

Examining the Possibilities of Promoting Tourism in Sunderbans in India

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Abstract- The delta formed by Ganga and the Brahmaputra is the largest of the world. A vast and dense mangrove forest has grown up on this delta. This is the Sunderbans – famous for its Sundari trees, its unique ecosystem and the Royal Bengal Tiger. Once, it was almost impossible to penetrate, but now a large part of the forest has been cleared away as the pressure of population has increased on the land. The local people as well as the government is looking for alternate sources of income and development. Ecotourism has now gradually becoming popular. Infrastructural facilities have increased, improving the connectivity of the land. The number of nature loving and adventurous tourists have also grown. As a result, it has been possible to nurture ecotourism in the area. But it needs to be remembered that Sunderbans is already ecologically fragile. The process of development should have several checks and balances built into the system to ensure that the ecosystem is not compromised any further. This paper seeks to examine the real ground level situation.

INTRODUCTION

Mangrove ecosystem is one of the unique ecosystems of the world. They typically develop in active delta regions where saline water from the sea enters the river channels during the time of tidal flow. The regular ingress of the saline water causes the soil to turn saline. As a result, only certain species of trees can survive there. In addition, the soil remains saturated with water for almost twelve hours every day. The roots of the trees remain submerged. In order to breathe, the trees develop negative geotropic roots called pneumatophores. These rise up from the soil and create a strange tableaux. Thus, a unique ecosystem is created.

The largest mangrove in the world covers the Ganga Brahmaputra delta as the rivers drain into the Bay of Bengal (Jalais, 2007). It covers an area of 9630 sq kms of which about 4000 sq kms fall in India and rest in Bangladesh. This region is called Sunderbans

after the unique Sundari (meaning beautiful) tree found in this region.

In 1972, the UNESCO drafted the World Heritage Convention, aimed at conserving fragile and / or valuable natural and cultural resources which are facing threats of extinction. India is a signatory. Under this convention, Sunderbans was declared as a World Heritage site. Its status was given further importance when it was designated as a Ramsar Site in 1982. This Convention offers special protection to wetlands of the World.

Over time, Sunderbans have developed a unique ecosystem comprising of various types of flora and fauna. Human habitation is increasing in the area creating pressure on the fragile environment and limited resources. It is becoming urgent to look for new avenues of income. Many inhabitants have thus turned to tourism. But, as the scale of tourism is increasing, several concerns are also raising their heads. The region already suffers from soil degradation, floods, almost yearly ravages by cyclones as well as conflict between man and wildlife. In such circumstances, how far is it advisable to develop tourism in the area?

OBJECTIVES OF THE STUDY

The objectives of this study are as follows:

1. Describe the cultural and physical resources of Sunderbans
2. Analyze the economic need of developing tourism in the area
3. Study the impact of development of tourism in Sunderbans with special emphasis on ecotourism
4. Suggest a plan to maximize benefits from tourism while preserving the environment

The Sunderbans

Chatterjee (1990) has identified the territory of Sunderbans as a contiguous deltaic region, spread over India and Bangladesh. This vast mangrove forest has grown up on the delta created by the Ganga in India and Brahmaputra and Meghna in Bangladesh. It stretches from 21°32' N to 22°40' N and between 88°05' E to 89°00' E. It is bounded by the Bhagirathi Hooghly river on the west and the Icchamoti, Kalindi and Raimongol rivers on the east (in India). The northern boundary is marked by the Dampierres – Hodges line. Politically, Sunderbans lies in the two districts of the state of West Bengal in India. These are the North and South 24 Parganas. There are 54 main islands here which are inhabited and 48 more islands which are the realm of the Reserve Forest. But as this is an active delta region, temporary banks and islands are being continually formed and destroyed.

The importance of Sunderbans lie in its unique flora and fauna. There are 84 species of flora. Of these, 26 are mangrove species. The most common trees, apart from Sundari, includes Hetal, Golpatta, Bain, Keora, Garan, Garjan, Geonwa etc. The Hetal tree is iconic here as it offers the best camouflage for the Royal Bengal tiger. The fauna here is highly diverse as can be seen in Table 1.

