



## **Analysing tourism attractiveness using probabilistic travel model: A study of Gangtok and its surroundings**

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### **Abstract**

Eco-tourism is now one of the largest industries in the world. Gangtok as a core centre of Sikkim commands over different tourist spots in East Sikkim which are directly linked by a network of roads centering Gangtok and are perfectly accessible for one-day trips. The tourist attractions of East Sikkim are clustered mostly in and around Gangtok, the state capital. This study analyses the tourism infrastructure as well as seasonal arrival of tourists in the Gangtok city and develop a probabilistic travel model on the basis of tourist perception which will help the tourism department to further the economic development of the area.

**Keywords:** command area, cultural, eco-tourism, probabilistic travel model, tourism, tourist attractions

### **Introduction**

Tourism is now one of the largest industries in the world that has developed alongside the fascinating concept of eco-tourism. The World tourism Organisation (WTO) has defined that tourism involves travelling to relatively undisturbed natural areas with the specific object of studying, appreciating and enjoying nature and its virgin flora and fauna as well as the existing cultures of the original inhabitants of the tourist centres. The concept of tourism could be traced back to ancient times when people travelled with a view to acquiring knowledge of unknown lands and people, for the development of trade and commerce, for religious preaching and also for the sheer adventure of discovery. In fact the system of tourism involves a combination of travel, destination and marketing, which lead to a process of its cultural dimension.

Sikkim state in India has been considered a potential tourist zone in the Himalayan region. It is characterised by beautiful terrains varying in altitude from lofty mountains to valley floors dissected by torrential rivers. Tista, Rangit, Lachung, Lachen, Zemu, Lhonak, Sebozung rives divide the region into several units. The wildlife sanctuaries of the state viz. Fambong Lho, Alpine Sanctuary, Shingba Rhododendron Sanctuary, Maenam Wild Life Sanctuary and Kanchendzonga National Park are irresistible to nature lovers. Lakes at high altitudes especially, Gurudongmar Lake, Tsomgo Lake, Khechipalri Lake, Green Lake, Memancho Lake enhance the beauty of the natural landscape (Govt. of Sikkim, 2002). Yumthang Valley, Chopta Valley, Lachen Valley comprises with variety of natural fauna which includes almost 3000 species of flowering plants, 11 species of oak, 250 species of ferns, 40 species of primulas and 350 species of medicinal plants and herbs. Moreover, Sikkim is known as the home of orchids having about 450 species both in its subtropical and temperate regions (Italian Foreign Exchanges Office, 1998).

There is plenty of academic literature relating to tourism demand forecasting. The study of tourism demand began in the 1960s. Though 420 essays studying this object have been published from 1960 to

2002, the real development occurs until the 1980s, because more than 90% of those 420 essays are published in the 1980s and after over 80 more essays have been published in the recent five years, from 2002 to 2007. The scholar such as Corneliu and Mihai (2011) who clear up and observe the literatures just list the related literatures or study the recent ones. Among many tourism forecasting models, the generally used are the traditional quantitative and/or qualitative research methods, such as the Delphi method, the life cycle method, the econometric method, the space gravity model, and the time sequence method, etc. Since the 1980s, the comparative study of accuracy of different tourism demand forecasting models began to appear. The scholars, such as Lovingwood, and Mitchell (1989), Popescu and Corbos (2010) and Shoval and Raveh (2004) compared the accuracies of these methods by analyzing the data of different countries. But none of the existing models is intended for Hong Kong. In addition, the international tourism forecasting model currently used is the time sequence method. Though the time sequence is believed to be the most practical forecasting method of tourism, it can only predict the future growth or decrease of the tourist number and cannot interpret the causing factors. So the enterprises or the official tourism department cannot take the targeted measures to promote the growth of tourists.

It has been studied that, tourist are prefer Gangtok city to start their travel origin for the basic transport, lodging, tour information etc. facilities. Most of the time tourist spent their time to acclimatise with the alpine climate and necessary tourist information. Within this short time of two to three days, tourists travel the surrounding places of Gangtok. In this study, an attempt has been made to perceive their travel preferences in and around Gangtok city.

