Original Research Article

Multiple Drivers Influencing Residents' Perception of Ecotourism in a Biodiversity Rich Forest Protected Area of Bangladesh

ABSTRACT

Local people have both positive and negative attitudes towards ecotourism. It is because they are the beneficiaries of ecotourism, though sometimes, they are also the victims of its activities. Expression of the residents' perception depends on multiple drivers. This study is an attempt to assess the drivers influencing local peoples' perception on impacts of ecotourism in Satchari National Park (SNP) - a biodiversity rich forest protected area and famous ecotourism spot in Bangladesh. Interview surveys on local people of purposely selected four villages in and around SNP supplemented by the questionnaire were conducted during the September-October period in 2022. This study reveals that socio-cultural aspects secured higher ranks by processing higher mean values which follow economic and environmental aspects respectively. It is also found that local people's attitude towards ecotourism varies with the variation in education, occupation and income. Policy makers and forest department's officials should undertake necessary actions to solve the negative impacts of ecotourism.

*Keywords*Ecotourism;Satchari National Park;Resident's Perception;Protected Area;Biodiversity Hotspot

1. INTRODUCTION

Tourism industry is the most rapidly expanding industry of the world and generating about two trillion USD annually, which is about 12% of the global GDP (Fennell, 2004). The demand for ecotourism industry is also increasing worldwide and showing a steady rise, according to the estimation of the World Travel and Tourism Industry, ecotourism industry is growing at a rate of 10-15% annually (Drumm and Moore, 2005). This industry is growing as a valuable industry in developing countries like Bangladesh with promising nature conservation and economic development strategies (Mree et al. 2020).

Ecotourism is becoming popular globally as well as in Bangladesh because it is believed that it helps in economic development and employment generation of a country without hampering its environment and wildlife resources (Weaver 2008). In Bangladesh, domestic ecotourism in particular has become popular in the last few years, because of the country's economic development, improved road networks and advancement of other facilities (Islam and Majumder 2015; Saha and Mukul 2022). According to Mukul et al. (2017) and Uddin et al. (2013), in the recent years, forest based outdoor recreation is largely increasing due to expansion of protected areas and growing urban population in the country.

Participation from the community may guarantee both economic growth and environmental preservation by taking into account their opinions, values, and interests in the planning, decision-making, and implementation of ecotourism (Manu and Kuuder 2012; Vincent and Thompson 2002).Therefore, as ecotourism is primarily concerned with environmental conservation and community development, including the local community or residents is one of its fundamental components (Mree, et al. 2022).Local peoples' perceptions of ecotourism can be influenced by their involvement in it, as it has a significant impact on them. In other words, the support of the local community is essential for the sustainable growth of ecotourism in a given area(Manu and Kuuder 2012; Haddle 2005; Ap and Crompton 1998). Over the past few decades, this insight has resulted in a greater focus on how local peoples perceive the effects of ecotourism(Baral, et al. 2012; Ap and Crompton 1998).

Anthropogenic interference is the primary driver leading to the geographic disparity in diversity of species in Bangladesh (Uddin, et al. 2011). However, Satchari National Park (SNP) has a rich biodiversity. According to Mukul, et al. (2017), integrating ecosystem services into land-use planning can improve protected area management in tropical countries like Bangladesh. SNP contains 245 angiosperm species, divided into 183 genera and 72 families. Seven of these species are endangered. 86 species of herbs, 46 species of shrubs, 73 species of trees, 37 species of climbers, and 3 species of epiphytes are known to exist (Arefin, et al. 2011). At SNP, eight different kinds of wildlife have been found dead after collisions with cars, as stated by Quamruzzaman (2016). As a result, road kills are becoming a much bigger issue. Dhole(*Cuon alpines*) lives in SNP, but tourist pressure and illicit logging pose major concerns to the species' existence (Zakir, et al. 2020). Ecotourism in Bangladesh fosters economic development while protecting biological diversity, ecological processes, cultural integrity, and life support systems (Siddiqua, 2022).

