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INTEGRATED PROTECTED AREA CO-MANAGEMENT (IPAC)

ECO-TOURISM IN SATCHARI NATIONAL PARK



January 21, 2013

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Abstract

This study was designed and implemented under the USAID's Integrated Protected Area Co-Management (IPAC) project to assess the current tourism practices in Satchari National Park (SNP). In addition to the annual visitations, geographic, bio-physical, and managerial characteristics of the park, the study identified impacts of existing eco-tourism practices. The carrying capacity of the park has been assessed and important recommendations for appropriate visitor management strategies have been suggested.

On-site questionnaires were administered to a sample of 193 visitors to collect data concerning the demographic and other important attributes and characteristics. Local members of co-management organizations were interviewed to understand their attitudes towards eco-tourism in the park.

The visitation to Satchari is increasing, an increase of 40% in 2011. The visitation to the park varies seasonally: the visitation drops during the rainy season (May to August) but heavy visitation on weekends (Friday and Saturday) and holidays. Visitors mainly come to the park to rest and relax (35% respondents). The group size of visitors varies from a couple to group of maximum 200. Majority of the respondents (80%) said they were not willing to pay higher entrance fees as the existing price is good enough for the facilities provided presently. The local community members commented that eco-tourism has increased opportunities for their employment and has indeed benefitted them in their livelihood.

The effective carrying capacity (ECC) of the three officially designated trails was found as: 127 visitors/day on the half an hour trail, 132 visitors/day on the one hour trail, 99 visitors/day on the three hours. The results demonstrated that actual average visitation of the park is lower than the effective carrying capacity which is calculated with limiting factors. In reality there is a risk of carrying capacity overload particularly in the peak seasons. This calls for the development of an efficient and effective management system that can fulfill the two mandate of the park - the forest conservation and providing enhanced visitor experience.

Acronyms

CMC	Co-Management Committee
CONIC	Co-Management Nature Interpretation Centre
ECC	Effective or permissible Carrying Capacity
FD	Forest Department
IPAC	Integrated Protected Area Co-management Project
MC	Management Capacity
PA	Protected Areas
PCC	Physical Carrying Capacity
RCC	Real Carrying Capacity
SNP	Satchari National Park
TCC	Tourism Carrying Capacity
WTO	World Tourism Organization

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Chapter 1: Introduction

1.1 Eco-tourism and Visitor Management in Protected Areas

Eco-tourism is one of the fastest growing sectors of the tourism industry. It developed in the 1980s and since then it has been growing significantly in terms of popularity and application especially in developing countries, which are rich with natural and cultural assets (Boyd and Butler 1996; Briedenhann and Wickens 2004; Sander 2010). The development of eco-tourism came about as an acknowledgment and reaction to sustainable practices and global ecological practices (Diamantis 1999). It is also seen as a sustainable source of earning income for indigenous and rural communities (Mowforth and Munt 1998; Ponting 2001; Briedenhann and Wickens 2004; Schilcher 2007). Today, eco-tourism is a growing industry and it is one of the fastest growing sectors of the tourism industry.

The rise in eco-tourism meant more people were exposed to environmental issues (Wearing and Neil 1999), thereby, protected areas (PA) began to exercise eco-tourism as a conservation tool to preserve and develop natural resources. These places are now experiencing a steady increase in the number of visitors who see the PA as places of recreation and enjoyment. Other factors also contributed to the increase in visitation, such as increased demand to travel to serene, pristine and undisturbed natural areas to escape urban areas (Buckley 2000), improvements in global communications (Eagles et al. 2002a) and technological advances in transportation, making remote areas easily accessible to the public (Eagles and McCool 2002b).

Protected areas, especially in developing countries and to some extent in developed countries as well, were originally established with the sole purpose of preserving unique and important natural features and habitats, which is why they were not ready to fully cope with the intensive and unchecked rise in visitations and visitor related activities. This led to ecological impacts including trail erosion, wildlife disturbance, water pollution, overcrowding and conflicts (Ceballos-Lascuráin 1996; Manning 1999; Marion and Farrell 1998; Shelby et al. 1989). Although the protected areas' provision of

recreation and enjoyment to the visitors was acknowledged as a positive secondary outcome, the need for visitor management to protect the natural resources from excessive human impacts was not yet fully acknowledged.

The problems associated with increasing number of visitors to ecologically sensitive area have led park managers to face several challenges (Sowman and Pearce 2000; UNWTO 1992). The managers have the responsibility of carrying out conservation as well as encouraging visitor use of the protected areas (Beckmann 1991; Fennell 1999; Manfredo and Bright 1991; Manning et al. 1996; Pigram 1983; Wescott 1993). This may seem to be a relatively simple task to achieve but in reality it is not, especially when visits to the natural sites are increasing. The park management body has to effectively manage visitors to natural areas to ensure that conservation efforts and tourism activities are simultaneously met (Eagles and McCool 2002b). Therefore, it is increasingly recognized that for effective park management it is not enough for PA managers to have knowledge about natural resources only. It is now very important for park managers to have an understanding of the types of visitors that come to protected areas and the capacity of the protected areas to provide high quality visitor experience. This means that park managers have to be well equipped to provide maximum visitor enjoyment while at the same time ensuring minimum negative impacts on the natural and cultural resources and the local people. They must have a better understanding of park visitation patterns, numbers and trends (Bushell et al. 2007).

Along with effective visitor management, park stewardship requires strategic policy implementation to maintain ecological integrity. The World Tourism Organization predicts a dramatic rise in international tourism by the year 2020 and this prediction suggests that the use of eco-tourism as a conservation tool will be enhanced. Thus, park managers must have an increased understanding of the benefits and negative impacts of tourism to ensure the desired outcomes as the benefits stemming from eco-tourism in protected areas can be significant with more people enjoying, respecting and valuing nature.

1.2 Supporting Sustainable Use of Protected Area

Understanding the features of a protected area as well as the prevailing physical conditions such as temperature and precipitation is important when trying to find out the major causes of environmental impacts due to visitors. The specific activities carried out by visitors also play a role in determining the causes (Leung and Marion 2000; Leung et al. 2001).

Ralf Buckley and J. Pannell (1990) have categorized the types of impacts on the environment into three main groups – “*those associated with transport and travel; those associated with accommodation and shelter; and those associated with recreational activities per se*” (Buckley and Pannell 1990). Erosion, damage to vegetation, fires, water depletion and pollution, disturbance to wildlife, litter, changes to the environment for the provision of visitor services, noise, vandalism etc. are some of the impacts that arise from these three categories. Actions taken to lessen the primary impacts may give rise to secondary impacts that will further aggravate the impacts. Other negative impacts can be removal of plants and seed sources, introduction of exotic and invasive species that invite weeds and pests, improper use of pesticides, poor waste management system and air pollution. All these lead to loss of biodiversity and habitat degradation.

The greater the number of visitors a protected area receives, the greater is the environmental impact (Evans 2001). In this context, park managers have to deal with the issues of how much the degree and extent of change that is acceptable to a natural area. The answer to these issues is determined by factors that can be either political or social but availability of information to the park managers is crucial.

1.3 The Concept of Carrying Capacity

Concerns regarding the effectiveness of tourism as a tool to promote and achieve nature conservation, social and economic benefits for local people are expanding as the tourism industry is growing rapidly along with many local communities moving away from traditional resource extraction to tourism. Thus it is quite fitting to introduce the concept of carrying capacity into this scenario. Carrying capacity is a paradigm for addressing and

limiting the amount of tourism development and use at a destination. This has led to establishing carrying capacities in terms of specific numbers of tourists over a specified time.

The concept of carrying capacity has been applied in the field of range management and wildlife where it refers to the number of animals of any one species that can be accommodated in a given habitat (Dasmann 1964). It was only in the mid-1930s that carrying capacity was first suggested as a park management concept in the context of national parks (Sumner 1936). However, its application in the field of park management came about in the 1960s (Wagar 1964). Carrying capacity is the matter of determining the degree to which protected areas can be used without violating standards. Carrying capacity frameworks consist of Limits of Acceptable Change (Stankey et al. 1985), Visitor Impact Management (Graefe et al. 1990), Outdoor Recreation Management Framework (Manning 1999), Visitor Experience and Resource Protection (National Park Service 1997; Manning 2001), Carrying Capacity Assessment Process (Shelby and Heberlein 1986) and Visitor Activity Management Process (Parks Canada 1991).

Tourism Carrying Capacity (TCC) is the maximum level at which human activities can be carried out in an area without environmentally degrading the place. Middleton and Chamberlain (1997) defined Tourism Carrying Capacity (TCC) as *“the level of human activity an area can accommodate without the area deteriorating, the resident community being adversely affected or the quality of visitors experience declining.”* Carrying capacity is also often defined as the amount of use that an area accommodates before reaching degradation. The World Tourism Organization (WTO) (1997) defines carrying capacity as *“The maximum number of people that may visit a tourist destination at the same time, without causing destruction of the physical, economic, socio-cultural environment and an unacceptable decrease in the quality of visitors' satisfaction.”* It is inevitable for an area to undergo certain changes when it is being used. Thereby, it is not possible for an area to undergo change without being afflicted with negative effects. It is not realistic and appropriate to define carrying capacity in essentially numeric terms exactly.

1.4 Tourism Development in Bangladesh

Despite its poor-country status, Bangladesh is becoming increasingly popular amongst tourists worldwide. The framing of the National Tourism Policy in 1992 by the then government has given the country's tourism industry a facelift, and the importance and contribution of tourism in the country's economy sector was further realized. Considering the growth of tourism in the country, the Industrial Policy of 1999 recognized the tourism industry and incentives such as tax exemption were given.

Bangladesh is a country that is blessed with a rich diversity of nature – the world's longest stretch of sandy beach (120 km) in Cox's Bazaar, the wetlands, the islands, the mangroves in the Sundarbans and the evergreen and semi-evergreen hill forests. These natural features make the country a desirable destination for many tourists. Thus tourism in general and eco-tourism in particular is a fast growing industry in the country. The World Travel and Tourism Council expects the contribution of travel and tourism to gross domestic product to rise from 3.9% in 2010 to an estimated 4.1% by 2020.

During the last few years, the country has received numerous international recognitions. Sundarbans and Cox's Bazaar were enlisted as candidates in the Worldwide New7Wonders of Nature campaign in 2007, and in 2009 Sundarbans entered the 28 Official Finalist Candidates. Bradt Travel Guide published its 1st edition of their tourist guidebook, 'Bangladesh' in 2009. Lonely Planet, the world's most successful travel publisher, nominated Bangladesh in 2009 as one of the top 10 countries to visit and also published their 6th edition of their tourist guidebook, 'Bangladesh' (2008). Again in 2010, Lonely Planet nominated Bangladesh as the number one best value destination for 2011. In 2011 Bangladesh co-hosted with India and Sri Lanka the 2011 ICC Cricket World Cup.

1.5 Protected Areas in Bangladesh

Bangladesh has 34 protected areas (national parks and wildlife sanctuaries) covering about 2654.03 square kilometers, which is about 1.80 percent of the country area, and 5 eco parks under the provisions of Wildlife (Preservation) Amendment Act 1974,

subsequently Wildlife (Conservation and Security) Act 2012. Realizing the need to conserve the country’s protected areas, the Ministry of Environment and Forests with USAID support started the Nishorgo Support Project in 2003 to initiate people’s participation for better conservation of protected areas. The objective of this project was to conserve nature, promote nature-based tourism and work towards poverty reduction for local communities living in and around the protected areas by adopting the approach of ‘co-management’. Collaborative management, or co-management, is an approach where the government technical agencies collaborate with local communities and other key stakeholders in the management of protected forests, wetlands and other ecologically critical areas. The project has established Co-management platforms which includes Co-management committee (CMC), peoples forums (PF), nature clubs, youth clubs, forest resources user groups (FRUG), and community patrol group (CPG). The project also implemented various alternative income generation activities (AIGA) including promoting eco-guides, developing plant nurseries, dairy farming, and building eco-tourism facilities like lodges, and dormitories. These activities sensitized people in protected area management system. The project ran for five years until May 2008. In June 2008, the Integrated Protected Area Co-management Project (IPAC) was launched to build on the successful co-management interventions of Nishorgo.

The declaration of protected areas drew the attention of people towards nature and nature conservation. The increase in the people’s capacity to pay for travels within the nation gave an increase to the number of visitors traveling to natural destinations. Nishorgo also helped in the marketing of these areas as well as in developing visitor facilities in and around the protected areas. The following table (1.1) shows the increase in visitation to three of Sylhet division’s protected areas – Lawachara National Park, Satchari National Park and Rema Kalenga Wildlife Sanctuary over the last two years. These areas are preferred tourist destinations by both national and international visitors alike.

Table 1.1 Number of visitors to the three protected areas (2009-2011)

	2009-2010	2010-2011	2011-2012
Lawachara NP	91,602	1,05,790	1,07,662
Satchari NP	33,104	46,715	53,228
Rema-Kalenga WS	370	434	1,285

1.6 Objectives of the Study

The main objectives of this study are to:

1. Look into the trends of tourism in Satchari National Park
2. Documentation of existing visitor facilities and resources
3. Identify impacts of existing tourism
4. Assess the tourism carrying capacity of Satchari National Park

1.7 Duration of the Study

The duration of the study was from September 2012 to January 2013. The duration of field study at Satchari National Park was from 4 October 2012 to 10 January 2013.

