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**Adventure Tourism in Nepal Himalayas:
Environmental Effects**

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Article

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Abstract

Nepal is known as an ideal destination for adventure tourism with its diverse natural attractions and cultural heritage. However, The Nepali Himalayas is highly vulnerable to human influenced change, occurring at local and national scales. The objective of this manuscript is to assess the overall situation of the adventure tourism activities in the Nepali Himalayas and various environmental effects related to it. The methodology will be literature review with an evaluation of the findings. The collected data from publications of the Nepal Ministry of Culture, Tourism and Civil Aviation is organized and analyzed in a descriptive way where some of the data were presented in tabular form using a simple statistical tool. At the end, the manuscript will suggest the establishment of educational programs focused on different target groups and essential policy measures for local stakeholders and governmental bodies to reduce adverse environmental impacts of adventure travels.

Introduction

Adventure tourism is one of the fastest-growing categories of the global tourism industry (ATTA, 2020), as it offers novel experiences to travelers and development opportunities to countries. According to the Adventure Travel Trade Association (ATTA, 2018), adventure tourism

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is a trip that includes at least two of the following components: involvement in physical activity, engagement with the natural environment, and culturally immersive experience that interacts with local residents. Activities incorporating these elements and usually presenting physical challenges provide travelers with “high levels of sensory stimulation” (Muller & Cleaver, 2000).

As the understanding of ‘adventure’ varies depending on how individual travelers like to shape their own experiences, adventure tourism is a broad term. Adventure tourists have their own cultural, physical, and geographic comfort zones. Expectations from outdoor activities, levels of skill, self-sufficiency, likes, dislikes, mental attitude involved, and equipment ownership changes. The confines of adventure tourism are blurred as there is no definitive distinction between adventure and non-adventure. However, the main adventure travel activities are widely accepted such as climbing (mountain/rock/ice), trekking, abseiling, sea kayaking and whitewater kayaking, skiing and snowboarding, caving, ballooning, skydiving and parapenting, mountain biking, diving and snorkeling, surfing and sailboarding, snowmobiling and off-road driving, heliskiing, safaris, rafting, and so on (Buckley, 2006).

In this paper, adventure activities in Nepali tourism industry and their adverse effects on Himalayan environment will be investigated. The paper will begin with an overview of related data showing the growth in tourism sector in the country. The main focus will be on the the adventure activities such as trekking and mountain climbing in Nepali Himalayas. Next, environmental degradation in adventure tourism destinations especially in the mountain regions will be considered through the empirical findings from previous studies in literature. Finally, the manuscript will provide concluding remarks, whereby the benefits of implementing educational programs and policy measures in highly visited adventure travel destinations will be underlined, with respect to its influences on the maintenance of Nepal’s natural heritage.

Adventure tourism in Nepal Himalayas

Nepal represents the most popular destinations for adventure tourism of different types in Asia-Pacific region (Nepal, 2016). Nepal’s tourism sector has experienced exceptional growth in the last years due to its abundant possibilities of attracting tourists with diverse natural and cultural heritage and unique geographical features in the country. Tourism is a resource of relatively easily generated national income as it can be promoted and developed with minimum investment. Additionally, it is the main contributor of foreign income earnings and is a driving force of economic development in Nepal. Furthermore, it increases the employment in many tourism related sectors such as accommodation and transportation. It offers job opportunities in as adventure destinations located among isolated, subsistence populations and

improves the living standard of residents. With adventure travel being fundamental for Nepal's economic development, the Nepalese government upgraded its adventure travel objectives recently.

Adventure tourism is going to remain popular as long as human body creates adrenaline. There are around 100 some various kind of applicable adventure tourism activities around the globe. Since there is always room for improvements, on one hand we can improve the varieties on the other hand we can extend the sharing age group. Under the light of technical advancements and innovative approaches to the subject we can keep adventure tourism always up-to-date. In the case of Nepal, there are only a few adventures activities in mind although there are more than a dozen such activities are available for whole family with various age group and gender.

Nepal reached one million tourists arrivals in 2018 and maintained similar level of tourist attraction in 2019 (Ministry of Culture, Tourism and Civil Aviation 2020). The number of tourist arrivals and its growth rate are presented in the Table 1. The downturn in 2015 was due to Gorkha Earthquake and unofficial barrier along the Nepal-India border. However, numbers soon returned to their previous levels which imply growth prospects of tourism industry in the country.

