permafrost of periglacial environment due to climate change and it will surely cause negative impact on the mountaineering as the instability of permafrost is associated with some natural hazards.

Conclusions and future perspectives

The unique mountain features with rugged terrain make the Himalaya a seamless tourist destination for the mountaineering activities. Mountaineering is a nature-based tourism and has contributed significantly to the economy of Nepal since after it opened its door to climbers from late 1940s; however, the mountaineering activities are potentially impacted by the climate change and threats to the future of this business. The studies have indicated that the Himalaya and its environments are more severely affected by climate change than any other parts of the world. Climate change has given rise to many natural hazards, like snow cover change,
permafrost degradation, glacial lake outburst floods, avalanches, and rock falls. These natural happenings have caused huge impact on the fatalities of the mountaineers, and biological, societal and economic impacts. Though, the technical parts of the mountaineering has advanced, but unpredictable weather have huge number of fatalities among mountaineers. The increase in intensity of one-day rainfall on mountain regions cause slope failures and results in dangerous rock falls and avalanches. Nepal Himalaya is experiencing an increase in the number of glacial lakes and lately snow cover are rapidly decreasing. The glacier lakes are increasing at an alarming rate forming potentially dangerous glacial lakes, which can cause GLOF in the coming years. The Dig Tsho GLOF can be considered as an example how disastrous it can be to the people and the environment. The increase in the LLP of the permafrost in the periglacial environment will trigger rock falls, debris flow, and sediment load will destroy bridges, trails and aesthetics of the mountains. The snow avalanche is also one of the main reasons for the fatalities among mountaineers and cause the loss of trekking trails. The increasing temperature has caused the decrease in the cohesion of the snow and the mass load is discharged in a huge amount destroying everything that comes along the way. So, the climate change will bring about direct and indirect impacts on mountaineering business. The control of climate change hazard is a must for mountaineering. The general approaches can be adapted to address the climate change impacts and ensure the secure mountaineering activities more effectively are summarized here.

- Dry snow can be expected on the route of the climbing and near the summit of peaks. An increasing temperature can decrease the snow cohesion that can trigger the snow avalanches and increase the risk to any human movements during the mountaineering activities. So careful considerations should be applied while summiting those peaks;
- Avalanche prone zones in the high mountain slopes must be avoided to be used as a trail;
- Snow avalanches are likely to get on release on slopes between 25° and 55° and large avalanches begin to deposit on slopes around 10°, so the camping on the peaks should be planned accordingly to avoid hazards (McClung, 2016);
- Temporal pattern of avalanche deaths is dictated by weather and climate patterns. The proper time of the pre-monsoon and post-monsoon seasons that is more favorable for mountain climbing should be selected in Nepal Himalaya;
- Climbing on the high peaks requires harsh winter climbing experience and avalanche-forecasting ability, training and basic avalanche equipment
(shovel, probe, and transceiver) to ensure a basic level of safety;

- Sensitive weather and avalanche forecasting is required for the safest mountaineering and more meteorological stations should be kept at higher altitudes;
- Mitigation programs are required for the GLOFs for reducing the potential risks;
- Early warning system should be installed in the high hazard areas;
- Hazards and risk assessment of different hazard types require in the trekking trails, tourist destinations of the high mountain areas to avoid the potential hazards and risks;
- More scientific studies on the high mountain processes, glaciers and periglacial regions are required to better understand the climatic impacts.

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