1.8 Constraints

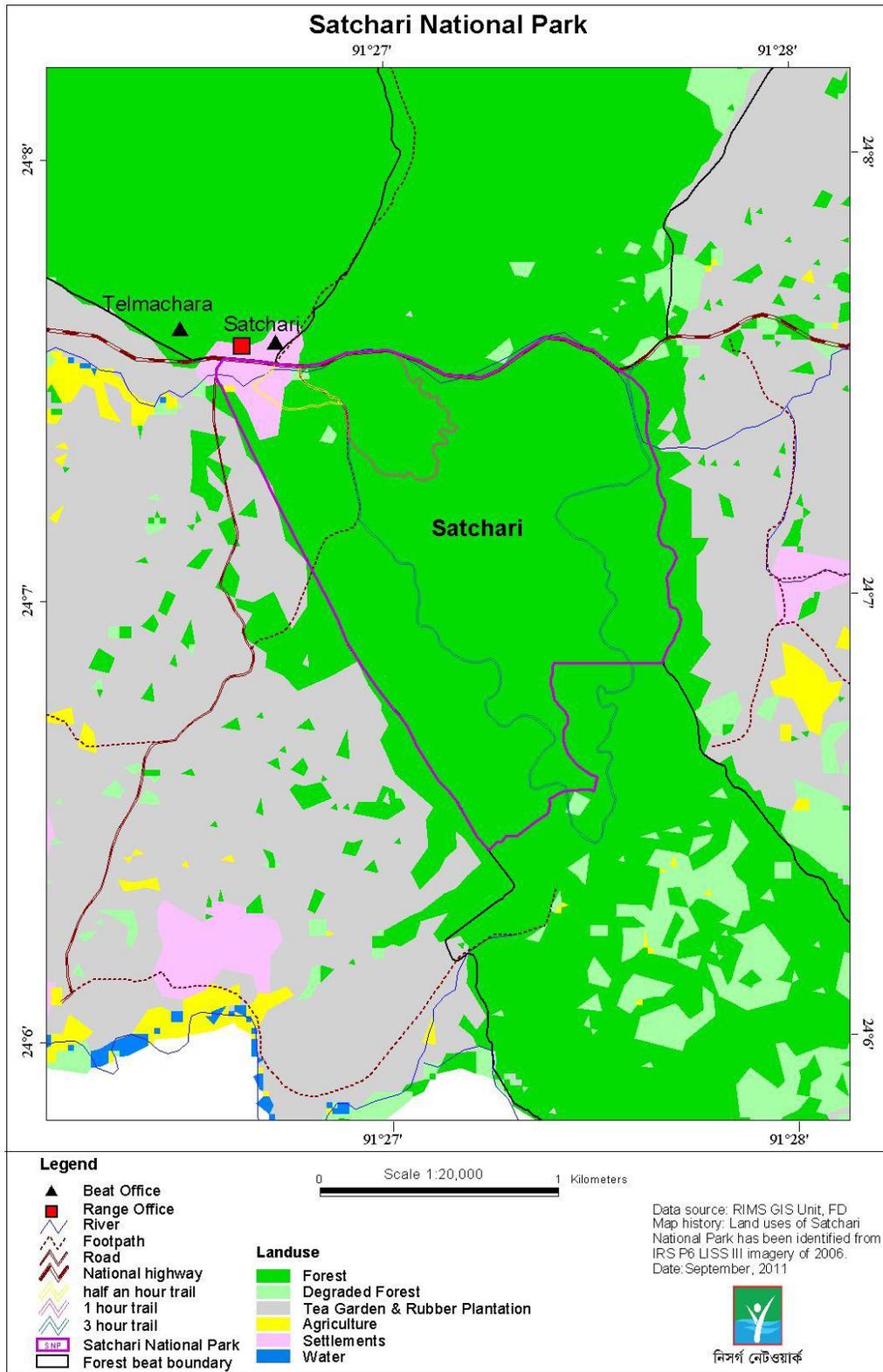
The following constraints were faced while conducting this study:

- No baseline data was available for the study.
- The duration of the study was insufficient for carrying out a detailed and more comprehensive study.
- Data analysis was carried out in Excel and it was time consuming as there was no access to a software program for analysis.
- Data entry was manual and it was time consuming.

1.9 Further Studies

In order to have a better understanding of the tourism in Satchari National Park it is important to ensure that continual investigation takes place. The information will help the park management staff to efficiently manage the park and its visitors. Further studies are required on the visitors and their level of awareness and education, segmentation of visitors that come to the park, the impacts of tourism on the habitat and wildlife of the park and the type of eco-tourism that is taking place in the park.

Chapter 2: Study Area



Map 2.1 Satchari National Park

2.1 Location and Constitution

Satchari National Park (SNP) is located about 130-140 km northeast of Dhaka in the Paikpara Union of Chunarughat Upazila of Habigonj district (Map 2.1). SNP stands on the Dhaka-Sylhet old highway in Sylhet division. SNP is governed by the Forest Act of 1927 as well as the Wildlife Conservation Act of 1974, subsequently Wildlife (Conservation and Security) Act of 2012. The national park was established in 2006 and covers an area of 243 ha and is a part of the 6205 ha of the Raghunandan Hills Reserved Forest. The park is well connected by rail, air and road. It lies on the Dhaka-Sylhet old highway and is about 130-140 km northeast of Dhaka, in the Sylhet division. It is 60 km southwest from Srimangal (between Teliapara and Srimangal) and the nearest airport is Sylhet.

The forests of the park are mixed tropical evergreen and semi-evergreen. Hillocks, locally known as *tillas*, are scattered throughout the landscape and their altitudes range from 10-50 meters. A number of small, sandy bedded streams flow throughout the forest, all of which dry out following the end of rainy season in October-November, and are subject to intensive commercial harvesting of sands during the dry period. The park is surrounded by tea estates which are eco-tourism attractions.

2.2 Biodiversity Significance

The forests of the park are composed of mixed tropical evergreen and semi-evergreen plant species. It is characterized by high rainfall and a multi-tier vegetation of rich biodiversity. SNP originally supported an indigenous vegetation of plant species. However, all of the original forest has been removed or considerably altered, turning it into a secondary forest. Fossil remains are found on the floor of the forest (Figure 2.1).



Figure 2.1 Fossilized wood blocks

The following five broad types of habitats can be found in Satchari National Park:

- high forests represented by the remaining natural forests;
- plantations including the monoculture of exotics;
- grasslands and bamboos;
- wetlands, and
- cultivated fields.

The first two habitats are the largest in extent and also important from park management point of view. Bamboos and canes have been planted in many plantation areas, after removing undergrowth vegetation.

SNP supports a number of animal species (mammals, birds, reptiles and amphibians) which are both forest-dwelling and wetland-associated species of different genera and families. Satchari has a wildlife diversity consisting of 197 species. There are more than 6 species of amphibians, 18 species of reptiles, 149 species of birds and 24 species of mammals. Although the forest is too small to support large primate populations, Satchari is home to many primates including the globally endangered Hoolock Gibbons, Pig-tailed Macaque and Capped Langur. Other mammals such as the Orange-bellied Himalayan squirrel and Barking Deer are found in the park.

A number of bird species including the Greater Racket-tailed Drongo, Hill Myna, Oriental Pied Hornbill, White-crested Laughing Thrush, Puff-throated (Spotted) Babbler and White-rumped Shama are found in the park.

2.3 Local Communities

SNP is surrounded by a number of villages comprising nearly 10,000 households with a population of about 56,000. The local Tiprapara is the only village located inside the park and is home to an ethnic community of the Tripura tribe with 16 households. The local people are engaged in the eco-tourism activities as alternative means of generating income to reduce the dependence on the forest.

2.4 Eco-tourism in Satchari National Park

As a nature-based tourism site, SNP is easily accessible and it is the next popular tourist destination after Lawachara National Park (IUCN 2008). However, level of visitation is comparatively low to Lawachara and so SNP still has a tranquil natural environment. Figure 2.2 shows the level of visitation (2009-2010 and 2010-2011) which shows that visitation is increasing.

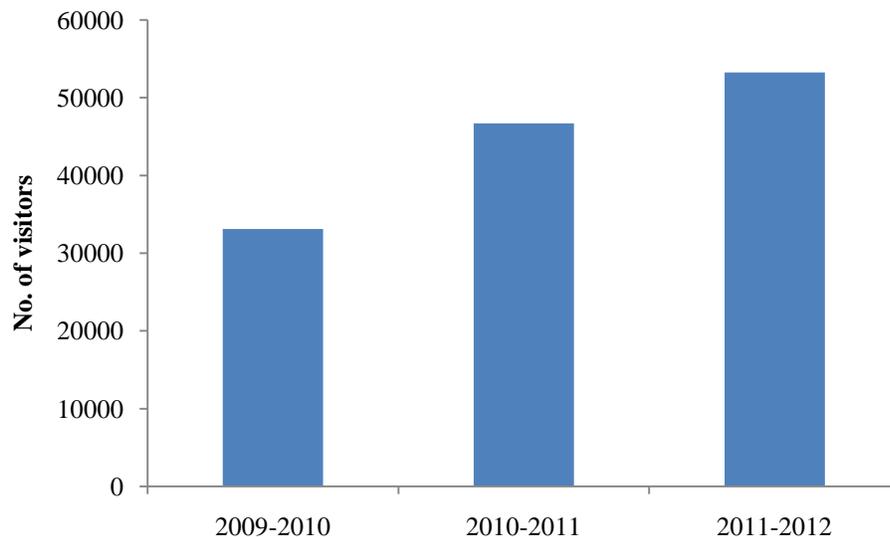


Figure 2.2 Visitation to Satchari National Park

Sighting of wildlife, especially Capped Langurs and Pig-tailed Macaques, is common and so SNP is one of the major eco-tourist attraction sites. Capped Langurs are the flagship species of SNP. Oil palm plantations in the northern boundary of the park also attract visitors to SNP. The park is open for visitors throughout the year, although visitation reduces considerably during the rainy season (May to August) each year. Visiting hours are from 9 a.m. to 5 p.m.

Entry to Satchari National Park was free until November 2009 when the entry fee system with approved rates was introduced (Table 2.1). The entry fee is collected at the main entrance where locals from the Tiprapara manage visitors.

Table 2.1 Entry fee to Satchari National Park

Fee charged for	Rate
Adult/per person	20 TK
Student and minor/per person	10 TK
Foreigner	5 US\$
Parking	25 TK
Filming	6000 TK/day
Picnic/per person	10 TK

2.5 Interpretive Services

The park provides guide service and currently there are 12 trained eco-guides to take visitors around the park and to interpret nature. The guides are from the villages within and around SNP. Visitors to SNP can choose from three existing nature trails – half an hour trail, one hour trail and an intensive three hour trail.

The park supports an interpretation center, information center and shops for buying food and beverages. The interpretation center was set up in 2010 to enhance visitor experience by educating them about the biodiversity of the park. The information center has brochures and other informative materials about the park and also sells T-shirts, caps and products from the ethnic community. The shops inside the park are run by locals and so the development of Satchari National Park has generated jobs for the locals and has provided them with alternative means of earning income and depending less on the forest for their livelihood.

Half an hour trail: The trail starts on the main metallic road adjacent to the entrance road of Satchari Range Office and ends at the same point after a loop. A signboard with the writing, 'Wilderness Area' is positioned to the south of the road. Just behind the signboard to the right there is a *jarul* tree and from there the trail continues for about 1 km (855 m to be exact). The width of the trail varies from 0.5 m to 3 m. The earthy trail starts with grass cover and later the trail has exposed surface with minimum grass covering. Visitors come across a dry stream twice, and Tiprapara where they can learn (with permission) about the culture and lifestyle of the Tipras.

One hour trail: Visitors will follow the half hour trail but they will not take the first turn on the right which goes towards Tiprapara. The trail is about 1.45 long. They will take the second right turn after walking for a while. Natural vegetation of the park along with the diversified forest species will be a treat for the visitors' eyes. Forest birds keep the atmosphere charming with their songs. If the visitors are lucky they can catch a glimpse of the endangered Hoolock Gibbon which is unique to this part of the country.

Three hours trail: This trail starts from the same location of the other trails as mentioned earlier but this one ends after reaching the main road to the east of the starting point near to Chaklapunji Tea Garden, where a big *Dumur* tree adjacent to the road and a signboard of *Agar* plantation are located. The length of the trail is about 5 km and visitors will enjoy the natural vegetation and diverse wildlife including the endangered Hoolock Gibbon.

2.6 Other Visitor Attractions in the Area

2.6.1 Tiprapara - Ethnic Community Village

Tiprapara is the only recognized forest village inside SNP, inhabited by 16 households of Tripura tribe. The headman leads the village which was established by the Forest Department (FD) inside the reserve forest to provide labor for raising plantations after clear-felling natural forests. Visitors can enter and go around the village after seeking permission and talk to the members of the tribe and understand their culture and their community lifestyle.



Figure 2.3 A house in Tiprapara

2.6.2 Tea gardens

Eight tea estates surrounding the park are great attractions for visitors. The names of some of the tea estates are - Satchari, Chaklapunji, Chendichera, Nabab Khan, Chandpur and Surma.



Figure 2.4 A view of one of the tea estates

2.7 Satchari National Park in Pictures



Figure 2.5 A Capped Langur, the flagship species of the park



Figure 2.6 The ticket counter



Figure 2.7 The Interpretation Center



Figure 2.8 Students visit the park in significant numbers



Figure 2.9 Majority of the visitors to the park are local nationals



Figure 2.10 The park officials including eco-guides constitute of the local people

Chapter 3: Study Methodology

3.1 Visitor Survey

Sustainable use of protected areas by visitors is ensured through careful planning and management (Newsome et al. 2002). The park managers can effectively manage the protected areas when there is an availability of quality information. The collection of visitor data provide them with information of the best facilities and services that they can provide to meet visitor needs (Wardell and Moore, 2005). The type of information needed for effective park management, may include the activities visitors are going to engage in, who they are and from where they are coming and their level of satisfaction with their visit to the protected areas. The information collected can then be used to make an assessment of the values of the protected areas, its resources and its commercial activities and the attitudes of visitors. Having minimal data or no data at all can misrepresent and undermine the values of the protected areas to the public, government and business (Hornback and Eagles 1999).

The type of method that must be chosen to collect data depends on the study objectives. The most widely used method for collecting detailed information on visitors is visitor surveys based on questionnaires and so was adopted for this research. Also a number of principles were used when designing the survey and these included avoiding jargon, ambiguity and leading questions, using simple questions and asking only one question at a time.

De Vaus (1991) recommends using both open ended and closed ended questions for good survey design and this was adopted for the visitor survey. Open ended questions are those that are asked without providing a range of possible answers. Closed ended questions are those that provide respondents with a range of answers to choose from. The benefit of adopting this approach is that respondents are saved from having to share personal information such as age and income and the range of answers provided make it convenient for analysis (Sinha et al. 2012).

The visitor survey was conducted inside the national park and a self-administered survey approach was adopted for logistic reasons. The questionnaires were pre-tested at the national park and due changes were made for ensuring their effectiveness. Three eco-guides from Satchari National Park were selected to approach the visitors and distribute the questionnaires. They were trained prior to the data collection to ensure quality information. The researchers also joined them during the administration of questionnaires. Visitors were given a brief introduction on the purpose of the survey before asking them to participate. The time taken to answer each questionnaire by a visitor was approximately 15 minutes.

Each visitor survey questionnaire had 35 questions. The first 10 questions and questions 30 to 34 were related to socio-demography measures namely information source about the park, number of visit, type of travel group, duration of stay, lodging at, mode of transport, main purpose of visit, sex, place of residence, age, education level and profession. These were closed ended questions. Question 11 asked visitors about the important factors that were considered for deciding to visit the park. The level of importance was measured using Likert scale. Question 12 was a closed ended question that asked about the activities that the visitor would be participating in while in the park. Questions 13 to 24 were also closed ended and open ended questions that asked the visitors about the visitor facilities available in the park and their knowledge regarding guide service, interpretation center and information center. The visitors were also asked to identify the types of disturbances they found in the park and to measure each one on a scale of 1 to 3, with 1=too much, 2=little and 3=none. Question 24 asked the visitors to rate the level of importance and satisfaction of 12 park facilities. Likert scale was used for the measurement. Questions 25 to 29 and 35 were both open and closed ended questions that asked the visitor about the overall satisfaction of the park, willingness to pay a higher fee, recommending the park to friends and reason for the recommendation and any particular suggestion for the improvement of the park.

