CHAPTER ONE

INTRODUCTION
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1.1 Introductory Statement

India is recognized as one of the twelve biodiversity centers in the world comprising two ‘Hot Spot’ regions namely the Western Ghats and the Eastern Himalayas. The rich and diverse flora and fauna of India is a reflection of the country’s wide range of environmental regimes. The country harbours around 5.2 per cent of the world's known plants and animal species. India's rain forests hold a high concentration of the nation's total plants and include many species, which are endemic. A network of protected areas with active participation of local communities is considered as one of the best forms of the conservation of biodiversity. India has already established more than 500 protected areas and National Parks covering around 4.5 per cent of the total land area. The establishment and management of these areas have resulted in a variety of issues, such as, the park-people conflict which is very significant in India. The local communities view protected areas as Government imposed restriction over their traditional
practices and the resource use. For them, the benefits of the park are intangible and this is mainly at the cost of tangible benefits from the area. At the same time, the effective management of protected areas requires substantive direct costs, which is not affordable to many developing countries. Therefore, the economic valuation of protected areas will help the policy makers to take unbiased decision on its management and sustainable utilization. The recent Multi-lateral Environmental Agreements (MEAs) including Convention on Biodiversity (CBD) have fully recognized the sustainable utilization of biodiversity. It is one of the topmost agenda of the on-going discussion at the Inter-governmental Forum on Forests (IFF) of the United Nation.

One potential benefit, which arises from protected areas, is that of eco-tourism. It is a non-consumptive and non-marketable direct use of natural resources and it is growing at around 10-15 per cent per annum globally. Most of the eco-tourism destinations are natural areas in tropical countries. In India, most of the protected areas have not been fully utilized the potential benefits from the emerging global eco-tourism. In
many areas, visits to these places are basically local in nature.

In the present study, an attempt has been made to estimate the recreation value of eco-tourism benefits of Kaziranga National Park (KNP) in Assam.

1.2 Objectives

The broad objectives of the present study are as follows:

1) To study the socio-economic characteristics of tourists such as nationality, gender, age, reasons for visit, household income, educational level, length of stay, cost of travel etc.

2) To determine the recreational value by estimating the consumer surplus for visit to KNP.

3) To examine the price elasticity of demand for visit to KNP.

4) To analyse the structure of tourist demand and its linkages.
1.3 Hypotheses

The following hypotheses have been tested:

1. The eco-tourism in KNP may be associated with the young, better educated and those whose lifetime income prospects are above average.

2. The local travel cost may be considered as a better index of the price paid by the tourists to KNP than the total travel cost.

3. The demand for tourism services in Kaziranga National Park (KNP) is expected to be inelastic with respect to price.

1.4 Methodology

In the present study, an attempt was made to find the recreational value of tourism and to determine the structure of tourist's demand. In order to determine the recreational benefits, a version of Travel Cost Method (TCM) was applied. There are two approaches of the travel cost method namely 1) Individual Travel Cost Method (ITCM) and 2) Zonal Travel Cost
Method (ZTCM). In the present study, zonal travel cost method was applied since many tourists were coming from long distances and it was not possible for them to visit more than once in a year. The visitors were divided into zones on the basis of political boundary like States/regions and a separate foreign zone was considered for foreign tourists coming from abroad. Statistical demand functions were calculated regressing the visitation rate upon total travel cost, local travel cost, education, household income, opportunity cost of time, age, gender etc. An attempt was also made to estimate the consumer surplus and elasticity of demand for visits to KNP which are important for formulation of policy.

As far as the survey was concerned, a stratified random sampling was used to determine the proportion in which domestic and foreign visitors should be selected in the sample. The tourists were selected randomly and the interviews were conducted in two phases (October – December, 2004 and January – March, 2005) around a period of six months corresponding with the peak tourist season.
The questionnaire was framed carefully and there were three sections of the questionnaire (Appendix). Section I was designed to obtain data on socio-economic characteristics of the tourists. Section II and III were framed respectively to deal with tour and travel cost related questions and responses of the tourists related to various facilities enjoyed by them. It took some time to conduct the interview of the tourists. However, most of the tourists co-operated with us. Prior to the survey, a pilot survey was conducted in September, 2004 which enabled us to check the viability of the questions prepared to collect the necessary data. During the survey altogether 403 effective interviews were conducted out of which 350 were domestic and 53 were foreign tourists. The sample size apparently consisted of around 5.53 per cent of the total tourists who visited the park. However, it is to be noted that each respondent was selected at random in a group/ family and each respondent was requested to give information about the number in his/her group/family. It was estimated that average size of members of the sampled tourist was 3.46. Hence, on that basis the sample size covered around 20 per cent of the total tourists who visited the park.
1.5 Theoretical Framework