Table I: Diversity in flora and fauna in Sunderbans

Type	Number of species
Flora	84
Fish	120
Birds	290
Mammals	42
Reptiles	35
Amphibians	08

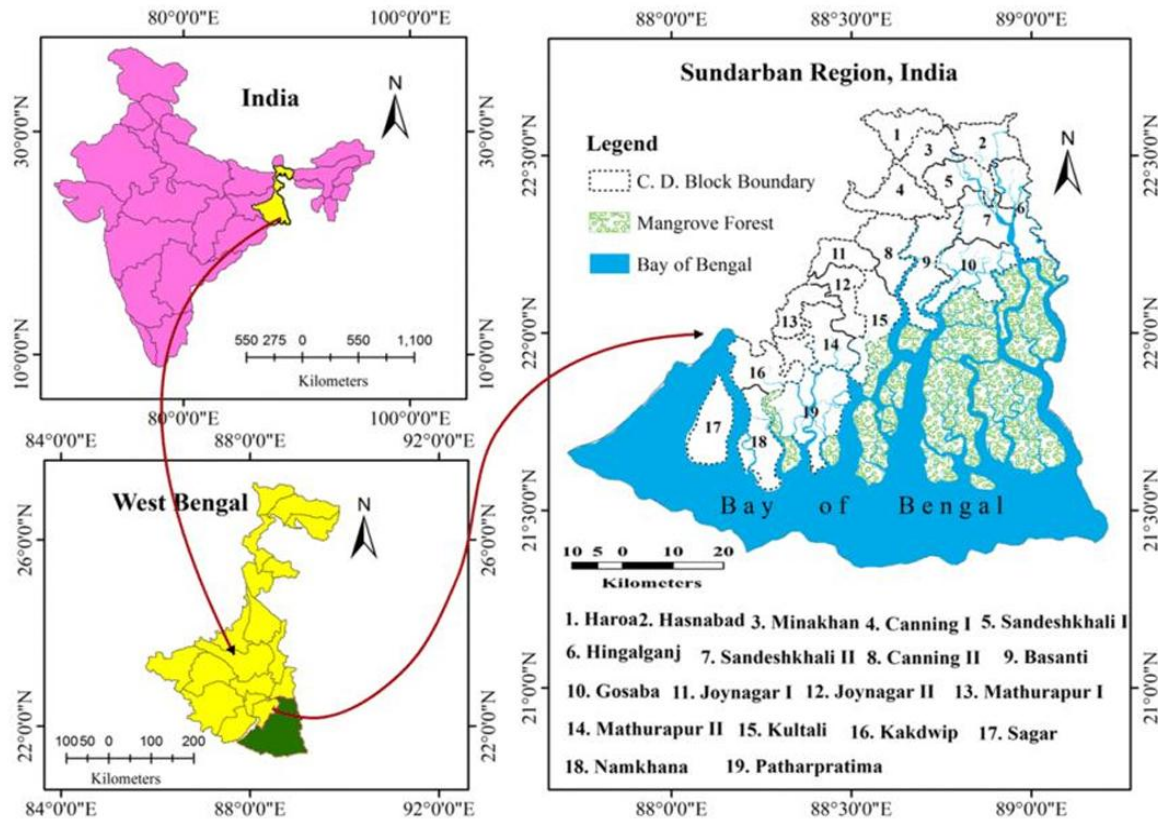
Source: Adapted from Rangeet Mitra (2024)

While all the animals contribute towards creating this amazing ecosystem it is the Royal Bengal Tiger who is the undisputed king. Sunderbans is the only mangrove habitat of the species *Panthera Tigris* in the world (Jamal et al, 2022). According to the report titled Management Effectiveness Evaluation (MEE) of Tiger Reserves, 2022, prepared by the Wildlife Institute of India, Dehradun, and National Tiger Conservation Authority, the number of tigers in Sunderbans have increased from 88 in 1996 to 101 in 2022. While this is a good news, it still ranks 31 out of 50 Tiger projects in the country. Forest officials have reported that the number of tigers is quite high compared to the carrying capacity of the land. This is disturbing because it is likely to lead to increasing conflict between man and wildlife in the future.