3.2 Village Survey

There is only one recognized forest village inside the park, known as Tiprapara, which was earlier inhabited by 24 households. During the survey it was found that only 16 households exist as some have moved out. Landscape villages, which are located on the eastern, north-eastern and north-western parts of the park, fall under the identified 5-km wide interface landscape zone meaning these villages are to be taken into account for effective management of the park. Thus, for administering the village survey Tiprapara and 15 other villages were selected. The main purpose for carrying out the survey was to find out the attitude of the local people towards the protected area and eco-tourism inside the park.

The household head or the eldest member present in each household was interviewed. The questionnaire comprised of closed ended questions that aimed at getting information on the socio-demographic profile of the villagers, their livelihood options and their attitude towards eco-tourism and conservation. Pre-testing of the questionnaires was carried out in the park for their efficacy. Each questionnaire consisted of 21 questions and the villagers answered each attitude statement according to the strength of their agreement.

In total, 121 households were interviewed in 16 villages. The names of the villages along with the total number of households interviewed are shown in the table below.

Table 3.1 Names of villages interviewed

Sl. No.	Name of village	No. of households interviewed
1.	Tiprapara	16
2.	Satchari Tea Garden	10
3.	Deorgachh	5
4.	Ramnagor	2
5.	Shahjahanpur	9
6.	Chandpur Bosti	4
7.	Bagbari	7

8.	Enatabad	2
9.	Teliapara	6
10.	Sharakona	1
11.	Gazipur	10
12.	Rambanga Tea Garden	10
13.	Chaklapunji Tea Garden	10
14.	Surma Tea Estate	10
15.	Kapai Tea Estate	10
16.	Chandi Chara Tea Garden	9
	Total number of households interviewed	121

3.3 Eco-guide Survey

There are 12 trained eco-guides who are available for providing visitor services in the park. An eco-guide survey was carried out to understand their level of knowledge regarding guide service, the park, eco-tourism and conservation. A total of 6 eco-guides were interviewed.

The questionnaires for the survey consisted of both open and closed ended questions. Each questionnaire consisted of 15 questions and the questions were related to the socio-demography profiles of the guides, knowledge of the park, the briefing about the park to the visitors, conservation and eco-tourism, problems faced by the guides and suggestions to improve the tourism to the park. The survey was administered inside the park.

3.4 Quantification of Garbage

The holding area in the park, which is where the Forest Rest House, Range Office and eco-tourism infrastructures are located, is the most popular site amongst visitors. Some visitors go to the half an hour trail, one hour trail and three hours trail. In order to identify the amount of garbage generated by the visitors the holding area was chosen. All the non-

biodegradable garbage was collected from the area and weighed and shifted out of the site. The collection continued again after a week and was weighed.

3.5 Mapping of Trails

In order to calculate the carrying capacities of the trails, the trails and the existing zones were mapped through GPS. The information was used to find out the length of the trails and the areas with erosion. The maps collected were then overlaid on the digital image of Satchari National Park.

3.6 Sharing with the Stakeholders

Discussions were held with the Co-Management Committee (CMC), Nishorgo Youth Club, Nishorgo Sahayak, eco-guides and other stakeholders to get their understanding of the present eco-tourism in Satchari National Park and what improvements they would like to see in the future. Discussions were also held with IPAC staff and FD staff (Divisional Forest Officer, Range Officer and Beat Officer of Satchari).

3.7 Collection of Secondary Data

Secondary data on the number of visitors coming to the park, the revenue generated through eco-tourism and the usage of the one and only gate to the park were collected from the IPAC Office. Meteorological information was collected from the Bangladesh Tea Research Institute based at Srimangal.

Chapter 4: Visitor Patterns in Satchari National Park

Domestic tourism in Bangladesh has been on the rise. It is estimated that about five lakh people travel inside the country annually and this is growing at an annual rate of 15 per cent. The country's economic growth has grown more than 6 percent per year for the last decade and this has contributed to higher standards of living and an increased disposable income particularly amongst the middle class (average BDT 28,182 in 2011). With the rise in purchasing power people are able to travel to destinations of interest.

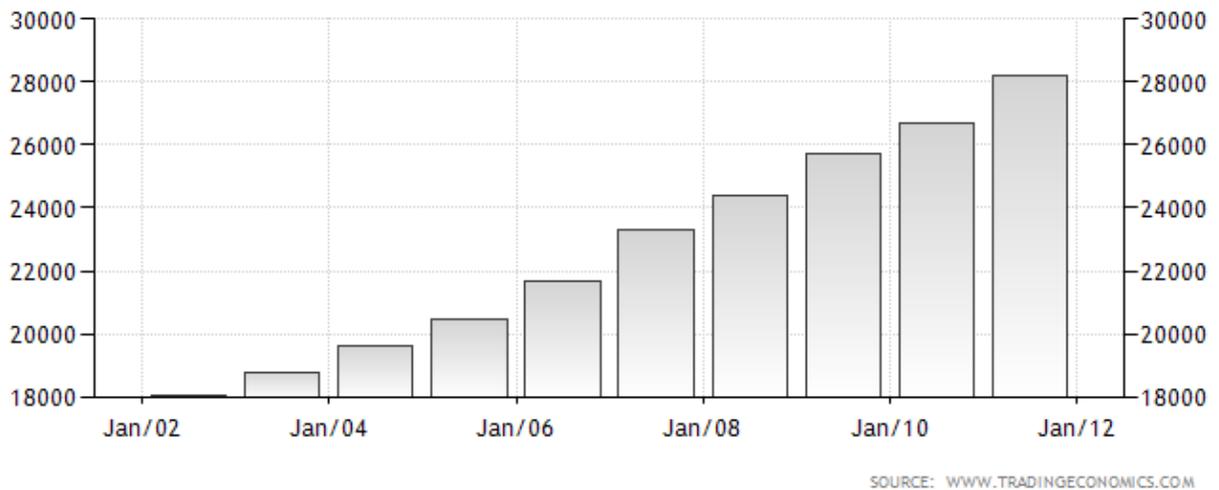


Figure 4.1 Disposable Income of Bangladesh [Source: www.tradeingeconomics.com]

Another important factor that contributes to rising tourism in the country is the increase in educational level. With a higher education level, the desire and opportunity to travel also increases (Bushell et al. 2007). Studies have shown that high education levels are correlated with demand for outdoor recreation, which leads to changes in patterns of recreation and tourism. In Bangladesh, the level of educational attainment is increasing (Figure 4.2). There is now a rise in tourism that involves learning while traveling (e.g. guided tours), participating in specific learning travel programs (e.g. educational tours) and learning activities such as wildlife viewing.

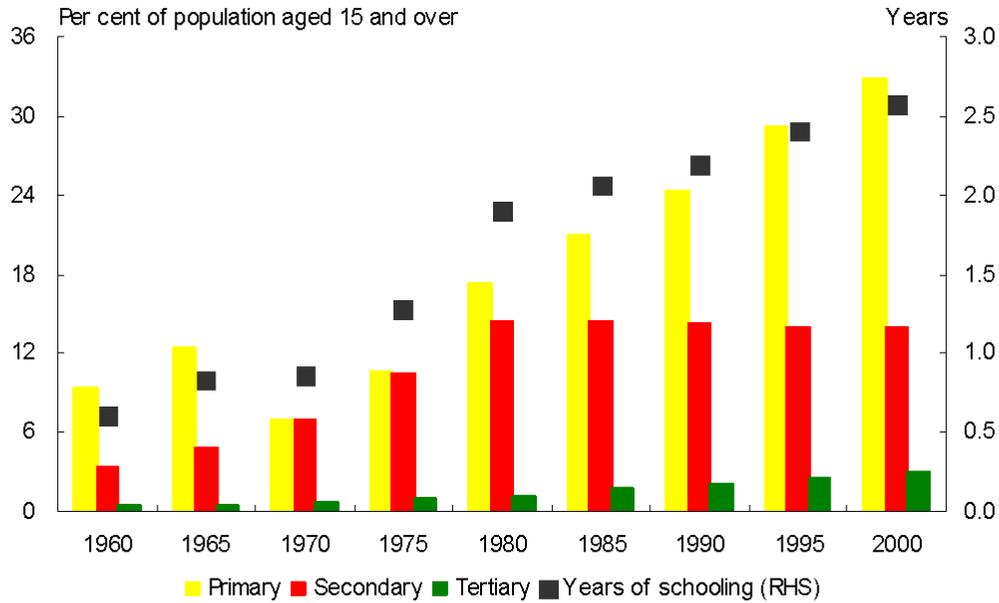


Figure 4.2 Trends in educational attainment, 1960-2000 (Source: Barro & Lee 2000)

The records in the CMC office in Satchari National Park revealed important aspects of visitation patterns to Satchari National Park. Park visitation to Satchari National Park has been increasing over the recent years, as shown by Figures 2.2 and 4.3.

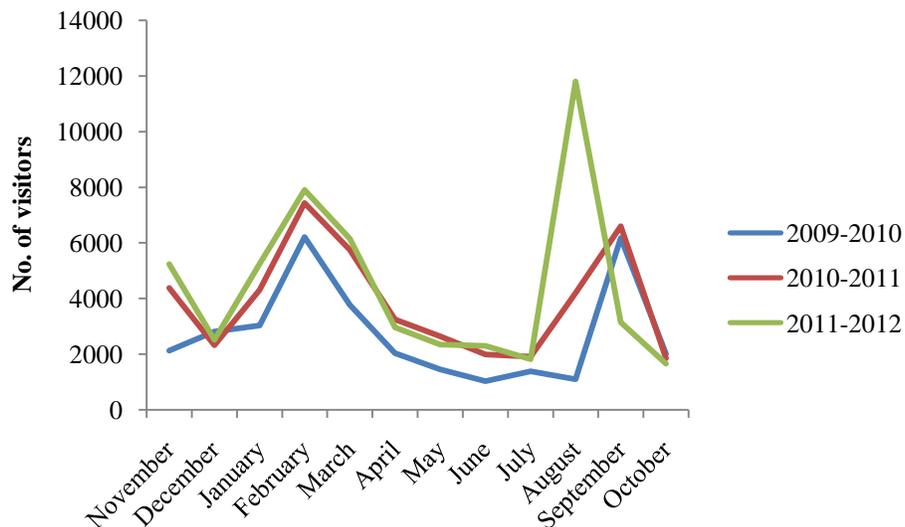


Figure 4.3 Trend of visitation in Lawachara National Park 2009-2012

Majority of the visitors that come to the park constitute of local visitors, with the proportion of foreign visitors being very less (Figures 4.4, 4.5 and 4.6).

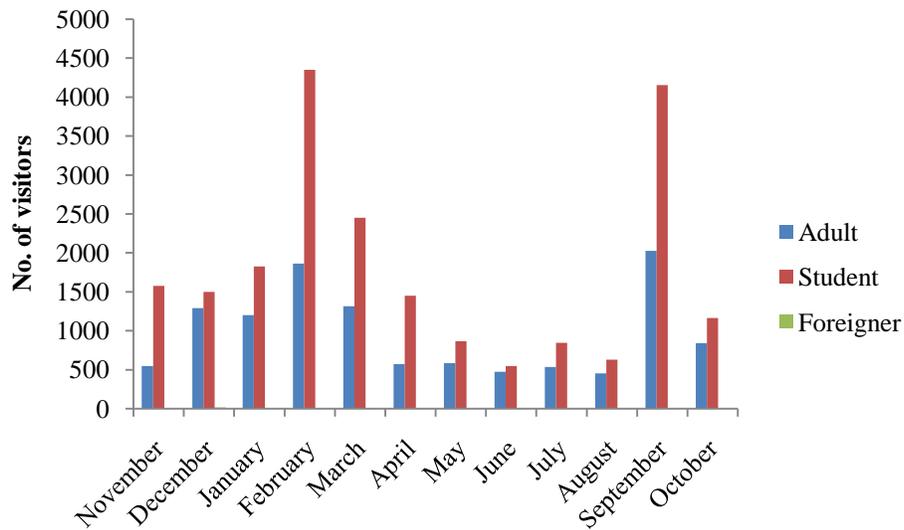


Figure 4.4 Visitation to Satchari National Park 2009-2010

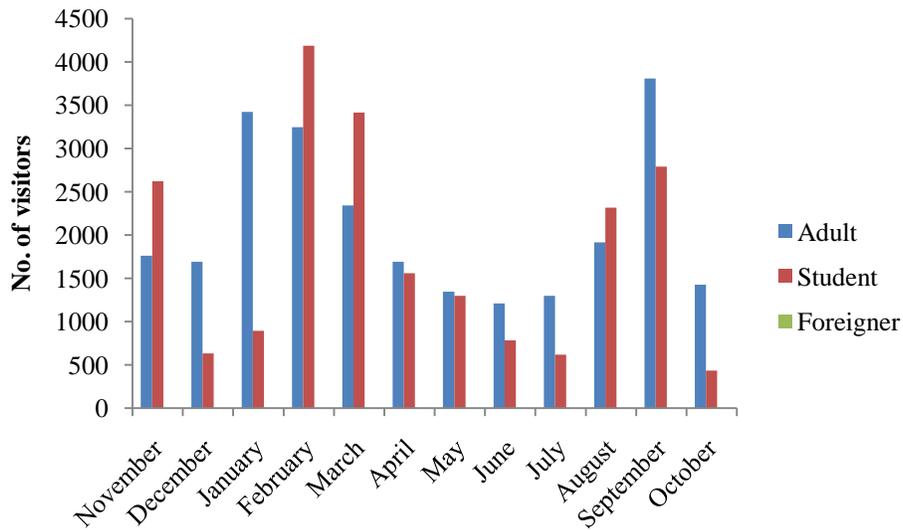


Figure 4.5 Visitation to Satchari National Park 2010-2011

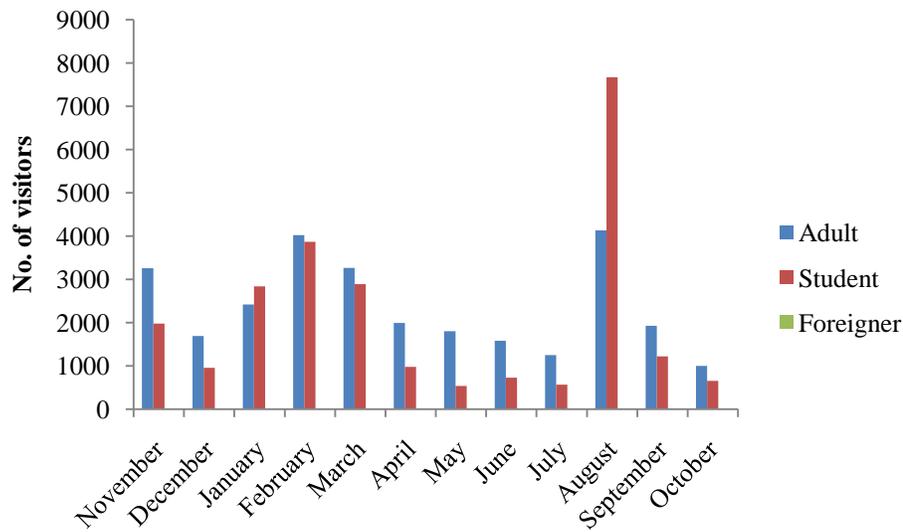


Figure 4.6 Visitation to Satchari National Park 2011-2012

The percentage of foreign visitors is not high and has shown very little change. Foreign tourists visiting SNP are those who are currently living and working in Dhaka and other cities. The proportion of students and minors visiting Satchari is quite significant. During the period of 2011-2012, students and minors formed 47% of the total visitors to Satchari.

