

ADVENTURE TOURISM SPECTRUM, ENVIRONMENT AND LIVELIHOOD OPPORTUNITIES: A CASE STUDY IN SOUTHERN SINGALILA TREKKING CORRIDOR OF INDO-NEPAL BORDER

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Abstract: Promotion of adventure tourism is debated for its impacts on environmental quality. For minimization of impacts, soft categories of adventure tourism are preferred worldwide with geotourism packages to serve the adventure seekers. It is widely appreciated as a strategy for geoconservation and sustainable development. Southern Singalila range in the border of India and Nepal is famous for trekkers as well as for its unique Land Rover tourism. This paper is an attempt to evaluate the perception of host population on tourism activities with reference to livelihood opportunities and environmental impacts. Both qualitative and quantitative methods have been adopted for the analysis with application of GIS in mapping. The scope of introduction of geotourism in adventure tourism spectrum has been evaluated from sustainability perspectives.

Key words: Land Rover, Trekker, Geotourism, Geoconservations, Sustainability

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INTRODUCTION

Adventure tourism is the activity based tourism, which incorporates risk of different dimensions. Level of risk and uncertainty are the keys motivating adventure seekers to opt a destination of activity tourism (Weber, 2001). The origin of adventure tourism could be traced back in the urge of satisfying ego aspects of the consumers. This is why adventure tourism is categorized as ego tourism from travel motivation perspective by the sociologists working in the field of tourism as well as in the researches of the other behavioral scientists. Ego tourism is a function of serious leisure in which the tourists have

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opportunities to satisfy their ego by expressing their abilities, fulfilment of their pursuit and identify themselves as unique human beings (Stebbins, 1982). In such tourism, ego of consumers are of prime importance while the attractions are just the objects for their ego satisfaction. The model put forwarded by Maslow (1970) may be conceived as the base for explanation of the ego centricity in adventure tourism. In Maslow proposed ordered hierarchy of human needs (Table 1), motivation for adventure tourism could be identified in level 5 as one of the highest level personal motives.

Table 1. Maslow Model Explaining Hierarchal Level of Adventure Tourism (Data source: Triangulation from a number of literatures studied: Maslow, 1970; Kaplan, 1975; Stebbins, 1982; Swarbrooke et al., 2003)

Level	Need (after Maslow)	Travel and Tourism Paradigm
I	Physiological:hunger, rest thrist and shelter	Travel for body comfort
II	Safety and security	Recreational tourism paradigm
III	Belonging and love: sociological	Travel and social relationship
IV	Esteem: cultural	Travel for outstanding experiences
V	Personal self fulfilment	Adventure tourism paradigm

The flow of tourists from core countries of Europe and North America to the peripheral countries depends on the appeal of a variety of attractions which are considerably unique (Pearce, 1979). Tourism is considered to be a practical means for development for the periphery if it is community based and responsible (Atanga, 2019).

A number of new terms have been derived in the tourism marketing to explain the motivations, acting as a pull factor for the visitors from core to periphery. The wilderness of the National park (Figure 1) and to view the world renowned snow peaks (Figure 2) are among such attractions that draw the adventure tourists in peripheral region for serious leisure. It is noteworthy to mention that serious leisure (Hamilton-Smith, 1993) is a term that is intimately related with both adventure tourism and geotourism. This is because neither adventure tourism nor geotourism are recreation oriented mass tourism products. In both the cases, the motivation of travel is to exprience and learn from the dynamics of natural systems. Casual leisure is the opposite pole of serious leisure in the leisure continuum (Kaplan, 1975) and adventure tourism and geotourism could be identified among the serious leisure oriented activities. The trekking in the study region initiates from Manebhanjyang, a market town offering facilities and amenities. In the initial segment from Manebhanjyang to Chitrey (about 3 kilometers), the physical capabilities of the adventure seekers have been somewhat tested on exposure to a steep slope of about 30° on an average. On the way from Chitrey, the trekkers experience a number of minor landslides which may raise their interest on origin and evolution of geomorphosites.

After a night stay at adventure tourism camp of Tonglu or Tumling (about 9 kilometer from Chitrey), they enter in a geotourism paradise on the next morning the glimpse of which have been presented in Figure 2, 3, 4, 5 and 6. The trekking destination Sandakaphu is an interesting domal shapped structure subjected to conspicuous physical weathering and climbing on the top (3636 meter from m.s.l) is an outstanding adventure tourism experience for a geotourist. Thus there is scope of symbiosis between adventure tourism and geotourism in the study region. Geotourism sites may provide adventure tourists a number of appreciated destinations and thereby being responsible for a boost in the soft adventure tourism sector. This is why in places like the Southern Singalila trekking corridor where adventure tourism is supported and supplemented by geotourism attractions, the mountain tourism industry has reached to its climax.

