

# Periodic Research

## Assessing Impacts Through Community Perception: An Empirical Study for Sikkim

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#### Abstract

The small alpine land Sikkim is the most popularly known destination for its unexploited, naïve hill stations, salubrious weather and rich culture. This small, hidden land has a wide range of differences with respect to its physiography, drainage system, ethnicity and socio-cultural aspects. Tourism promotion and development has resulted in high economic, social, cultural and of course environmental impacts and as such the need for tourism impact researches is imperative and essential. The present article has chosen residents as a key term around which the types of tourism development are extensively related. It is also because they represent the local government and their perception about tourism and tolerance level starts from tourists and their number, intensity and behavior. The perception survey is also based on existing literature and destination specific parameters in the form of statements. Factor analysis is done to bring to light the important issues to focus on future strategies.

**Keywords:** Environmental Impact Assessment, Common Property Resources, Sustainability ,Polluter Pays Principle, Parameters of Sustainability, Factor Analysis.

#### Introduction

Sikkim is ecologically a fragile region. The state has the responsibility to conserve its rich biological diversity that includes coexistence and protection of over 5000 species of angiosperm (*one third of the total national angiosperms*). Again this place has multi-ethnic communities. So the need for ecological, cultural, and social diversities is not only essential but imperative as well. Eco tourism is traveling to relatively undisturbed natural areas with the specified objective of studying, admiring, and enjoying the natural flora and fauna and related cultural aspects therein. Sometimes referred to as nature tourism, ecotourism is nature based tourism designed to minimize ecological impact to a tourism area and includes activities such as landscape sightseeing, hiking, bicycling, and canoeing. Sikkim is a small hilly state, bounded by vast stretches of Tibetan plateau in the North, the Chumbi Valley and the kingdom Bhutan in the East, the kingdom of Nepal in the west and Darjeeling (West Bengal) in the South. Though small, the environmental, social and cultural diversities are not so. Some scholars believe that the word Sikkim involves Nepalese dialect and it refers to a 'now place' or the term has been derived from a Sanskrit word which means a 'mountain crest'. The people of Sikkim have ethnic diversity. The Bhutias came from Tibet, the Lepchas were the aboriginal community and the Nepalese came from Nepal. When Sikkim was an independent state it faced many invasion by its neighboring countries and the king took the help of the British India and, later, gifted some of its region including Darjeeling to the British India. Now this 22<sup>nd</sup> Indian State (joined Indian Union in 1975) has Over 81% of the total geographical area under the administrative managerial control of the Ministry of Environment and Forest, Government of India. Over 45% of the total geographical area of the state is under tree cover and nearly 34% of the geographical area is set aside as protected area network in the form of national park and wildlife sanctuary. The basic statistics of flora and fauna are given here under.

**Table 1: Flora and Fauna of Sikkim**

Mammals	144 species
Birds	550 species
Butterflies and Moths	650 species
Reptiles	33 species
Frogs	16 species
Orchids	550 species, 95 Genera
Rhododendrons	36 species, 45 varieties
Flowering Plants	Over 4000 species
Ferns and Allies	300 species
Conifers	9 species
Medicinal plants	Not enumerated

**Source: Economic Survey 2010-11, Govt. of Sikkim**

The maximum summer temperature 28<sup>o</sup>C and minimum winter temperature is 0<sup>o</sup>C. Sikkim has a variety of mineral resources including coal, limestone, iron ore, graphite, pyrite etc. The temperature in the bottom of the valleys (up to 600 meters) situated at lower elevations, particularly during summers, are similar to the monsoon type of climate. The temperature starts falling between 600 meters to 2000metres above sea level enjoys cool temperature climatic conditions and further up (2000 meters to 3000metres) it is cold temperate climate. Arctic type of climate is found above 5000 meters. Sikkim is ecologically a fragile region. The state has the responsibility to conserve its rich biological diversity that includes coexistence and protection of over 5000 species of angiosperm (one third of the total national angiosperms). Again this place has multi-ethnic communities. So the need for ecological, cultural and social diversities is not only essential but imperative as well.

**Literature Review**

In their article, "Environmental Economics of the Khangchendzonga National Park in the Sikkim Himalaya, India", Maharana, I., Rai S.C., Sharma, E.( 2000, September), explained the application and relevance of Contingent Valuation Method (CVM) to measure Willing to Pay (WTP) important part of Polluter Pays Principles (PPP). Using a random survey, the average WTP was 8.84 USD for foreign visitors per visit, followed by 6.20 USD per household per year and 1.91 USD per domestic visitor. The WTP was strongly influenced by age, education and income.