## Study area

Gangtok, the state capital of Sikkim is ideally located from the tourist point of view. During the past few years there had been a regular growth in the number of tourists, visiting the state which increased to 41,000 in 1985 and gradually culminated in 2, 25,500 in the year 2005 (Formica & Uysul, 2006; Corneliu & Mihai 2011). It may be due to the disturbances in Kashmir, Darjeeling and the hill town Shillong, which are the other important tourist centres of India. Since 1995 there has been an avalanche of tourists not only in Gangtok but also in many of the other potential tourist centres of Sikkim mainly centering on Gangtok as the nodal point which provides the maximum amount of information about (i) transport networks radiating to different tourist spots, (ii) administrative facilities required for permission to visit the remote, isolated and border areas, (iii) statistical information pertaining to the development of tourism, (iv) historical or evolutionary records of different tourist places and (v) foreign exchange facilities (Census of India, 1991). As a result it is expected that in the next 20 years the number of tourists visiting Gangtok would increase by at least 10,000 per year (Master plan for Gangtok, 2020-UD & HD, Government of Sikkim).

Gangtok as a core centre of Sikkim has potential command area over different tourist spots in East Sikkim, which are directly linked by a network of roads centering Gangtok and are perfectly accessible for one-day trips. The tourist attractions of East Sikkim are clustered mostly in and around Gangtok, the state capital. The town spreading from Talangchang to Bhurtuk along the western slopes of the hills is located at the altitude of 1200 meter to 1700 meter. In the north of Gangtok town there are hills, which gradually gain their altitude leading up to the ranges of the Kanchendzonga, which are towards the north west of Gangtok and the third highest mountain of the world. Trade and commerce are the most important functional linkages between Gangtok and its neighbouring regions. As a result, the entire state of Sikkim depends on Gangtok to meet its economic requirements. Gangtok, as base town offers the best infrastructural facilities to visiting tourists.