Apart from the tiger, other common species found in the Sunderbans are Cheetal deer, wild boar, monkeys, several species of wildcats, aquatic animals like Olive Ridley turtles, crabs and shrimps as well as a variety of birds like cormorants, Brahmini kite, osprey, crested serpent eagle etc. The forest is regarded as birdwatchers' paradise. The Sunderbans are also home to some endangered species like the Irrawady Dolphin, Gangetic dolphin and the barking deer. Many different types of snakes including King Cobra, Krait, Russel's Viper etc are common. The estuarine crocodile is another famous predator of the area.

Human beings live in close proximity to the animals in this area. This trend has increased especially after the partition of India when a vast number of refugees settled here and started agriculture, because this was the only unclaimed land available. The population has increased continually as time passed, creating increasing rates of deforestation and more and more conflict between man and the wild life.

Fig. 1: The Location of Sunderbans in India



Source: Adapted from Ali et al, 2019

Table II: The changing population of Sunderbans in India

Year	Population
1941	959675
1951	1159559
1961	1532102
1971	2003097
1991	3154704
2001	3757356
2011	4426259

Source: Sarkar 2011, District Census Handbooks, Census of India

The main economic activity of the area are as follows:

- Agriculture – Though the soil is mostly saline, the water brackish, the people of Sunderbans still depend mostly on agriculture. Monoculture of kharif rice is the most prevalent form of farming. In some areas, depending on the suitability of the soil, lentils and vegetables like pumpkin, okra etc are cultivated. Recently, efforts have been made to introduce cotton cultivation (Saha, 2015). However, agriculture in Sunderbans suffer from poor yields. This is a

result of the saline soil. In addition, crops are often destroyed by rising sea levels and cyclones whose intensity and frequency has increased in the recent years due to loss of vegetation cover.

- Aquaculture – Cultivation of fish and shrimp is one of the most important activities of this area. Fish cultivation is often carried out in conjunction with rice cultivation and / or duck rearing. Common species include Rohu, Katla and Mrigel. Silver Carp, Grass Carp, Common Carp and Java Barb are now being raised widely as the yield is higher and there is a good market. Brackish water species like Asian Sea Bass, Flathead Grey Mullet are also raised, but the most prized product in this category is the Giant Tiger Prawn (Kumari, 2020). Aquaculture is not carried on in a very scientific manner in the region. As a result, though it is a popular activity, it causes significant environmental degradation.
- Collection of non timber forest products – Sunderbans have long been known for its forest products. The most prized is honey. Crab fishing is another important activity. Honey collectors are allowed to enter the buffer zone

of the forest in groups of 5 to 10 and collect honey and beeswax. Sunderban honey is a GI tagged product prized for its purity.

Table III: Collection of honey and beeswax in Sunderbans

Year	Crude Honey Collected(in Kg)	Bee Wax Collected(in Kg)
2004-05	22120	1100
2006-07	25170	1142
2007-08	21368	1396
2009-10	13800	632
2010-11	14300	265
2011-12	18025	1468
2012-13	24750	2227
2013-14	20950	1764
2014-15	47412	4563

Source: Mitra (2018)

As the population of the Sunderban region has increased steadily, the three above activities are failing to keep up. Physiologically, the area is not suitable for agriculture. In recent years the increase in frequency of disasters like cyclones and floods have brought agriculture to a critical point. While fishing, catching and / or cultivating crabs and prawns remain a major occupation, the risks are increasing day by day. The honey collectors are facing same problem. There has been 368 confirmed deaths due to tiger attacks in the Sunderbans between 1999 and 2014. The total number of attacks are probably more than 400. This is a unique issue in Sunderbans. In various other Tiger projects of India, tigers live closely with humans, but there has been no attack reported. Experts have suggested four theories.

(<https://www.lairweb.org.nz/tiger/maneating8.html>) First, tigers drink saline water which damage their liver and kidneys and make them go after humans who are easier prey. Second, honey collectors often illegally enter the core zone to collect more honey. Honey is best available in May which is also the mating season of tigers. Hence, when they are disturbed, they tend to attack and kill. Third, there is paucity of prey like wild boar and cheetal deer. Tigers of Sunderbans are used to eating fish and are expert swimmers. So, when they find a boatful of fishermen with their catch, they attack in hopes of easy food. Finally, the cubs learn this behavior from the mother. Local people say that corpses often float down the channels. These are people who have died

in cyclones and floods as well as from snakebite as local superstition indicate that such corpses be thrown in the river. These dead bodies offer early taste of human flesh to the tigers of Sunderbans.