In the article "Impact of firewood extraction on tree structure, regeneration and woody biomass productivity in a trekking corridor of the Sikkim Himalaya" written by Chettri, N., Sharma E., & Deb D.C., & Sundriyal R.C. ( 2002, May) explained how tourism in Sikkim was a rapidly growing industry and recorded a roughly 10 fold increase in visitors during the past 2 decades. The authors mentioned in their article that how the phenomenon resulted in encroachment on the forest for firewood (Rai and Sundriyal 1997; Chettri 2000). They mentioned that although the Government regulation in Sikkim forbade the use of firewood in remote trekking areas yet the trekking support staff and travel agents were still continuing the use of firewood in remote trekking

areas resulting in various environmental degradation including deforestation, landslides, avalanche etc.

Another article, "Assessment of Natural Resources Use Pattern: A Case Study along a Trekking Corridor of Sikkim", authored by Chettri, N., & Sharma, E.( 2006, March) claimed that the subsistence in the Himalaya were largely dependent upon resources derived from natural forests due to the free and easy access to those resources and simplicity in their use. Sikkim was distinct to have the 43% of its total geographical area under forest cover, of which 34% is under dense forests. The burgeoning human population and family fragmentations were exerting a tremendous pressure on the natural resources to meet the requires of food, fuel, fodder, timber, and other human needs. In recent years, tourism had increased manifolds in Sikkim, which caused one of the major factors behind destruction of forests. Irrational use of natural resources resulted in the lowering of forest quality and shortage of resources. As a result, people started using less-valued species as firewood and fodder. This study dealt with bio-resources use pattern by the community and tourism enterprises along a trekking corridor in the Sikkim Himalaya, with special reference to firewood, fodder, and timber.

The article "The Effectiveness of Environmental Interpretation at Resource Sensitive Tourism Destinations" was written by Kuo , I-L. (2002) mentioned that the development and implementation of tourism legislation with respect to the visitor activity could contribute to the ultimate destination experience. Environmental interpretation in a resource sensitive tourism destination was considered to be an effective visitor management strategy that helped to encourage visitors to adopt more appropriate behavior in order to sustain the development of tourism. Through this paper, he aimed to examine the processes and purposes of visitor management and environmental interpretation, including various definitions and functions. The effectiveness of environmental factors in visitor management with a sustainable orientation was also addressed in this paper.

"Tourism in Destination Communities", edited by Singh S., Timothy D.J., & Dowling R.K. (2003), was broadly divided into three parts viz. community tourism perspectives, community tourism dynamics, challenges and opportunities for destination communities. The first part 'community tourism perspectives', dealt with the interrelationship between tourism and local people, diverse structural nature of destination communities based on morphological traits, various efforts to place destination communities into a broad based typology of tourism-destination relationship. The anthropological and aboriginal issues relating to the identity heritage, economic and present socio-cultural issues, political issues, rights, responsibilities and ethical issues contributing to the proactive and sustainable practices were taken into account in the second part of the book. The third part was essentially

addressing and entering into the deep aspects of tourism development and planning, considering the level or extent of involvement of locale people, attitudes of hosts, and inclusion or presentation of hosts in destination marketing.

In their book "Strategic Management for Tourism Communities: Bridging the Gaps", P.E. Murphy, & Murphy A.N.(2006) advocated a solid understanding of the business and community aspects of tourism as resources can be squandered on inappropriate tourism developments that fail to meet the expectations of either the hosts or the tourists. According to them, the entrance of the community in the global tourism market resulted in two negative aspects. The first one was to misread the market and the community's true competitive position within that market and the second one was when a community of a successful destination failed to appreciate changes that tourism can bring.

In the article "Community Capacity Building: An Emerging Challenge for Tourism Development" Moscardo G. (2008) considered tourism development and more specifically community based tourism development with various avenues opened for community development through tourism activities. He also said that community development through tourism could bring about equality, justice and social dignity. But to ensure a sustainable orientation in community development the need for impact assessment was advocated. Community development through tourism and its impacts were multidimensional and was subject to the problems and prospects related to a particular destination. The article has identified and analyzed several barriers to effective tourism development including a model for community capacity building for tourism management. The challenge for this model was that there existed critical gaps in our knowledge of how to achieve the goals embedded in the community capacity-building approach to tourism development. An understanding of the processes dealing with tourism impacts and an understanding of effective ways to enhance a community's collective tourism knowledge contributing to planning and evaluation were considered in the model along with the mechanisms for improving community participation.

