

The Potential of Tourism Development in the Mangrove Forest of the Coastal Region of Kutch District: Gujarat



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Abstract

The world is now traveling through the ever increasing importance nature-based tourism. This paper highlights the variety of tourism potential along the west coast of the Kutch regions. The area covered by mangrove along the Gujarat coast is one of the highest among the mangroves forest states in India. It is endowed with a great diversity of natural ecosystems, which the major features i.e., salt pans, intertidal zones, swamps, marine algae (sea weeds), sea grass, mangroves, coral reefs & creeks. Mangroves are an extremely important component of the coastal marine environment both in an ecological sense as well as in economical terms. A 100 sq km stretch of rare mangrove of Kutch regions is being destroyed by human activities to facilitate the port & the container terminal. Nearly, 1.4 lakh people are dependent on the mangrove for their livelihood. This nature-gifted reserve can be preserved by the development of pollution free, eco-tourism only the way left to achieve sustainability in this area. Mangrove of the study area sustains a rich and highly bio-diversified intertidal flora and fauna, which may enhance the potential of bio-tourism. The basic plan behind study of this area is to attract tourists, which will have the opportunity of visiting the mangrove system and watching the marine wildlife, birds and fishes and enjoy the food and other refreshments on the boat itself and at the same time involve local people, predominantly the fishermen, in protecting the specialized forest eco-system. The well planned tourism in this area could provide economic and political incentives for proper management and preservation, which could fetch additional profit to local communities at regional economies.

Keywords: Mangroves, Tourism Potential, Marine Environment, Eco-Tourism, Bio-tourism, Sustainability

Introduction

Now days, the places of natural surrounding is becoming a major attraction for tourists interests, because of its pure natural values. Today, Asia along comprises 46 exclusive mangrove species and 14 non-exclusive species. In this zone, 28 exclusive species have been recorded from India (Blasco, 1977). Singh (1985) reported 4 more species from India. Now in India, 32 exclusive mangrove species may be considered, out of which 13 are found in west coast, 23 on east coast & 27 in Andaman Regions. Though occurring in seasonal climates of the tropical and sub tropical regions of the world, mangrove species are evergreen (Koriba, 1958). The tidal amplitude may reach even up to 12 m in the state and is categorized as arid or semi arid zone¹

It is unanimously accepted that the tourism industry is an infrastructure industry, an economic driver and is an intrinsic part of the development of a region. Gujarat, despite having country's largest coastline (1600 km) & beautiful coastal geomorphology its nature based tourism developments are at the stage of dormancy. It does not mean that the authorities are not trying, but the process is still at its infancy stage. The coastal states are unable to trap this great economic potential to their advantage. Due to the high aesthetic value of the coast there is an enormous potential for tourism development.

Review of Literature

This present research paper highlights the present & future potentialities of mangrove forest areas in terms of attracting nature loving tourists along the coastal areas of Gulf of Kutch. Very few scholars have studied about the potentialities of mangrove areas in terms of attracting tourism. Present situation of mangrove and Island ecosystems along the

Periodic Research

Indian coast was evaluated based on their structure, production, utilization and management (Untawale, 1983). Upadhyaya & Joshi, 2015 have clearly mentioned about the significance of mangrove in maintaining ecology of the study area. With the help of the mangrove plantations the fragility of the coastal areas can be minimized. The distribution of mangroves along the Gulf of Kutch was evaluated in detail (Untawale and Wafar, 1993). D.M. Cabahug (2002), highlights about the mangroves ecotourism which can be a new tool to promote environmentally and culturally friendly tourism. Although his study area was along the Red Sea in Egypt, he tried to highlights the significance of Mangroves in the coastal areas. He also indicates that mangroves areas can become the ecological tourist destination. Kulkarni (1957) had rightly observed the Utilization of mangrove forests in Saurashtra and Kutch. Salam, Lindsay & Beveridge (2011), indicated about the significance of Sundarban mangrove forest in terms of nature based tourism activity. "Nature-oriented tourism can be one means to help achieve sustainability in the reserve forest as well as protecting the important world heritage site. Well-planned tourism could provide economic and political incentives for proper management and for conservation and could bring additional benefit to local communities and regional economies". Nair V (2002), wrote about the flora and fauna of Kutch region. Mentioned about different varieties of coastal flora which can be a great natural and economic asset to a region. Growth patterns of mangroves in the Gulf are given in detail by Singh (2000). Mandal & Naskar (2008), studied about different habitats diversities of mangroves in India. He classified the Kutch mangrove as coastal mangrove. Overall many scholars have presented their view regarding habitat of mangroves not their impact on tourism development. So my objectives are to discuss about the impact and potentialities of mangrove forest in tourism development, which has not much been gained attention recently.