Visitation to the park varies seasonally as the climate of both the home and destination of visitors affect visitation to the park (Figure 4.7 shows the rainfall pattern during 2010-2011).

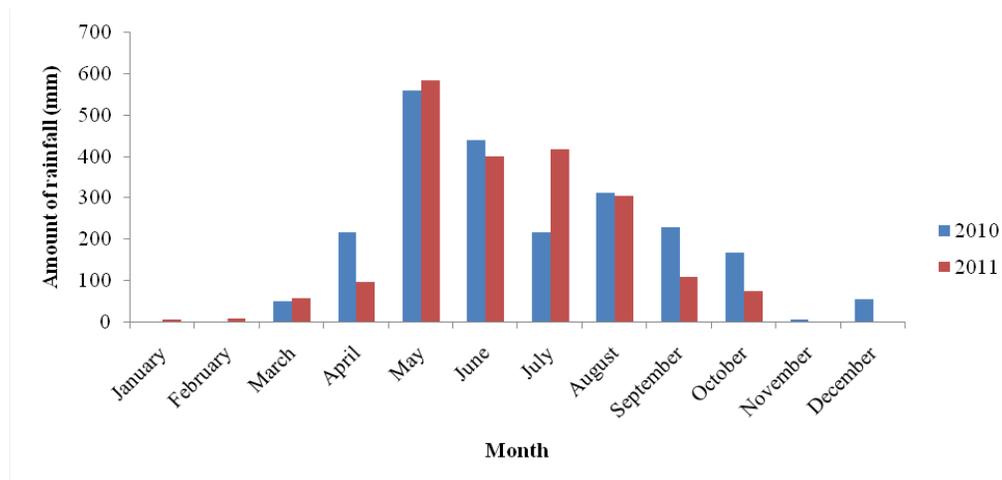


Figure 4.7 Rainfall pattern during the years 2010-2011

Figures 4.4, 4.5 and 4.6 show that visitation to Satchari drops from May to August due to the rain. A number of other factors affect visitation, including school vacations and festival days. Figures 4.4 and 4.5 show that majority of the students come to the park in the months of February and March when the school sessions begin. During that time, the educational pressure is less as school session begins in January so the students are taken out on excursion. Festivals such as Eid and Puja affect visitation. In Figure 4.6 a drastic increase in visitation is visible in the month of August. This is due to the fact that Eid al-Fitr is celebrated during that time.

Records from the CMC office in Satchari reveal that the park receives heavy visitation on weekends (Friday and Saturday) and holidays. In the year 2011, there were 247 weekdays and 118 weekends and about 24 public holidays. Figure 4.7 shows that 42% of the total visitors to Satchari came on weekdays and 58% came on weekends and public holidays.

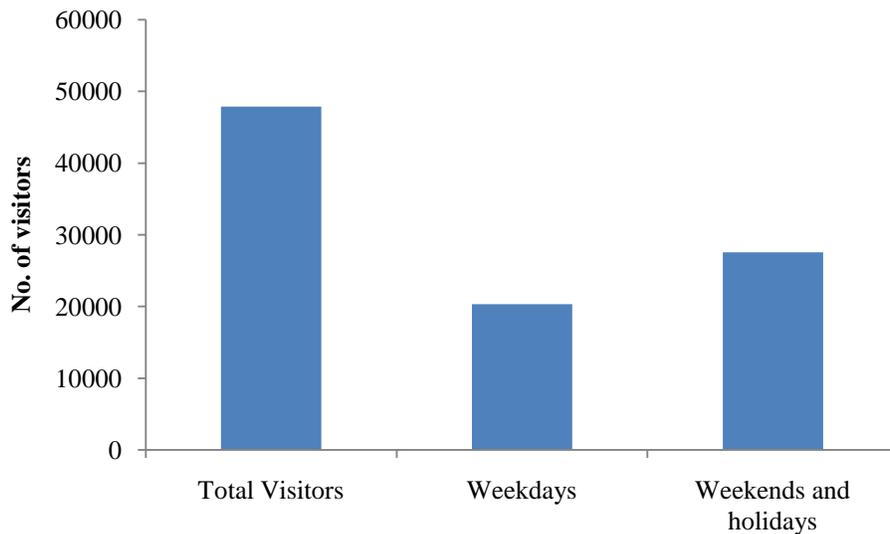


Figure 4.8 Distribution of visitors to Satchari over weekdays and weekends and public holidays in 2011

Visitor management in Satchari National Park will have to consider the seasonal fluctuations and be efficient in organizing manpower to cope with lean and peak visitation times. It is also very important for the park managers to have a good understanding of the different types of visitors, their expectations in terms of services, facilities and the experiences they seek. Understanding and responding to the diversity of visitors' needs and expectation is a challenge. Visitors visiting the park bring with them their own agendas and motivations and also each one is different in terms of their ethnicity, gender, age etc. Thus, the park needs to keep its own visitor data for the managers to make decisions based on tangible information and not on rough judgment. Effective visitor monitoring can be achieved given that it is consistent and systematic in its design and collection (Lockwood et al. 2006). Data on the visitors were collected during the survey and the most important aspects of the visitors and their trip characteristics were selected and are shown and discussed in the following chapter.

Chapter 5: Findings and Discussion

5.1 Visitor Characteristics

In all 193 visitors were interviewed in order to find out the socio-demography and other factors as discussed below.

5.1.1 Group Size

Visitors of all ages visit the park. Members of each age group come to the park bringing with them their own set of expectations. The majority of the respondents were accompanied by at least one other person, while 5% visited SNP on their own (see Table 5.1). During the survey, it was found out that some visiting groups comprise of large number of members. These findings indicate that visitation to Satchari National Park is a sociable activity.

Table 5.1 Group size of visitors to Satchari National Park (N=193)

Group size	Number of group size	%
Alone	5	3
As a couple	16	8
With friends	65	34
With family	35	18
As a group	46	24
School/University group	13	7
Business associates traveling together	13	7

5.1.2 Original Residence of the Respondents

Nearly 35% of the total visitors came from Sylhet division, where SNP is located. This indicates the importance of SNP as a local recreational resource. 63% of the respondents came from outside of Sylhet division, such as Dhaka, Brahmanbaria, Chittagong etc. This indicates that visitors from far and near visit Satchari. Only 2% of the respondents were foreigners (Table 5.2).

Table 5.2 Structure of respondents' composition (N=193)

Original residence	Number of respondents	%
Sylhet Division	68	35
Outside of Sylhet Division	121	63
Foreign	4	2

5.1.3 Frequency of Visit

Overall 59% of the respondents were found to be on their first visit to the park, while the rest (41%) were on their repeat visit. This means that Satchari is characterized by a high level of first time visitors.

5.1.4 Length of Stay

Visitors were asked to state the duration of their stay. 182 responses were collected to this question. 50% of the respondents stayed for 2 to 4 hours, while 26% stayed for a short stop (under 2 hours). Only 24% stayed all day (4 to 8 hours). A further analysis showed that no matter how long the visitors stayed in the Park, two reasons dominated their trip characteristic, which are to rest and relax, and enjoy nature and outdoors. This was reflected in the responses of 66% of the visitors.

Table 5.3 Duration of stay in the park (N=182)

Durating	Number of respondents	%
Short stop (under 2 hours)	47	26
Half day (2 to 4 hours)	91	50
All day (4 to 8 hours)	44	24
Base	182	100

5.1.5 Factors Influencing Choice of Destination

Figure 5.1 shows the factors that were found important for the respondents to choose Satchari as their destination. Good weather, quality of landscape, natural environment, wildlife viewing and recommendations from others were important factors. The visitors were aware of the concept of national park, but visitor behavior in the park did not reflect nature-based tourism.

Distance from home is considered not at all important. The reason for such a response could be due to the fact that a significant number of the respondents were from nearby regions like Brahmanbaria and also that when the survey was taken majority of the respondents had purposefully set on coming to the park and other attraction areas as it was the holiday/weekend period. For majority of the respondents, learning about ethnic culture was somewhat important but not so relevant.

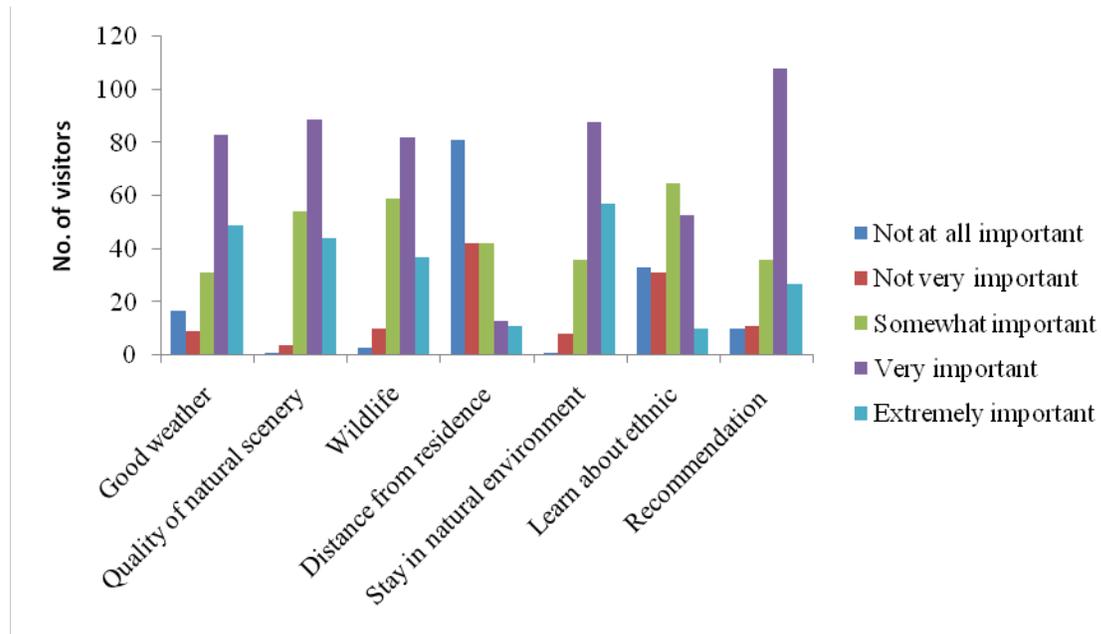


Figure 5.1 Factors influencing decision to visit Satchari National Park

5.1.6 Visit Purpose

The visitors were asked to indicate their main purpose of visit to the park and 35% responded that they had come to the park to rest and relax. This indicates that one of the major trip characteristic of visitors to Satchari is to carry out leisure activities. 32% of the visitors responded that they had come to enjoy nature and outdoors. 7% of the visitors had come on educational tours, 6% to learn about plants and animals, another 6% to spend time with family and friends, 12% for picnicking and 2% for bird watching. It is interesting to note here that only 12% of the visitors have come to picnic. The reason could be that not all of the members of the picnic party have been interviewed for the survey, hence the low percentage of number. The findings listed above indicate the perception about national park in the minds of the visitors.

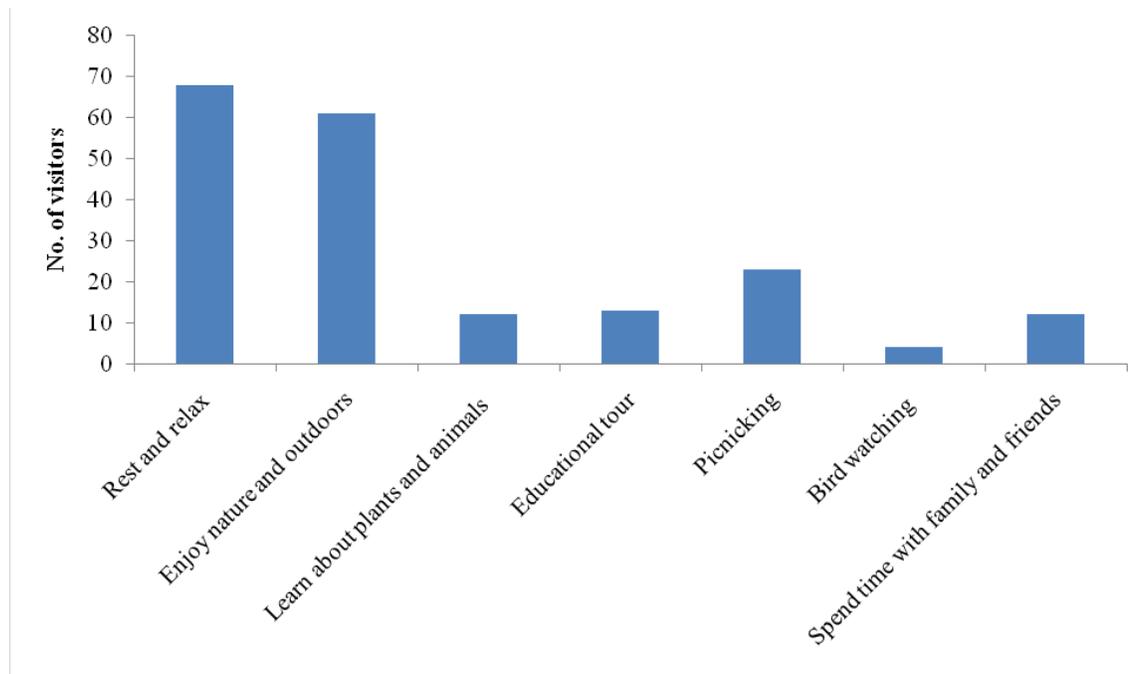


Figure 5.2 Responses to the question: What was the main purpose of your visit to this park? (N=193)

5.1.7 Source of Information

Visitors were asked as to from where they received information about Satchari. Majority of them first heard about the park from friends and by word of mouth. A significant number heard about the park from the newspaper and television. This indicates that mass media is yet to play an important role in disseminating information on tourism experiences to visitors to Satchari National Park. Figure 5.3 shows the findings.