In their article, "Community Based Tourism Development: A Case Study of Eco Village Sari in Kedarnath Sanctuary Region", Gupta S.K. and Bhatt. V.P. ( 2010) addressed philosophical changes in tourism development from conventional mass tourism to the adoption of alternative tourism through many frameworks and strategies. They analyzed and interpreted socio-economic impacts of tourism and reviewed the opportunities and challenges for community based tourism through SWOT analysis and opinion survey.

## Objectives & Hypothesis

Objectives of the study was to understand the level of tolerance that will contribute to the ultimate tourism impact assessment for destination

Sikkim. Following are the objectives stated below which are measurable and quantifiable in nature.

1. To measure the impacts of tourism with the help of hosts as they represent local government and local entrepreneurs as a majority in Sikkim.
2. To identify the key factors or limiting factors responsible for future environmental strategies for tourism in Sikkim

As tourists and their arrivals are considered to be the key factor around which perceptions of host community change with the passage of time, following hypothesis is given here under

H01: Current environmental management of natural resources is independent of existing types of tourists visiting the destination.

## Data Collection and Methodology

This study was conducted using self-administered questionnaires with the consent from the hosts beforehand in four places viz. Gangtak, Mangan, Namchi and Pelling which are broadly representing all districts of Sikkim. The respondents were informed that their participation was on a voluntary basis and all information provided would be kept private and confidential. Questionnaires were distributed only to those who agreed to participate in the study. The researcher then briefly explained the nature and requirement of the survey before the respondent filled up the questionnaire. A total of 260 hosts were contacted, and the overall response rate was 57.69% (150 completed, usable questionnaires). Principal component analysis (PCA) is a statistical procedure that uses orthogonal transformation to convert a set of observations of possibly correlated variables into a set of values of linearly uncorrelated variables called principal components. The number of principal components is less than or equal to the number of original variables. This transformation is defined in such a way that the first principal component has the largest possible variance (that is, accounts for as much of the variability in the data as possible), and each succeeding component in turn has the highest variance possible under the constraint that it is orthogonal to (i.e., uncorrelated with) the preceding components. Principal components are guaranteed to be independent if the data set is jointly normally distributed. Then principal component method of factor analysis is taken into consideration that maximizes the sum of squares of loadings of each identified factor. It also determines loadings of variables on different factors by using the standard normal values of the observations of the original (input) variables. In the following, matrices will be indicated by indexed variables. "Subject" indices will be indicated using letters a,b and c, with values running from 1 to  $N_a$  which is equal to 10 in the above example. "Factor" indices will be indicated using letters p, q and r, with values running from 1 to  $N_p$  which is equal to 2 in the above example. "Instance" or "sample" indices will be indicated using letters i,j and k, with values running from 1 to  $N_i$ . In the example above, if a sample of  $N_i = 1000$

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students responded to the  $N_a = 10$  questions, the  $i$ th student's score for the  $a$ th question are given by  $x_{ai}$ . The purpose of factor analysis is to characterize the correlations between the variables  $x_{ai}$  of which the  $x_{ai}$  are a particular instance, or set of observations. In order that the variables be on equal footing, they are standardized:

$$z_{ai} = \frac{x_{ai} - \mu_a}{\sigma_a}$$

where the sample mean is:

$$\mu_a = \frac{1}{N} \sum_i x_{ai}$$

and the sample variance is given by:

$$\sigma_a^2 = \frac{1}{N_a} \sum_i (x_{ai} - \mu_a)^2$$

The factor analysis model for this particular sample is then:

$$\begin{aligned} z_{1,i} &= l_{1,1}F_{1,i} + l_{1,2}F_{2,i} + \epsilon_{1,i} \\ &\vdots \\ z_{10,i} &= l_{10,1}F_{1,i} + l_{10,2}F_{2,i} + \epsilon_{10,i} \end{aligned}$$

or, more succinctly:

$$z_{ai} = \sum_p l_{ap}F_{pi} + \epsilon_{ai}$$

where

1.  $F_{1,i}$  is the  $i$ th student's "verbal intelligence",
2.  $F_{2,i}$  is the  $i$ th student's "mathematical intelligence",
3.  $l_{ap}$  are the factor loadings for the  $a$ th subject, for  $p = 1, 2$ .