Considered to be an emerging subset of tourism (Christiansen, 1990), adventure tourism incorporates group of adventures, classified as the hard and soft (Beedie &

Hudson, 2003). The more adventurous is the type of activities offered by the entrepreneurs, the tourism concerned is categorised as hard subjected to the level of risk intensities (Dar, 2014). Hard and soft are actually the two relative terms that constitute the opposite sides of a continuum of adventure tourism spectrum depending upon the application of risk theory (Gyimothy & Mykletun, 2004). It is from the beginning of the 21st century, adventure tourism has been recognized as the promising sector of global tourism industry (Swarbrooke et al., 2003). Being classified as an activity based tourism, adventure tourism may be land based, water borne or air based (Page et al., 2005). Southern Singalila range (Figure 3) is one of the unexplored paradises for land based adventure tourism. It offers the scope of paragliding, day trekking, nature walk and rock climbing along with an uncommon adventure tourism product named Land Rover tourism. With the research questions on impact of adventure tourism development on host population, the study was initiated. This paper attempts to address the research gap on the scope of symbiosis between geotourism and trekking for the use of planners and entrepreneurs concerned on sustainability issues.



Figure 1. Entry gate of Singalila National Park



Figure 2. View of Kanchendghongha Series of snow peaks from trek route

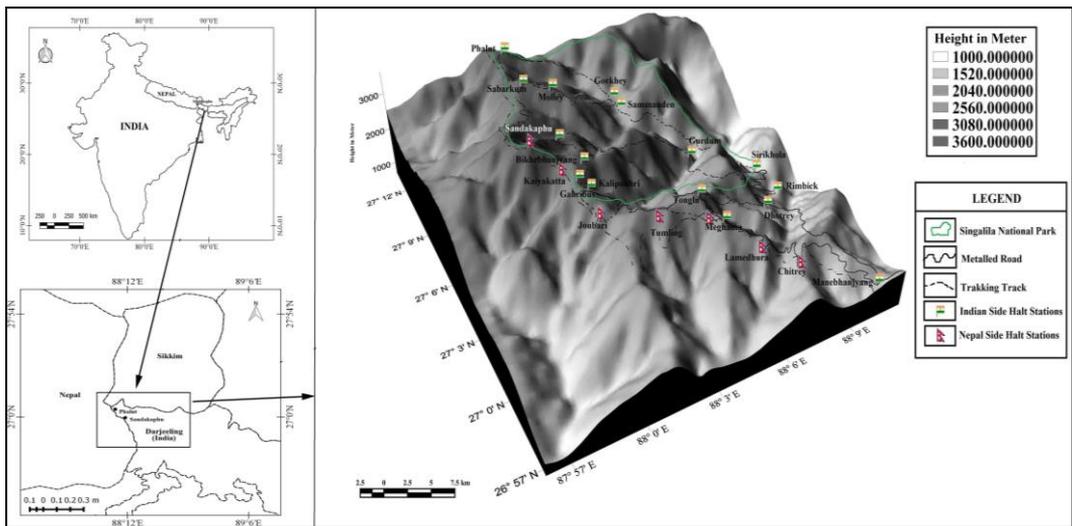


Figure 3. Southern Singalila range accommodating a trekking corridor

THE STUDY AREA

The topography of the trek route is the outcome of prolonged denudation under polycyclic geomorphological processes, which makes it a geotourism paradise. Past effects of glacial cycle are also present on existing landforms. The landscape is subjected to the operation of mass wasting processes resulting into regular landslides and avalanches during monsoon as the water pressure accumulated over the surface causes sudden collapse, often produces casualties of considerable dimensions. The running water is the most active agent of erosion and flash flood is considered as the dominant triggering agent of severe geomorphic hazards (Kapur, 2010). Depending on surface gradient, the discharge rate varies from place to place all over the southern Singalila range.

The previous planation surface is prominent on the trek route from Sandakaphu to Phalut, the uppermost layer of which is full of debris. In Holocene period the region experienced the last uplift and since then the topography is subjected to continuous sub-aerial denudation. This is why conspicuous waterfalls are absent in the trek route and only a few cascades (Figure 4) that become active in rainy season manifest the geomorphic and tectonic history of the landscape. A number of faults and joints represents the past tectonics activities that is a characteristics of Himalayan geology (Wadia, 1963). At Kalipokhri, one of such fault line is prominent at the vicinity of a lake (Figure 5) at the head of Lodhma Khola, which is regarded as a sacred site for both the local Hindus and Buddhists. The community perceives the tectonic forces as a magical force which is responsible for all creation and destructions.



