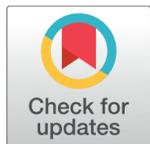


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An investigation on ecotourism potential and possibility of community integration in its development in Orchha, Central India

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Abstract

Objective: The present investigation was undertaken with an aim to study the floral and faunal diversity of the Orchha Wildlife Sanctuary (OWS) and to study whether ecotourism can be utilized for community development in the study area. **Methods:** Floristic and faunal diversity was studied through surveys followed by sample collection and their identification and visual sighting. Community was studied for understanding their socio-economics, livelihoods and attitude and perception of ecotourism. Similarly, data were collected from the tourists (domestic and foreign) about tourists' profile, demands, their attitude and perception about ecotourism activities and their level of satisfaction. Two hundred twenty rural households, hundred domestic visitors and fifty foreign tourists were surveyed in Orchha and OWS using convenience sampling technique. Primary data (both qualitative and quantitative) were collected mainly by using semi structured questionnaires and group discussions. Quantitative data was analyzed using descriptive and frequency statistics while qualitative data was analyzed using content analysis and framework analysis models. **Findings:** Forty two genera of angiosperms comprising 23 families were observed in the sanctuary. A total of 15 fish, 6 amphibians, 13 reptile, 98 bird, and 19 mammal species are reported. It was found that the birds were the most dominant vertebrates. Four species of turtle and rare species of vulture including king vulture were present in the OWS. OWS has got lot of potential for community based ecotourism development. Integration of community requires skill development and capacity building by training the youths of the village with tourism business skills. These youths can form village level institution to run the ecotourism business for capacity building of rural community, infrastructure development and benefit sharing. This institution would also participate in the conservation of natural resources and biodiversity. **Novelty:** This is a first such extensive study of the floral and faunal diversity of OWS. Further, this is the first attempt to study the possible integration of ecotourism activities with community development activities of the area.

Keywords: Orchha Sanctuary; ecotourism; community; Central India

1 Introduction

Today tourism is the largest service industry in India, with a contribution of 9.2% to the national GDP and 8.1% of the total employment (1). India witnesses more than 10.56 million (2019) annual foreign tourist arrivals and 1854.93 million domestic tourism visits in the year 2018 (2). India is presently ranked 34th in world travel and tourism competitiveness index, supported by rich natural and cultural resources and strong price competitiveness (3). The state of Madhya Pradesh, topographically, is a land locked state with rich and varied forest cover and most promising ecotourism center. Ten national parks and twenty five wildlife Sanctuaries provide huge space for ecotourism. The state has formulated its first eco-tourism policy about twenty years back to promote tourism in a sustainable manner. OWS is situated in Bundelkhand region of Madhya Pradesh. OWS is a unique land formation, formed as an island created by conjunction and confluence of the two rivers Betwa and Jamni and may be considered as only wetland sanctuary of North India. This sanctuary is known for some species of turtles and vultures. Natural beauty of the nature reserve with Jamun and Arjun tree species dominating the bank of the rivers, clear cut zone of Teak and Kardhai, waterfalls created on the rivers and the back waters are all unique to this ecosystem. There are about 100 bird species which could be found at the Orchha sanctuary, which includes many migratory birds from all over the World. Beside bird watching, OWS offers many other adventure sport options including river rafting, canoeing, boating, trekking, camping and jungle trekking and hiking opportunities. The sanctuary is located about 1 km from the heritage and religious town Orchha, where large number of domestic and international tourists visit every year. The rich biodiversity and historical and cultural value of Orchha makes it one of the most suitable spots for ecotourism. Orchha is a block in the Tikamgarh district of Madhya Pradesh. According to census of India, 2011 records, total area of Orchha is 198 km² including 168.08 km² rural area and 29.67 km² urban area. Orchha has a population of 47,358. This include rural population of 35847 (male 19,115, female 16,732) and urban population of 11511 (male 6076, and female 5435). There are 34 villages in Orchha block and about 9,625 houses in the sub-district. There are 28 villages located inside and within the five km periphery of the sanctuary. People residing in the nearby villages are mainly engaged in agriculture and cattle rearing with marginal land holdings. They are unemployed, poverty stricken and largely dependent on natural resources for their subsistence. This is causing natural resource depletion in the area and posing a threat to conservation and protection of natural resources. Since the area is an existing tourism destination and large number of tourists visit every year. The area has got good potential for community based ecotourism development. However, a careful and objective planning based on structured information about the natural resources and tourism market potential and local resources is required to develop a successful ecotourism strategy. This will make ecotourism economically viable with larger benefits to local community, socially and culturally responsible, ecologically feasible and producing a high level of satisfaction to the visitors. The present study carried during 2015-18, analyses the flora and fauna of the sanctuary, local community and tourism in the area.