Table 1: Tourist arrival and average length of stay, 1994-2019

Year	Total		By air		By Land		Average Length of Stay
	Number	Growth Rate (%)	Number	Percent	Number	Percent	
1994	326,531	11.2	289,381	88.6	37,150	11.4	10.00
1995	363,395	11.3	325,035	89.4	38,360	10.6	11.27
1996	393,613	8.3	343,246	87.2	50,367	12.8	13.50
1997	421,857	7.2	371,145	88.0	50,712	12	10.49
1998	463,684	9.9	398,008	85.8	65,676	14.2	10.76
1999	491,504	6.0	421,243	85.7	70,261	14.3	12.28
2000	463,646	-5.7	376,914	81.3	86,732	18.7	11.88
2001	361,237	-22.1	299,514	82.9	61,723	17.1	11.93
2002	275,468	-23.7	218,66	79.4	56,808	20.6	7.92
2003	338,132	22.7	275,438	81.5	62,694	18.5	9.60

Year	Total		By air		By Land		Average Length of Stay
	Number	Growth Rate (%)	Number	Percent	Number	Percent	
2004	385,297	13.9	297,335	77.2	87,962	22.8	13.51
2005	375,398	-2.6	277,346	73.9	98,052	26.1	9.09
2006	383,926	2.3	283,819	73.9	100,107	26.1	10.20
2007	526,705	37.2	360,713	68.5	165,992	31.5	11.96
2008	500,277	-5.0	374,661	74.9	125,616	25.1	11.78
2009	509,956	1.9	379,322	74.4	130,634	25.6	11.32
2010	602,867	18.2	448,8	74.4	154,067	25.6	12.67
2011	736,215	22.1	545,221	74.1	190,994	25.9	13.12
2012	803,092	9.1	598,258	74.5	204,834	25.5	12.16
2013	797,616	-0.7	594,848	74.6	202,768	25.4	12.60
2014	790,118	-0.9	585,981	74.2	204,137	25.8	12.44
2015	538,970	-32	407,412	75.6	131,558	24.4	13.16
2016	753,002	40	572,563	76	180,439	24	13.4
2017	940,218	25	760,577	81	179,641	19	12.6
2018	1,173,072	25	969,287	82.63	203,785	17.37	12.4
2019	1,197,191	2.05	995,884	83.19	201,307	16.81	12.7

Source: Ministry of Culture, Tourism and Civil Aviation (2020)

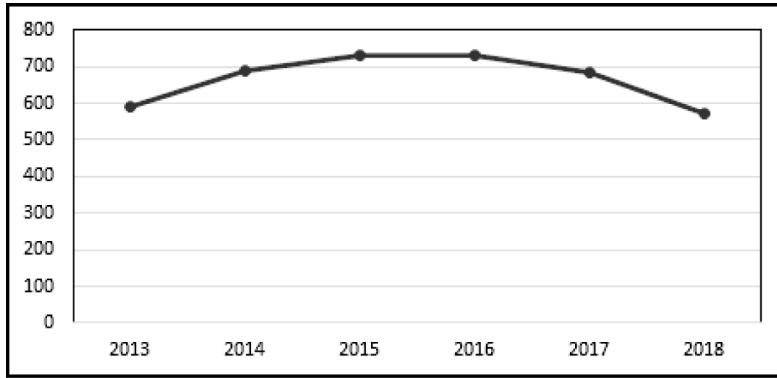
Nepal earned foreign currency equivalent to NRs 75,808.56 million from tourism sector in 2018/19. Gross foreign currency earnings through this sector amount to NRs 42,736.91 million in the first six months of current fiscal year 2019/20 (Table 2). Annual foreign currency earned per person shows a decreasing pattern after the year 2015 with the continual increase in number of tourist arrivals in Nepal (Figure 1). The sudden drop in the number of tourist arrival in 2015 was due to the negative effect of the earthquake and the obstruction at the Nepal-India border.