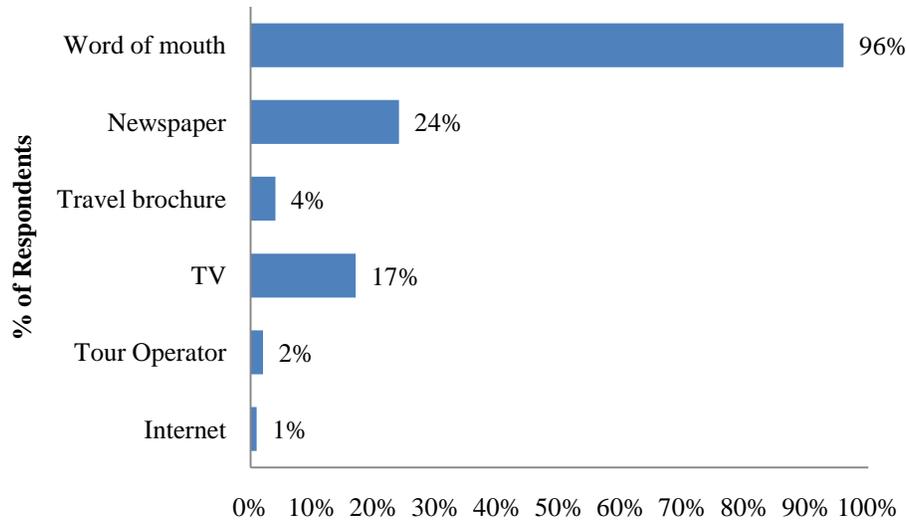


Figure 5.3 Source of information about Satchari National Park for respondents (N=193)

5.1.8 Activities Undertaken

The visitors were asked about the activities they have participated in or ones they are going to do in the SNP region. The most popular activities amongst the visitors were wildlife viewing (78%), photography (70%) and relaxing/fun/enjoyment (66%). The less popular activities were guided tour (18%), visiting the ethnic community (17%), picnicking (11%) and education tour (5%) (see Figure 5.4). The results generated indicate wildlife viewing is one of the major attractions of the Park. During the survey, it was observed that sighting of the Capped Langurs and the Pig-Tailed Macaques was common. These primates are used to the presence of visitors in their habitat and thus their appearance is a common sight. One of the popular activities undertaken by the visitors in the park is relaxation/fun/enjoyment. This confirms the fact that most visitors come to the park for this purpose. Only 18% of the visitors participated in taking guided tours. This indicates that taking a walk in any of the three trails is not a popular activity. However, it is important to bear in mind that some visitors take the liberty of taking walks in the trails by themselves without the help of guides. Another indication from this data is that hiring of guides by visitors in the park is low. The reason for this, as stated by the guides themselves, is that the visitors are not informed about the availability of guides in the park. Also, 52% of the visitors responded that they did not know about the availability of

guides in the park. It was observed during the survey that most of the visitors carried out their activities (rest and relaxing and enjoying) in the picnic zone and the areas adjacent to the tourist shops and information center.

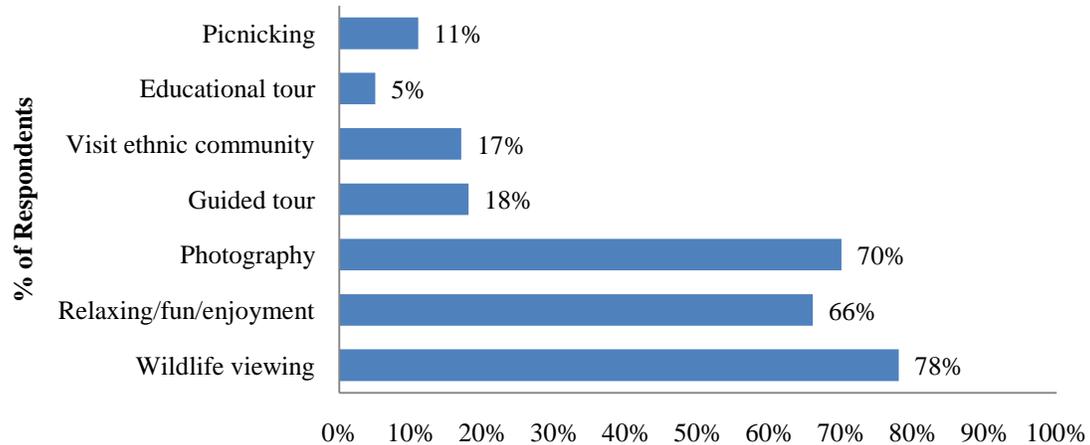


Figure 5.4 Source of information about Satchari National Park for respondents (N=193)

5.1.9 Park Facilities

Visitors were asked to rate the existing visitor facilities. The respondents rated toilet to be somewhat satisfactory. They are very satisfied with the service of the park staff but some of them mentioned that interaction between the staff and visitors were at a minimum level. This aspect need to be increased as interaction helps in establishing a healthy relationship between visitors and park staff, which will result in better and improved visitor management and improved park facilities. Interestingly, majority of the respondents were unable to rate the trails as they had no experience of taking the trails. The same was seen in the case of guide service. This indicates that trail and guide service usage are very less in Satchari. Visitors responded that interesting information on ethnic culture is not available. Majority of them rated that they had no experience of it (78%). Another interesting finding was that when asked about the availability of information, 35% responded as having no experience whereas 27% responded they were somewhat satisfied. It should be noted here that the entrance gates has a map, signage on do's and don'ts and signage on plant and wildlife information in and around the park, including the trails. However, some of the signages have been vandalized.

5.1.10 Overall Satisfaction of Satchari Park

Visitors were asked to rate their overall satisfaction of SNP on a 5-point scale (1=very dissatisfied, 5=very satisfied). Overall, an average of 4.2 was calculated from the total scores collected. This indicates that visitors to SNP are satisfied with their visit to the park. When it came to recommending SNP to friends and others, an average of 4.4 was calculated which confirms the visitors rating of their overall satisfaction of their experience in the park.

5.1.11 Willingness to Pay

In order to estimate the reaction of visitors to increased entrance fee charge, visitors were asked if they were willing to pay a higher fee entry. Only 186 out of 193 respondents answered this question. 80% of them said no and 20% said yes. The maximum amount given by those who were willing to pay was Tk. 100 and the minimum amount was Tk. 30. Most were not in favor of a rise in the entrance fee as they felt the existing fee was enough for the present visitor facilities. When enquired further, some of the respondents who responded negatively said they would be willing to pay higher if the visitor facilities were upgraded or if more added to the existing ones.

5.1.12 Additional Facilities

The visitors were asked to respond as to development of which facilities within the park would help them to enjoy their visit more. 135 respondents took the time to respond and their answers were compiled and the most common ones were picked out. They are shown in the table below:

Sl. No.	Suggestions
1.	Eco-cottages should be set up within the SNP zone to allow visitors to stay overnight.
2.	More toilet facilities should be made available.
3.	Sitting arrangements such as benches and round sheds should be developed inside the park.
4.	Fresh water accessibility should be there. Setting up a tube well would be good.

5.	More visitor facilities such as a watch tower, hotel facilities, well maintained trails and walking tracks, information on visitor safety, pre-visit information and more maps and signboards.
6.	Restaurants should be developed within the park zone.
7.	Stalls for buying indigenous products should be set up within the zone.
8.	Take steps to reduce noise pollution.
9.	Better litter management should be ensured.
10.	More signage should be put up inside SNP with more information on plants and wildlife.
11.	Expert eco-guides should be appointed in the park.
12.	Signboards should be put up at each walking trail.
13.	There should be resting huts for visiting public.
14.	Availability of electricity is needed.
15.	A health center should be set up within the SNP zone for dealing an emergency situation.
16.	A flower garden should be developed inside the park.
17.	Bins should be set up at strategic points inside the park.
18.	Information on the ethnic community and culture should be made available.
19.	Proper management of the signboards should be carried out by the park staff.
20.	The park needs to focus on keeping the main entrance way and the immediate surroundings clean and free of litter. The park officials need to enforce strict penalties on littering. There should be more info about the flora and fauna in the park. There should be a quiz at the end of the trail to see how much people have actually retained.

The demand for supply of electricity was quite high among the respondents. If this demand is met then the running of the interpretation center will be possible and the vandalism on the Center can be brought to a stop. During the survey, visitors were asked whether they knew about the interpretation center and only 161 responded. 58% of them did not know about the center. This indicates that the interpretation center is not being used as it was originally planned. The supply of electricity can help to get the Center up and running and provide educative experience to the visitors. Majority of the visitors also suggested that more toilet facilities and sitting benches be introduced in the park.

One of the suggestions echoed by all the respondents was the establishment of eco cottages or lodging facilities. There is no lodging facility available in and around the park. There is one rest house belonging to the Forest Department but it is not open to the public. There is, however, a students' dormitory inside the park area. It is not ready for use at the moment but renovation work is ongoing at the moment.

5.2 Eco-tourism Impacts

Any activity carried out in an environment is sure to leave an impact on the environment. However, it is important to ensure that the impact is not of destructive nature. Social activities of visitors in a protected must be monitored to ensure that the activities have a low impact on the natural resources, i.e. flora and fauna as well as on the community that is part of the protected area's environment. The major task of protected area managers is to protect the ecosystem and its vulnerable natural qualities while at the same time providing visitors an instructive experience (Kajala *et al.* 2007). Visitors coming to a protected area may cause disturbance to habitat and wildlife and it is the task of the park management staff to ensure that the disturbances are within acceptable limits.

In Satchari National Park, the major disturbances to the environment are vandalism, noise, littering, picnicking and overcrowding. It was found out that 23 traveling parties had more than 20 members. The picnic parties not only create noise pollution but they also cook in the forest. Cooking in the forest has been banned as fire is a potential hazard in the area during the dry season. However, cooking has been allowed in the area where the shops are stationed. The picnickers leave behind a significant amount of garbage in and around the forest which causes difficulties in cleaning up as the litter is not concentrated in one area. The garbage includes disposable plastic plates, water bottles, soft drink bottles, wrappers and food waste etc. Besides the waste generated during the picnic and waste collected during the journey to the park is taken out of the vehicles and dumped in the park.

Littering is one of the major issues faced by the park management staff. Although bins are set up in the park, they are not used by the visitors and also by the locals, who also cause some of the littering. More bins need to be set up at strategic points.

Some of the reasons for the litter problems in SNP are:

- a lack of understanding of the consequences of littering;
- an inadequate distribution of bins;
- a preference for cleaning up litter rather than preventing it and
- a lack of effective litter monitoring.

Park managers at Satchari need to know what are the major reasons for littering in the park and take up the necessary steps. Spread of litter has a variety of negative impacts on the environment. It reduces the beauty of the area, poses danger to wildlife and pollutes the environment.

During the study, the half an hour trail in Satchari and the areas of the ticket counter, interpretation center and the shops were cleared of all the non-biodegradable garbage. The total weight of the garbage came to be 12 kg and 1.5 kg of waste was cleared only from the half an hour trail. This indicates that less number of visitors frequent the trail.

Upon entering the park, visitors play loud music from their mobile phones and sound system. Also, many visitors are not sensitive to the natural environment. They create a lot of noise amongst themselves. All these disturb the wildlife which retreats further into the forest. The noise also disturbs the local people and other visitors.

During the study it was found that most of the signage, the interpretation center and even the trees have been damaged. The trees bear etchings and graffiti on them that visitors have made during their stay in the park. Interpretative signage containing information of the park was found to be torn and defaced.

5.3 Local People's Attitude

In all 121 households of 16 villages were surveyed in order to find out their attitude towards eco-tourism and their awareness about related issues. The villages selected included the ones which were eco-tourism dependant as well as the ones who were dependent on the forest. The ones that are tourism dependent are not necessarily dependant on the resources of Satchari but are dependent on the visitors of Satchari for their livelihood.

Figure 4.17 shows that 44% of the respondents agree that eco-tourism has increased opportunities for their employment and 53% say eco-tourism has benefitted in their livelihood. The community members are involved as CMC member, patrolling group members, Nishorgo Sahayak, members of Nishorgo Youth club, guides and entrepreneurs producing handicrafts for selling to visitors and shopkeepers.

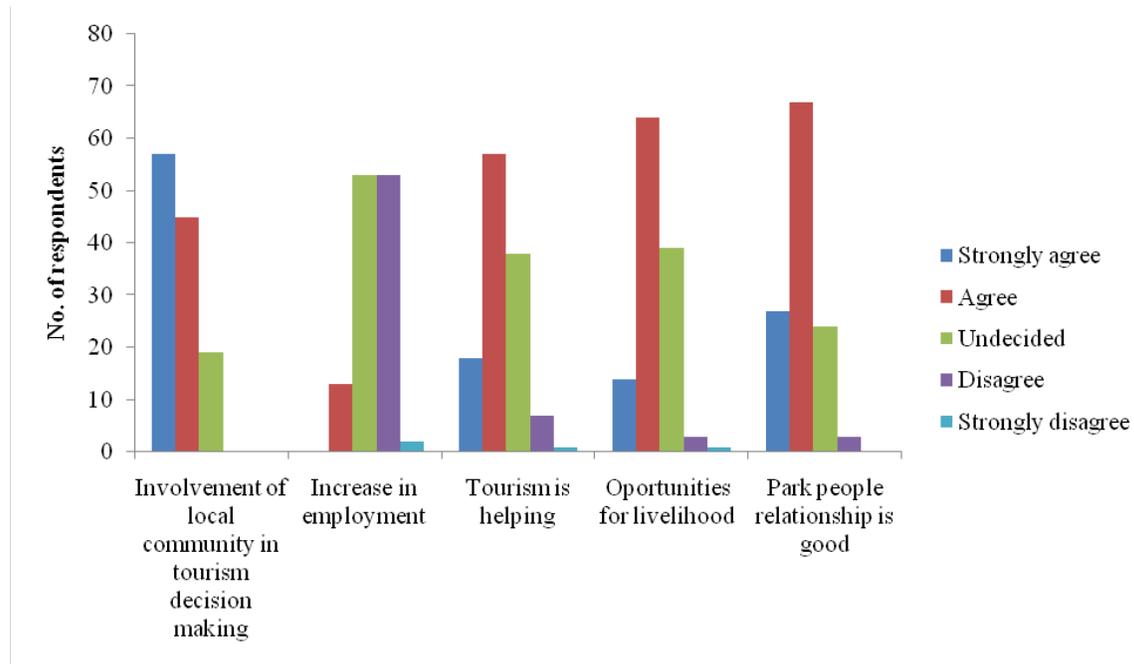


Figure 5.5 Attitude of community towards tourism (N=121)

47% of the villagers strongly agreed that the community should be more involved in decision making about eco-tourism development in the area.

67% of the villagers responded that the park people relationship is good whereas 21% were undecided as these respondents are not directly influenced by the national park and are not resource dependent.