Figure 4. Cascade on Rammam River



Figure 5. Fault guided lake at Kalipokhri

A nappe structure at Kaiyakatta (Figure 6) is represented by the bedding planes composed of hard, compact rock masses. Down slope movements of debris from convex summit segment of slope have been subjected to gravitational collapse while tectonic effect on landforms are very much prominent in transverse fault areas. The planation surface elevated by tectonic movements experienced a series of unwrapping and thrusting. Mechanical weathering is dominant along with different types of mass movements (Ollier, 1979) to sculpture the geotourism landscape. The word Singalila has its origin in Tibetan word *Singley-La* which means a tree covered mountain pass (Lama, 2009). The region is inhabited by people of diverse ethnicities like Lepcha Gorkha, Sherpas, Tibetans, Rais, Tamangs, Chettris, Bahuns, Sunwars, Limbus, Gurungs and Bhujels belonging to Mongloied racial stock. An altitude specific trend (Table 2) in the distribution of these communities bears direct relationship with literacy and employment status. Since Manebhangyang is the Land Rover hub, Rai and Chetry communities who are more literate

and educated being found engaged in Land Rover (Figure 7) oriented tourism services while the other communities with less literacy and education level, who are settled below 2000 meters of altitude are engaged mostly in agricultural and small business activities.

Lepchas are agriculturists by tradition and they used to practice agriculture irrespective of altitude where they have been settled. In settlements along the trek route, local people are serving as hoteliers and shop owners to cater the tourists and trekkers. The communities found in between 2000-3000 meters are mostly the practionners of animal husbandry with horticulture while the communities found above 3000 meters are largely dependent on trekkers and tourists for their livelihood at present. Tourism acts as the agent of social cohesion and community development (Cappucci, 2016) and it is very much prominent in the high altitudinal areas of southern Singalila trekking corridor.



Figure 6. A nappe structure at Kaiyakatta



Figure 7. Land Rover, the moving heritage

Table 2. Relation of relief with ethnography (Data source: Ethnographic survey during field visit 2018-2019)

Height in Meters	Name of Villages	Dominant Communities
Below 2000	Manebhangyang, Chitrey, Sirikhola, Gurdum	Rai, Lepcha, Gorkha, Chettris, Limbus
2000-3000	Lamedhura, Tumling Bikhebhanyang, Gorkhey Kalipokhri	Gorkha, Nepali, Tibatans, Lepcha, Tamang
Above 3000	Sandakaphu, Phalut, Sabarkum	Gorkha, Nepali, Tibatans, Tamang, Gurungs.

OBJECTIVE OF THE STUDY

1. To study the status of existing trekking and Land Rover safari in the study region.
2. To investigate the man nature interface in relation to the promotion of adventure tourism in Singalila forest villages.
3. To explore the potential of newer types of adventure tourism combining with sustainable geotourism which would be suitable for the habitat, economy and society.

MATERIAL AND METHODS

According to 2011 census the total population of Singalila forest (India side) was 1632. This population was distributed among the eight villages of varying population sizes. For conducting focus group discussions (FGD), the participants have been stratified with respect to age, literacy and education level, occupational status and stakeholder status. The total sample size is 164, i.e. 10 percent of total population. Focus group discussion has been adopted as one of the data generation techniques availing the

opportunity of interviewing several respondents from the community systematically and simultaneously (Babbie, 2011). Rooted in market research, FGD is a structured grouped process conducted for the purpose of obtaining detail information on specific topic, product or issue (Zarinath & Siti, 2009). As FGD is widely recognized as a tool for qualitative field research, it has been undertaken in understanding the perception of the community on various tourism related issues, which are further dealt with the application of statistical techniques like Chi-square test. For the present study, the FGD is conducted in India side villages during lean season when the stakeholders of hotels and homestays have provided sufficient time on their leisure (gathering 8-12 in number) and discussed on several issues put forwarded for their perusal. A number of new sites and scope of paradigm shift in the field of adventure tourism and its relation with disasters are among the outcomes of such discussions. The livelihood status of the villagers was taken into consideration and adventure tourism is appraised for its scope of providing new employments and fresh income. The conflict of interests among the stakeholders of trekking and Land Rover tourism activities is an interesting arena in focus group discussion. The discrimination between India side and Nepal side villages on adventure tourism operations has been taken into special consideration in view of the difference in environmental laws and guidelines of these two sovereign countries. The benefits from Land Rover tourism for the villagers of both the countries have been compared with a view to the fact that a number of the Land Rovers are operated by the Nepalees and they used to accommodate their passengers for night stay in Nepal side villages.

