

The online visit for January 2022 was proposed with the following program.

Awareness Campaign at

1. Dihing Patkai Abhayaranya
2. The **Bogibeel Bridge**, over the Brahmaputra River between Dhemaji and Dibrugarh district .
It is the longest rail-cum-road bridge in India, measuring 4.94 kilometres over the Brahmaputra river
3. Gibbon Wildlife Sanctuary or Hollongapar Reserve Forest, an isolated protected area of evergreen forest located in Mariani, Jorhat, Assam

This was expected to enhance Tourist Awareness campaign, School students awareness campaign , visit (Online /offline), Tourist Stakeholder Awareness workshop

Ecotourism :

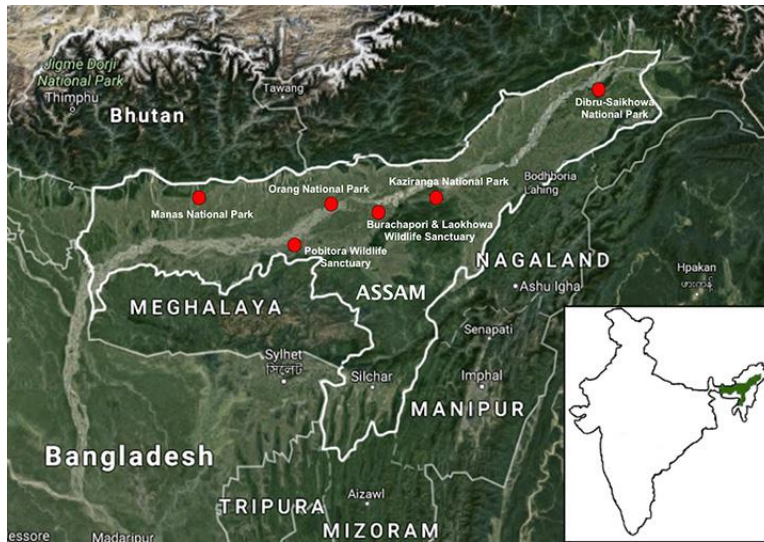
Ecotourism ('eco' as in ecological) is a type of tourism that is founded primarily on a specific interest in the natural history of a region. The term ecotourism was coined by Héctor Ceballos-Lascurain in 1983, and was initially used to describe nature-based travel to relatively undisturbed areas with an emphasis on education. The concept has, however, developed to a scientifically based approach to the planning, management and development of sustainable tourism products and activities. The concept emerged out of the eco-development and sustainable development literature of the 1970s and 1980s and has generated a significant amount of interest and controversy. Interest, because it represents an alluring alternative to the mass tourism paradigm that has been so transformative to the social and ecological conditions of destinations throughout the world; and controversy because many feel that it has yet to live up to its position as a more responsible or ethical form of travel. Eco-tourism focuses on local cultures, wilderness adventures, volunteering, personal growth and learning new ways to live on our vulnerable planet. It is typically defined as travel to destinations where the flora, fauna, and cultural heritage are the primary attractions. Responsible ecotourism includes programs that minimize the adverse effects of traditional tourism on the natural environment, and enhance the cultural integrity of local people. Therefore, in addition to evaluating environmental and cultural factors, initiatives by hospitality providers to promote recycling, energy efficiency, water re-use, and the creation of economic opportunities for local communities are an integral part of ecotourism.

Dihing Patkai Abhayaranya

Dehing Patkai National Park is located in the Dibrugarh and Tinsukia districts of Assam and covers an area of 231.65 km² (89.44 sq mi) rainforest. It is considered to be the Amazon of the East and is the longest stretch of lowland rainforests in India. The Dehing Patkai National Park was inaugurated as a National Park and upgraded from a Wildlife Sanctuary in June 2021.