To find out the awareness of the community, respondents were asked if they knew about CMC, eco-cottage, eco-guide, entry fee and Nishorgo Network. Figure 5.6 shows the findings: 76% responded that they were aware of the CMC; 96% of the respondents were not aware of eco cottage. The reason for this huge negative response is due to the fact that

eco cottage is yet to be introduced in the park. This concept is still very new. 62% of the respondents responded they were aware of eco-guides. This is due to the fact that locals from some of the respondents' villages work as eco-guides in the park. 87% of the respondents responded that they were aware of the entry fee system in the park and 74% said they were aware of Nishorgo Network.

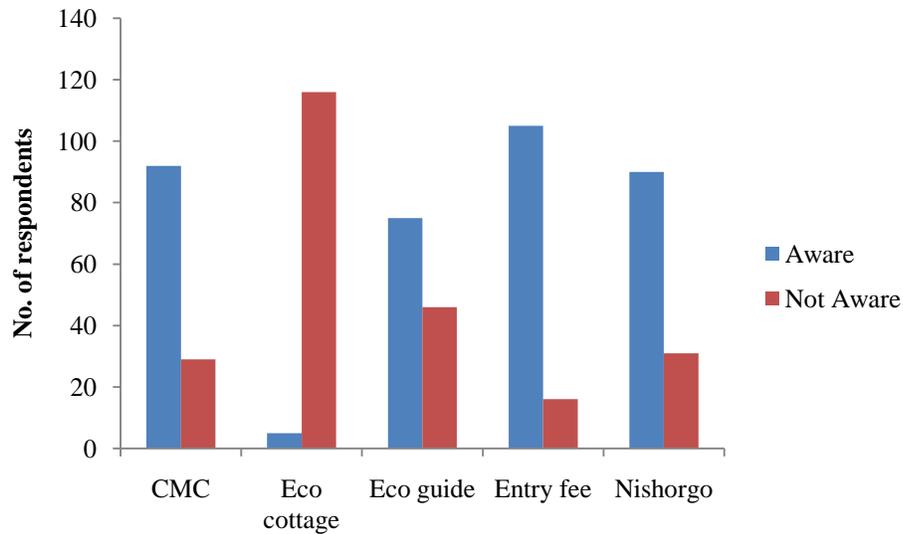


Figure 5.6 Awareness of the villagers (N=121)

5.4 Conclusion

The above findings and discussions show that the visitors to Satchari National Park demonstrate diversity in terms of socio-demographic characteristics such as origin of residence, group size and visit characteristics such as type of main purpose of visit, activities, frequency of visit, source of information and factors influencing choice of destination. The findings of this study provide a baseline of visitor information which is helpful in controlling and monitoring the visitor experience and behavior. The information will help the park officials to target programs and services that tailor to visitor interests. The measurement of satisfaction with specific park facilities, services and attributes provides information to assist in park planning and management decision making.

With the rise in income, educational attainment, leisure time and mobility, more and more people are traveling. Also, recreation facilities in the country are few and the protected areas like Satchari National Park are seen as favorable recreation sites to spend time with family and friends and so visitors are increasingly thronging to these natural areas. Visitors come to the park with their own set of expectations and they benefit in an exclusive way through their experience and enjoyment in the park. Thus, it is important that park managers are equipped well to deal with increasing number of visitors.

The above findings also show that tourism in the park is received well by the local communities living in and around the park. However, more involvement of the local people in tourism decision making is important. Also, field observations and discussions with the locals and park management staff have shown that more interaction is required between them.

Chapter 6: Park Carrying Capacity

Carrying capacity of the three trails of Satchari National Park, namely half an hour, one hour and three hours trail was calculated. This chapter presents how we have measured the different carrying capacities of the trails and the results obtained. It is important to keep in mind that none of the figures derived can be considered definitive. Continuous monitoring and revision is required.

Three levels of carrying capacity are established:

- i. physical carrying capacity (PCC)
- ii. real carrying capacity (RCC)
- iii. effective or permissible carrying capacity (ECC)

PCC is always greater than RCC, and RCC is greater or equal to ECC:

$$PCC > RCC \quad \text{and} \quad RCC \geq ECC$$

6.1 Physical Carrying Capacity (PCC)

PCC is the maximum number of visitors that can physically fit into a defined space, over a particular time:

$$PCC = A \times \frac{V}{a} \times Rf$$

where: A = available area for public use

$$\frac{V}{a} = \text{one visitor per m}^2$$

Rf = rotation factor (number of visits per day)

The following criteria and basic assumptions must be taken into account while measuring the PCC:

- that the available area (A) is determined by the particular conditions of the considered PA. For open areas, the available area can be determined by physical features such as rocks, crevices, ravines, etc. and by limitations imposed due to fragility or as a result of the need for safety precautions. In the case of nature

- trails, space limitations are dictated by tour group sizes and by the distances required between groups in order to avoid interference or mutual disturbance;
- that a person generally requires 1 m^2 of horizontal space in order to move about freely ($\frac{V}{a}$), and
 - the rotation factor (Rf) is the number of permissible visits to a site over a specified time (usually calculated by daily open hours) and is expressed by:

$$Rf = \frac{\text{Opening period}}{\text{Average time of one visit}}$$

6.1.1 Physical Carrying capacity of Trails

6.1.1.1 Half an Hour Trail

- It is an open space that allows visitors to move about freely.
- Each person occupies a space of 0.75 m^2 of the nature trail and the nature trail is 0.75 m wide.
- The recommended minimum distance between visitor groups is 50 m (IUCN 1996.).
- Maximum recommended group size to be handled by a guide is 7 persons.
- Half an hour is required to visit the site.
- Site is open 8 hours per day
- Trail length is 855 m .

If each person needs 1 m of trail, then each group will require 7 m . The recommended distance between groups is 50 m and so 15 groups can fit into the trail. These groups will require 105 m of the trail if they are present at the same time. The nature trail is open 8 hours per day and each visit takes half an hour so a person can make 16 visits per day.

$$\begin{aligned} \text{Thus PCC of the trail} &= 105 \text{ m of trail} \times 1 \text{ visitor/m} \times 16 \text{ visits/day} \\ &= 1680 \text{ visits per day} \end{aligned}$$

6.1.1.2 One Hour Trail

- It is an open space that allows visitors to move about freely.
- Each person occupies a space of 0.6 m^2 of the nature trail and the nature trail is 0.6 m wide.
- The recommended minimum distance between visitor groups is 50 m.
- The maximum recommended group size to be handled by a guide is 7 persons.
- One hour is required to visit the site.
- The site is open 8 hours per day.
- Trail length of the trail is 1450 m.

If each person needs 1 m of trail, then each group will require 7 m. The recommended distance between groups is 50 m, 25 groups can fit into the trail. These groups will require 175 m of the trail if they are present at the same time.

The nature trail is open 8 hours per day and each visit takes an hour so a person can make 8 visits per day.

$$\begin{aligned}\text{Thus PCC of the trail} &= 175 \text{ m of trail} \times 1 \text{ visitor/m} \times 8 \text{ visits/day} \\ &= 1400 \text{ visits per day}\end{aligned}$$

6.1.1.2 Three Hours Trail

- It is an open space that allows visitors to move about freely.
- Each person occupies a space of 0.75 m^2 of the nature trail and the nature trail is 0.75 m wide.
- The recommended minimum distance between visitor groups is 50 m.
- The maximum recommended group size to be handled by a guide is 20 persons.
- Three hours is required to visit the site.
- The site is open 8 hours per day.
- Trail length of the trail is 5100 m.

If each person needs 1 m of trail, then each group will require 7 m. The recommended distance between groups is 50 m, 89 groups can fit into the trail. These groups will require 623 m of the trail if they are present at the same time.

The nature trail is open 8 hours per day and each visit takes three hours so a person can make 3 (rounded to nearest value) visits per day.

Thus PCC of the trail = 623 m of trail x 1 visitor/m x 3 visits/day
= 1869 visits per day

6.2 Real Carrying Capacity (RCC)

RCC is the maximum permissible number of visits to a site, once the corrective (i.e. reductive) factors derived from the particular characteristics of the site have been applied to the PCC. These corrective factors are obtained by considering biophysical, environmental, ecological, social and management variables.

RCC is expressed by the following general formula:

$$RCC = PCC - Cf_1 - Cf_2 - \dots - Cf_n$$

where, Cf is a corrective factor expressed as a percentage.

The following formula better explains the RCC with corrective factors in percentages:

$$RCC = PCC \times \left[\frac{(100 - cf_1)}{100} \times \frac{(100 - cf_2)}{100} \times \frac{(100 - cf_3)}{100} \right]$$

It is important to note that the group of corrective factors is not necessarily the same for each site. Corrective factors are closely linked to the specific conditions and characteristics of each site. It is important to remember that the carrying capacity of a protected area must be measured site by site.

The corrective factor, given in percentage term, is expressed by the following general formula:

$$Cf = (M_1/M_0) \times 100$$

where: Cf = corrective factor
M_l = limiting magnitude of the variable
M_t = total magnitude of the variable.

6.2.1 Correction Factors for Real Carrying capacity of the Trails

6.2.1.1 Rainfall

The trails can become very slippery especially during the rainy season and significant erosion takes place. Wildlife viewing also becomes difficult and the mist in the air during this season decreases the quality of photographs or videos to be taken. The limiting magnitude is calculated as:

$$\begin{aligned}M_l &= \text{number of rainy days} \times \text{total rainy hours/day} \\ &= 115 \text{ rainy days} \times 6 \text{ hours} \\ &= 690 \text{ hours of limiting rain/year}\end{aligned}$$

The total magnitude is calculated as:

$$\begin{aligned}M_t &= \text{number of days in a year} \times \text{total visiting hours/day} \\ &= 365 \text{ days/year} \times 8 \text{ visiting hours/day}\end{aligned}$$

Thus, the rainfall correction factor (Cf_r) is calculated as:

$$Cf_r = \frac{690}{2920} \times 100 = 23.63\%$$

This factor would be uniform for all the three trails.

6.2.1.2 Erosion

Visitor use in sites with slopes of less than 10% present little or no risk of erosion regardless of the soil type so visitation restriction is not necessary (IUCN 1996). Gravel, sand and clay soils on slopes of between 10 and 20% present a high risk of erosion, as do all the soil types on slopes exceeding 20% (Table 6.1).

Table 6.1 The erosion risks of different soil types based on slope ranges

	<10%	10%-20%	>20%
Gravel or Sand	low	medium	high
Lime	low	high	high
Clay	low	medium	high

(Source: Cifuentes 1992)

The erosion of trails is considered as a corrective factor because visiting the trails is one of the activities taken by visitors to Satchari.

i. Half an Hour Trail

- Total length of the trail is 855 m.
- A total length of 50 m has medium erosion.
- A total length of 120 m has high erosion.
- In order to assess the different erosion risks a weighting factor of 2 is used for medium risk and 3 for high risk (IUCN 1996).

Thereby, the limiting magnitude is 460 m (50 m x 2 + 120 m x 3).

Hence the erosion corrective factor (Cf_e) is:

$$Cf_e = \frac{460}{855} \times 100 = 53.80\%$$

ii. One hour Trail

- Total length of the trail is 1450 m.
- A total length of 80 m has medium erosion.
- A total length of 150 m has high erosion.
- In order to assess the different erosion risks a weighting factor of 2 is used for medium risk and 3 for high risk.

Thereby, the limiting magnitude is 610 m (80 m x 2 + 150 m x 3)

Hence the erosion corrective factor (Cf_e) is:

$$Cf_e = \frac{610}{1450} \times 100 = 42.07\%$$

iii. Three Hours Trail

- Total length of the trail is 5100 m.
- A total length of 200 m has low erosion.
- A total length of 500 m has medium erosion.
- A total length of 750 m has high erosion.
- In order to assess the different erosion risks a weighting factor of 1 is used for low medium risk, 2 is used for medium risk and 3 for high risk.

Thereby, the limiting magnitude is 3450 m (200 m x 1 + 500 x 2 + 750 m x 3)

Hence the erosion corrective factor (Cf_e) is:

$$Cf_e = \frac{3450}{5100} \times 100 = 67.65\%$$

6.2.1.3 Disturbance to Wildlife

Satchari has species of wildlife that are of particular importance for the park and that includes the hoolock gibbons and capped langurs. Uncontrolled behavior of visitors and other issues cause problems particularly during the mating and nesting (for the bird species) season of the wildlife. Thus, disturbance to wildlife is considered a limiting factor. The mating season for the wildlife is April to August (5 months). The disturbance to wildlife corrective factor (Cf_w) is calculated as:

$$Cf_w = \frac{5 \text{ limiting months}}{12 \text{ months}} \times 100 = 41.67\%$$

This value will be the same for all the three trails.

6.2.2 Real Carrying Capacity of the Trails

i. Half an Hour Trail

$$\begin{aligned} RCC &= PCC \times \left[\frac{(100 - Cf_e)}{100} \times \frac{(100 - Cf_r)}{100} \times \frac{(100 - Cf_w)}{100} \right] \\ &= 1680 \times \left[\frac{(100 - 53.80)}{100} \times \frac{(100 - 23.63)}{100} \times \frac{(100 - 41.67)}{100} \right] \\ &= 1680 \times (0.462 \times 0.7637 \times 0.5833) \\ &= 346 \text{ visitors per day on the trail} \end{aligned}$$

ii. One Hour Trail

$$\begin{aligned} \text{RCC} &= \text{PCC} \times \left[\frac{(100 - \text{Cf}_e)}{100} \times \frac{(100 - \text{Cf}_r)}{100} \times \frac{(100 - \text{Cf}_w)}{100} \right] \\ &= 1400 \times \left[\frac{(100 - 42.07)}{100} \times \frac{(100 - 23.63)}{100} \times \frac{(100 - 41.67)}{100} \right] \\ &= 1400 \times (0.5793 \times 0.7637 \times 0.5833) \\ &= 361 \text{ visitors per day on the trail} \end{aligned}$$

iii. Three Hours Trail

$$\begin{aligned} \text{RCC} &= \text{PCC} \times \left[\frac{(100 - \text{Cf}_e)}{100} \times \frac{(100 - \text{Cf}_r)}{100} \times \frac{(100 - \text{Cf}_w)}{100} \right] \\ &= 1869 \times \left[\frac{(100 - 67.65)}{100} \times \frac{(100 - 23.63)}{100} \times \frac{(100 - 41.67)}{100} \right] \\ &= 1869 \times (0.3235 \times 0.7637 \times 0.5833) \\ &= 269 \text{ visitors per day on the trail} \end{aligned}$$

6.3 Effective Carrying Capacity (ECC)

Effective or permissible carrying capacity (ECC) is the maximum number of visitors that a site can sustain, given the management capacity (MC) available. ECC is obtained by comparing real carrying capacity (RCC) with the management capacity (MC) of the park. For Satchari National Park, the management staff was recommended 30 staff including FD officials and CMC members for proper management. However, only 11 staff are in charge. So, the present MC of the park is 36.67% ($11/30 \times 100\%$).

i. Half an Hour Trail

$$\begin{aligned} \text{ECC} &= \text{RCC} \times \text{MC} \\ &= 346 \times 0.3667 = 127 \text{ visitors per day} \end{aligned}$$

ii. One Hour Trail

$$\begin{aligned} \text{ECC} &= \text{RCC} \times \text{MC} \\ &= 361 \times 0.3667 = 132 \text{ visitors per day} \end{aligned}$$

iii. Three Hours Trail

$$\begin{aligned} \text{ECC} &= \text{RCC} \times \text{MC} \\ &= 269 \times 0.3667 = 99 \text{ visitors per day} \end{aligned}$$

Thus, the results show that the ECC on any day on the half an hour trail is 127 visitors, on the one hour trail it is 132 visitors and on the three hours trail it is 99 visitors.