The general approach to TCM for estimating consumer surplus is explained in this section, and it is applied to the case study as follows:

Generating the Travel Generating Function (TGF)

The travel cost method takes as a basic proportion that there may be a negative relationship between the cost of travel and the number of visits made to the site. Other variables, which may affect the rate of visits, include socio-economic characteristics of individuals that enable them to travel, such as income and occupation, and variables that may affect their tastes for traveling to natural environments, such as age and education. Variables, such as the attractiveness of particular sites and the cost of travel to substitute sites may also affect the rate of visits to the sites. It is usual to test whether any of these variables add to the explanatory power of the demand function generated. The travel cost is usually measured as the monetary outlays for transport and services and it may include
a value for the opportunity cost of time spent on traveling. The TGF, thus, takes the general form:

\[ \frac{V_i}{P_i} = f(C_i, X_{ij}) \]  

(1)

Where \( V_i \) is the number of visits, \( P_i \) is the population of zone \( i \), \( C_i \) is monetary travel cost, \( X_{ij} \) are the \( j \) other variables which affect \( \frac{V_i}{P_i} \) and \( i \) indexes the zone of the visitor origin. The TGF is estimated from observations of travel costs to the number of visits made by visitors who have travelled different distances from home to the site.

Apart from requiring a negative relationship between costs and rate of visits there is no theoretically correct form for the TGF and various functional forms have been used, including linear, semi log and double log specifications.

The effect of differing population in the origin zones is taken into account by dividing the number of visits by zone population in thousands, \( \frac{V_i}{P_i} \). The multiple linear regression analysis using Ordinary Least Squares (OLS) is then applied to the observations for zones 1 to \( n \), to estimate the function
which best describes the range of observations. The linear form of this function is:

\[ \ln(V_i/P_i) = \alpha + \beta_1 C_i + \beta_2 X_{1i} + \beta_3 X_{2i} + \ldots \ldots \ldots \ldots \ldots (2) \]

Where \( X_1, X_2 \ldots \ldots \) are variables from (1) that add to the explanation of \( V_i/P_i \).

There are several criteria whether the function achieved by regression analysis is a satisfactory fit to be adopted as the TGF. The most basic criteria for TCM is whether the coefficient of travel cost is negative and significantly different to zero. Similarly, whether the coefficients for other variables are significantly different to zero is important in selecting which other variables to be included in the function.

The degree to which the function generated explains the observations of \( V_i/P_i \) from all zones is conventionally signified by the adjusted R statistic. If the adjusted-R remains low after adding variables other than travel cost, it may be that one or more variables affecting travel behaviour have not been identified and included.
In travel cost study, it is desirable to compare alternative functional forms. Walsh (1986) observed that the semi log form:

$$\ln \left( \frac{V_i}{P_i} \right) = \alpha + \beta_1 C_i + \beta_2 X_{1i} + \beta_3 X_{2i} \ldots \ldots \ldots (3)$$

is most often used for regression analysis of outdoor recreation demand.

**Consumer Surplus**

The recreational value of an outdoor site is reflected in a visitor’s willingness to pay for the visit. This can be estimated as the consumer surplus under the demand curve of the site by travel cost methodology.

1.6 **Brief Description of the Study Area**

The present study area i.e. Kaziranga National Park is located in Assam. Let us first discuss the socio-economic profile of Assam briefly.

Assam with a population of 266.38 lakh (2001 Census) is the largest State of the North East in terms of population. The State has a geographical area of 78,438sq.Km (Map-1.1). It is
relatively the most developed amongst the North Eastern States and it is known for its rich forest and natural resources and biodiversity. However, it is yet to achieve the development at a pace as compared to other parts of the country despite having vast natural resources.

The Net State Domestic Product (NSDP) of Assam at current prices for the year 2001-02(Q) was Rs.29, 19,788 lakh. As compared to the previous year, it indicates a growth of 5.79 per cent as compared to India’s NNP growth of 9.51 per cent. During the period 1993-94 to 2001-02, the NSDP at current prices grew at a compound annual growth rate of 10.15 per cent compared to the nation’s NNP growth of 13.31 per cent.