The tourist resources of Sunderbans

The activity of tourism has developed gradually in the Sunderbans. While the Royal Bengal Tiger is a coveted sight, the forest is so dense and the undergrowth so thick that it is very difficult to see. Sunderban tigers are spotted only when they come to the river for drink or happen to swim across the river. But, though spotting a tiger is very much a matter of luck, the sheer beauty of the forest cannot be denied. It is the only mangrove forest in India where the wildlife safari is done by boat. Crocodiles swimming by is not uncommon. A variety of bird calls give an exotic air. Combining all this, Sunderbans have now become an important tourist destination of the country.

The major tourist spots here are as follows:

- Sajnekhali – This is generally the first and most important spot in Sunderbans. A watch tower have been set up here which can accommodate around 20 people at a time. It overlooks the Sunderban National Park. Lucky visitors can spot deer or wild boar. But Sajnekhali is best known for bird watching. There are more than 200 species of birds. The most commonly seen are egrets, ibises, plovers, kingfishers, pelicans as well a variety of migratory birds. This area also has a Mangrove Interpretation Centre which provides many interesting information to the tourists about this unique ecosystem.
- Sudhanyakhali – This is another watchtower which overlooks a sweet water pond. One can sometimes spot wildlife like wild boar and axis deer coming here for a drink. Several bird species like magpie robin, kingfisher, egrets are spotted. Estuarine crocodiles and monitor lizards are also spotted sometimes. A small mangrove park has been created here to showcase the main flora species of the area.
- Dobanki – The government has constructed a half kilometer long canopy walk in this watchtower so that tourists can look down upon the majesty of the jungle. A variety of kingfishers may be spotted here.
- Netidhopani – This point is another popular spot for the birdwatchers, but its true significance is cultural. There is a ruin of almost 400 year old

Shiva temple here. The spot is intimately linked with mythology and history of south Bengal.

- Bhagabatpur crocodile breeding centre – This centre was set up in 1976 for a breeding program for the saltwater crocodile of the area. The centre is laid out in the midst of the forest and is a huge attraction for the tourists.
- Hiron point – It is located at the extreme tip of the mangroves and offers a vast unobstructed view of the Bay of Bengal.

However, the real thrill and beauty of Sunderbans come not from these spots but the long boat rides which are the only means of transport to go from one spot to the other. Lunches ply along designated routes and tourists get to experience a mangrove cruise which is unlike any other available in the country.

The interdependence of man and nature, their coexistence for almost 200 years has developed particular cultural and religious beliefs which has contributed towards creating a unique intangible cultural resource (Saha, 2017). For example, tiger is worshipped here as Dakshin Ray. Fishermen, crab trawlers and honey collectors must worship the local goddess Bono Bibi for protection from attacks of wild life. Women who have lost their husbands to tiger attacks are ostracized as tiger widows as it is believed that their menfolk must have displeased the gods of the forest in some way in order to fall prey to wildlife. This cultural heritage needs to be protected. Joint forest management techniques have been introduced here for this purpose. However, the threats facing the physical environment is also posing a danger to this heritage.

