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Ecotourism potentials in Barnawapara wildlife sanctuary of Chhattisgarh with special reference to livelihoods of tribes

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Abstract

The study on the Ecotourism Potentials in Barnawapara Wildlife Sanctuary of Chhattisgarh with Special Reference to Livelihoods of Tribes. Primary data were collected through questionnaire from tourist/visitors, Local residents, Forest officers/staff. Secondary data were collected through review of literature. Out of the 18 villages studied in Barnawapara Wildlife Sanctuary few suggestions are collected from the forest dependent communities like – Development of rangelands in forest area so that proper food material should be available to the herbivore animals, Solar water system should be installed to overcome the water scarcity during summer season, the local people should have given the job opportunity in management of tourist spots, so that their income can be improved. As Barnawapara wildlife sanctuary is rich with attractive beauty of flora and fauna and located at the eastern part of Chhattisgarh, these areas endowed with varieties of temples (Sirpur, Turturiya, Matagarh Shivrinarayana, Giroudhpuri and Chatapahaad), waterfalls (Siddhkhoh), hill resorts (Dev Hills Darshan) and Picnic spot etc., Chhattisgarh is a must visit state in India for all tourist enthusiasts. These paper focuses community's dependency on different forest product and ecotourism destination located in an around Barnawapara wildlife sanctuary of Chhattisgarh.

Keywords: Barnawapara, biodiversity, Chhattisgarh, conservation, ecotourism, fauna and flora, livelihoods

1. Introduction

The term 'ecotourism' was given by Hector Ceballos – Lascrainin 1983, and it was primarily used to describe nature travel to relatively undisturbed areas with an emphasis on educational important. Its early definition, while his modified term was officially adopted by IUCN (International Union for Conservation Nature and Natural Resources) in 1996. (Eco club International Ecotourism Monthly Oct. 06) Basically, ecotourism means- "tourism involving travel to areas of natural or ecological interest, typically under the guidance of a naturalist, for the purpose of observing wildlife and promotion of understanding and conservation of the environment." Through ecotourism travelers better understand the unique natural and cultural environments round the globe. The World Conservation Union (IUCN) describes ecotourism as, "responsible travel to nature which conserves the environment and improves the livelihood of local people. Moreover, it should contribute income and education to the contribution of ecosystems (Brown 1997) [2]. Eco-tourism can play a significant role to uplift the local population with regards to economic benefits and livelihood. There is a need to identify the good eco-tourism spots and develop the infrastructure to provide good hospitality and educate them regarding environmental conservation. In Chhattisgarh there is a lot of scope for the eco-tourism industries to earn more revenues and play a significant role for conservation of nature and natural resources. The present tourism is changing rapidly people wants to observe nature, heritage, and recreational destinations to enjoy, and conventional tourism is forced to meet a challenge to government and private parties to develop new venture to the tourism industries to cater better facilities. It is well known that Ecotourism is tourism where the natural beauty, local community and visitors will be benefitted. Tiwari *et al.*, 2014 [3] considered as a distinct form of tourism development by replacing the conventional tourism in sustainable and community-based efforts improving the living standards of local, host communities living on the fringes of forest areas. Sustainability is a very important aspect of all development initiatives. Ecotourism ultimately seeks to contribute to community both directly and indirectly. This is achieved not necessarily by changing the traditional practices of livelihood like Agriculture, fisheries, local looms etc., but more often by improving such activities. If we consider all the facets of travel as an eco-tourism, we can see that it is more than a journey for rest, relaxation, and recreation.

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The other benefits of community-based ecotourism particularly in rural areas providing income to communities, discourage migration to other place, and conserving biodiversity etc., are widely acclaimed. It is also observed that ecotourism check the exploitation of local residents and resources. In case of Kenya and its national parks which are regarded as the world's foremost ecotourism destinations, meet the livelihood aspirations of good number of its local people (Edgar Allan Amador 2004). Chhattisgarh has identified some regions having high potential for ecotourism with a lot of initiatives. Barnawapara Wildlife Sanctuary is one of the most beautiful and picturesque Sanctuary of Chhattisgarh. The Sanctuary located in northern part of Mahasamund, Chhattisgarh, and this Sanctuary is one of the beautiful and important sanctuaries in this region. It is established in 1976 the sanctuary is relatively a small one covering an area of only 245 sq km. the topography of the region comprises of flat and hilly terrain with altitudes ranging between 265-400 mts.

Ecotourism has become an emerging form of alternative tourism and it provides authentic experiences to nature lovers and enthusiasts. It is an accountable visit to study, enjoy and admire the natural beauty together with wild animals, plants, and native culture. The first objective of introducing and promoting ecotourism is to conserve the setting and therefore the social and economic well-being of native individuals. Conservation of multifariousness and cultural diversity is one of the necessary principles of ecotourism. It promotes the property use of natural resources and provides ample opportunities for financial gain and employment within the touristy destinations.

Laarman and Durst (1987) ^[5] outline it as a natural commercial enterprise within which the traveler is drawn to a destination as a result of his or her interest in one or additional options of that destination's natural history.

The International Ecotourism Society in 1991 produced one of the earliest definitions -"Ecotourism is responsible travel to natural areas that conserves the environment and sustains the well-being of local people".