While the NSDP at constant (1993-94) prices during the year 2001-02(Q) was Rs.15,96,698 lakh. As compared to the previous year real NSDP grew at 3.21 per cent compared to nation’s real NNP growth of 4.21 per cent. During the period 1993-94 to 2001-02 the NSDP at constant prices grew at a compound annual growth rate of 2.70 per cent as compared to the India’s NNP growth of 6.28 per cent.
The per capita income of Assam at constant 1970-71 prices was Rs.50.40 higher than the average per capita income of India in 1950-51. However, it started lagging behind the national average since the late 1960's. In 2001-02(Q) the state’s per capita income at current prices was Rs.10,951 as compared to the all India average of Rs.17,978. During the period 1993-94 to 2001-02, the per capita income at current prices grew at a compound annual growth rate of 8.47 per cent as compared to the national average of 11.51 per cent.

The per capita income at constant (1993-94) prices in 2001-02 was Rs.5,989 as compared to the national average of Rs.10,754. During the period 1993-94 to 2001-02 the per capita income at constant prices grew at a compound annual growth rate of 0.59 per cent as compared to the national growth rate of 4.28 per cent. Agriculture forms the backbone of Assam’s economy. According to 1991 census, about 69 per cent of the total workforce of the State was engaged in agriculture and its allied activities. The contribution of the agricultural sector to the NSDP was 35.09 per cent at current prices in 2000-01. Despite having been assigned high priority in successive plan periods
of the State, the pace of development of this sector has not been up to expectations as compared to other States of the country (NEDFi Databank Quarterly, 2003).

Assam is rich in forest resources and biodiversity. As per the data based on satellite imagery, around 30.20 per cent of land (Government of India, 2002) is covered under forests. It is also widely known for its abundant mineral resources. The exploitation of minerals in the State comprises of mainly petroleum (crude), natural gas (utilized), coal and limestone.

Assam is a land of several paradoxes. It is a resource rich region but suffers from the problem of underdevelopment. A State having higher economic growth at the time of independence than the all India average, has registered an alarmingly negative growth rate recently. The corporate sector is in a miserable condition with an astonishing loss of around Rs.1500 crore. The State has enormous potentiality with naturally gifted wildlife sanctuaries and important religious and historical sites of interests but it is yet to develop its tourism-based resources to make it a sustainable source of revenue earning. The comparative advantage of the State among many
of the States of the country can be illustrated in the following manner.

1. Assam has nature-based tourist spots, which can attract both domestic and international tourists.

2. The majestic river Brahmaputra and its tributaries offer enormous scope for water sports and water cruise.

3. The religious heritage site like Kamakhya and culture-cum-religious sits like Majuli, one of the largest river islands in the world, have the potentiality to attract tourists.

4. The hills and green valleys are nature-endowed avenues for adventure tourism.

5. The folk songs, dances and cultural richness of the innumerable tribes constitute one of the most attractive mosaics of the State.

6. Historical sites of importance in different parts of Assam are other sources of tourist attraction.
The following are the existing and potential varieties of tourism which are likely to make tourism in Assam a vibrant and sustainable project.

The tourist potential of Assam can be gauged from the following points:

a) **Nature Tourism**

Assam and its six neighbouring States of the North East are known for their bio-geographic richness. With its dense forests, uneven topography, flora and fauna, the majestic Brahmaputra and its tributaries, wild life sanctuaries like Kaziranga, Manas, Pabitara, Dibru-Saikhowa, Bhalukpong and similar others and many rare species of animals, Assam offers basically nature-centric tourism. From one end to the other, the State offers to the tourists so many places of natural beauty with a wide variety of wild life that very few places in the world can compete with. Nature tourism understood in terms of wild life sanctuaries constitutes the core of tourism in Assam. The tourists, both domestic and foreign, are likely to find these
places attracting and alluring, provided a well-defined program of action is evolved.

b)  Tea Tourism

Tea was first discovered in Assam in 1823 by two intrepid British adventurers, Robert and Charles Bruce and since then tea has become an integral part of Assam's economy. Each of these lush green tea gardens in Assam (about 1000 in number) is a treasure house of exotic beauty of nature with colourful people and their enchanting songs and dances, sprawling bungalows and residential facilities. Many of these tea gardens have polo fields and golf courses. There are as many as 30 air strips and helipads maintained by the tea garden management. These facilities can form into an attractive package for tourism. The road communication to most of the tea gardens is fairly well maintained and the rest houses and bungalows with modern facilities located there are generally kept ready for visitors and guests. Therefore, a co-ordination with the management of the tea gardens can effectively do a lot in promoting tea tourism in the State. It may be noted that tea
tourism is a recent concept and its potentiality remains unexplored.

