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PROBLEMS AND PROSPECTS OF ECO-TOURISM IN INDIA, WITH SPECIAL REFERENCE TO 'BHITARKANIKA', ODISHA

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ABSTRACT

Ecotourism is a dynamic and effective instrument that integrates 'ecology' with 'economy' for benefit of both. Well-planned eco-tourism can benefit both protected areas and residents of surrounding communities by linking long-term biodiversity conservation with local, social and economic development.

Bhitarkanika is a unique habitat with a lush green mangrove forest on the sides of meandering creeks and the tilde mud flats located in the Kendrapara district of Odisha, India. It is the second largest mangrove eco-system in India after Sunderbans and is home of diverse flora and fauna so intricately linked with each other. It forms the deltaic region of the rivers Baitarani and Bramhani. This area was not approachable from outside due to hostile conditions and lack of any communication whatsoever. After 1951 large scale encroachment on forest land took place due to expansion of agriculture.

KEYWORDS: Amphibian, Ayurvedic, Ecotourism, Estuarine Crocodile, Flora, Macro Fauna, Mangroves, Olive Ridley Sea Turtle, Reptiles, Wild Life Sanctuary

BHITARKANIKA NATIONAL PARK

Mangroves are salt tolerant, complex and dynamic eco-system that occur in tropical and subtropical inter-tidal regions. Bhitarkanika is one such location of rich, lush green vibrant eco-system lying in the estuarine region of Brahmani- Baitarani in the North-Eastern corner of Kendrapara district of Orissa. The area is intersected by a network of creeks with Bay of Bengal on the East. The alley between the meandering creeks and rivers, houses the second largest viable mangrove eco-system of India. Its 672 sq.kms. of mangrove forest & wetland, provides home to well over 215 species of birds including winter migrants from central-Asia and Europe. Giant salt water crocodiles and variety of other Wildlife inhabitant in this eco-system which form Asia's one of the most spectacular Wildlife area.

An area of 145 Sq.kms. have been notified as Bhitarkanika National Park vide Notification No.19686/F & E dated 16.9.1998 of Forests & Environment Department, Govt. of Odisha. It has much significance with regard to ecological geomorphological and biological background which includes mangrove forests, rivers, creeks, estuaries, back water, accreted land and mud flats. Bhitarkanika National Park is the core area of Bhitarkanika Sanctuary.

BHITARKANIKA WILD LIFE SANCTUARY

Bhitarkanika Wildlife Sanctuary was declared vide notification No.6958/FF AH Dtd. 22.04.1975 over an area of 672 square kilometers. The Sanctuary comprising Mangrove Forests meandering rivers, innumerable criss-crossed tidal inundated creeks provide last refuge to the already endangered salt water Crocodile (*Crocodile Porosus*).Besides estuarine Crocodile, the Sanctuary is rich in avifauna mammalian and reptilian population. Theses Mangrove forests are good habitat for King Cobra, Indian Python and Water Monitor Lizard. A large number of water birds visit Bagagahan heronry which is an area of approximately 4 hectare. within the Bhitarkanika Forest Block near Suajore creek from the month of June to October. Most of the Birds are Asian open bill. Egrets. Black Ibis, Cormorants, Darters & etc.

BHITARKANIKA RAMARSITE

During 2002 the Bhitarkanika mangroves having an area of 2672 sq-km. been declared as a Ramsar site being a wetland of international importance.

OBJECTIVES

1. To understand the meaning and Scope of Eco- tourism
2. To find out the potentials of eco-tourism in Odisha, specially in Bhitarkanika
3. To study the natural resources, flora & fauna in Bhitarkanika.
4. To understand the problems and find out the solutions of Bhitarkanika.
5. To study the role-played by Bhitarkanika for promotion of Eco- Tourism in national perspective.

METHODOLOGY USED

For preparing this report, I have adopted a questionnaire and observation method. A total of 40 questionnaires were filled in on the visit to Bhitarkanika. There were also interaction with the staff of Bhitarkanika Wildlife Sanctuary and the guides. A major limitation was that the dwellers in the Sanctuary could not be contacted to elicit their perceptions / concerns. Nevertheless, since the DFO himself was accompanying the team inside the Sanctuary, we could authenticate the information in order to arrive at specific conclusions and suggestions.