It stretches across the Dibrugarh, Tinsukia and Charaideo districts in Assam followed by the Tirap and Changlang districts of Arunachal Pradesh.. The Dehing Patkai National Park has an area of around 234.26 sq. km. and it was declared as a Wildlife Sanctuary of Assam in 2004. On 13 December 2020 Government of Assam upgraded it into a national park. On 9 June 2021 Forest Department of Assam officially notified it as a national park. It is located in the Dehing Patkai Landscape which is a dipterocarp-dominated lowland rainforest. . The forest further spreads over in the Tirap and Changlang districts of Arunachal Pradesh. Dehing Patkai National Park harbours the largest stretch of lowland rainforests in India. Dehing Patkai Wildlife Sanctuary was declared as Dehing Patkai Elephant Reserve under Project Elephant. Dehing-Patkai as a potential wildlife sanctuary was identified in late 1980s during a primate survey as "Upper Dehing Wildlife Sanctuary". Subsequently during a study on white-winged wood duck in early 1990s, it was discovered as a globally important site for this duck and recommended to be upgraded to "Upper Dehing National Park".



The Dihing Patkai National Park, the state's seventh national park spans an area of 234.26 square kilometres and is located in the Dibrugarh and Tinsukia regions' Jeypore and Soraipung Ranges. It is famous around the world for its rainforest, which is one of the few remaining tracts of Assam Valley Tropical Wet Evergreen Forests. Elephants, hoolock gibbons, golden cats, clouded leopards, and other species live in the park. In the park known for its vast biodiversity, 47 animal species, 47 reptile species, and 310 butterfly species have been reported to far. Dihing Patkai National Park known as Amazon of the East is part of the largest stretch of lowland rainforests in India.



The park derives its name, partly from this river which is gives life to the rainforests and all its biodiversity.

Flora in Dehing Patkai

The flora of Dehing Patkai is very rich and is highly resourced. There are various exotic species of orchids which are found here along with different types of trees. It is for the presence of these varied species of orchids that Dehing Patkai is a very important forest of Assam. A total of 101 species of orchids have been recorded here in the forest out of which 79 are found to be epiphytic, 1 saprophytic and 21 terrestrial. Some of them are even found out to be very vulnerable which is 28 in number, 5 are threatened, 8 critically endangered and 15 endangered species.

Some of the very important types of trees found here in Dehing Patkai are Samkothal, Elephant Apple, Bheer, Hollang, Dhuna and Nahar. The state tree of Assam is Hollong. Apart from these there are also other types of overwood species which are *Mesua Ferrea*, *Dysoxylum hinectiferum*, *Castanopics indica* and *Vatica lanceaefolia*.



Elaeocarpus flower



Dipterocarpus macrocarpus
young leaf



Plant Orchid Papilionanthe teres



Mesua ferrea



Ardisia

Fauna in Dehing Patkai

Dehing Patkai is a bio diverse forest as well with a huge number of animals residing in it. Reptiles, mammals and butters are easily visible within the forest which are 40, 42 ans 30 in numbers respectively. Some of the common animals found in the forest are Hoolock Gibbon, Stump-tailed macaque, Himalayan black bear, Loris, Himalayan Squirrel, Leopard cat, Porcupine, Sun bear, Golden cat, Barking deer, Capped langur. On the other hand, there are also innumerable species of birds that can be found such as the slender billed vulture, yellow-vented warbler , white-winged duck, marsh babbler, , brown fish owl and osprey among others. A total of 293 species of birds have been calculated to be found here.



Dehing Patkai rainforest harbours about 293 bird species, belonging to 174 genera and 51 families. The majority is resident (63.7%), some are winter visitors (23.1%), and very few are summer visitors (2.5%). About 10.7% are altitudinal migrants, coming mainly from the higher reaches of the western, central and eastern Himalayas. Avifauna includes slender-billed vulture, white-winged



duck, greater adjutant, lesser adjutant greater spotted eagle, beautiful nuthatch, marsh babbler, tawny-breasted wren-babbler, yellow-vented warbler, broad-billed warbler, white-naped yuhina,

white-cheeked partridge, great hornbill, brown hornbill, Oriental darter and painted stork, osprey, kalij pheasant, grey peacock pheasant, besra, black baza and hill myna.