c) Eco-tourism

Eco-tourism is also a new concept, developed around the idea of travelling to places of natural beauty, moving around and staying with the places of nature for a couple of days. It has the twin objectives of conserving environment and improving the welfare of the local people. Countries like Costa Rica, Greece, Kenya, South Africa have already successfully promoted eco-tourism. Kerala presents a unique success story of eco-tourism in our country. On this similar line, Assam has immense scope for eco-tourism, as its natural scenario and climatic condition resemble those in Kerala. The State is virtually free from industrial pollution. Its green forests, blue hills, enchanting rivers are the bases on which an eco-friendly tourism can be developed. For that a host of matters to be properly addressed, including: (a) development of good approach road to the spots of tourist attraction (b) creation of infrastructural facilities like good quality tents with provisions for
food and other logistic (c) river cruising and water sports, bird
watching towers etc. These facilities are likely to attract eco-
tourists. It may be noted that eco-tourism is yet to come to take
off stage in Assam.

d) Cultural Tourism

Assam is a conglomeration of various ethnic tribes and
groups each having distinct language, culture and way of life,
festivals etc. Most of these people have their spring festivals.
Songs and dances, display of colourful dresses, tasting of
innumerable varieties of both vegetarian and non-vegetarian
dishes mark these festivals. Sankardev Kalakhetra, Guwahati,
has been organizing in recent years spring festivals on the line
of the desert festival of Rajasthan called the Rangali Utsav in
the month of April in which the various colourful shades of
Assam are presented. This could be as big an attraction as the
Pushkar Mela in Rajasthan. The recent ventures like the
Brahmaputra Beach Festival, which takes place in mid-January
and Elephant Festival at Kaziranga in January are yet to
produce significant results.
e) Adventure Tourism

The enchanting blue hills and speedy rivers of Assam provide an enormous scope for the development of adventure tourism. Recently, some of the adventure sports activities like rock climbing, trekking, para sailing, water sports, river rafting and angling are promoted by the Department of Tourism. There is an annual angling competition held at Bhalukpung Potasali side every year in the month of November in which both domestic and foreign tourists participate. But other areas of adventure tourism like hand gliding are yet to grow. Assam has a number of ideal places like Nilachal hills (where the Kamakhya temple is situated) in the city of Guwahati and the hills around Kaziranga. Since most of the tourists come to the State through Guwahati and visit Kaziranga, there is an enormous scope for hand gliding.

Let us now provide a bird’s eye view of KNP, the present study area.
1.7 Brief Description of Kaziranga National Park

The Kaziranga National Park is situated in both Nagaon and Golaghat districts. The park is located in the southern bank of the Brahmaputra river and at the foot of the Mikir Hills (Map-1.2). It is basically a flood plain ecosystem in which grasslands predominate. About 70 per cent of the park area is covered with 'elephant grass', which grow up to a height of five meters during the rainy season. In the western range, these grasslands dominate, with shorter varieties of grass growing around the water bodies, which are locally known as 'beels'. The 'beels' are recharged each year by the floodwaters of the Brahmaputra.
Map 1.2: Map of Kaziranga National Park
The park contains about 15 species of Indian threatened (Scheduled I) mammals. It harbours the world’s largest population of Indian rhinoceros, which has increased from few dozens in 1908 to 1855 in 2006 (Table 1.1). The rhino, the most attractive animal of the tourists is mostly seen around swampy areas with extensive grasslands, as grass is its main food. Occasionally, during lean periods, it also feeds on water hyacinth (*Eichornia crassipes*), the fruit of some trees such as *Trewia nudiflora, phyllanthus emblica* and *Zizyphus jujuba* and the tender leaves of some shrubs and herbs and the seedlings of various trees species. During the pre-monsoon and monsoon months, rhinos spend most of their time during the day walling in the water. At night they sleep on dry ground. During winter, they graze for longer hours both in the morning and in the evening and wallow in water for considerably fewer hours. The park has also elephant, wild buffalo, swamp deer, hog deer, barking deer, samber, holock gibbon, gour, leopard, otter, pythons, civet cat, wild boar, tiger, capped langur etc. Around thirty four numbers of mammals are found in the park. The Table-1.1 gives the annual census of some animals from 1978 to 2006.
Table 1.1: Number of Different Animals from 1978-2006