THE MANGROVE ECOSYSTEM

A variety of plants are seen putting up luxuriant growth in this inter tidal habitat. These species are endemic to the area and are called mangroves. Some species occurring outside inter tidal environment are called associates of mangroves. As many as 62 species of mangrove & its associates are found in Bhitarkanika Sanctuary. The mangrove is specialized plants which can tolerate inundation and salinity. Their adaptation to salinity condition is by preventing high concentration of salt, entering roots and secreting salts from their leaves. Mangrove seeds germinate on the trees, before they are disseminated.

They grow a spear like hypocotyls, which when dislodged, get embedded into mud and develop anchoring roots. Many mangroves have stilt root, which are aerial and acts as anchoring structure to withstand wave action.

Some mangroves have inverted wedge like projections on the ground from the underground root system, called pneumatophores. The plants breathe in oxygen through the pores of pneumatophores during prolonged time of submergence of the root system.

Wetlands are important repositories of biological diversity and are among the world's most productive ecosystems. They help regulate water flows, remove sediments and pollutants, and provide essential habitats for diverse fauna. They are threatened in many parts of the world by drainage for agriculture or urban expansion, conversion to aquaculture ponds, overgrazing in forested wetlands, logging. Bio-diversity is usually analyzed at three levels, the variety of communities and ecosystem within which organisms live and evolve, the variety of species themselves, and the genetic variety within those species. The degradation of the whole ecosystem such as forests, wetlands and coastal waters, is in itself a major loss of bio-diversity and the single most important factor behind the current mass extinction of species.

Mangrove ecosystem supports a range of interconnected food chains which directly sustain the fisheries to exist. Algae and detritus sustain shrimps and prawns which provide a food source for species such as Bhekti *(*Lates Spp.*)*. Cat fishes, etc. Fish and prawns spend most of their adult life at sea and return to the mangrove areas where they spend their early life. Some of the commercially important fishes are illisha *(*Hilsa illisha*)*. Khainga (Mullet Spp.*)*. Bhekti *(*Lates calcifer*)*. Kantia *(*Mustus qulio*)*. Kokill or Anchovy (Coilia dussumier*)* etc. Some fish species that are of interest as aquarium fishes include Rice fish (Oryzias melastigma*)*, Panchx (Aplocheilus ponchax*)*. Puffer fish (Chelonodon fluviafilis*)*. Terapon jurbua. Acer fish (Toxotes Jaculator), Climbing Perch (Anabas testudineus). Dwart gourami *(*Colisa lalia). Species Eleotrid *(*Sleeper). Glass fish *(*Chanda Spp.*)*. Pipe fishes, Mud skippers (Periophthalmus *and* Bolephthalmus Spp.*)* etc. The mud skippers are able to survive short periods of aerial exposure, skip around on the water and mud and build chimney like burrows in muddy banks of river and creeks throughout the Sanctuary.

In the whole of South-East Asia as well as in the Northern Indian Ocean countries Bhitarkanika is famous for its reptilian fauna. It is an unique reptilian refuge. The reptilian fauna is largely dominated by Indo-Chinese elements. The longest estuarine crocodile of the World measuring more than seven meters long are located here.

STATUS OF MANGROVES IN ODISHA

In Odisha, the mangroves extend from Balasore coast to Puri coast over an area of 211 Sq. Km. around Dhamra Mouth mangroves exist in very dense patches in Bhitarkanika area which has been declared as a sanctuary by Government of Orissa in 1975 for better protection of the habitat and the

diverse wildfire. It is located between, 20°4' North - 20°8' North latitude and longitude 86°45' East - 87°50' East and the total area of the sanctuary is 672 Sq. kms including the creeks, rivers, etc.

Mangrove forests are of great importance and have protective value apart from their huge economic potential, in the area where no plant species other than mangroves grows. In mangrove ecosystem, ecological succession follows distinct course from the eastward fringe forests to land forms and on the other-hand from the saline brackish water environment to non-saline, freshwater and mesophytic environments.

Most of the mangrove species are well-developed on well-drained edges of the tidal creeks, rivers and channels. Water logging of the soil causes dwarfing in the plants. .Fresh water supply from rain or runoff from upstream water, evapo-transpiration, silty nature and soil nutrients are important factors contributing to dense Mangrove growth. Distribution of species is dependent on the salinity and supply of freshwater.