In matrix notation, we have

$$Z = LF + \epsilon$$

Observe that by doubling the scale on which "verbal intelligence"—the first component in each column of  $F$ —is measured, and simultaneously halving the factor loadings for verbal intelligence makes no difference to the model. Thus, no generality is lost by assuming that the standard deviation of verbal intelligence is 1. Likewise for mathematical intelligence. Moreover, for similar reasons, no generality is lost by assuming the two factors are uncorrelated with each other. In other words:

$$\sum_i F_{pi}F_{qi} = \delta_{pq}$$

where  $\delta_{pq}$  is the Kronecker delta (0 when  $p \neq q$  and 1 when  $p = q$ ). The errors are assumed to be independent of the factors:

$$\sum_i F_{pi}\epsilon_{ai} = 0$$

Note that, since any rotation of a solution is also a solution, this makes interpreting the factors difficult. See disadvantages below. In this particular example, if we do not know beforehand that the two types of intelligence are uncorrelated, then we cannot interpret the two factors as the two different types of intelligence. Even if they are uncorrelated, we cannot tell which factor corresponds to verbal intelligence and

which corresponds to mathematical intelligence without an outside argument.

## Data Analysis and Discussion

Out of thirty, the twenty four factors (statements) are loaded and grouped into seven components and thereby prioritizing the areas of addressing (i) marginalized tourism economy (due to loss of revenue) with high scope i.e. institutionalized conventional economic impacts of tourism with a tendency of more negative impacts excluding new job opportunity, (ii) tourism development vigilantes with an active role of NGO, Eco clubs and media to create awareness, (iii) community oriented hospitality and tourism literacy/awareness i.e. the need for community oriented hospitality and environmental literacy/ consciousness for tourism round the year, (iv) Poor quality tourism trap in economy resulting in serious concern for low spending, less responsible, tourism impact unconscious domestic tourists and its unhealthy acceleration, (v) encroachment for tourism i.e. road ways is found to be the prime indicator of encroachment over land areas, forest etc. for tourism, (vi) good tourism for inclusive growth i.e. the urge of the local community for international tourism and related development of export oriented industries, (vii) socio-political crisis is implying the importance of peace and harmony in and outside the State as a part of tourism culture for hosts and guests in Sikkim respectively. So, following are the recommendation on the part of the local community and their barometric suggestion to assess the tolerance level. When questions were asked to the respondents regarding the measurement of impact of tourism on economic, socio-cultural and environmental issues, following results are found.

**Table 2**  
**Impact Variables and Related Components**  
**(Exhibited through Co-relational Matrix)**

Factors	Variables	Co-Relational Matrix Value	Outcome
Factor I	Gap-R/P	0.685	<b>Gap</b> between rich and poor with a greater scope of income and employment.
	Illigl-W/S	0.847	
	T-Arrvl-Pollu	0.548	
	Chunknonres	0.633	
	E-Control	0.679	
	Tispid	0.816	
Factor II	Jo	0.704	NGOs, media, Government etc. as <b>vigilant</b>
	Ngo/Eco-Satis	0.840	
	Media-Satis	0.834	
	Essen-Commo-I	0.581	
Factor III	Auto-Pollu-I	0.577	Community <b>awareness</b> for ecology and environment
	Tnec	0.773	
	Tmcthg	0.567	
	Hces	0.770	
Factor IV	SEASON-E	0.525	Poor domestic tourism <b>trap</b>
	TNESSM	0.741	
	DTLCSA	0.505	
Factor V	EC-ESSEN	0.685	<b>Encroachment</b>
	BRO-SATIS	0.683	

	ENCRO-L-FA	0.853	of land and <b>deforestation</b>
Factor VI	FT-EFSREB	0.824	<b>Driving force</b> for other industries
	DF-W/H	0.618	
Factor VII	POLI-DIS-SILI	0.753	<b>Cultural exchange</b>
	EXEXC	0.783	

**Source: Field Survey, 2011-12**

**N.B.: Statistical Analysis is Made With the Help of SPSS**

**BRO-SATIS**=The role of Border Road Organization and such other authorities of the Central and State government is satisfactory, **CHUNKNONRES**= Major chunk of income from tourism is enjoyed by nonresidents of Sikkim, **DF-W/H**= Tourism is the driving force for other industries like wine, handicrafts etc., **DTLCSA**= Domestic tourists lack awareness on economic & social Impact of tourism, **EC-ESSEN**= Environmental consciousness among tourists is essential for the development of Sikkim as a destination, **E-CONTRL**= The economic control goes to the hand of the people who are 'Non-Resident' of Sikkim,