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<tbody>
<tr>
<td>Rhino</td>
<td>938</td>
<td>1080</td>
<td>1069</td>
<td>1164</td>
<td>-</td>
<td>1552</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1855</td>
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<tr>
<td>Elephant</td>
<td>773</td>
<td>523</td>
<td>515</td>
<td>1094</td>
<td>945</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1048</td>
<td>1246</td>
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<td>Buffalo</td>
<td>610</td>
<td>677</td>
<td>1090</td>
<td>1034</td>
<td>-</td>
<td>1192</td>
<td>-</td>
<td>-</td>
<td>1431</td>
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<tr>
<td>Tiger</td>
<td>14</td>
<td>52</td>
<td>50</td>
<td>72</td>
<td>80</td>
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<td>86</td>
<td>-</td>
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<tr>
<td>Swamp Deer</td>
<td>697</td>
<td>756</td>
<td>635</td>
<td>427</td>
<td>-</td>
<td>398</td>
<td>468</td>
<td>-</td>
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<tr>
<td>Sambhar</td>
<td>215</td>
<td>158</td>
<td>55</td>
<td>34</td>
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<td>-</td>
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<tr>
<td>Barking Deer</td>
<td>95</td>
<td>93</td>
<td>-</td>
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<tr>
<td>Hog Deer</td>
<td>6855</td>
<td>9872</td>
<td>2911</td>
<td>2048</td>
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<tr>
<td>Bear</td>
<td>4</td>
<td>2</td>
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<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Bison</td>
<td>23</td>
<td>30</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Wild Boar</td>
<td>733</td>
<td>1645</td>
<td>555</td>
<td>140</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>Others</td>
<td>232</td>
<td>196</td>
<td>-</td>
<td>-</td>
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</table>

Source: Department of Forest, KNP, 2006

KNP is also famous for its sizeable population of exotic and rare birds. In fact, the birds in the park and its surrounding exceed 500 species, which is one of the highest in the country. Migratory birds visit the park especially the eastern range during winter and some of them establish breeding colonies. KNP has twenty five globally threatened and twenty one near-
threatened bird species. The twenty five globally threatened species include the swamp francolin (*Francolinus gularis*), the lesser white-fronted goose (*Anser erythropus*), Baer’s pochard (*A. Baeri*), Blyth’s kingfisher (*Alcedo Hercules*), the pale-capped pigeon (*Columba punicea*), the Bengal florican, the Nordmann’s greenshank (*Tringa guttifer*), the black-bellied tern (*Sterna acuticauda*), Pallas’s fishing eagle (*Haliaetus leucoryphus*), the greater spotted eagle (*Aquila clanga*), the emperial eagle (*A. Heliaca*), the lesser kestrel (*Falco naumanni*), the white-bellied heron (*Ardea insingns*), the spot-bellied pelican (*Pelecanus philippensis*), the Dalmatian pelican.

Moreover, around nineteen main species of fish are found in water body of Kaziranga.

If we go through the history of KNP we find that Lady Curzon first heard about rhino of Kaziranga from her British tea planter friends when she came to Assam in winter of 1904. Although she could not see the animals, but she could spot hoof prints with three toes. Alarmed by the fact that the rhinos in Kaziranga was heading for extinction, she convinced her
husband Lord Curzon, the then Viceroy of India, to take measure to save the unique animal. Under the initiative of Lord Curzon, a preliminary notification announcing the intention of the Government to declare 57,273,60 acres of Kaziranga as a reserve forest was issued. Finally Kaziranga was declared as reserve forest in January 1908 with the primary objective of preserving the rhinoceros and other large mammals. Subsequently KNP was declared as a Game Sanctuary in 1916. Gradually, the sanctuary began as a nucleus encompassing a small area, expanded to its present size. Finally, in 1974, it was declared as Kaziranga National Park. In 1985, the original core area of 428 sq km was declared as World Heritage Site by UNESCO.

1.8 Characterisation

The entire study is arranged into six chapters. The first chapter makes an opening statement regarding the nature of study, objectives, hypothesis to be tested, methodology, brief description of study area and analytical framework.
The second chapter is divided into two parts: 1) The first part, on the basis of literature available analyses some theoretical issues and approaches to the valuation of environmental goods and (ii) the second part organizes important empirical studies which were conducted so far on various aspects of recreational value of nature reserve and forests in the world in general, and India and North East India, in particular.

The third chapter concentrates on socio-economic characteristics of the tourists surveyed.

In the fourth chapter an attempt is made to analyse the structure of tourist demand and its sectoral linkages.

In the fifth chapter, an attempt is made to estimate the recreational value of eco-tourism of KNP by applying travel cost method.

Finally, the conclusions and policy implications follow in the sixth chapter.