In Bhitarkanika, upper level of mangrove forests in interior forest blocks is exposed to air for a few days and during mid-solar phases tide water does not reach there. This helps to compact the soil layer as the absence of the tidal water brings the soil particles closer. In the seaward side, *Avicenna Alba*, *A. marina* and *Sonnertia species* are established as pioneer species and their seeds and seedlings are distributed within high tide level to the mean sea level. These seedlings grow in such a fashion that their roots become interconnected and check soil erosion. There is a large number of other species that prefer shady localities.

DYNAMICS, ECOLOGICAL ROLE AND IMPORTANCE OF THE MANGROVE ECO-SYSTEM

The mangrove ecosystem is both complex and dynamic. It is a highly fragile ecosystem. The essential factors for maintenance of the system are regular fresh water influx from adjoining land and tidal inflow from the sea. Any change in the regime of either factor, whether in quality or quantity is likely to effect a corresponding change in the mangrove biota. In fact world's best mangroves have developed in areas having regular flow of fresh water or where the fresh water influx is more.

Sheltered waters of mangroves provide nursery grounds for commercially harvested prawns and shrimps which although breed only in the sea usually spend their early life in the mangrove environment. Several fish species come to the estuary to breed viz., Bhekti and Hilsa. Prosperous coastal fisheries on a sustainable basis are important to the economy of the people living around mangroves. About a lakh of people depend directly or indirectly on fishing in the coastal districts of Balasore, Bhadrak, Kendrapara and Jagatsinghpur. If mangroves were absent, there would be very little detritus and very low yield of fish, affecting the subsistence and general economy of the region and the state. This alone justifies the conservation of mangrove ecosystem

THE FLORAL DIVERSITY OF BHITARKANIKA

The mangrove forests of Bhitarkanika in the Bramhani- Baitarani-Dhamra deltaic region are continuous and comprise single compact patch of estuarine forest in Odisha and second largest compact patch in mainland India after Sunderbans of West-Bengal. It is cut off by countless creeks, rivers and waterways. Forests in Bhitarkanika grow in various associations in different stage. As many as twenty such distinct associations can be identified. Bhitarkanika had rich mangrove forests in the recent past up to the first half of the 19th century. In spite of this, Indian botanists of the past have ignored mangroves of Odisha in general and that of Bhitarkanika in particular. Due to the remoteness of the area, even in the British India period and immediately thereafter for more than four decades, no sincere attempt was made by the botanists for a thorough study of the mangrove plants of this region. A thorough study is yet to be taken up on various aspects of the diverse estuarine plants, especially on their physiology, ecology, anatomy, distribution pattern in relation to various environmental factors, contribution of the mangroves to the food web of the tidal estuarine system and coastal fisheries, plant animal associations, etc.

The Floral diversity of Bhitarkanika Includes a total of more than 300 plant species it includes both mangroves and non-mangroves belonging to 80 families (93 number of plants belonging to 18 monocotyledons families and 209 number of plants belonging to 62 dichotyledons families.

THE FAUNAL DIVERSITY OF BHITARKANIKA

Bhitarkanika presents a variety of habitats, microhabitats and climatic conditions. Therefore, the faunal component and faunal diversity is also extremely high in comparison with other mangrove forest areas of Orissa. The habitat diversity includes agricultural fields, rivers, fresh water ponds, rich mangrove vegetation, tidal rivers, creeks and creek lets; estuaries; mud flats; fresh water and brackish water wetlands; riverine islands; offshore islands; muddy and sandy coastline etc. which provide home for a varied and large number of animal species. Mangroves serve as resting, nesting, feeding, breeding and nursery ground of several faunal groups and thus play a key role in the food web of tidal rivers, tidal forests and in the estuarine food web. Mangrove plants are the source of rich food for the organisms of the mangrove-ecosystem. The animals that are associated with the mangroves cover a wide range of invertebrate and vertebrate groups. In Bhitarkanika the animal species are distributed in distinct zones throughout the sanctuary depending upon surrounding plant community and other environmental factors such as soil type, salinity, tidal flooding etc.