2 Materials and Methods

2.1 Study of floral and faunal diversity

The study area includes Orchha town and OWS. Orchha is an important heritage town in Madhya Pradesh, India. The total area of OWS is 45.86 square kilometer. Geographical position of OWS is latitude 25° 13' 45"N to 25° 22' 30" N and longitude 78° 33' 45" E to 78° 40' 15" E. The altitude of the sanctuary varies from 207 to 357 meters above Mean Sea Level.

2.1.1 Floral Diversity

The floristic exploration of the sanctuary was carried out and floristic composition was noted by making visual observation. Specimen samples were collected at different reproductive stages viz. flowering, fruiting, to prepare herbarium (4; 5; 6) and substantiate their correct identity. The plants were identified with the help of Flora of Madhya Pradesh (7; 8; 9), Flora of British India (10), other literature, field keys and monographs (11; 12; 13; 14).

2.1.2 Faunal Diversity

The faunistic surveys were carried out at various locations in the sanctuary. Specific methods were adopted for the study of different group of vertebrates. Fish fauna of the sanctuary was studied by periodically trapping the fishes using locally available fishing gears from different locations. Fishes were collected during pre-monsoon, monsoon, and post-monsoon seasons. These specimens were identified and then transferred back to the water body. The Amphibians were recorded by visual encounter surveys, audio surveys and opportunistic records. Visual encounter survey was used for recording reptiles. Observations were taken from entire Sanctuary, sighting records of birds were noted down. The mammals were surveyed by using a combination of direct and indirect methods. The direct method included sighting of animals as the main data whereas indirect methods based on quantification of indirect evidences such as pellet groups, scats, pug marks and hoof marks.

2.2 Study of rural households and tourists of Orchha

2.2.1 Data collection

Primary data were collected mainly by using semi structured questionnaires. These questionnaires were administered to different groups of people living in and around and visiting to Orchha and OWS. Amongst which were rural household representatives, domestic tourists, foreign tourists, tourism facilitators, allied departments and tourism experts. Both open and close ended questions were asked with the space for any additional comments at the end of the interview. Questions were structured to answer issues concerning nature conservation, ecotourism

and the benefits locals get from these activities and the consequences for their livelihood. These questionnaires were written in English but administered in Hindi except to the foreign tourists. A total of 400 questionnaires were administered. Informal discussions with the village heads, forest department personnel, souvenir shop owners, and hotel and restaurants owners were also a valuable source of information.

2.2.2 Sample size and sampling technique

Snowball and purposive techniques (15; 16) were used to identify 220 participants from 10 selected villages out of 26 villages for group meetings and interviews (Table 1). The selection of these villages was based on three major criteria: locations, characteristics, and socio-demographic and economic backgrounds of the places. Convenience sampling technique was employed for selecting 100 domestic and 50 international tourists at Orchha ecotourism sites (OES) for questionnaire survey with semi-structured interviews. These interviews were undertaken in order to collect information about tourist demands, their attitude and perception about ecotourism activities and their level of satisfaction. To assess the potential of demand and supply for ecotourism in OES area, it was also necessary that demands and opinions of the private business sector were considered. Therefore 15 tour operators, travel agencies and tourism facilitators were interviewed. Tourism expert, people from forest and allied department were interviewed using semi structured questionnaire survey. Sustainable Livelihood Framework (SLF) was adopted to analyse the livelihoods of rural household.