From theoretical standpoint, there is no doubt that the study region is vulnerable to various geomorphic hazards and disasters. The anthropogenic factors relating to various tourism operations are vital in the context of investigating the dimensions of environmental impacts. A number of human interferences for settlement and adventure tourism development have triggered the man-induced denudation in the region which comes in its threshold with the addition of bituminous road in the cultural landscape facilitating the Land Rover tourism. The effort to build concrete walls across the steep slopes may be a temporary solution but disaster in the long run could not be prevented. Under such circumstance, the level of community understanding on the anthropogenic causes of hazards and disasters is considered as the yardstick and interviews have been conducted to assess the awareness and preparedness to combat the causalities relating to adventure tourism promotion. Literacy level of the population has been given prime importance to identify the target group on developing preparedness. The changing literacy (Figure 8) and employment status (Figure 9) of the Singalila forest people during the last two decades are vital in the context of implementing awareness and preparedness programmes. The focus groups have been constituted deliberately ensuring the participation of porter and guides to understand the level of preparedness if any disaster takes place.

Further an open ended questionnaire is used for the household survey in both India and Nepal villages to detect the changing way of life and perception of the impacts on the development of trekking as well as Land Rover tourism. In consideration with the introduction of both hard and soft adventure tourism, the issues concerning ecological and economic sustainabilities have been identified through FGDs. From Figure 9, it is evident that despite the trekking and Land Rover tourism activities of the region, unemployment has increased between 2001 and 2011. Diversification of adventure tourism activities with introduction of newer types of adventure tourism products may be one of its remedies.

A number of recommendations have been derived in FGDs in this context. It also provides the platform for community involvement in suggesting geoconversional measures to combat the environmental impacts arising from adventure tourism development.

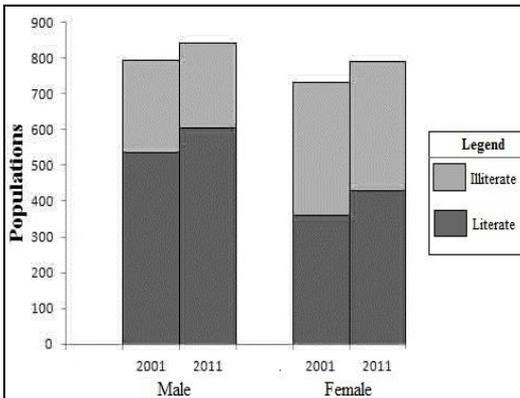


Figure 8. Literacy status of Singalila Forest Villages (Source: Census data of 2001 and 2011)

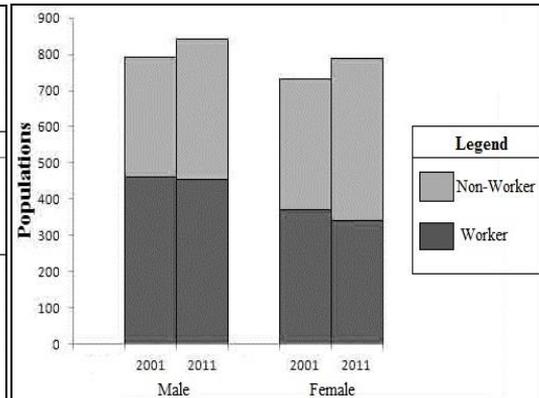


Figure 9. Employment status of Singalila Forest Villages (Source: Census data of 2001 and 2011)

RESULTS DISCUSSIONS

Sandakaphu is famous for the opportunity of Land Rover adventure, which is not available elsewhere in India. Land Rover is a six seater heritage vehicle which is running since British period prior to independence of India on this route as the lifeline of the communities settled in high altitude areas. Field survey reveals that 43 Land Rovers are presently registered in the office of Land Rover Association of Sandakaphu which has been affiliated to operate the Land Rover adventure in the region, which is an international border area between India and Nepal. The road at present is reconstructed by SSB (*Shastra Seema Bal*), a military organization of the Republic of India guarding Indo-Nepal border. Due to Indo-Nepal historical friendship treaty of 1950, the citizens of both the countries can move and stay in the territory of both the countries without having formal visa and passport for earning their livelihoods. It is revealed that though the office of the Land Rover Association is located in India side, the maximum number of drivers being deputed by this organization are the Nepalese. Among the 43 Land Rovers registered, 26 Land Rovers are however owned by the Indian citizens.