1.1 Significance of ecotourism

Ecotourism offers opportunities to the people in the backward and remote areas to take the economic benefits. The main goal of ecotourism is to strengthen the cause of conservation by providing informed wilderness experience to visitors and it enables the visitors to study and enjoy the forest, wildlife, people, and their culture by providing additional employment opportunities for local communities. As a result, resource dependency can be reduced to a larger extent. At the same time, it can be a powerful means for protecting and promoting the unique biodiversity along with landscapes and seascapes provided the principles of ecotourism are implemented. With the percolation effects of tourist expenditures, local people play the role of crusaders for the protection of flora and fauna. Thus, ecotourism provides paid employment to villagers and the types of employment being generated included guides, porters, conservation workers, small shopkeepers. The ecotourism policy is to develop a sustainable community-oriented and managed approach to enforce rules for the visitors, service providers, and community members.

2. Materials and Methods

2.1.1 Study site

The study was carried out in the Bar and Kothari ranges of Barnawapara Wildlife Sanctuary of Baloda Bazar Forest

Division. The geographical location, physiographic and other features of study site are given below. Barnawapara wildlife sanctuary was built in 27 July 1976. The name of the sanctuary derived from Bar and Nawapara forest villages. Which are situated in the heart of the Sanctuary and adjacent to each other. The Sanctuary lies at a distance of 100 km away from Raipur, 27 kilometers from Pithora, 28 kilometers from Patewa and Jhalap.

2.1.2 Geographical location and physiography

The study was carried out in The Barnawapara wildlife sanctuary extend between 210 18' 45.00" to 210 30' 00.00" North latitude and 820 22' 30.00" to 820 37' 30.00" East longitude. The sanctuary consists of 244.66 km² of total area. The Barnawapara Sanctuary is encircled by reserved forest on all sides except part of the northern and eastern boundaries where Dharkhar forest village, Khurmuri, Phurphundi, Busripali and Pakrid revenue villages are situated. Upper western boundary is throughout formed by Balamdehi river. Sanctuary is connected to Nagpur-Raipur-Sambalpur national highway no. 06 (NH - 06) by all-weather roads from Patewa (28 km), as well from Pithora (27 km). Fig 1 show location information.

2.1.3 Climate

The Sanctuary area has a dry humid tropical climate, with consists three major seasons *viz.* rainy, winter and summer. The rainy season begins in mid-June and lasts through the month of September. The winter season starts in November and lasts through to the end of February. The summer season begins at the beginning of March and lasts until mid-June.

2.1.4 Rainfall (Precipitation)

The total annual precipitation of the study area is estimated in the range of 1200-1300 mm. It decreases steadily from the south-east to the north-west directions. During June to September, about 80% of the annual precipitation is obtained from the southwest monsoon in the study region. In July, the maximum amount of rainfall takes place

2.1.5 Temperature

The average monthly (maximum temperature) ranges from January to May as 27.2-41.9 °C and average monthly (maximum temperature) ranges from December to May as 12.6-27.50 °C respectively. The annual average (minimum and maximum) temperature of study area is 20.4 °C and 33.2 °C respectively.

2.2 Data collection and analysis

Three types of respondents were chosen for primary data collection. In each field of study through questionnaire developed for recording the data.

- Tourist or Visitors,
- Local Residents
- Forest officers or Field Staff.

Primary data has been collected from 3 types of respondents. The main purpose for the selection of Visitors/Tourist is to obtain the information regarding the awareness about ecotourism and importance, expectations and shortfall for facilities and services required, if any along with the correct measure to correct the shortcomings for better facilities and infrastructure needed to increase the ecotourism of Chhattisgarh. Local residents were selected in order to gather

the information regarding the knowledge of ecotourism and regarding the benefits had been received through the ecotourism activities, whether they understand about the conservation of protected areas and its importance to conserve the biodiversity both floral and faunal. Forest officer/staff were selected to know about the opinions for the shortcomings of the flora & fauna, Resort facilities food availabilities and to know the ways how we increase the ecotourism at the Barnawapara sanctuary.

2.3 Method of enquiry and collection of data

Enquiry method was carried out through survey method and primary data was taken for collection of information. The

primary data collection was done by the separate interview & filling of the questionnaire by the respondent (visitors/tourist, local people and staff/forest officer) itself. Different information collected are: source of income, occupation, knowledge about forest area, flora & fauna and their utilization pattern. First of all, we tried to build good rapport with the villagers in the informal way & in friendly environment in order to obtain the true and actual honest information from them and then they were separately interviewed and also separate proforma was requested to fill by themselves to record the data to reach some concrete conclusion regarding ecotourism impact on their livelihood how and why important.