6.4 Conclusion

Carrying capacity is simply not about calculating the number of visitors but about how to manage the visitors coming to the protected areas. Visitation to Satchari is increasing and so planning and management for tourism growth is becoming very essential. The effective carrying capacity of the trails are 127 visitors/day (half an hour trail), 132 visitors/day (one hour) and 99 visitors/day (three hours). The management staff of the park must ensure that the number of visitors entering the trails is below the effective carrying capacity. The carrying capacity can change with the improvement in the organizational and technical capacity of the Park. At present, the management capability of Satchari National Park is 36.67% and when it is increased to its full capacity then the ECC of the trails can be increased.

The park received 1,33,047 visitors during 2009-2012 (source: CMC office, Satchari) which means an average of 44,349 visitors visited the park per year and 122 visitors per day. This demonstrates that the actual average park visitation is lower than the estimated carrying capacity. However, these are the mean numbers. In reality, there is still a risk of carrying capacity overload especially in the peak seasons. The park management staff has to be trained to efficiently manage the visitors during these seasons and to keep the impacts on the environment to a minimum.

The assessment of carrying capacity does not provide necessarily limits for development but opportunities for reorienting eco-tourism development. Carrying capacity is a great

tool to safeguard development and ensure further sustainable growth through the adoption of appropriate measures.

Chapter 7: Recommendations

The park managers in Satchari National Park should ensure that nature-based tourism sustains the values for which a protected area exists. To achieve this, a range of issues have to be addressed in order to empower the local people and the management staff to enable them to promote and practice nature-based tourism in Satchari National Park. This chapter lists the strategies and management techniques that can be applied to Satchari National Park.

7.1 Ensuring the Practice of Eco-tourism

The following issues need to be looked into to ensure the practice of eco-tourism in Satchari National Park:

- It is important to ensure that sufficient revenue for re-investment in conservation and ecological restoration is available.
- Policies and regulatory conditions need to be flexible to benefit conservation.
- Undesirable impacts of eco-tourism on the natural environment can be minimized by improving visitor management.
- Increasing local people's income and benefits from tourism in national park
- Identify the changes which would enable local people to secure benefits of employment from tourism in the national park.
- Introducing and improvising facilities and infrastructures in the protected area which will help in raising conservation awareness.
- It is necessary to make an assessment of the perceptions of the protected area and tourism in order to improve marketing and visitation profiles and maximizing revenue benefits.

The table below shows some of the strategies and management techniques that can be applied in Satchari National Park:

Table 7.1 Strategies and Management Techniques for Satchari National Park

Strategy	Management Technique	Responsibility
Encourage use of entire tourism Zone	<ul style="list-style-type: none"> • Rotation of trail usage • An alternate site can be developed and its use can be encouraged • Limit the number of visitors 	Forest Department and CMC
Reduce use of problem areas	<ul style="list-style-type: none"> • Discourage picnicking • Develop alternate sites to discourage excessive use of the areas where the tourist shops and student dormitory are located • Locate facilities such as drinking water points at concentration points (picnic zone, interpretation center zone, ticket counter and tourist shops and student dormitory zone) 	Forest Department and CMC
Modify seasonal use	<ul style="list-style-type: none"> • Discourage/ban use of the park during monsoon 	Forest Department
Modify type of use and visitor behavior	<ul style="list-style-type: none"> • Completely ban cooking of food by picnic parties • Discourage noise, vandalism and graffiti • Teach park ethics to the park management staff who can later disseminate them to the visitors • Encourage a limit to a group size 	Forest Department, CMC, eco-guides, IPAC
Modify visitor expectations	<ul style="list-style-type: none"> • Inform visitors about appropriate protected area use • Inform visitors about the resources of the protected area 	CMC, eco-guides, IPAC
Increase resistance of the area	<ul style="list-style-type: none"> • Prevent the trails from impact • Closure of the area during monsoon • Involve the ethnic community to guide visitors in their village and acquaint them about ethnic culture and traditions 	Forest Department and CMC

7.2 Introduction of Zonation

Appropriate zoning of a protected area is fundamental to all other management strategies. Zoning is a tool for allocating overall management objectives and priorities to different areas, thereby helping park managers to define what uses will and will not be allowed (Drumm and Moore 2005). Zoning involves the decision of what kind of recreational opportunity will be provided and where. There is a choice of either concentrating or dispersing visitors. In the case of Satchari, dispersal technique is to be chosen to deal with negative impacts in small areas.

At present the Park has two entry approaches (one from Dhaka side and one from Chunarughat side). There is only one ticket counter. The existing zones in the Park are – the picnic zone, nature watch zone (the three trails) and the conservation education zone (the interpretation center and information center) and recreation zone (tourist shops, student dormitory and the area adjacent to the information center).



Figure 7.1 Zones of the park for zone management

The following are the recommendations:

- i. All eco-tourism activities to take place in delineated eco-tourism zones

- ii. It is very important to have the interpretation center, CONIC, open to the visitors during the visiting hours i.e. 9 a.m. to 5 p.m. The area where the center is located is the conservation education zone. The center is not functioning now due to the unavailability of electricity. Renewable energy such as solar power can be used to solve the energy problem.
- iii. In the meeting with the major stakeholders, several participants recommended that the visitors get the first contact at the interpretation center. This zone should have the ticket counter as well as information materials about the Park and its services such as eco-guides. They also recommended that collection of tickets at the existing ticket counter can be stopped and instead set up one at the entrance point from Dhaka side. If needed in the future, another counter can be set up at the entrance point from Chunarughat side.
- iv. The existing ticket counter can still be there and another one can be opened up at the entrance (the Dhaka-Sylhet highway).
- v. It is recommended that cooking activities by visitors should be completely banned in the Park. Food for the picnic parties can be cooked by the locals in their homes and served in a designated area in the picnic zone where the garbage generated can be collected from one point. This will ensure efficient litter management and more importantly, generate a means of alternative income for the locals. A minimal amount earned from this entrepreneurship can be donated to the CMC to aid in meeting the conservation goals. This will enhance their conservation awareness. The locals can receive prior training to ensure quality food and service is provided to the visitors. This recommendation was strongly supported by all participants in the meeting with the stakeholders.
- vi. During peak seasons and weekends, visitors should be allocated trails on a rotation i.e. first come first serve. If a visitor has a special request for a particular trail then they will have to wait for the allocation. This would ensure utilization of all the trails. The problem of parking space and crowding too will be taken care of.
- vii. Carry out a comprehensive study on the Park to assign new zones to the park.
- viii. Declare the park to be a plastic free zone.

- ix. Complete ban on burning and burying non-biodegradable garbage in tourism zones – garbage to be collected and segregated and taken off site away from the park and water sources once in a week to identified sites by the upazilla administration.
- x. Speed limit to be controlled for all vehicles and ban use of music in the “Silence Zone.”
- xi. It is recommended that the park be opened from 6 a.m. to 5.30 p.m. during the summer and 7 a.m. to 4 p.m. during the winter. This will require the availability of park staff during these visiting hours.
- xii. An alternate recreation zone can be developed to prevent overcrowding in the existing zones.
- xiii. Two gates and check points to be installed at the entry of Satchari from Chunarughat side and one at the entry of the park from Dhaka side. This is important to maintain speed limit and keep a watch on the vehicles entering the area of the park. The area between the two gates and check points can be declared as “Silence Zone”. Honking and music amplifiers can then be banned through the use of appropriate signage placed on the road.
- xiv. Automated ticketing system can be introduced at all the ticket counters and data can be downloaded and backup prepared daily.

7.3 Improvement of Trails

Officially there are three trails that have been identified. They are half an hour trail, one hour and three hours trail. However, visitors enter the forest and make their own trail as per convenience of time. To improve the management of trails, the following are the recommendations:

- i. Visitors should follow designated trails. The signage and markers need renovation as most of them have been vandalized and bear graffiti made by visitors.
- ii. Visitors should be allowed only on guided tours in all the trails.
- iii. Trail brochures on each of the trails can be provided to the eco-guides who can provide it to their visitors. Visitors have a choice of choosing from Bengali and English version of the trail brochure.

- iv. Some of the resources on the trail can be signage containing information about the flora on the trail and cautions. Majority of the respondents during the survey have responded that information on visitor safety is important.
- v. For the bird watching enthusiasts a checklist of birds in Satchari can be prepared. This can be priced and sold from the information center as well as at the interpretation center.
- vi. Resting shelters can be set up in the trails with benches for visitors to rest and enjoy nature. This facility was recommended by both the stakeholders and park staff and the visitors who participated in the survey.
- vii. A counter can be placed at the entrance of each trail to monitor visitor use and to provide assistance to the visitors on trail usage. Brochures and other information materials can be kept in these counters.
- viii. There should be a counter at the entry and exit points of each trail. At least one staff should be there in all the counters to collect information of how many people have visited the trails. This will help the management staff to understand how many visitors visit the three trails annually and to know whether the number of visitors visiting the trails is following the effective carrying capacities of the trails.
- ix. The establishment of counters at the entry and exit points of all the trails will ensure that only guided tours (by the eco-guides accredited to the park) policy is implemented successfully.
- x. Build a watch tower at a strategic point (which can be found out through the means of a comprehensive study) where people can have a better view of the park and the wildlife.

7.4 Eco-guides

13 eco-guides were trained under the Nishorgo Support Project and Integrated Protected Area Management (IPAC) project of which only 7 are actively working in the park. All the eco-guides are from Tiprapara and adjacent villages. At present, the eco-guides are paying a fee to the CMC from their earnings. They are all registered with the CMC.

Following are the recommendations:

- i. Visitors will not be allowed to visit the trails without the trained eco-guides. Even if the visitor is accompanied by a tour and travel agency guide, it is still mandatory for the visitor to hire an eco-guide accredited to the park. 52% of the visitor respondents answered that they did not know about the guide service. Thus, it is important that the park staff, especially the ones at the ticket counter, disseminate this information to the visitors. This will help in promoting the practice of hiring eco-guides during the trail visits (when and if declared mandatory).
- ii. Each year during the monsoon period the eco-guides should undergo capacity building courses to develop knowledge and communication skills. English courses are recommended as it was found during the guide survey that the English skills of the eco-guides need furnishing and improvement. The eco-guides have also requested the need for training in the English language.
- iii. The eco-guides should be on a roster every day so that each guide gets a chance in the day. The fee submitted by the eco-guides to the CMC can be used to provide uniform, guide kit (such as binoculars) and training.
- iv. The guides should be provided uniform and an identity. This also increases their credibility as eco-guides accredited to the park. It was observed during the survey that visitors hesitated to take eco-guides because the guides were dressed in regular clothes like any other visitors in the park. Thus, the introduction of uniforms and an identity card will distinguish the eco-guides from everyone else in the park. This will also give a morale boost to the eco-guides and encourage them to stay in the profession.
- v. Regular formal interaction of eco-guides with the CMC sub-committee on eco-tourism for exchange of ideas, observations and suggestions. This view was shared by the CMC and eco-guides.
- vi. Train more youths from the adjoining areas as eco-guides. This will increase the number of locals participating in the conservation efforts of Satchari. Youths from the ethnic community should be encouraged so that they can take visitors on

guided tours in their village. This will help the visitors learn more about the ethnic community.

- vii. Establish a hut where eco-guides can be based at.
- viii. Conduct a certification program for the eco-guides to enhance their professionalism and to distinguish them into different categories. The recommended categories are given in Table 7.2. Category Green eco-guides are specialists who can accompany international visitors. Category Blue eco-guides are also specialists who can accompany elite national visitors and category Pink eco-guides are generalists who can accompany the general visitors to the reserve. The guide fee is to be fixed as per category. The guide fee can also be decided as per the length of the trail. The certification can be valid for three years to enable the eco-guides to upgrade.

Table 7.2 Category of Eco-guides

Category	Qualification
Green	<ol style="list-style-type: none"> 1. Fluent in communication in English and Bengali 2. Knowledge of the resource 3. Knowledge of birds 4. Knowledge of flora and fauna
Blue	<ol style="list-style-type: none"> 1. Fluent in communication in Bengali 2. Knowledge of the resource 3. Knowledge of Birds 4. Knowledge of flora and fauna
Pink	<ol style="list-style-type: none"> 1. Fluent in communication in Bengali 2. Knowledge of the resource

7.5 Pricing

Fees collected from the visitors, parking and film shooting can fulfill several management goals. Introducing high fees can dissuade visitors from using a particular area and thus reduce impact. People tend to generally value something they pay for. Setting appropriate fees is not an easy task. Socio-political factors are often the reasons behind low entry fees. Some examples of those factors include political concern about

increases in park fees upsetting local constituencies, lack of research into appropriate methods for determining reasonable pricing policies, lack of partnership between private operators and park agencies and varying levels of visitor services and infrastructure (Sinha et al. 2012). Modest fees generally do not have a significant effect on visitation.

The findings from the survey showed that majority of the visitors were not willing to pay an increased park entry fee. A more comprehensive study needs to be launched in order to understand the need for an increased fee and by how much to increase.

7.6 Park Closure

The park receives visitors throughout the year. Visitation decreases during the rainy season i.e. from May to August. This is also the period when the vegetation gets a fresh lease of life.

Some recommendations are:

- i. The park should be closed from 1st April to 31st July.
- ii. The interpretation center can remain open for visitor use.
- iii. Training of guides during this closure period.
- iv. Maintenance of visitor use infrastructures.

7.7 Park Information and Interpretation

It is important to provide data, facts and advice to visitors concerning the park, its biodiversity, its significance and location of visitor facilities and rules and regulations. When this information is not provided, there is the risk others providing inaccurate or misleading information. Providing park information will assist in appropriate behavior by the visitors which will lead to reduction in impact.

Interpretation is disseminating information to visitors in such a way that they learn more about the resource and appreciate. Interpretation is more than stating facts and presentation of data. It is bringing them together so that the visitors come to understand and appreciate the values for which the park was established. This can help reduce visitor

impacts and provide greater public support for the park. The park has an interpretation center which is perfect for interpreting the nature to the visitors and for increasing visitor awareness and education. However, at present the center is not open due to the unavailability of electricity, which is needed to show documentaries and to run other media for disseminating and interpreting information to the visitors. Solar panels can be provided for to get this center running.