Objectives & Methodology

1. Researcher has attempted to project the various measures for potential tourism development
2. Assessment of its impact on economic & social progress of the mangrove bounded coastal areas of Kutch district
3. Proposing some suggestions for sustainable utilization of mangrove forests.

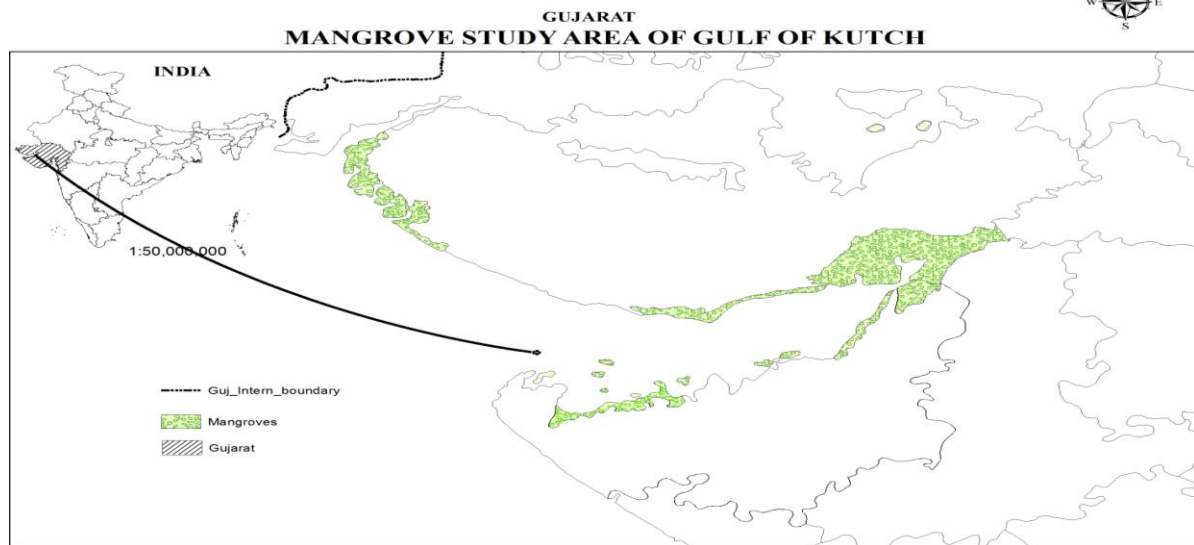
The present study is based on empirical observation & the available secondary sources. Audio visual methods were adopted wherever felt necessary. Further, descriptive analysis is done on the basis of the reports of the community to review the coastal regulation zone notification 1991, various articles at state, national & international level. Quantitative analysis is done on the basis of the reports from FSI & GITCO.

Hypothesis

The relationship between tourism and sustainability is a symbiotic one in the coastal areas.