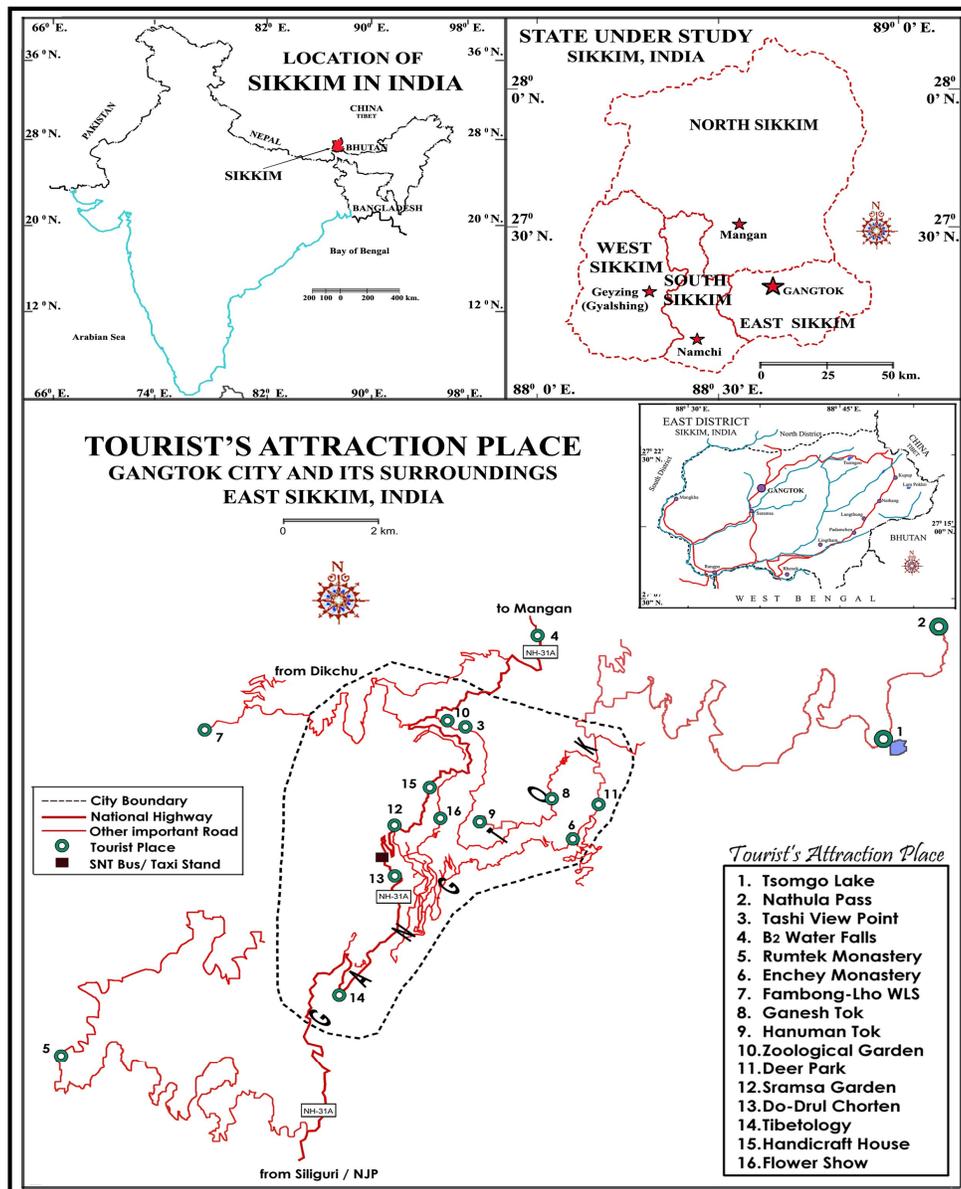


Figure 1. Tourist attraction sites within the study area

The tourist attraction in Gangtok can be classified under (i) natural sightseeing, (ii) monasteries, (iii) sanctuaries of different kinds viz., alpine and wildlife sanctuaries, (iv) manmade sightseeing and (v) cultural and historical places.

About 20 tourist attraction sites grace Gangtok and its surroundings (Table 1):

**Table 1. Classification of tourists' attraction to Gangtok and its surroundings**

Natural Sight Seeing	Monasteries	Sanctuaries	Man Made Sight Seeing	Cultural and Historical Attraction
1. Tsomgo Lake	1. Rumtek	1. Fambhong-Lho Wildlife Sanctuary	1. Ganesh Tok	1. Directorate of Handicraft and Handloom
2. Tashi View Point	2. Enchey Monestery	2. Kyagnos-la Alpine Sanctuary	2. Hanuman Tok	2. Do-Drul Chorten
3. Bridge B2 Water Falls			3. Flower Show	3. Tibetology
4. Nathula Pass			4. Saramsa Garden	4. Sa-ngor-Chotshog Centre
			5. JLN Botanical Garden	
			6. Tourist Village, Rumtek	
			7. Zoological Garden	
			8. Coronation Garden and Deer Park	

### Objectives

The following objectives have been set for the study:

1. To assess the tourism infrastructure in the Gangtok city,
2. To find out the nature of seasonal arrival of tourists in Gangtok city and
3. To develop the probabilistic travel model on the basis of tourist perception.

### Material and methods

The study is based on the primary data collected through the intensive field survey among the Indian as well as Foreigner tourist of Gangtok city. The primary information is supplemented with secondary data whenever is needed. Distance of different tourist's attraction places from Gangtok has been collected from SNT Taxi Stand of Gangtok.

#### *Sample design and data collection*

In order to make a proper questionnaire, primarily a pilot survey has been done to find out the most attractive places of the tourists came to Gangtok. With the help of pilot survey 15 places have been identified as most visited by the tourist. A Likert scale has been developed and sample has been collected through a detailed questionnaire. The tourists have been asked to give points which ranges 1 (denote lowest attractiveness) to 7 (denote highest attractiveness). The entire field survey was conducted during March-May, 2012 and collected data have been analysed.

#### *Adoption of statistical techniques*

For the purpose of the present study both qualitative and quantitative methods have been adopted. However, in quantitative analysis both simple and standard statistical techniques have been used to infer the facts.

- Primarily utility of tourism product has been measured with the help of following formula:

$$U_j = S_j / D_{ij}$$

where,  $U_j$  is Utility of Tourism Product Measure,  $S_j$  is Some Measures of Attractiveness of Destination J and  $D_{ij}$  is Distance between Starting Point and Tourist Destination.

- After having the tourism product measure, Probabilistic Travel Attitude [1] of Tourists has been analysed with the help of following formula:

$$P_{ij} = U_j / \sum U_j$$

$P_{ij}$  is measures of Probabilistic Travel Attitude of Tourists.

## Findings and analysis

In order to fulfill the objectives hotel owners, travel agent, tourists (domestic and foreign), taxi driver and local people have been selected for purposive sampling. The information regarding infrastructural facilities, probabilistic travel plan were ensured through field investigation. The entire field survey was conducted during March-May, 2012 and collected data (Table 2) have been analysed.

### *Tourism infrastructure in the Gangtok City*

Tourism infrastructure comprises mainly a number of good hotels, well connected to different tourist spots, a transport network, health units, marketing etc. to promote the growth and development of tourism.