Table 1. Village wise number of families, total population, male and female population of ten villages

Village	No of family	Population	No of Male	No of Female
Singpura	175	485	255	230
Lotna	94	515	266	249
Orchha	2409	11511	6076	5435
Ganj	80	439	229	210
Chandrawan	54	203	99	104
Ladpura	179	918	494	424
Mohanpura	242	1102	571	531
Madri	98	496	270	226
Radhapur	197	832	432	400
Ramnagar	165	849	439	410

2.2.3 Data analysis

In this study, two core methods were used for qualitative data analysis. First is the “content analysis” method and the second qualitative analysis approach used in this study is the “Framework Analysis” method (17; 18; 19). Concerning quantitative analysis, descriptive and frequency statistics were carried out to analyze the quantitative data collected from the questionnaires survey with rural households, domestic and international tourists as well as from the formal interviews with tour operators and travel agencies.

3 Results and Discussion

3.1 Flora of Orchha Sanctuary

The forests in Orchha sanctuary are Southern Tropical Dry Deciduous and Kardhai Forests. The forests are dominantly covered by *Tectona grandis* and *Anogeissus pendula*. Other species, *Adina cordifolia*, *Lagerstoemia parviflora*, *Terminalia arjuna*, *Terminalia tomentosa*, *Acacia catechu*, *Buchanania lanzan* and *Madhuca indica* are scattered all over the area. River banks and beds are occupied by *Syzygium cumini* and *Terminalia arjuna*. Forty two genera of Angiosperms comprising twenty three families were present in the sanctuary. The prominently represented family in terms of highest number of genera was Leguminosae comprising eleven genera. North part of the sanctuary was dominated by *Anogeissus pendula* whereas south part was mostly occupied by *T. grandis*. Rest of the forty species scattered across the sanctuary. Thirteen species of herbs and shrubs belonging to twelve families were observed in the sanctuary. Nine species of climbers and creepers were found in the sanctuary. Eight species of grasses recorded in the sanctuary including *Vetiveria zizanioides*, *Cymbopogon martini*. Thirteen species of aquatic flora mainly consisted of *Typha* species, Stoneworts, Hydrilla and Diatoms.

The vegetation in the sanctuary is mainly consisting of tropical dry deciduous species. Other studies reveal that southern tropical dry deciduous forest are represented by the dominant status of *T. grandis* along with co-dominant species such as *Buchanania lanzan*, *Shorea robusta*, *Diospyros melanoxylon*, *Butea monosperma*, *Hardwickia binnata*, *Boswellia serrate* (20). All of the above mentioned tree species were present in the Orchha sanctuary. According to a study of medicinal angiosperms (21) of OWS region, the percentage of tree species in OWS was highest (44%), followed by herbs (30%), shrubs (12%) under shrubs (6%), climbers (5%), and grasses (3%). The findings are similar with the findings of the present study. Some other floral studies carried out to submit MP state biodiversity board in the neighboring regions viz. plant diversity of Chambal Region (22) finds that tropical dry deciduous forests of Chambal region encompasses mainly trees such as *Anogeissus latifolia*, *Anogeissus pendula*, *Boswellia serrata*, *Acacia* spp., *Zizyphus* spp., *Lannea coromandelica*, *Tectona grandis* etc. ; a study of

flora of Bargi hills, Jabalpur (23) shows that the forests mainly consist of miscellaneous species, *Lagerstoemia parviflora*, *Butea monosperma*, *Diospyros melanoxylon*, *Chloroxylon sweitenia*, *Cassia fistula*, *Buchnanania lanzan*, *Terminalia alata*, *Gardenia laurifolia*, *Woodfordia fruticosa*, *Syzygium cumini* etc. The shrub layer consist of *Helicteres isora*, *Grewia hirsuta*, *Flacourtia indica*, *Wrightia tinctoria*, *Ziziphus nummularia*, *Vitex negundo*, *Lantana camara*, *Holarrhena antidysenterica*, *Indigofera cassioides*, *Flemingia strobilifera*, etc. Most of these miscellaneous tree species were also found scattered across the OWS. OWS situated in the M. P., which is on the genetic highway connecting Western Ghats and the North East, two of the biodiversity hotspots in the country, is one of the richest repositories of biological diversity. The State houses a diversity of ecosystems including plateaus, ravines, ridges, valleys, riparian areas and flat plains (24; 25).