Study Area

The areas selected for the present study are coastal areas of Gulf of Kutch, mainly the pockets of Mangrove forests. The main pockets are Kori creek (largest), Jamnagar & Rajkot coast. Although the Kori creek is a strategic location, then also the region has potential to attract tourists. The region experiences semi desert climatic condition and diverse geological and geomorphic set up which favours a multitude of coastal and offshore marine ecosystems. The Gulf is an east-west oriented indentation north of Saurashtra Peninsula. The study has been very general about prospects of tourism growth in the study area. It is about 170 km long and 75 km wide at the mouth, narrowing down abruptly with a distinct constriction at 70° 20' E at Satsaida Bet, and dividing into creek system often called the Little Gulf of Kutch. The Gulf has an area of 73000 km² and the average depth is 30 m.



Study Area: The Map Showing the Potential Mangrove Areas of Kutch

Physiography, Climate & Vegetation Type

The coastal configuration is very irregular with numerous Islands, creeks and bays². Besides, there are a number of eroded shallow banks like Pirotan, Dide, Dhani, Bet Shankodar, Paga, Adatra and Boria reefs, many of which harbor living corals. The Gulf and the surrounding region are seismically very active with a number of recorded past and recent earthquakes. The vast mudflats that get inundated during high tide consist of thick deposits of very soft marine clay up to a depth of 12-15 m underlain by calcareous sand and highly weathered, weak sedimentary rock.

The Gulf area is generally termed as semi arid region. The poor monsoonal rains and high rate of evaporation make the land area arid and seawater comparatively more saline. Long-term mean rainfall on the surrounding area is 42 cm/year. On an average the Gulf area is having negative water balance.

The air temperature varies from 10° C to 36° C over the year. January is the coldest month with night temperature falling below 10° C and May and June are the hottest months with high mean maximum temperature (36° C) during day and low mean minimum (26° C) during night.

Floral & Faunal Diversity

There are approximately 16 mangrove species reported from the Gujarat coast³. There are the variety of species like *Sonneratia Avicennia*, *Ceriops sp.*, *Sonneratio alba*, *Rhizophora mucronata*, *Heritiera*, *Avicennia marina*, *Avicennia officinalis*, *Bruguiera gymnorhiza*, *Bruguiera parviflora*, *Acanthus officinalis*, etc., which have been reported only from the West Gujarat coast.

The mangrove swamps of Gujarat coast are favoured by a variety of birds⁴, both migratory and resident. There are different species of crustaceans like *Penaeus indicus*, *P. merguensis* and *P. monodon*, while the crabs are represented by *Uca sp.*, *Scylla serrata*, *Thalassina*, etc. the fished are represented by several species like the mud skippers, clupeids, serranids, mullets, seabass etc. Another attraction is the existence of Microbial organisms like yeast, bacteria and fungi play a very important role in the decomposition of mangrove foliage, regeneration of nutrients and mineralization.

The Ecological Role of Mangroves

Mangroves play a major role in the stabilization of the coast and prevent from shore erosion. The dense network of prop roots, pneumatophores and stilt roots gives mechanical support by trapping the sediments. The other very important ecological role of the mangroves is the detritus material, which food and provides breeding and nursery grounds for new ones of many commercially important shrimps and fishes. The major production in the mangroves ecosystem is from the trees, but only a fraction of this production is consumed by herbivores. The leftover enters the mangrove water as litter fall. The decomposition of this leftover in turn is occupied by heterotrophic microorganisms which enhancing its nutritive value.

The detritus, besides forming a food source for deposit feeders, is also consumed by the variety of bivalves, shrimps and fishes, which migrate into the mangrove environment in their life cycle for better feeding and protection⁵. "There is a direct correlation between the extent of mangrove forests along a coastline and the fishery as well as shrimp catches from the coastal waters adjoining the mangroves"⁶.