Despite the increasing number of visitors and aptitude benefits of ecotourism have been meticulously described, there is scarcity of research on the perspectives of Bangladeshi community members, particularly at SNP. This study would render light on pivotal but unacknowledged aspect of the rise of ecotourism in the area. Beyond that, the point of view of the natives possesses an essential effect on the long term viability and profitability of the ecotourism sector making them key participants. Evaluating their view points on the socio-cultural, ecological and economic consequences of sustainable tourism at the SNP is the prime purpose of this research. Expanding upon the current understanding of SNP's biodiversity, human pressures, and particular problems like road kills and Dhole conservation, this research can concentrate on the specific economical, environmental, and socio-cultural consequences of ecotourism on local residents.

Few studies were found in Bangladesh on perception of ecotourism's impacts (Debashish et al. 2013; Mree et al. 2020; Sarker et al. 2021) and no studies were conducted regarding this issue at SNP – a biodiversity rich forest protected area in Bangladesh. With the objective of fostering ecotourism program that take into account native communities' priorities and enhancing positive outcomes whilst refraining from the negative ones, the research attempts to comprehend their point of view at SNP.

The aforementioned approach is crucial to maintaining the long term viability and sustaining of ecotourism programs in the region.In this study, many socioeconomic factors such as gender, age, marital status,

education, employment, income, and type of job-are examined for potential effects on the opinions of local peoples.

Utilizing this insight, ecotourism may be more efficiently and compassionately adapted to diverse native demographic arrangement. The objectives of this study are to determine inhabitants' opinions of the economic, environmental, and socio-cultural implications of ecotourism in SNP, as well as the relationship between demographic characteristics of local peoples and their perceived impacts of ecotourism.

2. MATERIALS AND METHODS

2.1 The Study Area

The area of SNP is about 243 hectares. It is located in Habiganj district of north-eastern region of Bangladesh. Geographically it is located between 24°07′12″N - 24.12000°Nlatitude and 91°27′03″E 91.45083°Elongitude. SNP (named after its seven streams) is habitat to a variety of creatures including birds, otters, Hoolock Gibbons,Dhole and other unique species. Along with its sign-posted walking routes and breathtaking views, the park is a popular destination for tourists. It is located in Habiganj district – a north-eastern region of Bangladesh. A village located inside the SNP is Tripura Para and three other villages, such asRatanpur, Deorgachand Gojnogor are located around the SNP were selected for this study (Fig. 1).

2.2 Preliminary Survey

Two native residents of the area (key informants) were directly interviewed on ecotourism in SNP in early September 2022. Subsequently, a final survey comprising four communities was conducted in October 2022.

2.3 Questionnaire Development

The influence that ecotourism has on SNP was evaluated by asking locals about their impressions using a questionnaire based on Ap& Crompton's effect items scale (Ap and Crompton, 1998). This scale encompasses socio-cultural, environmental, and economic aspects in addition to positive and negative effects. Depending on how well they statistically reflected the attitudes of the residents, 35 impact items were chosen from a larger pool of objects. Two criteria were used to evaluate each item:

Belief: To what extent has ecotourism affected the associated element (e.g., raised local wages)? (Scale: 1 denotes a significant drop and 5 a significant rise)

Assessment: To what extent is the resident pleased or dissatisfied with this change? (1 being disliked and 5 being liked)