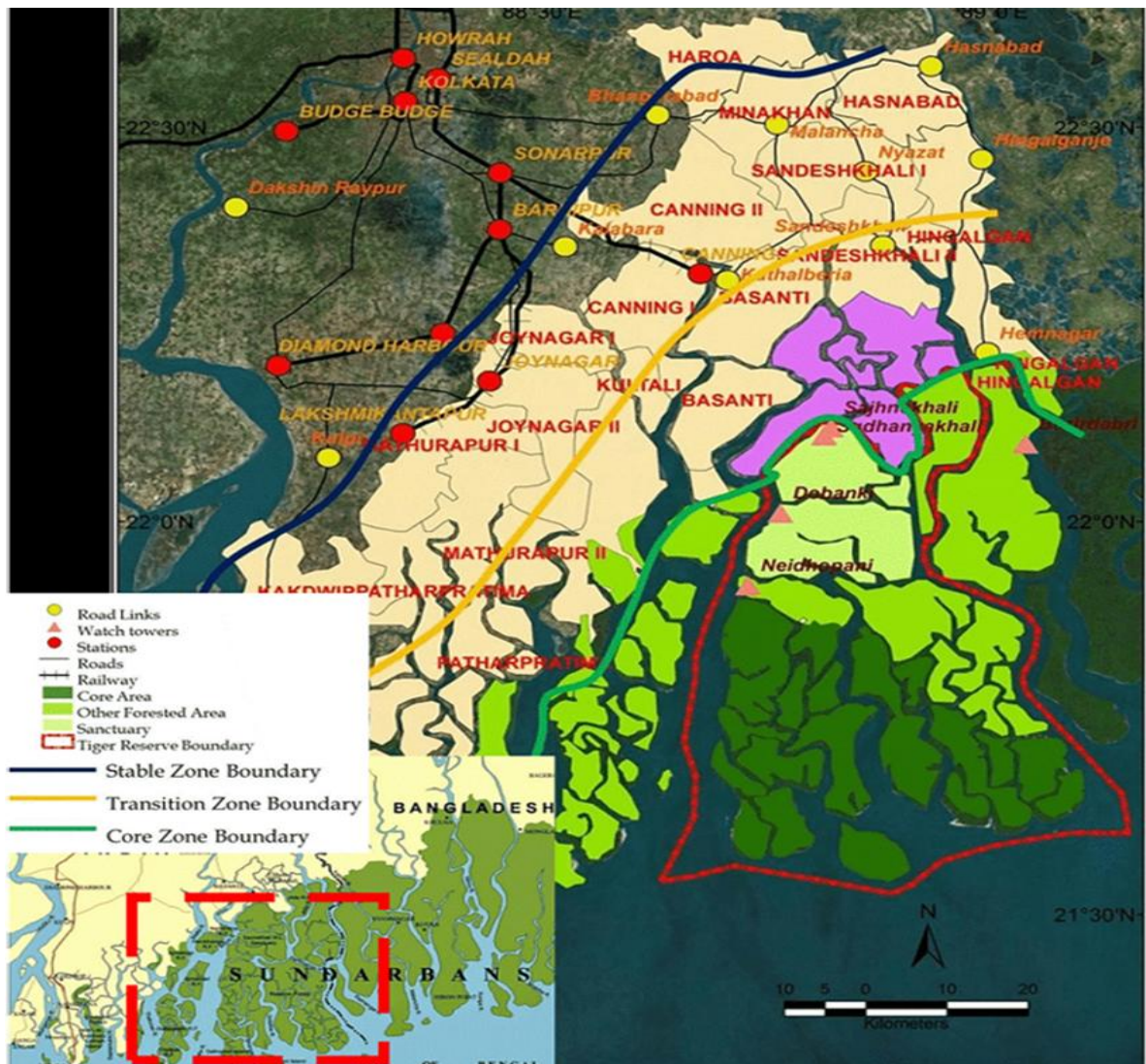


Fig 2: The tourist areas of Sunderbans

Source: Jamal et al (2022)

The pros and cons of developing tourism in Sunderbans

When we analyze the economic situation of the Sunderbans, it brings out a stark picture. As has been previously pointed out, the population is steadily increasing in this area. The pressure on the land is increasing. The main source of income remains agriculture. However, several factors hinder this. The saline soil and the backflow of sea water entering the creeks during high tides significantly affect the yield. Most of the sunderban farmers practice monoculture of rice. But fields of kharif rice are flooded every year. This result in low yield. Lentils and vegetables cannot sustain the population.

The rivers are the lifelines of Sunderbans. Fishing, fish culture, prawn culture and trawling for crabs is the second most important economic activity of the region. However, these activities have several risks. Boats of fishermen and crab hunters have faced accidents as well as attacks by wild animals. Those who trawl for prawns and crabs often discard the by-catch which affects the environment in a negative way. Dolphins are sometimes entangled in the fishing nets. In those cases the nets may be torn. This is a huge economic loss for the owner as these nets are not cheap. So, in other cases the fish is killed to release the net. These river dolphins are already endangered. Collection of non timber forest product also poses the risk of uncertainty and wild life attack. Honey collectors often wander into the core area. They destroy hives while smoking out the bees. All these leave negative impact on the environment.