The Economic Exploitation of Mangroves

Mangroves on the west coast of India are not managed & hence do not produce timber of much significant value. 'Because of the high specific gravity of rhizophoraceous wood, the species of *Rhizophora*, *Kandelia*, *Ceriops* and *Bruguiera* are preferred for firewood'⁷. The Gulf of Kutch, being arid zone, does not have any other vegetation or source of energy for cooking or as a green fodder for cattle, camel and goats. Kori possessing largest area under mangrove forest (Table-1) as compare to other regions, so no doubt more exploitable mainly for some wasteful activities. "A large population of camels regularly grazes on the green leaves of *Avicennia marina* and *Porteresia coarctata*"⁸. "Some 10,000 people live by selling mangrove firewood, the only source of firewood in the region in the Gulf of Kutch, and the mangroves are also heavily exploited for grazing by camels and cattle. Salt collection is also an important activity in the supra-littoral zone, especially in the Kutch region"⁹. Solar cookers, biogas plants, liberal LPG connections and use of electricity are some the firewood substitutes used to minimize the pressure on mangroves. Tannin is also extracted from the bark of mangrove species like *Rhizophora mucronata*.

In Gujarat, the mangroves forests have traditionally been used for variety of purposes like boat building, tannin extraction, firewood, stake for fishing, fodder etc¹⁰. Apart from the traditional use of mangroves trees for firewood, the local people also collect wax, honey, shells, timber, etc. from the mangrove forest. For boat building & brick-burning *Heritiera agallocha* & *Avicennia* and *Rhizophora* species, respectively are used.

Table-1
Distribution of Mangrove Cover in km²

S. No.	Region	Total Mangrove Cover	Percentage of State's Mangrove Covers
1	South Gujarat	6	0.6
2	Gulf of Khambhat	106	10.1
3	Gulf of Kutch (Saurashtra)	159	15.2
4	Kori creek (Kutch)	775	74.1

Source: FSI, 2009,

Depletion of Mangrove Forest in Gujarat

The mangrove of arid regions of Kutch is being destroyed by human activities. A 100 sq km stretch of rare mangrove forest in the Kutch area has been destroyed in few years back to facilitate the port and the container terminal. Major problem found was

increasing temperature & related evapotranspiration, little rainfall and also high salinity are the main reasons of depletion of mangroves. The Kutch mangroves are the largest mangroves cover and one of the few arid mangroves in the world. It is disturbing that only one of the original 8 species exists. The human activities and wrong policies of Government machinery have compelled to remove the mangrove forest of these regions. Nearly, 1.4 lakh people are dependent on the mangrove for their livelihood. In this region Mangals are very poor and they re-scattered along coastal regions. Mangals are the only source of firewood and also represent the main source of green fodder. *Kulkarni and Junagad (1959)* have stated that over 2500 camels belonging to Rabenis and estimated to be dependent on browsing in the mangrove forest of this tract. The total area of the mangrove forest is nearly 158.8 km sq.

There has been considerable loss of mangrove forest in Gujarat over the last 50 years. A significant reduction in mangroves areas in all coastal regions in India due to population pressure, deforestation, settlement of new colony and over exploitation of resources have been noticed. The industrialization and urbanization are the minor cause of mangrove destruction.

The forests were in healthy state until early 80's when industrial development became intensive along the southern coast. Dredging of mangrove forest for industries and the impacts of onshore development activities were responsible for the reduction in the density of vegetation. Another cause for loss of floral cover is the extensive deforestation of the mangroves along the coast. The resulted soil erosion washed onto the nearby corals has killed a large fraction of intertidal corals.

Role of Tourism in Protecting Conservation Areas

Birding and wilderness exploring is a popular form of eco-tourism, an activity that may ultimately help government improve their management of natural resources, ideally, eco-tourists visit sites to observe wildlife and as a result spend money in the area. According the GITCO report of 2013-14, total 0.29 lacs tourist arrived at Marine National Park (Narar Island, Khijadiya, Pirotan and Positra), while arrival of foreign tourist are only 0.002 lac. This was actually a decline over 2012-13. (Table-2) Governments and local people have economic incentives to maintain these areas in a natural condition to ensure continued visits by eco-tourists. Ecotourism is therefore being promoted as a tool for bio-diversity conservation and rural development (*Aronsson 2000*). To achieve these goals, however, careful management and planning is required. Before promoting eco-tourism activities, authorities should assess and mitigate the potential impacts from eco-tourism.