1. There are several species of crustaceans, molluscas and other invertebrates including protozoa and zoo planktons. The vertebrate fauna includes a wide variety of fishes, amphibians, birds, reptiles and mammals including aquatic mammals.
2. Bhitarkanika sanctuary is home for the largest number of salt water crocodiles in the Indian subcontinent. The heronry at 'Bagagahana' provides nesting and living space to about 80,000 water birds for their colonial nesting during rainy season where as the numerous wetlands scattered throughout the sanctuary serve as feeding and wintering grounds for more than 50,000 migratory birds during winter and early summer months. The Gahirmatha beach, which serves

as the eastern boundary of the sanctuary, is the world's largest nesting ground of the endangered, Olive Ridley sea turtle, Lepidochelys olivacea.

INVERTEBRATES

1. **Macro fauna:** There are as many as 60 genera and 64 species of sedimentary macro fauna inhabiting the littoral sediments of Bhitarkanika mangrove ecosystem.
2. **Meiofauna:** The meiofauna comprised of 30 taxonomic groups, as many as 34 genera and 55 species of harpacticoid copepods belonging to 16 families have been encountered in the study area of Bhitarkanika.

REPTILES

In the whole of South-East Asia as well as in the northern Indian Ocean countries Bhitarkanika is famous for its reptilian fauna. It is an unique reptilian refuge. The reptilian fauna is largely dominated by Indo-Chinese elements. With its numerous creeks, *nullah*, tidal rivers and good mangrove cover, the Bhitarkanika sanctuary in Orissa is home for the largest number of estuarine or the salt water crocodiles in the Indian subcontinent. The longest estuarine crocodile of the world measuring more than seven meters long are located here. The sanctuary is the home for all the three species of Indian monitor lizards including giant specimens of India's largest lizard, the water monitor lizard (Varanus salvator growing up to 2.5 metres length. The sanctuary also holds endangered snakes like Indian Python (Pvthon molurus), King cobra (Oohioohaaus hannah) as well as multiple number of a variety of other snake species. Gahirmatha coast which forms the eastern boundary of this sanctuary is the world's largest nesting ground of the endangered Olive Ridley sea turtle, Lepidochelys olivacea. Out of a total of 110 species of reptilian fauna found in Orissa (Mishra et at., 1996), Bhitarkanika has a total of 42 species recorded so far belonging to 22 families (Kar 1998).

MAMMALS

The mammalian fauna of Bhitarkanika consists of a total of 28 species belonging to 7 orders, 18 families and 25 genera (Kar 1998). The details of mammalian fauna are Spotted Dear or Chital ,The Sambar,The Indian Wild Boar, Asiatic Jackal, Panthera Pardus (Meyer), (Leopard or Panther), The Fishing cat, The Jungle Cat, The Leopard Cat ,The Striped Hyena, Common Mongoose, Oriya Name : Pani Odha, Oriya Name :Salia Patani, Palm Civet, House shrew, Rhesus Macaque, Three Striped Palm SquirrelThe Indian Porcupine,Indian Field Mouse,White-bellied House Rat,Indian Mole Rat,The Bandcoot Rat,Shortnosed Fruit Bat,Indian Pipistrelle,Chememia,Platanista gangetica (Lebeck),(Gangetic dolphin),Humpback dolphin,Irrawady Dolphin, Black Porpoise, etc

Fishes: Mangrove ecosystem supports a range of interconnected food webs which directly sustain the fisheries to exist. Algae and detritus sustain shrimps and prawns which provide a food source for species such as Bhekti, Cat fishes, etc. Fish and prawns spend most of their adult life at sea and return to the mangrove areas where they spend their conjugal life. Some of the commercially important fishes are llisha (Hilsa illisha), Khainga (Mullet J.), Bhekti (Lates calcitel, Kantia (Mustus Qulio), Kokill or

Anchovy (Coilia dussumierlJ etc. Some fish species that are of interest as aquarium fishes include Rice fish (Orvzias melastiQma), Panchax (Ajiocheilus oonchax), puffer fish (Chelonodon fIuviatilis)