3.2 Fauna of Orchha Sanctuary

The study reveals that total number of Vertebrate species was one hundred and fifty one in OWS. Fifteen species of fishes representing twelve genera over six families were observed in the OWS. Family Cyprinidae was represented by seven species, followed by family Bagridae, having four species. Remaining four families were represented by only one species each. Six species of amphibians were found in the OWS, representing six genera and three families. Family Ranidae represented by highest number of amphibian species was observed in the OWS. Thirteen species of reptiles belonging to nine families were recorded in the OWS. Highest number of species belongs to family Colubridae. Ninety-eight species of birds belonging to eighty-two genus and forty-three families were recorded in the OWS. Family Accipitridae has highest number of species (8) followed by family Ardeidae (7). Nineteen species of mammals belong to nineteen genera and fifteen families were recorded in the OWS. The common mammals in the sanctuary are *Axis axis*, *Sus scrofa*, *Vulpes bengalensis*, *Macaca mulata*, *Muntiacus muntijak*, *Boselaphus tragocamelus*, *Canis aureus*. OWS is particularly known for four species of turtle *Nilssonia gangetica*, *Lissemys punctate*, *Pangshura tentoria*, *Batagur kachuga* and four species of vulture *Sarcogyps calvus*, *Neophron percnopterus*, *Gyps bengalensis*, and *Gyps indicus*. The vulture species are rare and largely restricted to this sanctuary. The most commonly seen birds were the House Sparrow, Common Crow, Common Myna and Red-vented bulbul, peafowls, peacocks, swans, black swan, Jungle Bush Quail, minivet, stork, kingfisher, owls, woodpecker, geese, collared scops owls, orioles, babblers, wagtails, pipits and flycatchers.

According to a Zoological Survey of India (ZSI) study on faunal resources of national parks of M. P., Madhav National Park (Area 375 sq. KM), which is close to OWS (distance approx. 116 KM), inhabited by 347 species of Vertebrate (26), whereas OWS with an area of 45 sq. KM provides abode to 151 species. Another study by ZSI reveals that Madhya Pradesh freshwater fish fauna includes 172 species belonging to 68 genera, 27 families and 10 orders. In this context, OWS accommodates about 9 percent of fish fauna of the state in terms of species number. A study of Jabalpur district, nearby to the OWS findings suggest similar diversity of amphibians (9 species), birds (194 species), mammals (50 species) (27). The Amphibians largely represented by species of Anura including Indian Bullfrog, Common Toad and Common Tree Frog. The common toad *Bufo melanostictus* is very common. OWS is specially known for four species of turtle and four species of vulture. The Vulture species are rare and largely restricted to the sanctuary. The common mammals in the sanctuary are Chital, Nilgai, Wild boar, Fox and Monkey. Similar species diversity of mammals observed in nearby Panna National Park (28).

3.3 Tourists in Orchha

During 2017, foreign tourist arrivals in Madhya Pradesh were around 0.36 million while domestic tourist visits stood at 78.04 million (29). Orchha is one of the most preferred tourists' destinations of M. P. and around 97,000 foreign tourists visited Orchha in 2017. Over 1,200 tourists visited OWS in the same year. The tourists' survey suggests that among the domestic tourists, the percentage of male tourists (89%) was higher than female tourists (11%). The foreign tourists comprised similar number of male (52%) and female (48%) tourists. Average age of foreign tourists was 36 years where as average age of domestic tourists was 39 years. About 89% of domestic tourists were married. The percentage of married and unmarried among foreign tourists were almost equal. For the foreigners, 48% had pursued under graduate study and 42% had graduate and above level. Comparatively, the level of education of domestic tourists is different from that of foreign ones. This figure revealed that the majority of domestic tourists (29%) interviewed received bachelor education, whereas the second and third highest populations had completed high school (28%) and higher secondary school (22%) in that order. About 12%, domestic tourists only attended primary school. For the access to information about Orchha, the most frequent source of information in which international tourists get was from internet. Tourists' guide books, travel agency, friends and relatives (word-of-mouth recommendation) were the other common sources for them.