Elephant Reserve

The Dehing-Patkai Wildlife Sanctuary was identified as an Elephant reserve on 17-04-2003 under the Project Elephant (1992) by the Indian Government. This Reserve ranges within the eastern-south of



the sanctuary, having a total area of 937 Km² with 295 numbers of Asiatic elephants (**data given as per Elephant reserves of Project Elephant in India 2005**). Project Elephant has been formally implementing MIKE (Monitoring of Illegal Killing of Elephants) programme of CITES in 10 Elephant Reserves since 01.04.2004 including Dehing Patkai.

Tribes within the sanctuary:



Dehing Patkai Festival, Tinsukia, Assam

In the region of Dehing Patkai, there live a large number of ethnic tribal communities who are socio-culturally and physically akin to South East Asia. Among the tribes, the important ones are the Singphos, Tangsas, Neotes, Wanchos, Khamtis, Tai-Phakes, Duantias, Kacharis, other Bodos, Sema, Nagas, Deoris and non-tribals such as Ahoms, Mattaks, Morans, extra garden labourers, Nepalis are also seen living beside the sanctuary. Most of the indigenous and ethnic people benefit themselves from the forest natural resources and also helps in conserving the bio-diversity. Plants that are conserved, serve as a source of wild edible food in the form of roots, tubers, rhizomes, seeds, fruits and as agricultural and horticultural plants. Many of the plants conserved by ethnic people are used for medicinal purposes also such as: antidotes for snake bites and scorpion stings, for setting bone fractures by traditional healers, for curing wounds or arthritis, or as abortifacients and as cures for menstrual problems, etc. They also utilize forest produce such as forest timber and fuel wood. Plants are conserved in abandoned sites of shifting agriculture by the tribals and also in sacred groves as *in situ* conservation of biodiversity and ecological restoration.

Back in early 2000's, most of the people belonging to the tribes were uneducated, poor and socially isolated within the boundaries of the forest; they had limited exposure to other parts of Assam. The Government of Assam decided to promote upliftment of these societies by giving emphasis on Eco-cultural tourism so that there is community integration between the indigenous people and visitors to the festival. Thus, Dehing Patkai Festival came into being from December 2002 onwards.

Biomass within the forest:

Rainforests of North-East India especially in the Eastern Himalaya form a part of the Himalayan biodiversity hotspot with rich biodiversity with dense vegetation of trees, thus making rainforest ecosystems a major carbon sink. Despite the biological richness, forest degradation is a matter of serious concern in this region. The rainforests of Assam had been subjected to large scale commercial timber collection from the colonial period till the early twentieth century, which is still going on and this has resulted in the shrinkage of those forests. Also the forest is rich in oil, natural gasses, coal and timber which attract illegal mining and other activities such as deforestation, rapidly causing degradation of the forest area. Thus, reduction in trees and destruction of forest will increase carbon within the forest.

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The Bogibeel Bridge:



Historically, bridges have been vital transportation routes, connecting communities and shortening routes across our world. As a major lifeline in the present time and modern cities, health monitoring of bridges becomes an essential task. Known as the second-longest Rail-cum-Road Bridge, the Bogibeel Bridge spreads over the Brahmaputra River in the northeastern region of India.

Location:



The bridge is located 17km downstream of the town of Dibrugarh. It connects Dibrugarh in the south to Lakhimpur in the north. The River Brahmaputra runs to the north of Dibrugarh and is very wide,

spreading 10km. The rail-road bridge is the fourth bridge on the river, the others being Pandu Saraighat, Kolia-Bhumuraguri and Naranarayan Setu at Jogighopa – all of them in Assam.

The Bogibeel Bridge is the longest structure on the River Brahmaputra. The 4.94 km bridge is built across Dhemaji and Dibrugarh districts of Assam, India and aims to reduce the train travel time between Delhi to Dibrugarh by about three hours. It will also provide direct connectivity from Dibrugarh to Itanagar, reducing the travel distance by 705km. The Bogibeel Bridge is additionally recognized as the 5th longest bridge in India. The rail-road bridge was undertaken by the Northeast Frontier Railway, which is a part of the Indian Railways. The work on the project began in 2002 and was expected to be completed in seven years, but it has experienced time and cost overruns. It was previously scheduled to be completed by the end of 2015. The original estimated cost of Rs16.7bn (approximately \$312m) shot up to Rs33.78bn (\$630m) by 2011. The bridge was inaugurated and opened to the public in December 2018.