Table 3. Accommodation infrastructure for trekkers and travelers (Data source: Field Survey, 2018-2019)

Indian Side		Nepal Side	
Halt Stations	No. of Hotel (Total Beds)	Halt Stations	No. of Hotel (Total Beds)
Manebhangyang	7(350)	Chitrey	1(22)
Meghma	1 (32)	Lamedhura	3 (33)
Tonglu	2 (75)	Meghama	4 (127)
Gahribus	1 (48)	Tumling	7 (293)
Bikhebhanyang	2 (35)	Gahribus	3 (112)
Sandakaphu	2 (146)	Kaiyakatta	2 (48)
Molley	1 (50)	Kalipokhri	8 (250)
Sabarkum	1(14)	Sandakaphu	2 (200)
Phalut	1 (70)		
Gorkhey	5 (150)		
Sammanden	2 (103)		
Rammam	4 (100)		
Gurdum	1(27)		
SiriKhola	6(200)		
Total	36(1400)	Total	30(1085)

The normal tendency of the vehicles operated by the Nepalese drivers is to accommodate its passengers in Nepal side villages on route and under such circumference the earning from Land Rover tourism benefits Nepal more than India instead India has to bear the road maintenance cost along with the all adverse environmental impacts of Land Rover tourism against an earnings of Rs 100 in Indian currency per Land Rover trip that has been collected by forest office of Singalila National Park at Manebhanjyang. Table 3 represents the distribution of accommodation units in both Nepal and Indian villages (Figure 10) to reveal the division of benefits in this context.