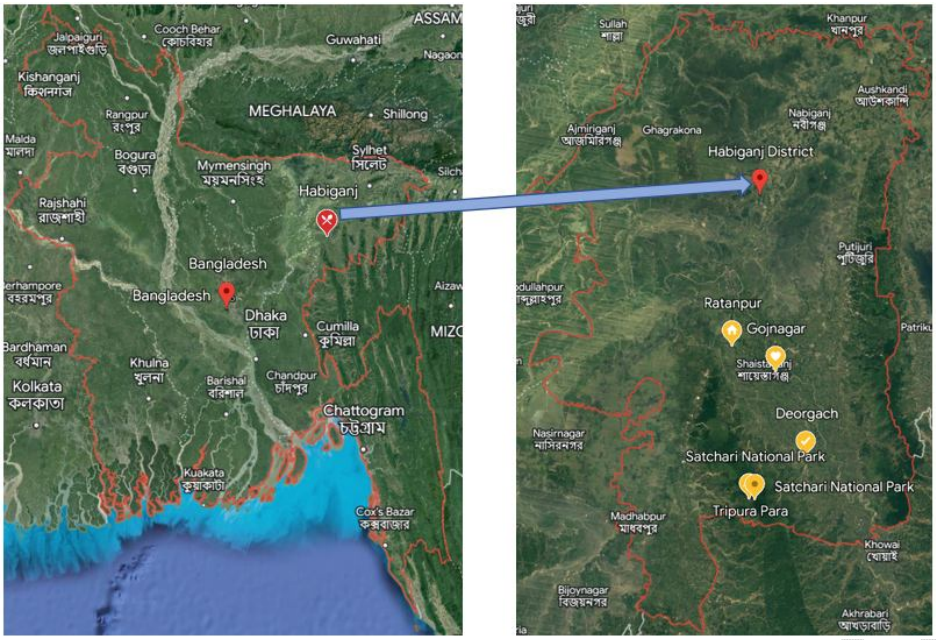

Fig1 Study areas

2.4 Evaluation of the impact items

Scoring: For each item, the belief and assessment scores were multiplied (maximum score = 25).

High score = strong positive assessment of the impact of ecotourism.

Low score = bad perception of ecotourism impact.

2.5 Selection of Respondents

Surveys were conducted in four settlements in and around SNP. Because Tripura Para village is in the heart of the park, all 23 households were selected as respondents;i.e. sample size was 100% (Table 1). Each of the remaining communities has at least 10% of the total number of households sampled (Table 1).

Table 1 Sample villages and respondents

No	Village	Distance (km)	Total Household	Sample Size	Percentage
1	Tripura Para	00	23	23	100%
2	Ratanpur	2.5	156	18	11.54%
3	Deorgach	3	316	38	12.02%
4	Gojnogor	3.5	328	33	10.06%

2.6 Data Collection

On-site visits to the villagers were used to conduct in-person interviews in order to gather data. Non-probability sampling was used in the random, bias-free sampling procedure. The Ap and Crompton scale-

based questionnaire was utilized to gather information. Eight demographic characteristics were documented together with information on impact perception.

2.7 Secondary Data Collection

Depending on what was convenient, a variety of sources provided the secondary data. The local forest beat office was primarily used to gather information about the forest. Google Earth was used to acquire maps, and Google Scholar was used to get more information.

2.8 Data Analysis

Microsoft Excel and R statistical program were used to data analysis.

Demographic Profiling of the Respondent: Eight demographic data were taken for profiling of the respondents. They are as follows: Gender, Age, Marital Status, Education, Occupation, Income (BD Taka/Annum), Service/ Job Type, Travel Abroad

Ranking of the Resident's Attitude Towards Perceived Impact of Tourism: The impact items on the questionnaire were observed to elicit reactions from the respondents.

The next step involved sorting the items by calculating the arithmetic mean of the sum of the belief and evolution components.The item with the highest mean, rated 1, would come first, followed by the second-highest (ranked 2), and so on. The value for that specific responder and item was not counted and was shown as missing if they selected "DK" for any component of the question, which stands for "Don'tKnow." To ascertain the extent of diversity in the responses, standard deviations were also noted.

Analysis of Variances: A one-way ANOVA was used to determine whether there were any differences between demographic characteristics and locals' attitudes toward tourism. In terms of the eight demographic factors-economic, environmental, and socio-cultural-each of the three effect regions was examined. A 95% confidence level was used while doing the ANOVA. Each and every outcome was added up and shown as such.

3. RESULTS AND DISCUSSION

3.1 Details of the Respondents

The study was conducted in four villages in and around SNP. A questionnaire based on Ap and Crompton was use to interview 112 respondents in total (1998). Table 2 shows the demographic characteristics of the respondents.

The bulk of responders (88%) were male who were married (74%). The respondents' ages spanned from 11 to over 50 years, with the largest group (30%) being between the ages of 31 and 40. The majority of responders (26%) had no or secondary education. Only 5% of those polled had a higher education, such as a diploma.