**Table 2. Types of hotels in Gangtok City**

Grade A	Grade B	Lodges	Total
17	137	57	211

Source: Sikkim Tourism, Govt. of Sikkim.

**Table 3. Types of hotels in Gangtok City**

Room Type	Maximum Tariff (in Rs.)	Minimum Tariff (in Rs.)	Average Tariff (in Rs.)
Family Room / Dormitory (Gr. B)	400	75	194
Singled/ Standard (Gr. B)	475	100	272
Double/ Deluxe (Gr. A)	850	200	491
Suites (Gr. A)	2900	600	1410

Source: Sikkim Tourism, Govt. of Sikkim.

Total length of roads inside the town is estimated to be 28 km covering 19.3 percent of the total developed area. Incidentally, the road density is higher in Gangtok in comparison to other state capitals of India. The composition of traffic in this area mostly constitutes of private cars and taxis. Thirty percent of this composition is private cars, 40 percent comprises taxi movements, which act as para transits and public modes in Gangtok. Bus constitutes only 3 percent of the traffic movement.

It has been observed during past few years that motor vehicles, especially two wheelers and goods carriers registered a high growth rate over other vehicles [17]. The private/ government vehicles have increased from only 47 in 1979-80 to 4189 in 1995-96 (Motor Vehicles Dept., Govt. of Sikkim) registering a growth rate of 32.3 percent.

There are many travel agents/ tour operators in Gangtok. They organize tours in different places of interest under a number of package tours in the following circuits:

- (i) Gangtok-Tsomgo (Chhangu Lake) Circuit,
- (ii) Gangtok – Rumtek Circuit and some other local trips offering under three points, five points and seven points one day trip for sightseeing. Incidentally, Gangtok is the headquarters of TAAS (Travel Agent Association of Sikkim), which promotes tourism in the state.

**Table 4. Probabilistic travel model of domestic and foreign tourists**

Tourist's Attraction Place	$D_{ij}$ (km.)	$S_j$	$U_j$	$P_{ij}$
Tsomgo Lake	40	6.85	0.17	2.53
Nathula Pass	56	6.23	0.11	1.64
Tashi View Point	8	5.89	0.74	10.88
B2 Water Falls	21	4.45	0.21	3.13
Rumtek Monastery	24	5.83	0.24	3.59
Enchey Monastery	3	2.32	0.77	11.43
Fambong-Lho WLS	25	3.72	0.15	2.20
Ganesh Tok	7	3.52	0.50	7.43
Hanuman Tok	12	3.76	0.31	4.63
Zoological Garden	8	4.72	0.59	8.72
Deer Park	5	2.11	0.42	6.24
Sramsas Garden	14	3.02	0.22	3.19
Do-Drul Chorten	5	1.92	0.38	5.68
Tibetology	6	1.32	0.22	3.25
Handicraft House	3	2.01	0.67	9.90
Flower Show	4	4.21	1.05	15.56
		$\sum U_j$	6.77	-----

From the local field survey it has been observed that Gangtok has a tremendous potentiality for carrying the burden of 70 percent of hotel industry in the state with facilities of well connected roads, transports, banking, booking centers of air ways, railways and distant bus journeys, medical facilities and some administrative facilities that are extended to the tourists. Both domestic and foreign tourists are required obtain a Restricted Area permit (RAP), an entry pass and a Protected Area Permit (PAP). RAP is required to visit Tsomgo Lake in East, Shighik, Yumthang, Thangu in North. PAP is required to visit Dzongri area and Yuksum in the West. Gangtok as a state capital town provides marketing opportunities for the local cottage industries viz. carpets, mask, various kind of ladies' bags, brassware, woolen garments, Thanka paintings (traditional art) etc.

*Seasonal arrival of tourists in Gangtok City*

Both domestic and foreign tourists usually visit Gangtok from March to May during the summer season. The second peak season of the year is October for domestic tourists with a flow of 13.2 per cent, whereas for foreign tourists the month of October and November are the peak season for their tour to Gangtok representing a flow of 16.4 per cent and 12.2 per cent respectively.

*Probabilistic travel model*

Probabilistic travel model is an approach to study the nature and preferences to different tourist spots of the domestic and foreign tourists. Basically from domestic and foreign tourist perspective it has been found from the survey that, the preferences to different tourist spots are different. Therefore, the structural forecasting method is needed to interpret the factors affecting the increase or decrease of tourists. This study hope by analyzing the factors to tourists of Gangtok and its surroundings will open new vision to the research in this field.