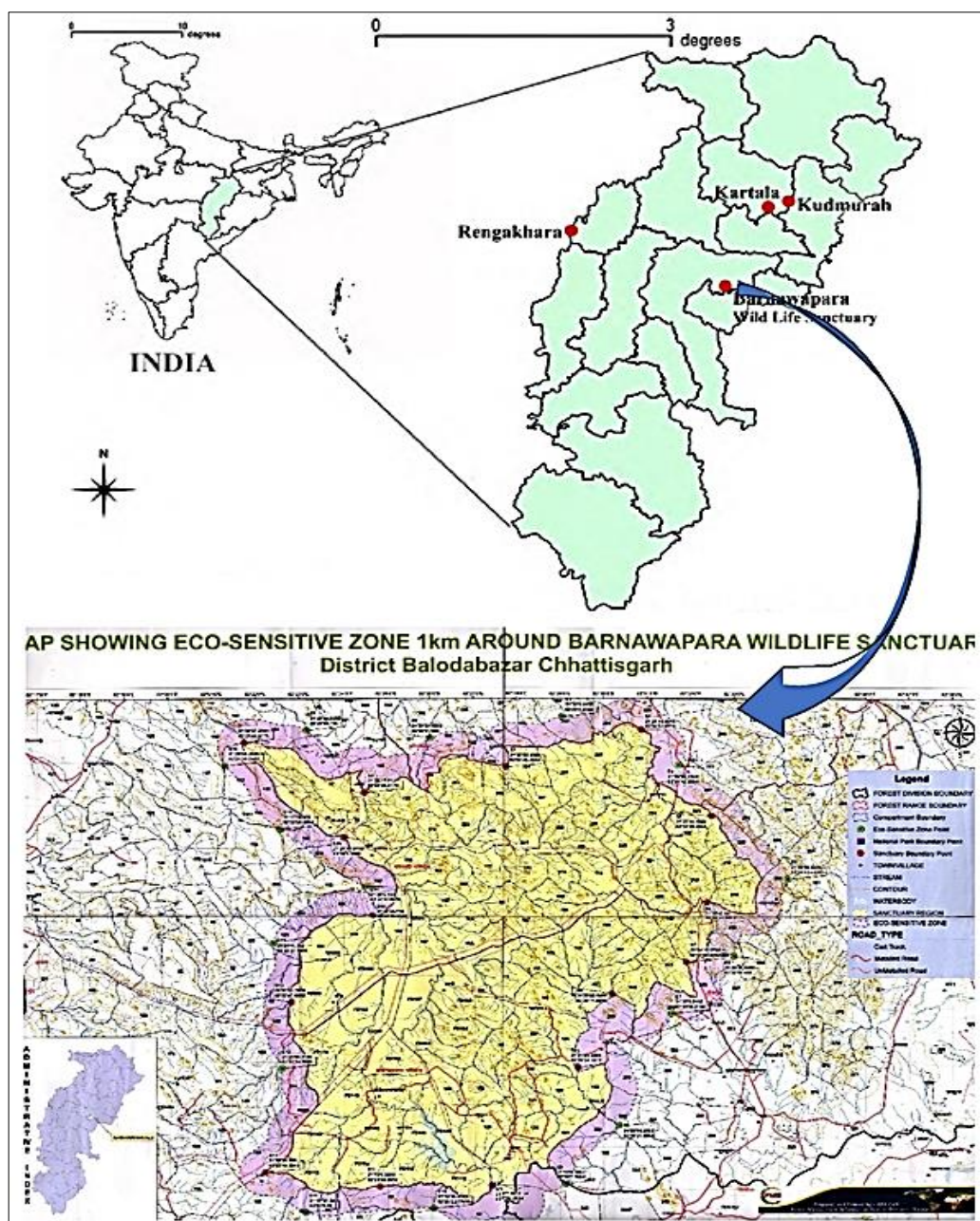


Fig 1: Location map of Barnawapara wildlife sanctuary

3. Result and Discussion

3.1 To work out the impact of ecotourism on livelihoods of tribes

In the present study area of Barnawapara wildlife sanctuary there were total 18 villages and from there we have been recorded the GPS co-ordinates (as an address) of that area and at the same time we have received all the suggestions from all

the 18 different villages through the personal interview by filling the questionnaire which was filled by themselves separately by the respondents itself and all such data were mentioned in the Table no. 1. There were different suggestions given by the respondents as some of them gets benefited and others do not receive any profit by the ecotourism activity and the benefits received by the local

people is employment being received through the driving of vehicle (gypsy). The major problem they faced is the non-disposal of the polybags and glass bottles in the runway and inside the sanctuary which creates major problems to the environment and to the animals. Thus, there were many suggestions regarding these problems such as the jobs should be given to the local residential by providing the formal training to them, polybags and the glass bottles (radially available inside the sanctuary) must be totally banned so as to protect the environment and the animals completely, afforestation should be done, dustbin must be radially available within every equidistant point and inside every vehicle so as to reduce the pollution and nuisance being created

Bibi *et al.* (2013) [1] determined the livelihood conditions of the peoples of three villages (Bait Qaimwala, Basti Allahwali and Jannu) and their dependency on biodiversity of Taunsa Barrage Wildlife Sanctuary, Pakistan from 2009 to 2011. For socio-economic status, Participatory Human Resource Interaction Appraisal method was used and for biodiversity assessment, direct census method and point count were used. Floral biodiversity contained 79 species of plants including; trees, herbs, shrubs, grasses, reeds and Fauna included fish, amphibians, reptiles, mammals and birds species. Similar observation were found in the present investigation confirms the results.

Fiseha (2013) reported that the contributions of protected area for local community livelihood were carried out in Senkele Swayne's Hartebeest sanctuary (SSHS). Primary data were collected through questionnaire, Key Informant Interview (KII), Focus Group Discussion (FGD) and direct field observation. Secondary data were collected through review of

literature. Out of the 32 rural kebeles found in the Siraro district, four kebeles surrounding the sanctuary were purposively selected for the study. Regarding to managing current destruction of the sanctuary, 27.2% of respondents supposed that, the sanctuary could be managed through ensuring protection and conservation while 13.9%, 11.9% and 11.3% respondents stated sanctuary destruction could be managed through benefit sharing, participatory wildlife management and controlling grazing respectively. Some other 10.6% and 9.9% of the respondents said the sanctuary destruction can be managed through awareness creation and controlling illegal activities.