THE OLIVE RIDLEY SEA TURTLE

Olive Ridleys are the smallest of all sea turtles. These are the only species of sea turtle which nests along Gahirmatha coast of the sanctuary as well as along the entire length of Orissa's coastline where ever exists a suitable sea beach. The adult is olive brown above and yellowish below. The species is distinguished by the presence of five or more coastal shields on carapace. Carapace length varies along 56.5 to 75 cm. A fully-grown female at the time of breeding ranges from 40 to 60 kg in body weight. It is large and triangular. Olive ridley is a circumglobal species and is widely distributed in the tropical waters of the Pacific, lndian and Atlantic Oceans. This is the commonest sea turtle along the Bhitarkanika's coastline as well as along the coastline of Orissa. Olive ridleys are 'omnivorous or predominantly carnivorous feeding on fish, crabs, crustaceans, molluscs, jelly fishes, etc. The species is capable of foraging at great depths (up to 150 meters or more in tropical waters and undertake long journeys in search of suitable feeding and breeding grounds.

In Bhitarkanika, Gahirmatha is considered to the world’s largest sea turtle rookery where large synchronized aggregation or arribada involving up to 6.9 lakh nesting female sea turtles occurs tow times a year, the first one during late December to mid-march and the second one in March or April months. In some nesting season there may be only one mass nesting. In last two decades along Gahirmatha Coast mass nesting has failed to occur in some years viz., 1980-81 and 1987- 88 nesting seasons. A matter of concern has been the lack of mass nesting consecutively for two years i.e., during 1996-97 and 1997-98 nesting seasons at Gahirmatha coast. Although in the past, mass nesting did not occur in some years this is the first time that no mass nesting has occurred for two consecutive years. However, mass nesting did occur at Rushikulya mouth both in 1996-97 and 1997-98.

A feature of the Olive Ridley population of Gahirmatha coast has been shifting of mass nesting site during last 20 years. During the above period there has been a northward shifting of mass nesting ground. In 1970's the stretch of coastline 'from mouth of Satabhaya up to Ekakula area was used for mass nesting. In 1980's the stretch of coastline from Habalikhati northwards up to Ekakula area was used for mass nesting. In May 1989, during a cyclonic storm, the Gahirmatha mass nesting beach got fragmented. Thereafter, since 1990 nesting season, mass nesting has become restricted to the northern most tip, now known as *Ekakulanasi Rookery*. Mass nesting usually occurs when condition to support mass nesting. Nesting takes place mainly at night. The incubation period varies from 45 to 70 days and is temperature dependant.

CROCODILES

Salt Water Crocodile

River systems of Bhitarkanika wildlife sanctuary and its fringe areas are the last strong hold of the species in Orissa. The estuarine or the salt water crocodile *(Crocodylus porosus)* is known to be the

largest (7 meter.) among all species of the living crocodiles in the world. It inhabits the deltaic regions of Bramhani, the Baitarani, Dhamra and Mahanadi river systems of the state and in the estuaries of these rivers where there is regular flow of tidal waters from the sea. These rivers and deltaic areas are the best preferred habitats of this species.

At present, saltwater crocodiles are limited to Sunderbans (West Bengal), Bhitarkanika (Orissa) and Andamans. The Bhitarkanika (deltaic areas of the rivers Bramhani-Baitarani-Dhamra) is one of the best habitats in the country where the largest number of saltwater crocodiles are seen thriving in the tidal rivers and creeks. The largest (22-23' length) Crocodile, the largest in the world is living in Bhitarkanika wildlife sanctuary. It is also the only place, in India, where the partial white (local name *Sankhua*) crocodiles are seen but their population is very small.

The saltwater crocodiles are carnivorous and scavengers. The species live mainly on fish (predatory fish). It often feeds on carcasses flowing into the area from nearby human habitations and occasionally feeds on cattle, deer, sambars, wild pigs etc. Female saltwater crocodiles nest in mangrove forests preparing a mound nest unlike other species of crocodiles which usually dig a nest on sandy river banks. Mating takes place during February to' April. Nests are made in May. An average of 45 eggs is laid. Hatchlings emerge from the eggs after 70-80 days. Mother Crocodile actively guards the nest by remaining in a wallow in the vicinity of the nest.