A vast majority of international tourists opted for cultural, historical and wildlife habitat areas followed by ecotourism sites, nature based sites, adventure and recreational places. However domestic tourists show more interest in ecotourism and religious tourism in Orchha (Table 2).

Table 2. Tourists' sites preference

Type of sites interested in visiting	Domestic %	Foreigners %
Cultural place	5	26
Historical place	23	18
Nature-based place	7	6
Ecotourism site	27	16
Recreational place	0	2

Continued on next page

Table 2 continued

Religious place	25	2
Adventure place	0	6
Wildlife habitat	13	22
Business place	0	2
Others	0	0
Total	100	100

It was found that most domestic tourists planned to spend between US\$ 20 and US\$ 200. About 20% foreign tourists spent US\$ 40 to US\$ 100 during the visit (Table 3). This was because they intended to save as much as they could to visit more places in the country. A majority of foreigners (50%) decided to spend only from US\$ 100 to US\$ 500 during their last trips. About 16% of the interviewed foreign visitors spent in between US\$ 500 to US\$ 1000. Domestic tourists reported that they visited a number of sites where ecotourism or nature based tourism had been developed. The sites included Panch Madia, Shikargah, Kuan-Bawdi, Bhorbag, Tungaranya, View point,

Table 3. Tourists’ spending pattern during their visit to OES

Expense in USD	Domestic %	Foreigner %
Upto 20	18	0
20-40	35	0
40-100	38	20
100-500	9	50
500 – 1000	0	16
1000 – 2000	0	10
3000 – 5000	0	4
Total	100	100

Picnic Chaupati, Nature trail, Jantur tower, turtle nesting sites, vulture conservation sites, in OWS and river side, stone bridge on Betwa and Jamuni river and boating and river rafting sites. Most of the tourists like these sites and activities and visit them again. Most of the foreign tourists were not aware about these nature based sites and activities in Orchha. Both domestic and foreign tourists were not completely satisfied from tourist’ services in the study area and expected improvement in the future. About 38% of the domestic tourists interviewed indicated enjoyment with scenic beauty, biodiversity and natural resources to be the important pulling factor of visit. Most important factor cited (53% domestic and 48% foreigners) was nature based recreational activities and nature of the sites. About 6% domestic and 16% foreign tourists reported the enjoyment through environmental education and interpretation (Table 4).

Table 4. Tourists’ satisfaction level with the products and services at destination

Factors of Satisfaction	Domestic Tourists			Foreigner Tourists			
	Satisfied	Satisfied but not completely	Dissatisfied	Satisfied	Satisfied but not completely	Dissatisfied	
Accommodation	18	48	34	13	26	11	
Transportation	12	57	31	8	30	12	
Food and beverage	5	46	49	4	26	20	
Guide service	21	43	36	13	25	12	
Leisure/Recreation activities	38	33	29	23	17	10	
Shopping	43	43	14	18	23	9	
Hospitality	21	69	10	13	36	1	
Security	20	51	29	13	26	11	
Price of the ticket to the site	46	50	4	28	20	2	
Facilities and site management	6	50	44	4	27	19	
Interaction with local people	55	40	5	8	31	11	
Information & interpretation about local culture, history, and resources	8	47	45	5	27	18	
Overall experience at the site	24	46	30	15	24	11	

About one lakh international tourists visited in Orchha in 2017. About 1-3% of total tourists who visit Orchha also visit OWS. The numbers of tourists who visit OWS are relatively low in comparison to the total number of tourists visited Orchha in 3.6 last years. However it is increasing every year. The percentage of male gender is higher in domestic tourists (Table 5).