Tourism provides a viable alternative economic avenue in the region. In the years following independence, the forest here was too dense and dangerous. But as more and more refugees began to reclaim the land and settled here, the infrastructure of the region was gradually build up. Today, connectivity and accessibility of the Sunderbans

have increased vastly. This has opened up the opportunity of developing the tourism industry.

In the meantime, the pressure of population on land has also increased. Over utilization has caused soil degradation affecting the productivity of land. It is urgent for the people to seek out alternate arrangements.

With the dawn of the new millenium, there has been a marked shift in the tourist market. People are now more interested in immersing themselves in the total cultural experience. Resorts and homestays have emerged in Sunderbans where tourists get to interact with the local people, eat local cuisine and enjoy indigenous cultural shows. The latter has become very popular as it provides employment to local women. Tourists get the feel of exotic experience. The dense mangrove forest, sound of the river and occasional bird calls and sound of the wildlife have created an atmosphere which the adventurous tourists love. When we add the factor that all transport is by boat, Sunderban tourism truly becomes an experience that is very much worth its value to the tourists.

The following figure clearly shows that apart from the covid years, tourism has been increasing steadily in the region. One added factor needs to be kept in consideration. The mangrove have become vulnerable to cyclones and super cyclones in the last two decades. Perhaps the most destruction was caused by the cyclone Aila in May 2009. The devastation was so extreme that the region bears the marks even today. It destroyed large part of the forest which was already vulnerable. The destruction of the protective mangrove cover led to the increased impact of following cyclones like Bulbul (2019), Amphan (2020) and Yaas (2022). The accompanied flooding has considerably decreased the fertility of the soil. People therefore are becoming more and more reliant on alternate source of income. Tourism has emerged as one of the most viable alternatives.

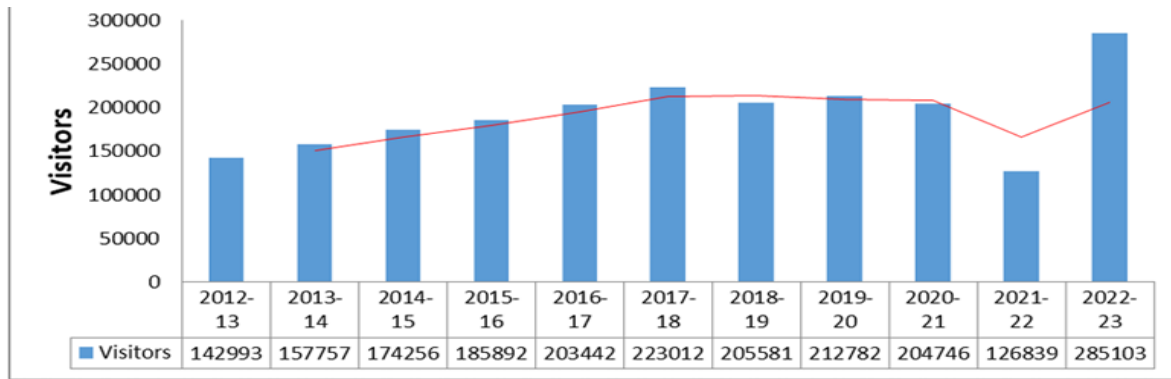


Fig. IV: Arrival of tourists in Sunderbans (India) from 2012-13 – 2022-23

Source: Sunderban Tiger Reserve, Annual Report, 2022-23

Fig. V: Revenue generated from tourism in Sunderban Tiger Reserve, 2022-23

Name of Eco-tourism site (PA/Zoo/Eco-park/ NIC, etc.)	Number of tourists visited during 2022-23		Revenue earned (in Rs.)
	Indian (Adult +students)	Foreigner	
STR Jurisdiction	2,82,834	2269	46655284.12

Source: Sunderban Tiger Reserve, Annual Report, 2022-23

Recently, the government is committed towards promoting ecotourism in the Sunderbans. According to United Nations World Tourism Organization, “Ecotourism is a type of nature-based tourism activity in which the visitor's essential motivation is to observe, learn, discover, experience and appreciate biological and cultural diversity with a responsible attitude to protect the integrity of the ecosystem and enhance the well-being of the local community.

Ecotourism increases awareness towards the conservation of biodiversity, natural environment and cultural assets both among locals and the visitors and requires special management processes to minimize the negative impact on the ecosystem.”