Rajendra *et al.* (2017) reported in his experiment at Aravalli hill and find out natural home of 616 species that includes 9 orchids and 25 locally and globally endangered plant species. But this sanctuary not familiar for the ecotourism activities, very few people visits this sanctuary. Apart from conventional practices, the science and technology approaches will help the forest department do a systematic plan for ecotourism activities. i.e. developing tourism facilities, nature trails, identifying more watching point, camping site, publicity, brochure and signage in this sanctuary.

Ranjith (2020) [7] evaluated the positive and negative impacts of ecotourism developments in Neyyar, Agasthyarvanam, and Ponnudi ecotourism destinations in Trivandrum and to assess the environmental and socio-cultural impacts of ecotourism development in these regions. The analysis of collected data reveals that environmental quality in terms of conserving natural resources, improving environmental quality Agasthyarvanam, and Ponnudi achieving good status. The low status observed in negative environmental impacts like ecosystem damage and natural hazards.

Table 1: Awareness of ecotourism, forest conservation and importance of protected area among local inhabitants of Barnawapara wildlife sanctuary

S.N.	Name	Qualification	Role of forest in their sustainable income and livelihood	Communication/information source	Benefit from tourist	If there are problem coming from the tourist and suggestion	Suggestion for improvement tourism activities
	Date of birth or age	Number of family member		Income in rupee (Annual)			
	Coordinates or location (North & east), accuracy 3m	Socio economic status (Land, house)					
1. Village - Barnawapara							
1	Laxmi Narayan Thakur	12 th class, DCA	Medicinal plant (Chirayata). Fuel wood (Karra, Senha, Kurru). Fruit tree – (Char, Tendu, Mahua, Aonla)	TV, Radio, Phone, News Paper.	Gipsy provides profit, and we get employment as guide and watchman	Polythene does not degrade, which pollutes the environment.	1. Develop rangeland forest for animals with forestation of fruit tree. 2. Solar water system should be installed to overcome the water scarcity during summer season. 3. Glass bottles & polythene material cause pollution which should be restricted. 4. Wine shop not be permitted within forest premises
	09/05/1992	6		50,000			
2	Shiv Prashad Thakur	BA	Medicinal Plant (Harra, Bahera, Vantulshi, Marod fali, Airi Jadi, Chirota etc), Fuel wood – Karra, Senha, Saja, Papda.	TV, Phone, News paper	We get some income by business	The roads are narrow and also have paved road. Paved road required.	1. Lion should be bought in this sanctuary. 2. Reduced number of Medicinal & fruiting plants
	03/06/1982	5		30000			
	21° 24' 13.91"N 82° 25' 24.31"E	Landless, Mud House					
	21° 24' 07.49"N 82° 25' 22.65"E	Land-2 acre, Mud House					

							<p>should be protected with the help of awareness.</p> <p>3. The local people should have given the job opportunity after the formal training.</p> <p>4. Tree cutting should be stopped.</p>
2. Village - Dond							
3	Bijesingh Nagvanshi 55-year-old	2 nd Class 6	Medicinal plant (Bhuyineem, Balray, Sabbhan), Fuelwood (Saja, Sarai), other tree (Mahua)	TV	No benefits from Tourists,	Pollutants- plastic, glass bottles must be banned in area.	<p>1. Need to increase the pond availability.</p> <p>2. We should have the 'Black buck'.</p> <p>3. Need funds to build the paved roads.</p>
	21° 23' 33.0"N 82° 23' 23.3"E	Land- 3 acre, Mud House		75000			
4	Rajkumar Netam 29/04/1982	BA 10	Use medicinal plant, fuelwood, Rangeland useful for animal, Mahua and Tendupata.	TV, Radio, News paper;	No benefits from Tourists,	No problem (The guidelines for visitors should be strictly followed.	<p>1. Grazing land, water facility should maintain here.</p> <p>2. Mixed forest should be encouraged.</p> <p>3. Paved road is needed.</p> <p>4. The visiting boundary for tourist should be increased.</p>
	21° 23' 34.4"N 82° 23' 18.5"E	Land-2 acre, Mud House		50000			
3. Village - Mudpar							
5	Nohar Singh 60-year-old	Saksharta Mission Pass 2	Medicinal plant (Kalmegh, Adusha), fuel wood – all plant debris, grazing land used for animal.	Radio	No benefits from Tourists,	The forest area gets polluted by the tourist	<p>1. Restrictions upon hunting of animals.</p> <p>2. 'Black buck' should made available here.</p> <p>3. Afforestation needed & picknick spot should be made available to avoid from getting pollutants here & there.</p> <p>4. Polythene should be banned within premises.</p> <p>5. Paved road is a must.</p> <p>6. Job should be given to local residential after formal training.</p>
	21° 24' 41.4"N 82° 24' 07.5"E	Land– 7 acre, Mud House		18000			
6	Vishwanath Thakur 11/09/1970	8 th Class 5	Medicinal Plant (Kalmegh). fuelwood use. Forage for animal from grazing land. Mahua tendu char etc. tree useful.	Radio	No benefits from Tourists,	Visitors create pollution by throwing the glass bottles & Plastic. No picknick spots should be here & hence no pollution will be as well.	<p>1. Water source should be made proper maintained.</p> <p>2. Afforestation should be done and deforestation should be restricted.</p> <p>3. Leopard should be bought at sanctuary.</p> <p>4. Ponds should be recharged and dams be made available the water facility.</p> <p>5. Roads are in a very bad condition which is a major reason we are still backward.</p>
	21° 24' 42.0"N 82° 24' 06.7"E	Land-0.35 acre, Permanent dwelling		20000			
4. Village - Padadah							
7	Jagdishvar Nagvanshi	9 th class	Medicinal plant (Bhuyineem, Harra,	No communication	No benefits from Tourists,	Visitors create pollution by throwing	1. The sanctuary must be pollution