**ESSEN-COMMO-I**= The price of essential commodities has been increasing due to tourism during the peak season, **EXEXC**= Tourism exchanges and expands culture in Sikkim, **FT-EFSREB**= Foreign tourists are more environment-friendly, socially respectful and economically beneficial to the host community, **Gap R/P**= Present tourist industry is increasing the gap between rich and poor, **HCES**= Host Community always extends support tourists visiting Sikkim, **ILLIGL-W/S**= Illegal trafficking of wines, species etc. resulting in loss of Govt. revenue in Sikkim, **Auto-Pollu-I**= Automobile pollution has been increasing in Sikkim day by day, **JO**= Tourism opens up new job opportunities in Sikkim, **NGO/ECO-SATIS**= The role of NGOs/ Eco clubs in your locality to develop tourism is satisfactory, **MEDIA-SATIS**= The role of media is effective to promote Sikkim as a destination, **POLI-DIS-SILI**= The political disturbance in transit region e.g. Silliguri, Darjeeling has been affecting tourism industry in Sikkim, **SEASON-E**= Tourism has brought about a seasonal economy in Sikkim, **T-ARRVL-POLLU**= Tourist arrivals during the peak season causes increase in air/automobile pollution, **ENCRO-L-FA**= Tourism has resulted in encroachment over agricultural land/ forest area in many areas in Sikkim, **TISPID**= Tourism industry in Sikkim can gain advantage from political instability in Darjeeling, **TMCTHG**= Tourism enhances mutual cooperation, trust among hosts and guests, **TNEC** = Most of the tourists in Sikkim are not environmentally conscious, **TNESSM**= Most of the tourists are not economically sound and they don't spend more, All such recommendations are depicting a new quality oriented tourism with a paradigm shift so as to ensure more revenue, less adverse impacts and adoption of more sustainable orientation from mass tourism to all contemporary types of tourism. So, the null hypothesis 'current environmental management is independent of existing types and forms of tourists' are also contradicted.

## Conclusion

Types of tourists, types of tourism, trade and tourism promotion among stakeholders including local

people, separate market and product development and analysis, aboriginal resource conservation and promotion, hidden natural attractions and adventures can be utilized for a separate positioning and changing Unique Selling Proposition (USP) of Sikkim. There is an immediate need to supplement the conventional types and forms of tourism through sustainable development principles in Sikkim. Culturally enriched hospitable events, eco-events like flower and orchid festival, events to promote handicrafts and handlooms, wine, tea etc. are needed as tourism products and means of promotion respectively. It is also noteworthy that current environmental management of natural resources is dependent of existing types of tourists visiting the destination as their choice, taste and preferences significantly contribute to the future development of the destination.

## Reference

1. Chettri, N., Sharma E., & Deb D.C., Sundriyal R.C. ( 2002, May). Impacts of firewood extraction on tree structure, regeneration and woody biomass productivity in a trekking corridor of the Sikkim Himalaya. Mountain Research and Development, 22, 150-158.
2. Chettri, N., & Sharma, E.( 2006, March). Assessment of natural resources use pattern: A case study along a trekking corridor of Sikkim Himalaya, India. Tata Energy Research Institute, 3(1), 21-34. Retrieved from <http://search.proquest.com/docviews>. 2011.03.15.
3. Batabyal D. (2013). Destination development: strategy for tourism in Sikkim (Doctoral Dissertation, University of Burdwan, W.B.), p.134-159.
4. Gupta S.K. and Bhatt. V.P. ( 2010). Community based tourism development: A case study of eco village Sari in Kedarnath sanctuary region. International Journal of Hospitality and Tourism Systems, 2(1), 199-215.
5. Kuo, I-L(2002, March/April). The effectiveness of environmental interpretation at resource-sensitive tourism destinations. International Journal of Tourism Research, 4, 87-101. doi: 10.1002/jtr.362.
6. Maharana, I., Rai, S. C., & Sharma, E. (2000). Valuing Ecotourism in a Sacred Lake of the Sikkim Himalaya, India. Environmental Conservation, 27(3): 269-277.
7. Moscardo G. (2008) Community capacity building: An emerging challenge for tourism development. In Moscardo G. ( Ed).. Building community capacity for tourism development. UK: CABI.
8. Murphy Peter E. and Murphy A.E. ( 2006). Strategic management for tourism communities: Bridging the gaps. New Delhi: Viva
9. Sikkim Tourism Policy (2010). Sikkim Tourism Development Corporation. Government of Sikkim. India.
10. Sikkim Strategic Planning , Tourism (May, 2008). Government of Sikkim and Building & Construction Authority ( BCA),Singapore.
11. Economic survey of Sikkim (2006-07). Govt. of Sikkim. India.
12. Singh S., Timothy D.J., & Dowling R.K. (Eds.). (2003). Tourism in destination communities. Cambridge :CABI,.