Table 5. Gender distribution among tourists

Gender	Domestic	Foreigner
Male %	89	52
Female %	11	48
Total	100	50

In case of foreigner tourists, the genders are almost equally distributed among tourists. Highest number of tourists who visited the sanctuary and town were young and in middle age group. This may be a positive point for ecotourism development as younger and middle aged people show greater interest in ecotourism (30). Level of education was high among foreign tourists as the foreign tourists mainly visited from European and North American countries. Contrary to foreign tourists, a large number of domestic tourists were school dropouts or completed schooling only. This may be attributed to the fact that literacy rate in India has been increasing in last few decades, however enrollment for higher education is still low (31). Domestic tourists visit from all most all northern states of India. For foreign tourists who were mainly from USA, UK and other European countries, Orchha was part of their larger tour programme of visiting Agra and Khajuraho. Most of the foreign tourists who visit Agra and Khajuraho, the world heritage sites also visit Orchha because of the proximity of Orchha to these Sites and its location lying in the middle of Agra-Khajuraho tourist circuit. Orchha is among top destinations in Madhya Pradesh for foreign tourists after Khajuraho (32) and famous for heritage, pilgrimage and nature. Foreign tourists prefer to visit forts and monuments in Orchha. Foreign visitors, who liked to spend less during their visit to Orchha, were mainly younger people who were still with universities, completing their undergraduate and graduate studies and had not yet started formal jobs. They came to visit India with their savings and wanted to visit as many places as possible.

3.4 Community attitude towards ecotourism development

To develop ecotourism successfully and engage community in the areas, it is necessary to understand different attitudes of community members towards its development as their motivations and reactions can affect the ecotourism process. Local households' interviews show that a majority of villagers (87%) welcomes tourists to visit the areas. When asked to choose specific types of tourists they prefer, their main interest was given to nature based tourists followed by ecotourists and adventure tourists. Between domestic and international tourists, each type was appreciated almost equally (59:61) by these respondents. More than half of the respondents (60%) said that they would choose ecotourism as one of the livelihood alternatives if they are allowed to prioritize development plans and strategies for their localities.

3.5 Community engagement in ecotourism management

Lately, the crucial role which the rural and local communities play in conserving the biodiversity has been recognized by many conservationists. Hence, involvement of these communities as stakeholders in planning and implementation of ecotourism activities becomes indispensable. In India many ecotourism sites are being managed with the participation of local communities. Among these, Thenmala located in Southern Kerala, is the first planned ecotourism site in India. The area has developed 10 specialized ecotourism spots which includes activities like boat rides, leisurely walks, adventure sports like mountain biking and rock climbing, visuals of Thenmala Dam, winding pathways, boardwalk, sculpture garden and the deep woods of Thenmala. Government of Kerala had formed a "Thenmala Ecotourism Society" to promote ecotourism activities in Kerala involving the tribes and local people as guides, helpers, local services providers and small scale entrepreneurs.

Based on the findings on tourists and community study at Orchha and also considering the example of ecotourism in Thenmala, community based ecotourism management can be developed at Orchha. An Ecotourism Committee (EC) for management and operationalization of ecotourism activities may be formed. A certain number of youths of village would be identified and trained in different trades of ecotourism services such as tourist guides, nature interpretation, hospitality and catering, camp management, and adventure activities. EC will have an elected president and a secretary to look after the management (operations, account & store management) of EC. The EC would work to meet following objectives: provide ecotourism services (guiding, food, accommodation facilities etc.) to the tourists and earn revenues; protect the sanctuary from illicit felling, wildlife poaching, forest fire or any incident, which might have detrimental impact on forest & wildlife. The EC would engage in providing ecotourism activities to the tourists. Some of the activities may be as: a. Nature Based Activities (Trekking, Nature Walks, Bird Watching, camping, bonfire, and Star Gazing): tourists are accompanied by guides on designated trekking routes and are also briefed about the do's & don'ts of Jungle. b. Cultural Activities (Folk Songs, Bullock Cart Ride, Village Tour) tourists are taken on village tour in Bullock Carts, in evening they can participate in music and dance on the beats of local folk songs sung by the committee members. c. Adventure Sports (river rafting, boating, river bathing, wildlife watching, climbing, cycling etc.). d. Food (ethnic food cuisines): community can arrange basic food menu for the tourists combined with their local cuisines as well as special items like organics e. Community managed prefabricated cottages and tents can be set up in the forest which will accommodate a number of tourists. Community may also provide home stays for the tourists, special facilities for old age like wheel chairs, emergency medical services and stay back care at base station to facilitate the family based tourists to participate. f. Community can engage in handicrafts and souvenir manufacturing and sale. Profit may be shared among participants who are producing and selling the products. EC may manage their account as per the set protocols of accounting principles generally followed by SHG's. They may manage cashbook, vouchers, bill book, attendance register etc. for their record. The money, received from tourists may first deposit in the account of EC. EC depending on the requirement and tourist bookings takes out the money for the recurring expenses. The EC calculates the number of man-days each individual member has contributed and after deducting all the

recurring expenses distributes the profit amongst the members of the EC. The EC also keeps a part (about 10%) of their profit as reserved fund, for working capital requirement and for off season repair and maintenance expenses.