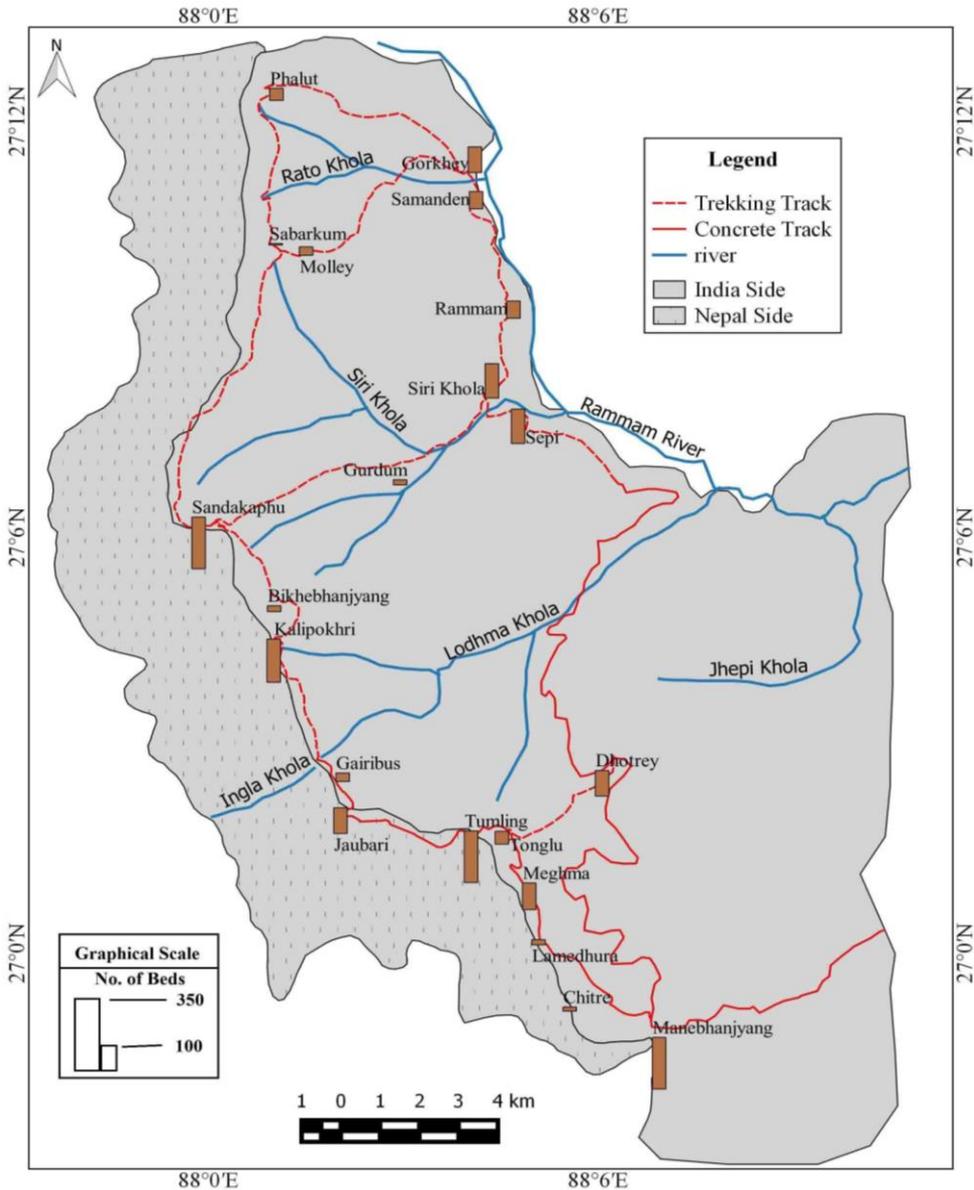


Figure 10. Distribution of accommodation facilities in Southern Singalila trekking corridor

A number of relevant issues have been put forwarded for the perception survey of the host population (Table 4), the response of which are subjected to Chi-Square test on 5% level of agreement while conducting the FGDs. The total population in Singalila forest (India part) according to 2011 census was 1632, among which 10% has been sampled and total 164 (male-114 female-50) population was involved in FGDs conducted in different Indian villages during 2018-19 (from October to March) on the trek route. The first objective was to study whether there is any significant level of difference between different age groups regarding the perception of impacts in the context of trekking and tourism development. A general hypothesis is that there is conflict between young and aged population in welcoming the impact of tourism activities. The Chi-square test reveals that this hypothesis would not be accepted for Southern Singalila range trekking route. There found no conflict between different age groups on this issue as the null hypothesis is accepted (Table 4). The next popular hypothesis is that tourism development is welcomed by the section of the host population who are educated and skilled to serve the visitors while the illiterate and little educated section of the society could not relate themselves with the expansion of this sector from the standpoint of obtaining benefits. This hypothesis is also rejected for the study area on 5% significance level as the null hypothesis is accepted (Table 4).

Further the responses of stakeholders and non-stakeholders on trekking–tourism benefits have been taken into consideration with hypothesis that there is no significant difference between workers in tourism sector and those who earn livelihood without any connection with tourism while welcoming the tourism benefits. Finally the issues on conflict between the interest of trekking entrepreneurs and Land Rover operators in the same route have been dealt with. The hypothesis that there is no conflict between trekking and Land-Rover tourism in the study region has been rejected.

Table 4. Perception analysis of the stakeholders (Data source: by the authors, field survey, 2018-2019)

Relevant Issues	Trekking and Tourism Development			Chi-Square Value	Remarks
	Agree (%)	Disagree (%)	Unsure (%)		
Level of welcoming tourism (n=164)					
Young (18-30 years)	18.90%	16.46%		2.93	Accepted
Mature (30-60years)	19.51%	28.04%	-		
Old (above 60 years)	4.87%	12.19%	-		
Welcoming tourism in relation to literacy and education (n=164)					
Graduated or above	9.75%	4.87%	9.75(%)	2.6406	Accepted
Educated upto school level	13.41%	10.36%	8.53(%)		
Illiterate	16.46%	12.19%	14.63(%)		
Agreement status on increase in quality of life among stakeholder and non-stakeholder (n=164)					
Employed in tourism sector	21.34%	11.58%	10.36(%)	3.29	Accepted
Other Workers	18.29%	18.90%	19.51(%)		
Land-Rover Tourism affecting trekking (n=164)					
Land-Rover stakeholders	12.20%	14.63%	6.10%	10.89	Rejected
Trekking stakeholders	9.75%	37.80%	19.52%		

Community involvement is a vital aspect in managing resource and infrastructure for sustainable geotourism implementation (Hakim & Soemarno, 2017). Availability of a number of geosites within a vulnerable geographical area generates possible threats for disasters, particularly landslides that could be addressed by adopting site management techniques involving the community under the umbrella of sustainable tourism

(Chakrabarty & Mandal, 2018). A questionnaire survey has been conducted to evaluate the positive and negative impacts of tourism incorporating the Nepal side villages along with the Indian villages which were previously subjected to FGDs. The responses have been recorded on a five point scale ranging from strongly agree (1) to strongly disagree (5) with emphasis on four positive and four negative issues (Table 5).