The vast majority of respondents (27%) were farmers or businessmen. A tiny percentage of respondents (6%) were housewives, whereas 14% worked in other fields. About 27% of the responders had an annual

income of less than BDT 60,000. About 39% of the respondents had an annual income BDT 60,000 – 1, 20,000 and rest 27% hadan annual income of more than BDT 1, 20,000.

About 82% of the respondents said they did not work in the tourism industry. A modest percentage of respondents (18%) worked in tourism. Almost all of the respondents (97%) have never travelled outside of the country.

Table 2 Demographic profile of the respondent

Variable		Tripura Para (23)	Ratanpur (18)	Gojnogor (33)	Deorgach (38)	Total *N=112*(%)
Gender	Male	21	16	26	36	99(88%)
	Female	2	2	7	2	13 (12%)
Age	11-20	6	0	7	3	16 (14%)
	21-30	3	2	7	7	19 (17%)
	31-40	8	5	3	18	34 (30%)
	41-50	1	6	7	2	16 (14%)
	>50	5	5	9	8	27 (25%)
Marital Status	Married	13	18	24	28	83 (74%)
	Unmarried	10	0	8	9	27 (24%)
	Divorced	0	0	0	0	0 (0%)
	Widow	0	0	0	0	0 (0%)
	Widower	0	0	1	1	2 (2%)
Education	No Education	3	7	14	5	29 (26%)
	Primary	4	7	8	8	27 (24%)
	Secondary	8	2	8	11	29 (26%)
	Higher Secondary	5	1	2	5	13 (12%)
	Undergraduate	1	0	1	6	8 (7%)
	Above	2	1	0	3	6 (5%)
Occupation	Business	8	5	4	13	30 (27%)
	Service	0	2	2	4	8 (7%)
	Farmer	5	3	14	8	30 (27%)
	Housewife	1	1	5	0	7 (6%)
	Student	5	0	4	4	13 (12%)
	Day laborer	2	2	2	2	8 (7%)
	Tourism	0	0	0	0	0 (0%)
	Others	2	5	2	7	16 (14%)
Income(BDT/ annum)	<60,000	5	5	16	4	30 (27%)
	60,000-1,20,000	10	9	12	13	44 (39%)

	>1,20,000	8	4	5	21	38 (34%)
Service/Job Type	Tourism	11	3	1	5	20 (18%)
	Non-Tourism	12	15	32	33	92 (82%)
Travel Abroad	Yes	0	1	1	2	4 (3%)
	No	23	17	32	36	108 (97%)

(Source: Field Survey, 2022)

3.2 Perceptions of the Effects of Ecotourism among Residents

Table 3 presents the locals' opinions about the detrimental impacts of ecotourism. For the purpose of categorizing and prioritizing impact factors, means were utilized. Considering the economic, environmental, and socio-cultural factors, the 35 components have been divided into groups. Furthermore, each item's standard deviation has been calculated and reported.

When all factors have been taken into account, the outcome demonstrates that the social and cultural variables have been prioritized above environmental and economic variables by analyzing fewer extreme values. Local pride, protecting the natural environment or not causing ecological harm, favorable attitudes of local residents towards tourists and investment in the economy, development, infrastructure spending (improves) ranked first, second, third and fourth respectively.

Table 3 Residents' perspectives on the perceived impacts of ecotourism

Factors/Impacts	N	Mean	Standard deviation	Rank
Economic				
Contribution to income & standard of living	112	20	6.745	7
Local economy improvement	112	20.25	6.96	6
Employment opportunity (Increases)	112	19.5	6.7675	8
Investment, development & infrastructure spending in the economy (improves)	112	22	5.05	4
Tax Revenue (Increases)	112	12.5	6.495	27
Public Utility infrastructure (Improves)	112	18	4.4625	12
Transport Infrastructure (Improves)	112	18	4.86	12