Design and construction: The Bogibeel Bridge is a welded-steel-truss-and-reinforced-concrete structure. It spans 125m and has strong box-type built-in sections. The bridge is supported on well foundations and 42 piers. The three-lane road has footpaths on either side. 170 strain gauges, 124 thermocouples, 6 displacement sensors, and 8 prism targets were installed on the top cross girder mains and intermediate, diagonal girder, bottom chord girder of the normal span and end span. All this was done in a very short period, which was challenging. Apart from this, the automatic weather station was installed at the centre of the normal span which was used to monitor the entire weather parameters. All the installed sensors, including the weather station were connected to an Automatic Data Acquisition system for real-time data.



Strain gauges and thermocouple installed on bridge

Bogibeel is India's first and only fully welded bridge construction. It is also for the first time that European codes and welding standards were adhered to in the construction of a bridge in India. Normally, in a steel bridge construction, bolts and rivets are used, which need periodic replacement due to shear failure over traffic loads. Construction of trusses using welding makes the connection between the components a permanent one, thereby eliminating the above failures. A welded bridge not only reduces maintenance cost but also adds to the longevity of the superstructure. It is estimated that Bogibeel Bridge is durable and serviceable for 120 years.

Gibbon Wild Life Sanctuary:

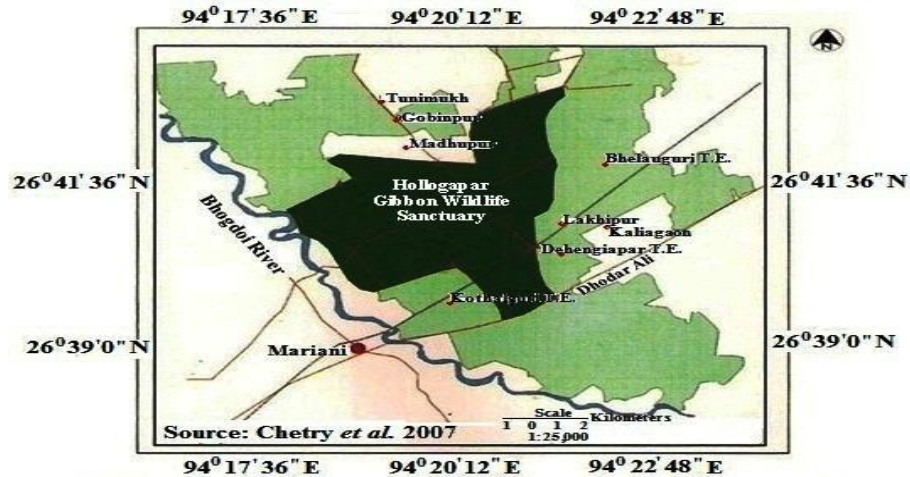


Assam which is the abode of natural infrastructure has a profound scope for the promotion of tourism. Among the varied attraction of the focal point of tourism in Assam continues to be prominently the Wildlife concerning internationally famous Kaziranga and Manas National Park, alike these Wildlife Sanctuaries, Gibbon Wildlife Sanctuary situated in Mariani of Jorhat District has scope for developing into an eco- tourism destination which can be explored but within the carrying capacity of the Sanctuary.