Table 2: Gross foreign exchange earnings from tourism by fiscal year, 2000/2001-2019/2020

Fiscal Year	Total Earnings (Net Received)			%Change in US\$
	NRs.(million)	Annual Average Exchange Rate	US\$ (million)	
2003 / 2004	18,147.4	-	245.9	62.9
2004 / 2005	10,464.0	71.76	145.2	-41.0
2005 / 2006	9,556.0	72.03	132.1	-9.0
2006 / 2007	10,125.0	70.19	143.6	-8.7
2007 / 2008	18,653.0	64.72	286.9	99.7
2008 / 2009	27,960.0	76.58	363.7	26.8
2009 / 2010	28,139.0	74.24	377.5	3.8
2010 / 2011	24,611.0	72.07	340.4	-9.8
2011 / 2012	30,703.8	81.02	379.0	11.3
2012 / 2013	34,210.6	87.96	388.9	2.6
2013 / 2014	46,374.9	98.21	472.2	21.4
2014 / 2015	53,428.8	99.49	544.1	15.2
2015 / 2016	41,765.4	106.35	392.7	-27.8
2016 / 2017	58,526.9	106.21	551.0	40.3
2017 / 2018	67,094.6	104.37	642.9	16.7
2018 / 2019	75,808.56		670.6	4.3
2019 / 2020*	42,736.91		375.7	
* 1st 6 month				

Source: Ministry of Culture, Tourism and Civil Aviation (2020)

Figure 1: Annual foreign exchange earnings per person, 2013-2018



Source: Own construction

Nepal’s adventure tourism market is dominated by land-based adventure activities, such as mountaineering subdivided into trekking and mountain climbing (Beedie and Hudson, 2003). The numbers representing trekking and mountaineering are illustrated in Table 3. The projection of earthquake in the numbers is evident again. The demand for trekking and mountaineering substantially drops in 2015 when climbing bans are prevailing, then continually surges as the tourism industry recovered.

Apart of mountaineering, other popular and established adventure tourism activities includes white water rafting, air adventure sports mainly represented by paragliding and skydiving (Wengel, 2019). Other established activities are kayaking and Jungle safaris (Aryal, 2019). Skiing and mountain biking, canyoning and stand-up-paddle boarding, as well as zip-flying and bungee jumping are other emerging adventure activities in Nepal (Wengel, 2020).

Table 3: Annual trekking and mountaineering numbers for Nepal, 2006-2019

Year	Trekking& mountaineering	%	Total
2006	66,931	12.7	383,926
2007	101,320	19.2	526,705
2008	104,822	21.0	500,277
2009	132,929	26.1	509,956
2010	70,218	11.6	602,867
2011	86,260	11.7	736,215

Year	Trekking& mountaineering	%	Total
2012	105,015	13.1	803,092
2013	97,309	12.2	797,616
2014	97,185	12.3	790,118
2015	9,162	1.7	538,970
2016	66,490	8.83	753,002
2017	75,217	8.0	940,218
2018	187,692	16.0	1,173,072
2019	197,786	16.52	1,197,191

Source: Ministry of Culture, Tourism and Civil Aviation (2020)

Environmental effects of adventure tourism

There are several tourism-induced environmental problems in the Nepali Himalayas. The large influx of visitors in some mountain destinations has resulted in the accumulation of garbage left behind by trekkers and mountaneers including food cans and wrappers, bottles, empty oxygen cylinders, spent batteries and ropes. These materials increases stress on environment by posing disposal problems. Trail erosion caused by increased trekking traffic is another adverse impact of adventure travel activities. Rapid population growth and the consequent exploitation of resources further contributes to destruction of forests and expansion of agricultural lands.

Trail deterioration

Various studies have shown that physical impacts on hiking trails caused by trekking are tread widening, incision, loss of vegetation cover multiple treads, muddiness, soil erosion on the tread surface, soil compaction, proliferation of informal trails, and the results of various depreciative behaviors such as littering and cutting of trail switchbacks (Nepal, 2004). Biological impacts contain vegetation trampling and degradation, forest thinning, decrease in biodiversity, wildlife disturbance, habitat fragmentation and introduction of exotic species. Furthermore, disposal of waste along the trail may pollute surface and groundwater. Formal and informal recreational trails contributes to forest degradation in urban areas and impacts tree structure. Therefore, management of trail networks especially in areas of high conservation value is highly important (Pickering & Norman, 2017; Ballantyne & Pickering 2015).