Information about many ecotourism activities and historical sites inside the sanctuary was not widely spread amongst the foreign tourists, therefore a small percent of foreign tourists, who come to Orchha, visit the sanctuary. Marketing and publicity of ecotourism activities may help to increase number of visitors to the sanctuary. Very few tourists expressed their satisfaction level as completely satisfied with products and services at destination. This suggests bringing improvement to the products and services offered to the tourists and create more facilities which would help to improve satisfaction level among the tourists. Most of the tourists were not familiar with nature based or ecotourism services besides having fun with their family and friends from a number of recreational activities. In addition, domestic tourists' direct contribution to the conservation of the areas would not be apparent, although usually they contribute more direct benefits to local livelihood activities. In this sense, it can be translated that domestic tourists are potential of providing indirect assistance to conservation through their interest in local livelihood improvement and decreased dependency of local people on natural resources consumption. The product development of the local tourism industry in Orchha is limited or is not well publicized to tourists. Additionally, some of these tourism activities could be provided by local communities with special arrangement.

Findings suggest that even though a huge amount of domestic and international tourists are not aware of all the tourism activities provided in Orchha, they are fond of these services and are willing to participate whenever these services are catered. This does not only include their preference to the existing services but shows that tourist interest in new environment friendly tourism services. This would help local communities and ecotourism developers to include other attractions and events or to branch out more appropriate services at Orchha sites. Realistically, tourism service and product diversification will not only help create more job opportunities for the local poor living in or close to the areas, but will also help increase tourist satisfaction and repeat visitation. A large number of tourists were willing to pay money during their visits if the tourism revenue can help directly and indirectly to strengthen and revitalize local culture, stimulate local economy, and improve people's living standard and quality of life. In addition, they want to spend money to help secure local livelihoods, preserve natural and built landscape, empower local communities to have more control over used and unspoiled resources and development for the betterment of their areas, and help promote local sense of pride. Yet, the level of tourist willingness to pay is not only subjective to tourist interest, but also to the income and education levels of tourists. A number of foreign tourists exceed the number of domestic visitors in terms of planning to stay longer in Orchha. Therefore, an idea to extend tourist length of stay in the areas is viable. Yet, this depends on the quality and diversity of ecotourism services provided at the sites or it would rely on the package tours organized by tour operators.

3.6 Challenges to ecotourism development

Major challenges for ecotourism development include:

1. Lack of infrastructure and superstructure to support ecotourism process, although the area has plenty of diverse attractions
2. Maintenance of available infrastructure: Regular maintenance of the infrastructure like repair of roads, sitouts, availability of safe drinking water, power back up and sanitation
3. Lack of funds
4. Lack of adequate publicity and marketing of ecotourism
5. Exceeding carrying capacity
6. Exploitation of tourists
7. Threat to ecology