Introduction:

Gibbon Wild Life Sanctuary is the only sanctuary in India to be named after a non-human primate- the Hoolock Gibbon (*Hylobates Hoolock*). It is located at the close proximity of the Naga Hills, in the Jorhat district, vering an area of 20.98 sq. km and is topographically characterized by an almost level land with an average contour height of 90 meters from MSL, with the average annual rainfall of 249 cm. During the British period in 1881, Gibbon Wild life Sanctuary was known as Hollongapar Forest, which was declared a wildlife sanctuary by the group of Assam notification no. FRS/37/97/13 dated 30/7/1997, which was further renamed as Hollongapar Gibbon Wild life Sanctuary on on 25th may 2004. It also been recently declared as Important Bird Area where along with endemic varieties, migratory birds rush into in large number particularly during the late summer and winter period. Topographically the surface of the sanctuary is gently sloping down from southeast to northwest, which essentially exhibit a very smooth and continuous interaction of down slope and high slope ecosystem within the sanctuary. This sanctuary is approximately 17km and 5km far away from Jorhat and Mariani town respectively. Bearing a host of biodiversity within limited space it has the scope for developing as an Eco- tourist destination.





Wildlife in Gibbon's Sanctuary:

The sanctuary has a rich biodiversity and is home to the only apes in India, the western Hoolock as well as the only nocturnal primate found in the northeast Indian states, the Bengal slow Loris. Other primates include the stump-tailed macaque, northern pig-tailed macaque, eastern Assamese Macaque, Rhesus Macaque, and Capped Langur. Also found at the sanctuary are Indian Elephants, Tigers, Leopards, Jungle Cats, Wild Boar, Three types of civet, four types of squirrel, and several other types of mammal. At least 219 species of bird and several types of snake are known to live in the park.

The sanctuary has a rich diversity of flora at each layer in the canopy. The upper canopy consists mostly of *Dipterocarpus macrocarpus* rising 12 to 30 m (39 to 98 ft) and having straight trunks. Other species found in the top canopy include Sam, Amari, Sopas, Bhelu, Udal and Hingori. A variety of evergreen shrubs and herbs make up the lower canopy and ground layers.

Hollongapara Sanctuary contains india's only ape family- the hoolck gibbon, numbering 106. Other primates in the sancutuary include in the Stump Tailed Macaque (Henduri Bandor) which are 233 in number , the Pig Tailed Macaque which are left with a population of 75 only , The Capped Langur with just 162, 174 Rhesus Macaques and the Slow Loris (Lajuki Bandor) whose estimation is yet to be made.

The sanctuary officially extends to the Disoi Valley Reserve Forest, Disoi Reserve Forest and Tiru Hills Reserve Forest, which are used as dispersal area for Indian Elephant and other animals. Three extensive tea gardens that belong to the estates of Disoi , Kothalguri and Hoolonguri

span the distance between Hollongpara Gibbon Sanctuary and the nearest forests in Nagaland , the Dissoi Valley Reserve Forest.

Snapshots of some Primates :



CAPPED LANGUR
Trachypithecus pileatus

CONSERVATION STATUS: VULNERABLE

- Named for the "cap" of black hair atop their heads
- They live in subtropical and montane forests rich in vegetation and fresh water streams
- Native to parts of Bhutan, northeast India, Bangladesh, and western Myanmar where they require unfragmented, undisturbed forests
- Threatened by slash and burn agriculture that destroys their habitats; populations are declining steadily



STUMP-TAILED MACAQUE
Macaca arctoides

CONSERVATION STATUS: VULNERABLE

- Also called bear macaques
- Resident in Cambodia, China, India, Laos, Malaysia, Myanmar, Thailand, Vietnam; introduced in Hong Kong; possibly extinct in Bangladesh
- True to their names, their tails are short
- Their faces grow more red with age and both males and females exhibit hair-loss like male pattern baldness in humans
- Threatened by habitat loss and hunting for their meat and body parts; populations are decreasing



NORTHERN PIG-TAILED MACAQUE
Macaca leonina

CONSERVATION STATUS: VULNERABLE

- Found over a wide range of southeastern Asia including India, Bangladesh, Myanmar, Thailand, China, Laos, Cambodia, and Vietnam
- They live in a diverse range of primary and secondary bamboo, deciduous, cloud, and evergreen forests
- Populations in Thailand eat stinging caterpillars, first rolling the caterpillars in their hands or in leaves to remove the stingers
- Threatened by habitat loss, hunting for their meat and body parts, and collection for the illegal pet trade
- Populations in Bangladesh are Critically Endangered