Shopping Opportunities (Increases)	112	17.75	5.22	14
Price and Shortage of goods & services (Increased)	112	16.75	5.8675	15
Price of land & housing (Increased)	112	15.75	6.44	17
Cost of living/property taxes (Increased)	112	12.75	5.8425	26
Environmental				
Preservation of the natural environment/ does not cause ecological decline	112	22.75	4.4275	2
Preservation of historic buildings and monuments	112	18.25	3.315	10
Improvement of the area's appearance	112	18.25	4.875	10
Increased traffic congestion	112	8.5	2.4425	29
Overcrowding	112	7	2.57	34
Increased noise pollution and waste	112	6.5	2.5975	35
Socio-Cultural				
Improves the quality of life	112	21.25	4.8575	5
Increases availability of recreational facilities/opportunities	112	19	4.825	9
Improves quality of fire protection	112	13.75	4.7575	23
Improves quality of police protection	112	15.25	4.6225	21
Improves understanding and image of different communities or cultures	112	15.5	4.7775	20
Promote cultural exchange	112	15.75	5.7325	17
Facilitates meeting visitors	112	13.5	5.6025	24

Preserve cultural identity of host population	112	15.75	5.5325	17
Increases demand for historical and cultural exhibits	112	14.75	4.71	22
Increased prostitution	112	8	2.5475	30
Increased Alcoholism	112	8	2.955	30
Heightened tension	112	7.5	2.545	32
Increased smuggling	112	7.25	2.2725	33
Increasingly hectic community and personal life	112	12.5	4.175	27
Creation of a phony (fake) folk culture	112	13.25	5.3425	25
Positive attitude of local residents towards tourists	112	22.25	5.2775	3
Community spirit among local residents	112	16.75	3.7175	25
Pride of local residents	112	23.25	3.9375	1

(Source: Field Survey, 2022)

3.3 Residents' Perceptions of the Effects of Ecotourism Vary Depending on their Demographic

Using an Analysis of Variance (ANOVA) approach, the study examined 35 impact items in order to assess potential statistical differences between resident's perceptions of ecotourism and demographic traits.Table 4 examines demographic variables, such asGender: Male, Female;Age range: 11-20, 21-30, 31-40, 41-50, and older than 50;Marital Status: Married, Unmarried; Education: No Education, Primary, Secondary, Higher Secondary, Undergraduate, Above;Occupation: Business, Service, Farmer, Housewife, Student, Day laborer, Tourism, Other;Income (BDT/Annum): <BDT 60,000, BDT 60,000-1,20,000, >BDT 1,20,000;Service/ Job Type: Tourism, Non-Tourism; Travel Abroad: Yes, No.

The findings of the one-way ANOVA observe which covered 245 F-values across 3 impact dimensions (economic, environmental, and socio-cultural), revealed that 39 of these F-values (15.92%) had been statistically significant (Table 4). Economic effect elements, totaling 77 F-values, had an importance price of 6, about 8%inside the specific dimensions. Socio-cultural elements, alternatively, indicated an appreciably more percent of importance at 18. About 21%(27 counts) had been statistically significant with 126 F-values. There turned into a 14% significance rate (6 counts) for environmental effect gadgets, which

accounted for 42 F-values. Based on those outcomes, impact objects concerning socio-cultural factors seem to have a substantially higher frequency of massive variations than effect items referring to economic and environmental elements.

Table 4 Variations in residents' perceptions of the effects of ecotourism according to their demographics

		Analysis of variance [level of significance* (p<0.05)]						
Factors/Impacts	Mean Rank	Gender	Age	Marital Status	Education	Occupation	Income	Service
Economic								
Contribution to income & standard of living	7	0.319	0.393	0.822	0.090	0.552	0.206	0.146
Local economy improvement	6	0.441	0.464	0.747	0.127	0.478	0.057	0.304
Employment opportunity (Increases)	8	0.264	0.584	0.173	0.010*	0.173	0.342	0.140
Investment, development & infrastructure spending in the economy (improves)	4	0.889	0.523	0.984	0.045*	0.800	0.646	0.802
Tax Revenue (Increases)	27	0.961	0.151	0.418	0.007*	0.432	0.157	0.432
Public Utility infrastructure (Improves)	12	0.218	0.964	0.449	0.003*	0.028	0.005*	0.066
Transport Infrastructure (Improves)	12	0.271	0.567	0.649	0.113	0.113	0.520	0.055
Shopping Opportunities (Increases)	14	0.147	0.375	0.745	0.877	0.743	0.149	0.390