3.7 Suggestions to meet these challenges

The area has inadequate social, public and infrastructural services (i.e. health centers, safe drinking water, communication services, etc.) to support immediate demands of eco-tourists. Some autonomous body like society may be created where all ecotourism beneficiaries will contribute some amount for maintenance of tourism infrastructure. Government body may also provide some revenue generated either from ecotourism like entry ticket or otherwise to the autonomous body. Existing network may be used for information dissemination about the sanctuary. Beautiful flex, billboards and signage may be erected at New Delhi, Hazrat Nizamuddin, Bhopal and Jhansi railway station and inside important trains which are connecting other tourist destination in the region viz. Shatabdi express Taj express Gatiman express etc. Flex billboards and signage may be erected at Delhi, Bhopal and Khajuraho airport. These may highlight the salient features of the Orchha and the sanctuary. Besides, hoardings and advertisements may be erected at specific locations of the above mentioned cities. To deal with excess tourists during on season, number of tourists can be regulated by entry tickets and dispersing tourists by developing more spots. To prevent exploitation of tourists, displaying rates of all commodities and services at tourists' spots can be made mandatory followed by regular monitoring and policing by police and local body representative. For ecology conservation strict adherence to laws and rules laid out under environmental rules and regulations should be enforced. Proper planning for safeguarding local culture and tradition of the area in consultation with the community should be undertaken. Educating the tourists about community's culture and traditions can done by involving all stakeholders, concerned institutions viz. Panchayat, NGOs, tourism and forest department. Promotion of local talent by encouraging the local cultural activities and linking local festivals and rituals with tourism activities. Promotion of local peoples' knowledge related with the ecology and environment. This may be done by village institutions, tourism department. Village level committee and ecotourism committee may derive a mechanism for conflict resolutions among stake holders, safety and security of the tourists.

4 Conclusion

Ecotourism can help to raise additional finance necessary for the protection of national parks and Sanctuaries, revenues that might not be available from other sources. Additionally, ecotourism can provide a viable economic development alternative for local communities with very less other income generating options. Ecotourism has helped rural communities in many other countries. Ecotourism activities have generated income for rural inhabitants and encourage conservation of wildlife and natural resources. This motivates rural people to diversify their livelihoods and generate economic incentives to conserve natural resources. Conservationists began to develop new approaches to meet economic wellbeing and conservation needs. These new approaches were based on making livelihood activities dependent on biodiversity protection and hence directly linked to biodiversity. As ecotourism is a market-driven activity, tourists' views, needs or expectations, behaviors and satisfaction can directly influence the shift of destination that might be intended or not. Development and management of ecotourism services in Orchha cannot go on board on the basis of potential attractions of the site alone. Understanding about the expectations of tourists is important. If ecotourism planners and operators have less information or knowledge about tourist demands, they would not be able to attract tourists, to set up effective marketing and promotion strategies, and to increase tourist satisfaction. This is because the nature of ecotourism is different from other types of tourism or mass tourism. The Orchha and OWS have got a lot of potential for community based ecotourism development. Community can be integrated with the ecotourism business. To integrate the community, initially skill development and capacity building is required. This can be done by training the youths of the village, providing them with necessary language and tourism business skills and integrating with the business. Village level institution to run the ecotourism business can be created which would be formed by the village youths and run the ecotourism business with proper structure and mechanism for capacity building of rural community, infrastructure development, benefit sharing and conflict resolution. This institution would also participate in the conservation of natural resources and biodiversity. This kind of arrangement would provide sustainable livelihoods opportunities to the people on one hand and ensure resource conservation on the other hand and thus a win-win situation for all.

4.1 Future Study

The future in ecotourism certainly lies in a symbiosis between the local residents, tourists and the forest department. Education of the local residents and tourists is crucial for a better understanding of the concept of ecotourism. Locals should be educated to prevent poaching activities and conservation of forest reserves. Studies pertaining to safety of tourists in case of any mishaps like forest fires or wild life encounters should be undertaken and probable solution to these like forming emergency rescue groups, facilities for air lifting etc. can be undertaken. To deal with forest fires, local masses should be made aware about it and train them to prevent, detect and control forest fires. Detection of fire can be done through construction of watch towers, network of wireless sets, fire finders etc. Forest fire control can be done by devising, testing and demonstrating the principles and techniques of forest fire management to local residents.

A situation of Covid 19 like pandemic outbreak may further complicate the activities of ecotourism. Travel and tourism is the most affected sector during such pandemic. In such times of crisis, self-driven accommodations at boutique hotels and home-stays will be the focus till the year 2021 as social distancing and staying at smaller properties reduce the risk of the spread of virus. Covid 19 pandemic enforced lockdown throughout the world and was also observed in India. This lockdown resulted in large scale improvement of air quality index in India. Significant reduction in levels of air, noise and water pollution and conservation of biodiversity was observed due to reduced human and industrial activities. Such interventions may be used in future to combat severe air pollution episodes like those witnessed in Delhi-NCR during winter season.

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