These days tourism development purely based on natural values. The relationship between tourism and sustainability can be a symbiotic one in the coastal areas. The benefits that a well-managed mangroves area can accrue to the boost of nature based tourist industry, in turn if can also facilitate the

protection of coastal areas. If tourism is properly controlled, it can create the conditions necessary to support the process of conservation through productive planning and comprehensive management in the west coast of Gujarat.

Table-2

Number of tourism arrivals at Marine National Park (Narar Island, Khijadiya, Pirotan and Positra) (2012-14) (in lacs)

Year	Domestic	Foreigner	Total
2012-13	0.21	0.004	0.21
2013-14	0.29	0.002	0.29

Source: GITCO report. (The data has been modified as per needs)

Ecotourism interests can also convince local people that their resources are more valuable when intact, than when extracted from the ecosystem. When a user fee or visitor admission fee structure is imposed, real economic incentives for protected areas can stimulate their formulations. Ecotourism hopes to change the unequal relationships of conventional tourism. Thus it encourages the use of indigenous guides and local products. It claims to combine environmental education with minimal travel comforts, help protect local flora and fauna and provide local people with economic incentives to safeguard their environment.

Major Attractions of Kutch Coast (Especially Mangroves)

The major attractions of the study area includes the natural beauty of mangrove forest, approaching migratory birds, inhabitants animals & other micro-organisms, which all together have a great aesthetic value. One can have very rare chance to see the commoner species in Kutch. Laughing and Collared Doves, common Babblers, Indian Robins, Rosy Starlings and House Sparrows were all numerous and it seemed that at almost every 100 m the wires were beautified with a variable wheatear. The visitors may learn that in this extreme part many important species are surviving, these included jungle and Large Grey Babblers, Magpie Robins, barbets, Green pigeons and hornbills. In fact glimpses of a Grey Hornbill is very rare, which is the first local specialty. The second local specialty is a group of noisy Marshall's lora; now an extremely local species confined to coastal west India and apparently exterminate from Delhi.

The Kutch area supports around 370 bird species & is particularly rich in raptors, waterfowl, waders & larks. Specialties include the Grey Hypocolius (Kutch is the only known wintering site in India), White-naped tit, Stoliczka's bush chat, Sykes's nightjar, Greater Hoopoe Lark, Merlin, McQueen's and Indian Bustards. Over 30000 common Cranes, hundreds of Steppe Eagle, Marsh, Pallid and Montague's Harriers, Long-legged Buzzards, Sand grouse, Pelicans, Flamingos and great flocks of Greater short-toed Larks are a feature of any winter visit to the area.

The area has a large potential to develop the various tourism spots such as Kutch coast bio-tourism, coastal, forest and agricultural tourism resorts. The coastal resort will definitely attract the

leisure complexes for holidays, conferences, water sports, shopping and other entertainment activities. Forest tourism resort will help in maintaining the natural beauty, which in turn boost the social & economic growth of the region. The floating resorts can also be developing when the water is at its full level. The development agricultural tourism may also introduce visitors to aquaculture (variety of species) farms. The Kutch mangrove forest, is not yet considered by the govt. & private experts to be the best protected in India. Tourists will have the opportunity of visiting the mangrove system and watching the marine wildlife, birds and flying fish and enjoy the food and other refreshments on the boat itself.

The mangrove forest cover zone must be recognized as a Biosphere zone by the state government because it is home to various kinds of plants, algae, fishes, birds and many other small creatures. The mangrove forest area can be develop as for school & colleges tourism, where the students will learn about the variety of flora and fauna.

The identical habitat of Gulf covers a wide range of ecosystem; sandy beaches, mud and sand flats, rocky foreshore and rock pools, sea grass beds, salt marshes and mangroves. The continuous wave action and associated littoral sediment transport make intertidal stretch a unique environment for biogenic activities of organisms. Gulf sustains a rich and highly bio-diversified intertidal flora & fauna.