Maximum agreement on positive impact of tourism is derived on infrastructural development (46.34% strongly agreed while 23.78% agreed, i.e 70.12% in total) which is the direct effect of the metallization of road by SSB (*Shastra Sima Bal*), the Indian military organization deputed for Indo-Nepal border. More than half of the total respondents have been agreed on the positive impact of tourism on local economy. A steady revival of local culture particularly in cuisine, dance and music performances is also noticed. It is because the indigenous items presented for the satisfaction of visitors have been appreciated by the trekkers and travelers, particularly the foreigners.

However perception level in understanding such revival among the host population sampled is less (49.75%), which represents a need for an awareness campaign for developing momentum in this respect. Only 35.97% of the respondents are found agreed on positive change in quality of life instead they have accepted the benefits from infrastructure and economic development on their way of life. It is because that the level of expectation is very much increased among the host population, which is nothing but the direct impact of the demonstration effects arising from the interaction with trekkers and travelers, who are mostly the representatives of affluent urban societies in the poor mountain villages of southern Singalila trekking corridor.

Table 5. Perception of the host population on impact of tourism activities
(Data source: Prepared by the authors, field survey, 2018-2019)

Tourism and its Impact	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
Infrastructural development of the area	46.34%	23.78%	15.24%	12.19%	2.43%
Increase of income and employment opportunities	31.09%	22.56%	24.39%	18.29%	3.66%
Revival of local culture	23.17%	36.58	12.80%	20.73%	6.70%
Positive change in the quality of Life	19.51%	16.46%	28.04%	25.60%	10.36%
Traffic congestion and vehicular pollution	5.48%	7.31%	12.19%	53.04%	21.95%
Conflict between trekking and Land Rover tourism operations	10.97%	23.17%	32.92%	24.39%	8.53%
Negative impact on forest and wildlife ecology	19.51%	35.36%	22.56%	12.19%	10.36%
Carrying capacity of the villages affected from accommodating tourists	10.97%	8.54%	23.17%	43.90%	7.31%

To study the negative effect of adventure tourism, the issues concerning environmental and economic sustainabilities have been taken into special consideration. Though there are a number of scholarly research on impact of trekking and tourism on forest and wildlife ecology, there is little awareness among the stakeholders in this context, as revealed from the perception survey. The researchers are the witness of illegal burning of forest woods in the fire places of the homestay units, who admit that more is the number of visitors, more is the requirement of forest cutting to satisfy them. Though there is surveillance from forest department, they know how to bypass the laws of the land utilizing their own connections and strategies. Though the Chi-square test accepts Land Rover-trekking conflict, only 32.22% respondents during questionnaire survey respondent on its negativity. It is not only for

the incorporation of Nepal side respondents who are much more benefited from Land Rover tourism but also represents the utility of adopting FGD as a methodology to analyze the ground realities in depth not being satisfied with the questionnaire survey outcomes. The apathy phase of host guest relationship of Doxey model (1975) prevails which represents a commercial relation between travelers and the villagers.

The benefits from such relation are among the factors responsible for their disagreement on carrying capacity problems. Carrying capacity assessment is essential to enumerate the stress on environment (Chakrabarty & Sadhukhan, 2018). A previous field study conducted during peak season reveals that the carrying capacity is very much affected and the situation of Sandakaphu, the destination settlement of the trek is alarming (Sadhukhan & Chakrabarty, 2018). The enormous pressure on its habitat is responsible for the extensive nature of mass wasting in the form of slumping and sliding with depletion of most of the local springs since the perennial nature of water table is affected (Samanta, 2018). However the host population is still not annoyed due to commercial attainment from trekkers and travelers. To combat such negative consequences from tourism, a policy of rational management with respect to environment may be ideal (Marszalek, 2018). There is fortunately, no serious traffic related issues in the area that is reflected from the responses registered on traffic congestion and vehicular pollution. From FGDs and questionnaire surveys a spectrum on the scope of promoting activity based adventure tourism has been derived (Figure 11), which may be very useful for adventure tourism extension in the region.