Sl.No.	Common Name	Zoological Name
1	**The Estuarine or Salt Water Crocodile**	Crocodylus porosus

AMPHIBIANS

The study of amphibians of Bhitarkanika has remained comparatively poor in contrast to the studies in other higher vertebrate groups such as reptiles, birds and mammals. Very little study has been made so far on the bioecology, habits, habitats and life history of different amphibian fauna in this deltaic complex. Out of the recorded list of 19 species of amphibians of Orissa (Mishra et aI., 1996), Bhitarkanika has a total of only 5 species belonging to 3 genera and 2 families. They are Family Bufonidae (1 species), Family Rhacophoridae (1 species) and Family Ranidae (3 species).

BIRDS

A total of 473 species of birds belonging to 59 families have so far been recorded in Orissa (Mishra et. al 1996), out of which Bhitarkanika alone has more than 170 species of birds. The avifauna of Bhitarkanika include varieties of aquatic birds including migratory waterfowls, raptors and a number of colourful resident and local migratory birds. The details of some avifauna are as follows:

BAGAGAHAN-THE HERONRY

The inner tidal zones, mudflats & the forested wet lands provide an ideal habitat to a large number of resident and migratory birds. More than 215 species of birds have been sighted in this area. The encouraging fact is the colonial nesting of large number of resident water birds in an island, locally called "Bagagahan. This heronry is one of the largest in the country.11 (eleven) species of colonial birds have been recorded, nesting in heronry.

The above birds, mainly nest in the mangrove trees such as Excoecaria agallocha, Heritiera fomes, Cynometra iripa, Hibiscus tiliaceus and Tamarix troupii. By the first week of June, the birds start arriving at this heronry and the nesting process get over by the end of November. Enumeration of these birds is carried out during August & September every year. It is observed that the relative abundance of various species of birds, nesting varies every year. The Asian open bill which constitutes almost 60% of the total nesting birds,feed exclusively on molluscs meat, that they obtain from the agricultural fields, surrounding the national Park since the area is a deltaic region and the land is very fertile, the farmers hardly use any fertilizer or chemicals in their agricultural fields. Thus pollution free agricultural fields provide enough molluscs for the storks to sustain. Bagagahan is a feather in the crown of Bhitarkanika.

TOURISTS VISIT IN BHITARKANIKA

SL. No.	YEAR	INDIAN	FOREIGNER	TOTAL
1	1998-99	13605	195	13800
2	1999-00	7802	50	7852
3	2000-01	17052	78	17130
4	2001-02	23706	171	23877
5	2002-03	26178	104	26282
6	2003-04	22887	122	22999
7	2004-05	25947	132	26079
8	2005-06	24288	181	24469
9	2006-07	31835	236	32071
10	2007-08	38739	333	39072
11	2008-09	39838	354	40192
12	2009-10	41356	387	41743
13	2010-11	4224	306	4530

Source: DFO, Rajnagar Wild Life

PROBLEMS

1. There is a small ‘interpretation centre’ at the park but contains limited information.
2. Basic amenities are not available.
3. No provision of refreshments either at the entrance or near the entrance.
4. The waste bins/cans are not installed at the entrance and park interiors.

5. Very less numbers of accommodation units in the park.
6. There is no adequate provision of drinking water inside park.
7. The watch-towers are not in sufficient number and are also not sufficient in height.
8. Trail paths are not well organised.
9. The guides were locals but found to be inadequately conversant with the languages other than Oriya.

SUGGESTIONS FOR THE DEVELOPMENT

The attract ability of Bhitarkanika is beyond doubt and it can attract the discerning eco-tourists. The strengths of park are relatively easy accessibility and abundance of natural resources including its beauty and tranquillity.