Both domestic and foreign tourists preferred Tsomgo Lake and Nathula Pass for its natural picturesque beauty. Every tourist enjoys the travel route to Tsomgo Lake. During April-May of every year this route is full of Rhododendron (State Flower) of different colours. Though the value of  $P_{ij}$  becomes very low for Tsomgo Lake (2.53) and Nathula Pass (1.64), it is basically also depend on

distance. According to Likert scale highest value according to preferences goes to Tsomgo Lake (6.85) and Nathula Pass (6.23).

Another circuit completes the local sightseeing of 5 points or 7 points and the domestic tourist are very much enjoying this tourist spots. Rumtek Monastery, Enchey Monastery, Zoological Garden, Tibetology, Tashi View Point, Hanuman Tok, Ganesh Tok etc. are the important spots have been point out by the domestic tourist. Flower show, Directorate of Handicraft and Handloom House, Lal Market are the local sights within the Gangtok city and tourists can easily access those points by walking. Tourist's perception characteristics of some of the tourist points are given in Table 5.

**Table 5. Attractiveness of some of the tourist points perceived by domestic and foreign tourists**

Tourist Points	Attractiveness
Tsomgo Lake	The lake remains frozen during the winter months. The lake located at a high altitude and attracts its air of blissful tranquility.
Nathula Pass	Located on the border between India and China in the Tibetan Plateau. It remains open only on Wednesday, Thursday, Saturday and Sunday. Due to this the tourist has lesser chance to visit this place.
Tashi View Point	Situated along the North Sikkim Highway, only 8 kms. away from Gangtok. From this point both Mt. Kanchendzonga and Mt. Sinialchu are clearly visible.
Rumtek Monastery	The Rumtek Monastery is the seat of Gyalwa Karmapa, head of the Kargyupa sect of Tibetan Buddhism, which has 300 centres worldwide. The original Rumtek Monastery was built by the fourth Chogyal in 1730 A.D. The monastery is located on the hill top above about 24 kms. away from Gangtok. The Rumtek Monastery is the replica of the Chhofuk Monastery in Tibet.
Fumbong-Lho WLS	It is located at a distance of about 25 kms. from Gangtok with an area of 51.75 sq.kms. covered by thick vegetations of Oak, Katus, Kimbu, Champa, thick bamboo forests and ferns. The sanctuary is the home to a large number of wild orchids, rhododendrons etc. The best seasons for tourists are April to May and October to December. Wild animals and Himalayan birds are found in this sanctuary.
Zoological Garden	It is known as Bulbulay and is situated about 8 kms. from Gangtok covering an area of about 205 hectares.

## Conclusion

Gangtok as the state capital of Sikkim has a historical background and is influenced by the traditional ethnic culture of the Sikkimese. After 1975, when Sikkim was merged with India as 22<sup>nd</sup> state, the state opened out to the domestic tourists. During the survey it has been observed 90 percent of the domestic tourists were from west Bengal and the remaining 10 percent were from other states of the country. As a result, Gangtok has now become a cosmopolitan city, which has inculcated a mixed Indian culture in terms of language, food habits, dress etc. The regular influx of population of different cultures has helped to form a cosmopolitan nature in Gangtok and its influence has also been marked on the different tourist centres of the state. Though the tourist centres are under the command of Gangtok, the nodal point of tourism in the state, if the development of infrastructure for each district is individually considered, each of these tourists centres could become nodal point of tourism for their respective districts, bringing the other tourist spots of the district under command of district headquarters [10, 11]. In such a way the state capital, Gangtok would able to maintain a sustainable growth in tourism through the process of eco-tourism without disturbing the bio-diversity in and around Gangtok.

Based on the suggestions offered by international tourists surveyed, the way forward for Gangtok tourism would involve declaring Bagdogra airport as an International Airport, upgrading the existing reservation counter to a full-fledged reservation centre instead of just an outstation agency, improving the maintenance of the NH 31A, declaring Sikkim as a tourists transit area between India and China for

which Nathula in the east and Katao in the north districts of Sikkim can be turned into transit points thus reviving the age-old trade routes and bilateral relations between two countries, publicizing Sikkim as an international tourists' heaven, intensively marketing local products, especially handicrafts to attract both domestic and foreign tourists, allowing Gangtok to get as 'overcrowded' as Darjeeling, and halting construction of multistoried buildings on the hill slopes since it has been declared a seismic zone.

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