	03/11/1990	14	Bahera). Fuel wood – Karra Senha. Other tree like Char, Mahua.	source		the glass bottles & Plastic. Plastics & other pollutants should be banned here & hence no pollution will be as well	free for animals. 2. Illegal deforestation must be stopped. 3. Dart tracks are there, which needs to improved. 4. Lack of co-operation within the staff. 5. Water facility is needed in the kitchen for cook & the situation gets worse during Summer season.
	21° 24' 27.1"N 82° 23' 17.1"E	1.55-acre land, Mud house,		60000			
8	Santram Satnami	-	Medicinal Plant (Bhuyineem). Fuelwood use. Grazing grass for animal	No communication source	No benefits from Tourists, instead we have loss from them.	-	1. Control the deforestation by forest department. 2. No good condition road facility is available. 3. The officer's behavior is always very rude with us.
	54-year-old	17					
	21° 24' 19.7"N 82° 23' 09.3"E	Landless, Awas Yojna		20000			
5. Village - Bafara							
9	Lachchhiram Dhruw	12 th class	Fuelwood use (Senha Karra, Birha), other tree - Tendu	TV, Phone	We run a shop & we get the customer by the visitors	Polythene bag creates the pollution	1. Roads are very damp & needs to pay attention. 2. Lion should bring here to maintain the 'food web' in the ecosystem.
	03/08/1995	5					
	21° 28' 33.00"N 82° 22' 31.47"E	15-acre land, Mud house		50000			
10	Manaram Diwan	3 rd Class	Medicinal Plant (Bhuyineem) Fuelwood, other tree - Mahua	Phone	No benefits from Tourists,	No problem	1. The local people should have given the job opportunity after the formal training. 2. Paved road is needed. 3. water availability is required for wildlife,
	63-year-old	13					
	21° 28' 30.98"N 82° 22' 31.89"E	3.5-acre land, Mud House		52000			
6. Village - Bhimbhour							
11	Maheshram Yadav	-	Medicinal Plant (Harra, Bahera, Bhuyineem, Bijanja Aonla). Fuelwood (Karra Senha)	TV	No benefits from Tourists.	No problem from tourist but having problem for travelling by the forest department	1. Roads are very damp & needs to pay attention. 2. Prevent deforestation 3. Wild elephants should be prevented to enter the forest.
	75-year-old	2					
	21° 27' 29.62"N 82° 23' 35.60"E	1.5-acre land, Mud House		50000			
12	Kalesh Diwan	12 th Class	Medicinal Plant (Bhuyineem), Fuelwood (Karra), Rangeland useful for livestock	TV, Phone, Newspaper, another person	Visitors use the firewood thus we get benefited.	No problem but if we cut one tree then in place of it, we should plant 11 trees.	1. 'Water plastic pouches' should not be thrown here & there which animals used to eat but unable to digest. 2. 'Cigrates' etc. should not be used within jungle could leads to fire. 3. Cart tract is there & needs attention.
	20/08/1988	4					
	21° 27' 31.07"N 82° 23' 32.98"E	1.9-acre land, Permanent dwelling		25000			
7. Village - Gudagarh							
13	Firtu Ram Chauhan	-	Medicinal plant (Bhuyineem), Fuelwood (Karra Saja), another tree (Mahua, Tendu)	Radio, another people	No benefits from Tourists.	Tourist spread their polythene & plastic bottles everywhere and this should be stopped.	1. Heavy vehicles from the sanctuary routes should be completely restricted
	65-year-old	-					
	21° 26' 53.94"N	Landless,		12000			