7.8 Strengthening of the CMC

To ensure that the conservation goals and visitor expectations and satisfaction are simultaneously fulfilled, it is crucial to strengthen the CMC. The following are the recommendations:

- i. Ensure that the existing eco-tourism plan for the protected area is implemented successfully and that the members of the CMC have knowledge about it.
- ii. Review eco-tourism in the protected area and make recommendations.
- iii. Monitor tourist facilities in close proximity of the national park to ensure site specific restrictions – ownership, type of construction, solar power, waste recycling, sewage disposal and merger with the environment.
- iv. Monitor activities of tour operators and travel agencies to ensure they adhere to the rules and regulations of the protected area.
- v. Based on the recommendation of the carrying capacity study indicate eco-tourism zones and set a ceiling to level of visitor use.
- vi. Develop code of conduct for the tour operators and travel agencies.
- vii. Develop guidelines for environmentally acceptable and culturally appropriate tourism practices which should be disseminated to the visitors, park staff, tour operators, travel agencies, hotel and resort industry
- viii. Develop monitoring mechanism for assessing impacts of tourism activities and provide training to the staff for efficient implementation of the monitoring mechanism.
- ix. Strengthen the existing sub-committee of CMC that is exclusively for eco-tourism.

- x. Ensure that the energy requirement of all tourist facilities is fulfilled from alternate energy source such as solar power and biogas.
- xi. Increase interaction between the CMC and the eco-guides and other park management staff.

7.9 Capacity Building

In order to implement the recommendations and create effective visitor use management system, it is essential to undertake capacity building of staff and personnel. It can be achieved by:

- i. Offer 15-day rigorous onsite training for new eco-guides.
- ii. Offer capacity building workshops/trainings to existing eco-guides and even sending them on exchange programs to other protected areas in/outside the country to enhance their knowledge and to allow sharing of information and experiences. This can take place during the monsoon season.
- iii. Offer an orientation course to travel agencies and tour operators and resorts and hotels to provide and update information of Dhaka and Sylhet division (as majority of the visitors are from these regions, shown in chapter 5) about the resources of the park and the rules and regulations for conducting visitors in the park.
- iv. Train the park staff to enhance their skills of visitor use management and the assessment and monitoring of impacts. It was found during the survey that there is a lack of communication between the visitors and park staff. This results in visitors not being aware of existing visitor facilities and in park staff failing to encourage visitors to follow the do's and don'ts of the park. Trainings to enhance their communication skills are necessary to bridge the communication gap between the visitors and the park staff.
- v. If automated ticketing system is introduced, then the staff needs to receive training to ensure efficient and proper use of the system.
- vi. Build up the capacity of local communities in planning, providing and managing eco-tourism facilities.

- vii. Build up the capacity of the eco-tourism sub-committee of CMC in planning, implementing and monitoring.
- viii. It is important to strengthen the financial capabilities of park staff, CMC eco-tourism staff and the CMC.
- ix. Strengthen the capacity of the CMC for planning, development, implementation and monitoring. CMC members can be taken on visits to know and learn about visitor use and management in other protected areas.
- x. Establish an effective and regular linkage between the CMC and the grassroots forums.

7.10 Tourism Networking

Establishing a network with the tour operators, travel agencies and hotel industry across the country can help in achieving the two mandate of the park – conserving the forest and providing enhanced visitor experience. This would also help in communicating with the network and keeping them updated about the developments in the national park and gaining support for conservation. The regional tour operators and hotel network would then create a link to other national networks/associations in the country. Such a linkage will help in implementing the code of conducts for eco-tourism in Satchari National Park.

Locals in Satchari can be encouraged to establish eco-cottages. The financial and technical support in the initial stages can be provided to them. The eco-cottage owners can then join the regional and national networks of eco-guides and eco-cottage owners. Such an association will build up the capacity of the eco-guides and the eco-cottage owners. Also, the establishment of eco-cottage owners in the region can provide financial assistance to the CMC by donating a certain fee from their earnings. This will help the CMC in fulfilling its objectives.

7.11 Infrastructure Requirements

The visitor and guide surveys and the meeting with the major stakeholders generated the need for certain infrastructures to be established in the park. The following table shows the required infrastructures:

Table 7.3 Required infrastructures

Infrastructure Requirement	
i.	More toilets (a strong recommendation from visitors and stakeholders who were interviewed)
ii.	Visitor sheds in the park (see section 7.3)
iii.	Automated ticketing system to be installed in the designated ticket counters (see section 7.2)
iv.	Drinking water points at concentration points (see section 7.1)
v.	More signage and markers
vi.	Resting benches in the trails (see section 7.3)
vii.	More bins (a strong recommendation from visitors and stakeholders who were interviewed)
viii.	Flower garden for beautification purposes
ix.	Guide hut in the park (see section 7.4)
x.	Souvenir shop (a strong recommendation from visitors and stakeholders who were interviewed)
xi.	Counters at the entry and exit points of the trails (see section 7.3)

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Appendices

Appendix I

VISITOR QUESTIONNAIRE

For Official Use Only:

Time of the survey:

Respondent No.:

Date of visit:

Name of Guide:

Thank you for participating in our visitor survey. As we assess the potential for eco-tourism development in this area, your responses are important for us. Please be assured that your responses will be held in confidence and would be used for drawing inferences for the study only.

1. How did you first find out about this park? *You may tick more than one box*

Word of mouth / friends

Travel brochure

Newspaper

Internet

TV

Tour Operator

2. How often do you visit this park?

Firstvisit

2-5 times a year

More than 5 times a year

Once a year

On a weekly basis

Other _____

3. Are you traveling – *(Please tick one box only)*

Alone

With friends

As a couple

With family

As a group

Business associates traveling together

School / university group

Other _____

4. If traveling with family, then number of children _____ and age of the oldest child _____ and youngest child _____.

5. How many people are in your travel party? _____

6. How long did you stay (plan to stay) in the park on this visit? *Please tick one box only*

Short stop (under 2 hours)

All day (4 to 8 hours)

Half day (2 to 4 hours)

7. Where are you lodging at? Resort Hotel Other

17. Did your guide brief you about – (Please tick the appropriate answer)

	Yes	No
Do's and Don'ts		
Park history		
What will you see		
Route you will follow		
Animals found in the park		
Other interest areas		
Other entry gates of the park		
Management activities		
Threats in the park		
Interpretation center		

18. (a) Was your guide knowledgeable? Yes No
 (b) Did he/she make your visit educative? Yes No
 (c) Would you like to travel with him/her again? Yes No
 (d) How would you rate your guide? Smart and Intelligent Dull and Boring

19. Which trail did you choose? *If not applicable then go to question number 20.*

- Half an hour trail One hour trail Three hour trail

20. Did you purchase any local product/souvenir from local market/people? Yes No

If YES what _____ and from where _____
If NO then go to question number 21.

21. Do you know about the interpretation center in the park? Yes No

22. Do you know about the information center in the park? Yes No

23. Did you notice any disturbance inside the park? Yes No

If yes what are they? If no, then go to question number 24.

Type of disturbance	Too much	Little	None
Plastic	1	2	3
Noise	1	2	3
Crowd	1	2	3
Too many vehicles	1	2	3
Other (specify)	1	2	3

24. Your experiences of the features of this park?

For each statement below, please tell us: (a) How important each feature is to you as a visitor and (b) How satisfied you were regarding each feature. Please circle one number for (a) Importance, and one number for (b) Satisfaction. If you have no experience of this feature, please still tell us how important it is to you, then circle the 'No experience'* in (b).	(a) Important					(b) Satisfaction					
	Not at all important	Not very important	Somewhat important	Very important	Extremely important	Not all satisfied	Not very much satisfied	Somewhat satisfied	Very satisfied	Extremely satisfied	No experience
1. Pre-visit information about the park was easy to obtain	1	2	3	4	5	1	2	3	4	5	*
2. Information availability like visitor guides/brochures/signage/books/maps in the park	1	2	3	4	5	1	2	3	4	5	*
3. Helpful park staff	1	2	3	4	5	1	2	3	4	5	*
4. Toilet facilities	1	2	3	4	5	1	2	3	4	5	*
5. Maintenance & convenience at the park	1	2	3	4	5	1	2	3	4	5	*
6. Well designed & maintained walking tracks/trails	1	2	3	4	5	1	2	3	4	5	*
7. Guide service in the park	1	2	3	4	5	1	2	3	4	5	*
8. Sightings of wildlife/birds	1	2	3	4	5	1	2	3	4	5	*
9. Able to enjoy nature in this park	1	2	3	4	5	1	2	3	4	5	*
10. Clear information about visitor safety	1	2	3	4	5	1	2	3	4	5	*
11. Less number of visitors present	1	2	3	4	5	1	2	3	4	5	*
12. Interesting information on ethnic culture	1	2	3	4	5	1	2	3	4	5	*

25. Overall, how satisfied are you with your visit to this park? *Please circle one number only*

Very dissatisfied

1

2

3

4

Very satisfied

5

26. Would you be willing to pay a higher fee for entering the park? Yes No

27. If yes, then how much? _____

28. If no, then why?

29. How strongly would you recommend this park to friends?

Not at all

1

2

3

4

Very strongly

5

Please give your reason

30. Please check one - Male Female

31. Where is your usual place of residence? _____

32. Your approximate age

- | | |
|--|--|
| <input type="checkbox"/> Less than 25 years | <input type="checkbox"/> Between 26 and 35 years |
| <input type="checkbox"/> Between 36 and 45 years | <input type="checkbox"/> Between 46 and 55 years |
| <input type="checkbox"/> Between 56 and 65 years | <input type="checkbox"/> Over 65 years |

33. What is the highest level of education that you have completed?

- | | | |
|---|---|---|
| <input type="checkbox"/> Grade school (1-5) | <input type="checkbox"/> High school (6-10) | <input type="checkbox"/> College (11-12) |
| <input type="checkbox"/> Graduate | <input type="checkbox"/> Post Graduate | <input type="checkbox"/> Vocational/Trade school <input type="checkbox"/> Other _____ |

34. What is your profession?

- | | | | |
|-------------------------------------|----------------------------------|---------------------------------------|---------------------------------------|
| <input type="checkbox"/> Government | <input type="checkbox"/> Private | <input type="checkbox"/> Selfemployed | <input type="checkbox"/> Others _____ |
|-------------------------------------|----------------------------------|---------------------------------------|---------------------------------------|

35. Would you like to add any particular suggestion for the improvement of the park?

Appendix II

Local People Attitude Survey

Date:
 Name:
 Village/Place:
 Age: Sex Religion Occupation

1. Total family members Adult Child (<14) Male
 Female

2. What is your education level?

Primary (up to class 5) High school (up to class 10) Graduate
 Post Graduate Others _____

3. Do you own land? Yes No *(If no, then please go to question no. 6)*

4. If yes, how much land do you own? _____
 Cultivated _____ Uncultivated _____

5. What are the crops you grow on your land?

Name of crops/vegetables	Duration in months	Yield (k.g./qty)	Self-use (k.g./qty)	Sell (k.g./qty)	Comments

6. Do you have livestock? Yes No *(If no, then please go to question no. 8)*

If yes what livestock do you have?

Type of livestock	How many?
Cow	
Bull	
Buffalo	
Goat	
Sheep	
Others	

7. Where do the livestock graze?

8. What are the major sources of income of your family?

	Monthly/Annual income	No. of people involved	Comments
Govt. job			
Private job			
Business			
Farming			
Daily Labor			
Bamboo Craft			
Others			
Others			

9. Does anybody from your family work elsewhere? Yes No (If no, then please go to question no. 11)

10. If yes then as what?
 How much does he or she earn per month?

11. Forest dependency

Forest product	Amount per day/month (appx.weight)	Place of collection and distance from village	Collection season/time period	Remarks
Fuel wood				
Timber/Bamboo(other than fuel wood)				
Green fodder				
Plants/plant parts for medicinal purposes				
Honey				
Fruits/Flowers (amla, Mahua, Tendu etc)				
Others				

12. Is anyone from the family involved with tourism in the park? Yes No

13. If yes then as what?

14. How much is your income from the tourism related activity (per month)?

- Less than BDT 1000 BDT 1000-3000 BDT 3000-5000
 More than BDT 5000

15. Does anyone from your family work for the park? Yes No

16. If yes then as what? _____

17. Is your house your own house or rented? _____
 Is your house - pucca kutcha Others

18. Do you know any park official? Yes No

19. If yes then whom? _____

20. To get an idea of your views regarding tourism in this area. *Please circle one number only*

	Strongly disagree	Disagree	Undecided	Agree	Strongly Agree
The park staff are helpful and co-operative	1	2	3	4	5
There should be involvement of local community in decision making about tourism	1	2	3	4	5
Employment opportunities have increased due to tourism	1	2	3	4	5
Is tourism helping you?	1	2	3	4	5
Park has provided opportunities for us to improve our livelihood	1	2	3	4	5
The park people relationship is good	1	2	3	4	5

21. Did you know? *Please tick*

	Not Aware	Aware
CMC	1	2
Eco cottage	1	2
Eco Guide	1	2
Entry fee	1	2
Nishorgo	1	2

Appendix 3
Guide Survey

1. Name: Age:
2. Village:
3. How many years as guide?
4. Education Qualification:
5. Guide Training? Yes () No ()
If yes, how many times? Year(s):

6. Interest in:

	Yes	No
Birds		
Plants		
Mammals		
General		

7. Do you know?
- (a) Total number of protected areas in the country? Ans:.....
- (b) Total area of Satchari PA? Ans:.....
- (c) The type of Satchari Forest? Ans:.....
- (d) How many types of birds available here? Ans:.....
- (e) Notable species for Satchari? Ans:.....
- (f) How many ethnic groups staying in & around the Satchari? Ans:.....

8. Do you brief your visitors about:

(Please circle the number of the answer that represents your answer)

	Beginning	Middle	End
Dos and Don'ts	3	2	1
Park History	3	2	1
Route you will follow	3	2	1
Animals found in the park	3	2	1
Other entry gates of the park	3	2	1
Management activities	3	2	1
Threat to the park	3	2	1
How to behave while in the park	3	2	1

9. Why should we conserve wildlife? (Tick only one box)

- (a) They are worth watching (b) They are part of ecosystem
- (c) They play crucial role in the ecosystem (d) They have cultural value
- (e) Ethical reason (f) All the above (g) Don't know

10. Do you think everybody should contribute towards conservation? Yes () No ()
If yes, then how we can conserve?

.....
.....
.....

11. Is tourism good for the park? Yes () No ()

12. Three major problems faced by you from tourists (As priority)

- (a)
- (b)
- (c)

13. Three suggestions to improve tourism (as priority)

- (a)
- (b)
- (c)

14. Any other occupation along with working as guide?

15. Father's Occupation:

USAID's Integrated Protected Area Co-management Project
House 68 (2nd floor), Road No. 1, Block-I
Banani, Dhaka - 1213
Bangladesh
www.nishorgo.org