Price and Shortage of goods & services (Increased)	15	0.091	0.182	0.586	0.369	0.063	0.331	0.194
Price of land & housing (Increased)	17	0.652	0.341	0.437	0.017*	0.726	0.702	0.181
Cost of living/property taxes (Increased)	26	0.602	0.532	0.532	0.100	0.155	0.253	0.207
Socio-Cultural								
Improves the quality of life	5	0.806	0.531	0.914	0.103	0.303	0.874	0.565
Increases availability of recreational facilities/opportunities	9	0.740	0.661	0.151	0.826	0.268	0.357	0.985
Improves quality of fire protection	23	0.042*	0.564	0.646	0.003*	0.072	0.105	0.175
Improves quality of police protection	21	0.009*	0.201	0.096	0.002*	0.004*	0.017*	0.121
Improves understanding and image of different communities/cultures	20	0.910	0.299	0.685	0.040*	0.011*	0.021*	0.129
Promote cultural exchange	17	0.353	0.406	0.655	0.009*	0.037*	0.835	0.952
Facilitates meeting visitors	24	0.434	0.026*	0.101	1.824	0.067	0.145	0.359
Preserve cultural identity of host population	17	0.073	0.687	0.145	0.071	0.002*	0.040*	0.911

Increases demand for historical and cultural exhibits	22	0.130	0.202	0.951	0.039*	0.011*	0.007*	0.194
Increased prostitution	30	0.124	0.724	0.512	0.164	0.066	0.928	0.568
Increased Alcoholism	30	0.983	0.052	0.987	0.200	0.496	0.188	0.086
Heightened tension	32	0.565	0.463	0.233	0.851	0.750	0.315	0.384
Increased smuggling	33	0.082	0.152	0.521	0.627	0.105	0.804	0.700
Increasingly hectic community and personal life	27	0.024*	0.175	0.616	0.035*	0.001*	0.001*	0.167
Creation of a phony (fake) folk culture	25	0.492	0.507	0.073	0.005*	0.005*	0.079	0.136
Positive attitude of local residents towards tourists	3	0.366	0.322	0.659	0.137	0.325	0.496	0.658
Community spirit among local residents	25	0.326	0.996	0.898	0.001*	0.817	0.217	0.516
Pride of local residents	1	0.529	0.035*	0.057	0.002*	0.125	0.079	0.015*
Environmental								
Preservation of the natural environment/ does not cause ecological decline	2	0.424	0.555	0.927	0.286	0.715	0.536	0.576
Preservation of historic buildings and monuments	10	0.687	0.015*	0.040*	2.227	0.002*	0.719	4.923
Improvement of the area's appearance	10	0.132	0.337	0.405	0.023*	0.067	0.139	0.015*

Increased traffic congestion	29	0.778	0.346	0.045*	0.088	0.705	0.239	0.064
Overcrowding	34	0.055	0.519	0.397	0.099	0.474	0.962	0.614
Increased noise pollution and waste	35	0.819	0.368	0.305	0.859	0.829	0.769	0.266

4. CONCLUSIONS

By adopting a reliable and fairly sound visitor impact scale, the study aims to determine how the inhabitants in SNP perceive the effects of ecotourism. For the most part, the features that the existing systems are able to handle are described by the scale taken together. The analysis evaluated the three main impact sets that economic, environmental, and socio-cultural as well as locals' perceptions of the impact of tourism on these factors.The study also determined whether there were any notable disparities between demographic factors and locals' perceptions of the effects of ecotourism. It can be concluded that local people in and around SNP acknowledge the importance of ecotourism to contribute in socio-cultural, economic and environmental aspects, though it has some negative impacts mainly on environmental aspect.This study recommends paying immediate attention to the policy makers and forest management officials to undertake the necessary actions to solve the negative impacts of ecotourism mainly the environmental aspects. Further studies on carrying capacity and ecotourism trends are needed.

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