1. Considering the peculiarity of the resource structure of Bhitarkanika, the authorities must think beyond the 'packaged-nature tour' being proposed. Being a virgin destination, the authorities can certainly concentrate on packaged-nature tours to get a feel of the market response. But this should not only the strategy. Other nature-related tourist activities like bird-watching, Crocodile breeding, health tourism, camping and trekking can be planned on a sustained basis.
2. A major strength of Bhitarkanika is the abundance of medicinal plant varieties. This, combined with the rich ayurvedic tradition of Odisha, we suggest that health tourism should be considered as a priority segment for future development. Odisha can certainly benefit from this segment like that of Kerala.
3. For the 'packaged-nature tours' that is being planned to start with, we propose to make it as a few days activity. There should be enough time at every stop-over for experience creation. The spots where there are chances of seeing wild animals, adequate arrangements should be made so that such animals can be seen in its natural settings.
4. The interpretation centre presently available is inadequate for sensitizing the tourist about the park and the significance of nature tourism to their life. Here interpretation centre should act as a 'life-enrichment centre' where the link between the nature and human life are established in creating a 'wholesome human being'.
5. The waste cans / bins should be installed at major stop-overs / points and tourists should be discouraged in carrying the plastic and polithin bags inside the park. However, the bio-degradable carry bags can be permitted with the instructions to bring it back.
6. Whatever may be the type of tourist activity inside the park, it should not be allowed to practice in the absence of an experienced guide who knows the 'biological-structure' of the park. I suggest that such guides should preferably be drawn from the local area due to their in-depth

understanding about the plant and animal life inside the park. Through proper training, such persons will be an asset even for the judicious management of the park.

7. Keeping in pace with the tourist traffic, few refreshment centres can be planned inside the parks mainly at the entrance and terminal point proposed in the itinerary.

8. The watchtowers inside the park are inadequate in number and are not above the tree-line. It is proposed that more number of watch towers should be installed at those points where the wild animals are frequently camping. The height of the existing towers also needs to be increased.

9. The proposed itinerary is elongated in nature and onward and the return journeys are through the same route. It would be advisable to find-out a 'circular route' in order to minimize the monotony of tourists.

10. At two or three main points in the route, there has to be provision for fresh water through bore wells, which will also help discouraging the tourists in carrying bottled water, a potential source of plastic pollution.

11. The facilities for overnight stay at the park entrance and / or outside the park would have to be developed for long-term sustenance of tourism here. Any such development effort of tourist facilities particularly accommodation should be in conformity with the park surroundings, including the design, material used for construction, building colours and appearance, sewage disposal and recycling mechanism, energy sources etc.

12. The vehicle movements inside the park should be restricted and monitored. Caution needs to be taken about the colour and speed of the vehicles moving inside the park.

13. The involvement of people living inside the park and its buffer areas should be ensured through appropriate mechanism to optimize the dual benefits of tourism development and conservation of Sanctuary. Tourism not only should provide them employment but also creating entrepreneurship skills should be a priority agenda. Various financial schemes including micro-finance and poverty alleviation schemes can be made available to them in the process.

14. There has to be a system of visitor statistics compilation which should include the number of tourists, their socio-economic characteristics and place of origin. Occasional surveys must be carried out to find-out the activities undertaken inside the park, their expectations and levels of satisfaction. This will help the facility development /improvement, regulation and monitoring activities inside park.

15. Boating service should be safer for the tourists. Instead of traditional boats, modern safe boats should be used to maintain safety of the tourists.

CONCLUSIONS

The virgin stretching beaches, lush green mangroves, migrating birds and turtles, the menacing estuarine crocodiles, meandering water courses, tranquil surrounding intercepted by the chirping of birds and the ever embracing nature, enthralls visitors from near and far off places to flock these unique places of tourist importance. Scientists, scholars, nature lovers and tourists have abundant food for thought and exploration. The scope of expanding the tourism is galore but it is to be harnessed. The enormous potential is to be tapped to bring the areas into the tourism map of India. The Bhitarkanika National Park, the Bhitarkanika Wildlife Sanctuary and the ;Gahirmatha Marine Sanctuary boast of nature's most picturesque sites. The unique bio-diversity, attract the visitors to the natures lap. Publicity campaigns brings the facts to limelight, which is yet to catch up with the available avenues

No doubt the Bhitarkanika wildlife Sanctuary and National Park is a paradise for the wildlife lovers with its rich bio-diversity, but due to lack of certain facilities and amenities there is less flow of tourist to this spot. The main focuses of this study are:

1. Facilitating the development of Conservation
2. Generation and diversification of local employment
3. Creation of demand for local agricultural products
4. Stimulation of local facilities like: Catering, Transport, Guides etc.

If the sanctuary is developed according to the biological and physical tolerance level, then a day will come when this sanctuary will become the main attractions for the tourists of National and International level of the global tourists market.

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