Considering the fact that Sunderbans is a biodiversity hot spot and a Ramsar site, ecotourism is the best possible practice of the area. It will ensure minimum intervention in the natural cycle. At the same time, it will provide much needed employment in the area. If tourism does not flourish, more and more pressure will be exerted on an already fragile ecosystem, leading to ultimate crash and loss of irreplaceable biodiversity.

As tourism infrastructure is slowly improving, income and employment generation is increasing. A niche market has been created among foreign

tourists as well. However, there is still some gaps between the various stakeholders. For example, Sunderbans used to have a no visitor day on Tuesdays to carry out maintenance work. This has been shifted to Fridays without consulting the tour operators as reported in newspapers. Most tour operators are not happy because tourism in Sunderbans rely heavily on weekend tourist traffic. A comprehensive plan needs to be set in place if ecotourism is to develop in the Sunderbans.

While the advantages of developing tourism is undeniable, there are some downside as well. One problem is already emerging and will probably become more serious in the future. This is the problem of construction of unauthorised lodges in the forest area. There are administrative loopholes. There are also the problem of encroachment and illegal construction. As a result, unregulated lodges are being built in many parts of sunderbans. In order to cater to the demands of the tourists, they are utilizing the fresh water supply and electric supply of the area. Both these infrastructural facilities are expensive and difficult to obtain. Overutilization of the fresh water is leading to back flow of the brackish water, contaminating more agricultural field.

One of the problems is that though ecotourism is the target, tourists visiting Sunderbans are often not

aware or responsible. Loud music and other disturbances are common. This is extremely harmful to the wildlife and has been proven to disturb their daily cycles. This is the reason that the government has kept one visitor free day in a week. However, this is not enough. If tourism is to become a viable alternative, tourists need to be made more aware.

The gradual erosion of mangrove cover is the direct result of tourism. It spells great danger to entire Gangetic delta – exposing it to destructive cyclones as well as the erosional impact of the sea. Yet, in order to please the tourists, more and more of the buffer area are being given over to tourist facilities. A delicate balance has to be maintained to preserve this ecosystem.

It has been observed over the years that only a very small amount of benefits of tourism trickle down to the local people. They are often employed as porters, cleaners, cooks, boatmen and guides. Women put up cultural shows. But the major income from tourism goes to the investors who are not native to the region. They provide the money and the connection to purchase land and construct resorts. In exchange, they get lions' share of the income.

Some suggestions

In spite of the difficulties, Sunderbans offer a unique opportunity to develop a niche tourism. Some suggestions are given here to maximize the benefits of this activity:

- No one who is not a permanent resident of Sunderbans should be allowed to purchase land and construct tourist resorts here. Cooperatives and self help groups should provide the finance.
- Strict building guidelines should be designed and implemented.
- Afforestation and forest reclamation programs should be taken up.
- The quality rather than the quantity of the tourists should increase. Marketing campaigns should target responsible and aware tourists. Concepts like voluntourism, green tourism etc should be increasing.
- Nature based activities like birdwatching should be given priority. Such tourists tend not to harm the environment.
- There must be a strict limit on sound to be made at tourist resorts in order not to disturb the wildlife.

- Boats and launches must be inspected regularly by designated authority. These are the main means of transport. A single accident can cause huge negative impact.
- Garbage collection requires special attention. More tourist visits automatically mean more garbage generation. Sunderban would do well to follow the policy adopted at several National Parks of India. In these parks, all tourist garbage are collected in disposal bags and taken out of the Park area, to be disposed at the nearby garbage collection centre. Such centres will have to be created near the tourist zones.
- The tourism industry here should follow a strict no plastic policy. Local people need to be made aware of the reason. Then only can it be properly implemented.
- Regular discussion with all stakeholders is necessary to promote tourism in Sunderbans without harming the ecosystem.

CONCLUSION

Sunderbans have long been regarded as a dangerous area. It is the land of man-eating tigers, estuarine crocodiles, infested with mosquitoes and covered with marshland. But the development of infrastructure has revealed the sheer beauty of the region which was hiding behind the danger. Conflict between man and wild life is still there. Cyclones have increased in intensity and floods are common. Yet, Sunderbans remain a tourist spot where rivers and forest meet together to gift an unforgettable experience to the tourists.

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