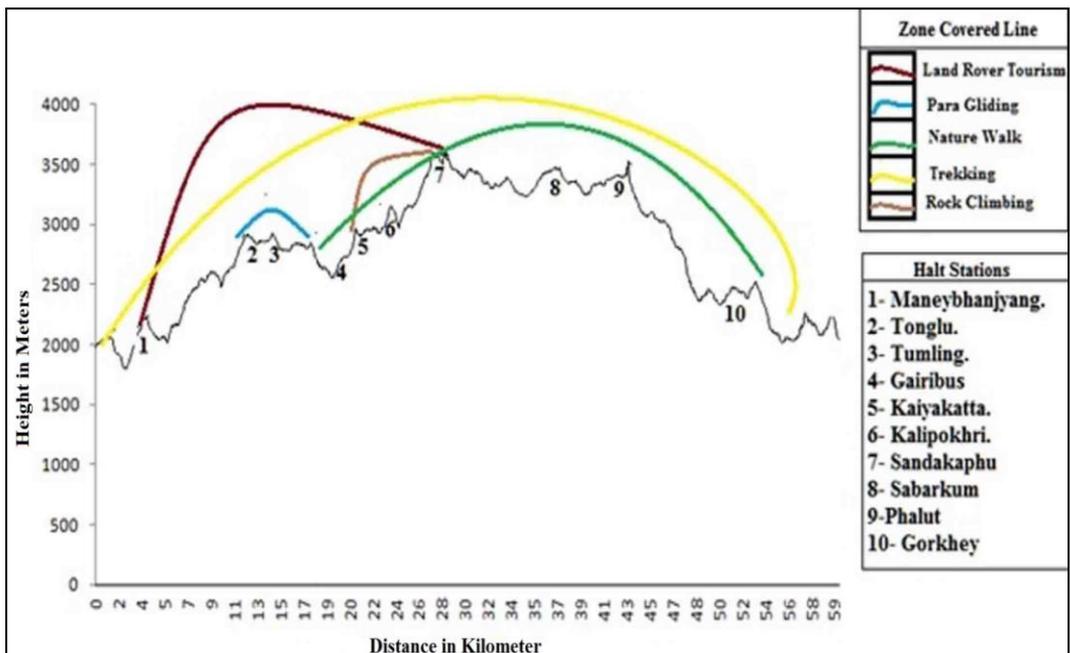


Figure 11. Cognition on adventure tourism spectrum (Source: FGD outcomes)

With such cognitive zonation for the promotion of adventure tourism, the stretches of vulnerable tracks are also identified. The rise from Kaiyakatta to Sandakaphu (Figure 11) is not only the most difficult part of the trek but also most vulnerable from the standpoint of geomorphic hazards. The expert drivers of Land Rover only agree to drive in this phase

only when weather is clear and sunny. The slope gradient between Sandakaphu and Phalut (Figure 11.) is less but due to the nature of rocks, the road maintenance is very difficult. This is why Land Rover journey usually ends at Sandakaphu.

Further the road is not motorable when it is covered with snow, which is located above 3500 meter from sea level. The stretch from Phalut to Gorkhey is the trek route identified with much more adventure tourism potentials which is yet to be explore.

CONCLUSION

Singalila forest is a paradise for adventure seekers, who could avail a number of options to reach at the apex of the satisfaction level while traveling the region. There is ample scope of introducing newer types of adventure tourism in the region in consultancy and active participation of local people as revealed from the study who are mostly literate and aware on the expanding tourism economy as well as necessity of their cultural survival. Nature walk, for example, is proposed to increase the extent of stay of the trekkers at the trekkers' hut of respective villages availing them opportunity to enjoy the outstanding scenic beauty of the surroundings. As the presence of local guides are mandatory for such nature walk for security reason, it may provide additional income and opportunities for the community. Such guides however should be trained to protect the travelers from wildlife and accidents.

For the geotourists specifically, they would be the source of indigenous knowledge acting as information providers on landscape ecology with special reference to human adaption in the lap of nature (Rokenes et al., 2015). In this context it is noteworthy to mention that mountain biking could never be recommended because of its adverse environmental impacts, both on nature and culture for which it has been already abandoned in many places of the world. In the sphere of sports tourism, marathon competition in relatively less slope gradient sections could be organized using the facility of metal road since high altitude running is recognize as one of the recent most adventure tourism products. Bird watching and expedition for Rhododendron may be other sustainable options. The geomorphosites of the region like mountain peaks, cascades, folds, various features of weathering etc provides the ample scope of symbiosis between geotourism and existing trekking opportunities along with Land Rover safari. Considering the whole spectrum of hard and soft adventure tourism (Pomfret, 2006), it may be concluded that attraction of geomorphosites could contribute to a lot in strengthening the soft adventure tourism sector in which risk is comparatively less and thereby considered more sustainable.

With the increase in the number of visitors in recent years, the threat on extension of the evil effects of adventure tourism has increased and by concentrating on the educative aspects of geotourism, it is necessary to diversify the future tourism activities in the region assuring ecological, economic and social sustainabilities.

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