Photo credit: David Harling, Duke Lemur Center/Creative Commons

SUNDA SLOW LORIS

Nycticebus coucang

CONSERVATION STATUS: ENDANGERED

- Named for their native Sunda Islands in Malaysia; and endemic to parts of Indonesia, Thailand, and Singapore
- Also known as greater slow lorises, *kukang* or *malu-malu* in Indonesia, and *ling lom* in Thailand
- Threatened by human encroachment and hunting for bushmeat and body parts
- Especially threatened by the pet trade where they rarely survive the stresses of captivity



The main concern in the reserve is that the habitat is being threatened by illegal trees felling encroachment by human settlements and habitat fragmentation. collection of large quantities of leaves and grasses from the forest bed to feed cattle poses interferences. The gardens are used by elephant as a corridor to Nagaland, making them vulnerable to frequent poaching. The railway further divided the park, standing a single group of gibbons in small fragments of the sanctuary.

Snapshots Of Railway Track, Tea Garden, Elephant Corridor :





Other mammal found in this sanctuary are Leopard Cat, Jungle Cat, Wild Boar, Asian Elephant, Indian Fox Bats etc. many different varieties of Lizard , Phyton, Cobra , Turtles are also found in this sanctuary.

Snapshots Of Leopard Cat, Wild Boar,Phython, Lizard





Due to the high density of primate population with this relatively small geographic area, the bird's nest and their eggs are devoured by the primates of the sanctuary. Hence the number of birds are relatively less. Among the birds found in this sanctuary are Hornbill, Green Pigeon, Owl, Woodpecker, Dove, Bulbul, Barbet , different species of Egrets etc.

Snapshots of hornbill and woodpeckers:



Different varieties of bamboo, cane orchids, ferns are found in abundance along with tress like holong, sashi, holokh, sam, kothal, ajar, titasopa, seleng etc in the thick forest of gibbon wild life sanctuary.

Snapshots Of Hollong (State Tree Of Assam) And Sashi Tree:



Hollong

Sashi tree

CONCLUSION:

Eco- Tourism idealistic goal is to improve the world through responsible travel, effecting never matching ideas, travelers can offer very real benefits to local community. However, tourism's relationship with the environment is complex involving activities that can have adverse environmental effects. On the other hand, tourism has the potential to create beneficial effects on the environment by contributing to environmental protection and conservation. It is a way to raise awareness of environmental values and it can serve as a tool to finance protection of natural areas and increase their economic importance. Every year community base Eco- Tourism venture -Gibbon conservation center in collaboration with Aaranyak (a registered society working in the field of biodiversity conservation in North- East) organizes training programme to ensure that all member of local communities are able to aid in the management, decision making and activity of the Eco Tourism operation creating public awareness where both national and international, including local delegates are invited to carry out the program.

- First and foremost is to achieve interventions i.e. Proper implementation of Wildlife protection laws for securing and protecting the wild life, community participation, and community outreach programs cum training should be organized.

- Secondly, it is necessary to include fellow government land attached to the sanctuary under its jurisdiction, which will enlarge the space for free and fare movement of animal species, curbing the problem of shortage of space and food.
- Thirdly, there should be Standard Government tourist accommodation as well as way side amenities to fulfill the demand of foreign and domestic tourists.
- Fourthly, Improved communication link should be provided for the tourist visiting the vary Sanctuary.
- Fifthly, Festivals should be organized to develop tourism in the area, alike the Elephant festival organized in Kaziranga in the month of February where most visitors from all around the world assimilate. Similar, initiatives should be adapted to enhance Eco- tourism in the area.
- Lastly, by well planned informative publicity, trained man power, improve service quality, and provision for research, could gear up the Sanctuary as a fine spot for eco- tourism.

In a nutshell, Consolidation of development activities along with inter- departmental understanding as well as co- ordination between Govt. and Private Agencies, NGO's will certainly open a new phase of Eco- tourism development in the region thereby benefitting the local communities.