	82° 24' 21.65"E	Mud House					so that the animals could freely move within sanctuary. 2. Deforestation should be stopped. 3. 'Neel gaay' is not present & is required here. 4. Cart roads are here which needs to be improved.
14	Subhash Thakur 45-year-old	MA(Hindi) 15	Medicinal plant (Balraj, Tejraj, Bhojraj), fuelwood (Karra, Kasahi, Semhal, Harra etc.), Forage for animal.	TV, Radio, News paper	-	Heavy vehicles should be restricted	1. Restrict the heavy vehicles in the sanctuary area 2. Restriction over deforestation. 3. Roads construction needs to be focus.
	21° 26' 55.15"N 82° 24' 17.79"E	10-acre land, Permanent dwelling		50000			
8. Village - Kothari							
15	Ghan Sing Bariha 44-year-old	- 5	Medicinal Plant (Bhuyineem Balraay), Another tree - Mahua, Bansera Kand.	Phone	-	In the tourist center, preference should be given to the local people for job.	1. The place of stay for the visitors needs to be improved more. 2. Dart track needs to be corrected. 3. Swampy ponds should be cleaned and new borewell should be installed.
	21° 27' 13.66"N 82° 31' 15.39"E	3-acre land, Mud House		32000			
16	Sahettar Ram Binjhar 01/01/1936	- 6	Medicinal Plant (Balraay, Hinglaj), Fuelwood (Karra, Senha, Bahera). Grasses for livestock. Another tree – Mahua, Tendu, Harra, Bahera.	TV, Phone.	No benefits from Tourists.	No	1. Pond needs to dig deeper. 2. Road construction is required.
	21° 27' 10.70"N 82° 31' 16.53"E	6.25-acre land, Permanent dwelling		12000			
9. Village - Taldaadar							
17	Setu Kumar Chauhan 22/08/1970	12 th Class 7	Medicinal plant (Balraay, Bhuyineem, Harra, Maidachhilka), Fuelwood (Karra, Senha), Another tree- Tendu, Mahul, Mahua, Char.	TV, Phone	No benefits from Tourists.	There are many problems like- loss in agriculture & threat to life.	1. Rangeland and water facility should be available everywhere for the animals. 2. New ponds should be developed. 3. Fruiting trees should be planted around the pathway.
	21° 28' 16.72"N 82° 31' 19.76"E	5-acre land, Mud House		50000			
18	Harichandra Bhoi 46-year-old	5 th class 7	Medicinal plant (Balraay, Bhuyineem), Fuelwood (Karra, Senha, Saja), Grasses for livestock.	TV	Yes	-	1. Water facility for animals is needed. 2. The pond is having the scarcity of water. 3. The plants should be planter along the roads.
	21° 28' 16.35"N 82° 31' 16.35"E	3-acre land, Mud House		30000			
10. Village - Hardi							
19	Santosh Bariha 47-year-old	5 th Class 3	Medicinal plant (Bhuyineem, Banhaldi), another tree (Mahua, Tendu, Char)	Phpne	No benefits from Tourists.	No problem	1. Plants should be prevented from the fire. 2. The pond is having the scarcity of water. 3. There should be the caves & bushes for the animals. 4. Dart track needs to be corrected.
	21° 23' 48.83"N 82° 26' 04.75"E	5.5-acre land, Mud House		60000			
20	Kundan Lal Kaiwart 53 year old	MA, B.Ed. 7	Medicinal Plant (Chirayta, Patal Khohda), Fuelwood (Karra, Paprel, Saja,	TV, Phone, News Paper.	No benefits from Tourists.	No problem	1. Plants should be prevented from the fire. 2. Restriction over
	21° 23' 41.77"N	3.5-acre land,		62000			

	82° 26' 16.04"E	Permanent dwelling	Dhwada), another tree (Mahua, Siyal, Char, Tendu)				deforestation. 3. Water facility for animals is needed. 4. The forest officials should need to be in the regular contact with the local residential so as to get informed in case of fire.
11. Village - Loritkhar							
21	Kandarpo Pradhan 04/02/1969	11 th Class 4	Medicinal Plant (Balraj), Grasses for livestock, another tree (Mahua, Tendu, Aonla)	Radio, Phone	No benefits from Tourists.	No problem but if in case for the coming of the relatives of the local peoples they should not be charged. (in marriage etc.)	1. Water scarcity for animals. 2. Roads should be made in such a way that it does not create any problems during the rainy season. 3. Jobs should be given to the local peoples on priority basis.
	21° 21' 16.55"N 82° 24' 39.74"E	1-acre land, Mud House		30000			
22	Jaikrishna Barik 50-year-old	4 th Class 2	Medicinal plant (Airy-Jairy, Balraay, Bhuyineem), Fuelwood (Senha, Karra, Saja, Kurru.)	Phone	No problem	We get disturb by the dusts which arises due to the dart track by the vehicles.	1. Rangeland should be planted. 2. Restriction over deforestation. 3. Plants should be prevented from the fire. 4. Tourist spread their polythene & plastic bottles everywhere and this should be stopped. 5. Dart track needs to be corrected.
	21° 21' 16.27"N 82° 24' 36.56"E	3.5-acre land, Mud House		25000			
12. Village - Amgaon							
23	Amol Sing Diwan 01/12/1968	12 th Class 5	Medicinal Plant (Aonla, Harra), Fuelwood (Saja, Karra, Parsa), Grasses for livestock, another tree – Mahua, Tendu, Char etc.	Radio, Phone	No benefits from Tourists.	No problem	1. Water facility for animals is needed. 2. Plantation should be done with a range of variety. 3. Plants should be prevented from the fire. 4. Rangeland should be planted.
	21° 20' 25.14"N 82° 25' 01.03"E	1-acre land, Mud House		40000			
24	Gangaram Dhruw 04/02/1982	8 th Class 4	Medicinal Plant (Aonla, Harra), Fuelwood (Karra, Saliha), Grasses for livestock, another tree – Mahua, Tendu, Char etc.	Radio	No benefits from Tourists.	No problem	1. Rangeland should be planted for deer, pig etc. 2. Fruiting plants should be planted in the free space. 3. Tourist spread their polythene & plastic bottles everywhere and this should be stopped. 4. Dart track needs to be corrected.
	21° 20' 23.02"N 82° 24' 57.66"E	1-acre land, Mud House		30000			
13. Village - Akaltara							
25	Rajau Ram 55-year-old	8 th Class 4	Medicinal Plant (Charouta, Fud-har), Fuelwood (Saja, Senha Karra, Tinsa), Grasses for livestock.	TV, Phone	No benefits from Tourists.	No problem	1. Lion should bought here. 2. Dart track needs to be corrected.
	21° 21' 19.11"N 82° 25' 58.10"E	2-acre land, Mud House		55000			
26	Ramratan Netam 16/08/1971	12 th Class 6	Medicinal Plant (Arjun, Maida, Airy-Jairy, Fud-har), Fuelwood (Senha Karra, Dhwada),	TV, Radio	No benefits from Tourists.	No problem	1. Water facility for animals is needed. 2. More pond is required in the
	21° 21' 22.46"N 82° 26' 01.77"E	6.74-acre land, Mud House		70000			