Trail impact features are roughly grouped into five categories consisting of vertical, lateral, structural, wetness-related, and others. There is a strong correlation between

trail degradation and tourist use. Apart from intensive use by tourists, there are other factors causing trail degradation such as altitude, gradient, vegetation, soils, landslides, and high relief, as seen by the degradation in lesser used trails (Nepal & Nepal, 2004).

Mutana and Mukwada (2018) concluded that decisions about trail maintenance should consider which sections are crowded, which are in a critical state of damage, and the site-specific problems. This involves effective policies aiming for tourist and trail management. For example, when tourist management policies control number of visitors and mobility within the protected area, alternatives for opening new routes or closing crowded routes should be explored.

Solid waste accumulation

The generation and accumulation of solid waste is one of the major threat to environment in mountain destinations which attracts high number of tourists. Garbage including plastics, glass bottles, tins, foil, batteries, tents by trekkers and climbers was so substantial that Bishop (1988) called the Nepalese Himalayas the 'highest junkyard on earth'. The study of Lama and Sherpa (1994) estimated that an average trekking group of fifteen people generated about 15 kg of non-biodegradable, non-flammable waste in ten trekking days.

There are other factors causing the disposal of human waste directly into rivers and streams such as the water pollution from toilets that are located close to streams and drinking water sources, the use of chemical soaps, and the washing of dishes and clothes (Huddart & Stott, 2020). A study found that disposal of glass, metal, and plastic is not carried out correctly in the Sagarmatha National Park (Manfredi et al, 2010). Particularly, floods in the rainy season increase the possibility of water contamination by burning or disposal in open dumps near the watercourses.

The accumulation of solid waste in mountainous regions exacerbated by inadequate disposal sites, waste management authorities, and infrastructure to contain waste produced by expedition travelers in these areas. Environmental impacts of the waste disposal along the trails are mostly undermined by visitors and locals. Large piles of waste remains unnoticed by the average tourist, as it is often hidden in holes around the trails or base camps (Kaseva & Moirana, 2010; Kuniyal, 2002).

Waste practices, environmental concern and knowledge sociodemographic and travel-related characteristics may differ among travelers. In improving awareness about waste issues, implementing educational programmes with specific focus on different tourist types may be more sustainable (Poudel and Nyaupane, 2017). Studies have shown that structured educational programme could lead tourist behaviors to become more environmentally responsible (Orams, 1997). Thus, educational measures may play a fundamental role in advancing the the overall waste situation in

sensitive mountain areas by informing travelers on the consequences of their waste disposal practices.

Cullen (1986) proposed several rules to be implemented by authorities to deal with the expedition garbage pollution. These are the establishment of disposal method for each site, continuing checks on garbage disposal according to prespecified disposal time, the inclusion of a refundable levy for ecological protection in climbing payments, authorization to headquarters staff for enforcing regulations.

Concluding remarks

Unique natural features, including the highest peak in the world, biodiversity, and natural landscapes, have made the Nepali Himalayas a major tourist destination for adventure activities. Thus, the tourism industry has a significant role in ameliorating economic conditions and in capturing a big share in national revenue. However, major growth in tourist arrivals in destinations of adventure tourism has imposed environmental risks in these areas. This paper intends to examine the impacts of adventure tourism in Nepali Himalayas and provides a regional perspective on assessing the management of trail erosion and solid waste in terms of policy implications in protected areas of Nepal.

There is a lack of awareness among adventure tourists about the potential burden of their waste disposal attitudes to nature in mountains and trekking trails. Tourism industry leaders and governmental bodies have begun to address issues concerning the adverse impacts of the tourism sector. Furthermore, relevant policies have been developed by national governments to offset the damages associated with adventure activities. Yet, implementation of these policies has not been successful in reducing given the complexities involved. For accurately determining the effects of tourism activities a more systematic and experimental impact assessment on various types of landforms is needed. Further research on the issue should be conducted in order to minimize damages to the ecosystem. The educational programs and policy actions need to be considered as a collaborative effort between various players in the tourism industry. Government agencies, tourism operators, and local people must cooperate in protecting the ecosystem to achieve a sustainable environment condition in Nepali Himalayas.

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