			Grasses for livestock, another tree (Mahua, Char, Tendu)				sanctuary 3. The staff has a very rude behavior with the local people.
14. Village - Gabaudh							
27	Parmeshwar Thakur 60-year-old	- 10	Medicinal Plant (Harra, Bhuyineem, Balraay), Fuelwood (Karra), Grasses for livestock. Another tree (Mahua, Char)	Phone, friends	No benefits from Tourists.	-	1. Black bug should be here. 2. Ponds depth should be increased. 3. Camera surveillance should be here by fixing a greater number of cameras.
	21° 20' 40.91"N 82° 26' 54.64"E	2-acre land, Mud House		30000			
28	Jaisingh/ Baldusingh 95-year-old	Educated 25	Medicinal Plant (Airy Balraay, Rakat Bedar), Fuelwood (Karra, Aonla, Saja), Grasses for livestock	TV, Phone, News Paper	No benefits from Tourists.	No problem	1. Medicinal plants should be planted here. 2. Pond beautification is necessary. 3. The forest product such as (Tendupata, harra, bahera, chironji) are being Encroached by the outsiders.
	21° 20' 35.23"N 82° 27' 00.52"E	10.5-acre land		65000			
15. Village - Devgaon							
29	Bhimsen Patel 61-year-old	5 th Class 6	Medicinal Plant (Bhuyineem, Tilayi), Fuelwood (Karra, Senha, Saja), Another tree (Mahua, Char, Tendu)	Phone, from Neighbor's house	No benefits from Tourists.	No problem	1. Instead of saagon and bamboo, other beneficial trees species should be planted which are beneficial for animals. 2. Dart track needs to be corrected. 3. We are unable to get permission for the harvesting of tendupatta.
	21° 20' 03.46"N 82° 26' 29.52"E	2-acre land, Mud House		48000			
30	Dharam Singh Thakur 50-year-old	4 th Class 9	Medicinal plant (Bhuyineem), Fuelwood (Saja, Karra, Senha), Grasses for livestock, Another tree (Mahua, Char, Tendu)	TV, Phone	No benefits from Tourists.	No problem	1. Water facility and Rangeland for animals is needed. 2. Dart track needs to be corrected. 3. Fruiting tress should be planter on the alley of roads. 4. Animal breeding center should be established here. 5. Dart track needs to be corrected. 6. Camera surveillance should be here by fixing a greater number of cameras.
	21° 20' 03.83"N 82° 26' 33.09"E	0.5-acre land, Mud House		55000			
16. Village - Chraoda							
31	Vishram Ratrey 75-year-old	- 8	Medicinal Plant (Airy Jairy). Fuelwood – (Karra, Karai, Saja, Aam), Another tree (Mahua, Char, Tendu)	Tv, Phone, News Paper	No benefits from Tourists.	No problem	1. Lion should bring here. 2. The trees which are beneficial for animals should only be planted here. 3. Dart track needs to be corrected. 4. Rangeland should be planted.
	21° 19' 47.49"N 82° 28' 04.41"E	4-acre land, Mud House		45000			
32	Ganesh Ram Bariha	5 th Class	Medicinal Plant (Chirayta, Tilayi).	TV, Phone	No benefits from Tourists.	No problem	1. Girraff should be here.

	60-year-old	7	Fuelwood – (Dhwada, Saja, Karra), Grasses for livestock, Another tree (Mahua, Char, Tendu, Bel)	50000			2. Camera surveillance should be here by fixing a greater number of cameras. 3. Aonla, ber, bel, should be planted here. 4. Dart track needs to be corrected. 5. Fruiting tress should be planter on the vacant lands.
17. Village - Dhebikhar							
33	Shreeram Bariha	8 th Class	Medicinal Plant (Chirayta). Fuelwood – (Senha, Saja, Karra), Grasses for livestock, Another tree (Mahua, Char, Tendu)	Phone	-	-	1. Rabbit & lion should bring here. 2. Aonla, ber, bel, ameli should be planted here. 3. Polythere and glasses should be banned here. 4. Paved track is needed.
	79-year-old	5		40000			
34	Sukhdev	-	Medicinal Plant (Chirayta). Fuelwood – (Dhwada, Karra), Grasses for livestock	TV, Phone	No benefits from Tourists.	-	1. Rabbit, leopard and fox should bought here. 2. Pond reclamation should be done so that it would remain fresh to use by animals. 3. Paved road is a must. 4. Bank & ATM facility is needed to overcome money problem.
	01/01/1973	5		50000			
18. Village - Dheba							
35	Dularuram Yadav	8 th Class	Medicinal Plant (Airy Jairy). Fuelwood – (Karra, Saja, Aonla), Grasses for livestock, Another tree (Mahua, Char, Tendu, Aonla)	TV, Phone	-	-	1. Rangeland and water facility for animals is needed. 2. Aonla, Saja, vidya should be planted here. 3. Lion, kangaroo, giraf should bought here. 4. Paved road should be constructed here. 5. Electricity is a must, not the tower.
	31/01/1978	6		60000			
36	Gaitram Diwan	Educated	Medicinal Plant (Airy Jairy). Fuelwood – (Karra, Saja, Dhwada), Grasses for livestock, Another tree (Mahua, Char, Tendu, Aonla)	TV, Phone	-	-	1. Rangeland and water facility for animals is needed. 2. Plastic must be banned within the sanctuary premises. 3. Paved road is a must, 4. Electricity is required.
	01/01/1954	10		80000			
19. Village – Rampur (Displaced Village)							
37	Ujjal Cherkiya	2 nd Class (Oriya medium)	Medicinal Plant (Bhuyineem, Balraay). Fuelwood – (Karra, Paprel), Grasses for livestock, Another tree (Mahua)	Radio, Phone	No benefit from the tourist.	No problem	1. Animals destroy the field crops, so kindly make a separate Rangeland for them. 2. Lack of co-operation from the forest department.
	70-year-old	11		45000			
	21° 19' 48.16"N 82° 28' 01.36"E	2-acre land, Mud House					
	21° 20' 16.52"N 82° 23' 12.60"E	4-acre land, Mud House					
	21° 20' 16.77"N 82° 23' 11.44"E	5-acre land, Mud House					
	21° 19' 26.06"N 82° 23' 28.24"E	3-acre land, Mud House					
	21° 19' 25.76"N 82° 23' 26.93"E	5-acre land, Mud House					
	21° 23' 16.85"N 82° 28' 19.16"E	10-acre land, Mud House					

3.2 Ecotourism destination in our study site

Table 2: Tourist attraction spot in Barnawapara wildlife sanctuary

S. No.	Tourist attraction spot	Detailed information and special features of the attractive spots in Barnawapara sanctuary
1.	Sirpur	It is situated at 40k.m. distance from the Barnawapara in the ghats of Mahanadi river. It is the only archaeological place where we get the shiva, Vaishnava and Buddh community relic at the same place. In the seventh century lord shiva temple, Laxman and gandheshwar temple were made-up of bricks and "Bouddh-Vihar" is one of the famous places here.
2.	Turturiya	Is situated at a boundary of the Barnawapara and at a distance of 13 Kilometre where the archaeological evidences have been found. Here the complete dense forest vegetation is present and also a lake which continue flows round the year which is also name as "Suri-suri ganga" by the local residentials. An old 8 th century temple of ram is situated along with the Valmiki ashram. According the ancient accreditation it is believed that 'Sita-mata' has spent the time during her 'vanvas' and also this is the birth place of 'Iuv-Kush'.
3.	Matagarh	At the distance of 2 km from Turturiya on the western hills an ancient temple of "devi maa" is situated. The main reason behind coming to place is for the sake of childless parents to pray for having the baby and when the which is get fulfilled, they again visit the temple and they used to tonsure of the child.
4.	Devdhara	It is situated at a distance of 22 km of Barnawapara and in attached to the eastern boundary of Barnawapara where the "devpuri hills" is situated where a lake surrounded by the bamboo and mixed forest is also a main attraction center and also used as a picnic spot.
5.	Dev-hills	The devpuri hills mount is one of the exciting places for tracking which fills a person with the thrill and excitement. This is the highest elevated point of the Raipur district. The Shivrinarayan and Mahanadi can be can easily visible from this point.
6.	Siddhkhoh	The siddhkhoh waterfall is very popular within the tourist community and situated around 32 kms from barnavapara. The average height of the waterfall is around 150 foot.
7.	Shivrinarayan	It is situated at the 50 kilometres away at the coastal area of the Mahanadi river which is one of the ancient temples. Here is the conjunction of shivnath, jonk, and Mahanadi river which forms the "Terveni Sangam". According to the ancient accreditation lord ram, laxman & sitamata have been stayed here for some part of their 'vanvas period' and also a lady named as 'sabri' had given the defiled ber fruit to the lord ram. A shiv temple is also situated at 3 kms from kharod. Laxman kund is available which is filled with water round the year.
8.	Giddhpuridhaam and Chhatapahad	Situated at a distance of 40 kms from Barnawapara which is the birthplace of "guru Ghasidas". Another place Chhatapahad is a huge stone where the guru ghasidas has acquired the knowledge and the visitors visit here.

Out of these above areas best place for visiting the tourist are Sirpur, Turturiya, Dev Hills, Siddhkhoh.

3.3 Impact of tourism industry on environment

The quality of the environment, both natural and man-made, is essential to tourism. However, tourism's relationship with the environment is complex. It involves many activities that can have adverse environmental effects. Many of these impacts are linked with the construction of general infrastructures such as roads and airports and of tourism facilities, including resorts, hotels, restaurants, shops, golf courses and marinas. The negative effects of tourism growth can gradually destroy the ecological resources on which it depends. On the other hand, tourism has the probable to create advantageous effects on the environment by causative to environmental safeguard and preservation. It is a mode to raise attentiveness of environmental principles and it can serve as a tool to finance the protection of natural areas and increase their economic importance. The opinion of the tourists about the impact of the tourism industry on the environment





Fig 2: Plates (a, b, c, d, e, f): Interaction with local residents of Barnawapara wildlife sanctuary

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4. Conclusions

Chhattisgarh is having 44% forest cover and so many Sanctuaries. If the tourist spots of these sanctuary area are properly identified and the publicity made then the ecotourism industry will play a significant role in employment generation for local residents as well as to uplift their livelihood. Awareness among tourists along with local residents in relation to flora and fauna through the environmental education should be provided, so that the people could learn more and more about the importance of the biodiversity conservation.

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