Prospects of Tourism Development in the Mangrove Areas

Gujarat is a great bird-watching destination in India situated in the northwestern corner of India. Situated in transitional zone provide high range of climatic conditions during summer and winter seasons. From the desert of Rann of Kutch, which melts into the arid Banni grasslands, much of northern Gujarat is wasteland which attracts a wide variety of wintering birds to the thorn scrub and great stretches of seasonal wetlands. Being a dense vegetation zone (especially Kori and Piroton) it has a great potential in attracting tourist form local as well as different states. Due to strategic location Kori mangroves will doesn't allow foreign tourists. Every year large number of tourists visit Koteshwar and Narayan Sarovar, they could be a great visitor to mangrove region. The tourist travel all the way to reach Narayan Sanctuary and Koteshwar and come back without any great entertainment. So the enhancement of mangrove areas for tourism would definitely fetch more tourists and also boost accommodation industry due to their stay. During the survey it was found that most of tourist did not find anything attractive which could make them to stay for more than a day. For the educational & ecological tourist, it will be proved as a heaven if it could be developed. So government must take apprehension towards replanting more mangrove varieties with proper management and care.

Problems Associated With Mangrove Eco-Tourism

Before promoting eco-tourism, authorities also must assess and formulate mitigations strategies

arising possibly from tourists. It has its own drawbacks, such as; it may cause harmful environmental impact; the harassment and change in the physiology of wildlife; the excessive movement in the forest may result into the destruction of flora & fauna; under the cover of tourist illegal poaching and trespassing may increase.

Conclusion & Suggestions

Mangrove of the study area sustains a rich and highly bio-diversified intertidal flora and fauna, which may enhance the potential of bio-tourism. The relationship hence proved to be symbiotic between tourism and sustainability. The basic plan behind study of this area is to attract tourists which will have the opportunity of visiting the mangrove system and watching, understanding the marine wildlife, birds and flying fish and enjoy the food and other refreshments on the boat itself. At the same time, it also involve local people, predominantly the fishermen, in protecting the specialized forest eco-system. It broadens the horizon of recreational tourism through its mystic landscape. The secondary purpose of creating awareness about the eco-tourism is to conserve the mangrove forest and its flora and fauna in a natural state.

Looking to its positive side such as environmental, social, economic and cultural implications, less investment required for developing infrastructure. In these areas only eco-tourism is most acceptable. Moreover the nature loving tourists will not mind to be in the lap of natural, non-sophisticated infrastructures to have best understanding of the natural surroundings.

To promote & conserve the mangrove forest for eco-tourism the following things indispensable:

1. Reduce human population dependency over mangrove resources by proving them supplementary economic activities
2. To upgrade the economic system and policies that increases the value of the environment and its resources
3. Equity in the ownership, management and flow of benefits from both the use and conservation, needs to be decentralized
4. Increase in knowledge and application especially among the inhabitants
5. Research needs to be conducted on the adaptive behavior of mangrove eco-system
6. The willingness of coastal communities to pay for alternate source of fuel for household consumptions
7. Although, the new plantations are under process in many other areas, such as in Sundarbans & Kerala coasts etc., shown positive results. The same can be very successful in the study area too.

References

1. Aronsson L. (2002), "The Development of Sustainable Tourism", University of Michigan.
2. Arunprasath A., Gomathinayagam M., (2015), "Ecological Importance of Rhizophoraceae- A true mangrove family", *International Letters of Natural Sciences*, Vol. 43, pp-1

3. Blascco, F., (1977), 'Outlines of ecology, botany and forestry of the Mangals of the Indian subcontinent. In: *Ecosystems of the World vol.-I: Wet Coastal Ecosystems* (V.J. Chapman, ed.) Elsevier, Amsterdam-Oxford-New York.
4. Cabahug, D.M. (2002), 'Community – based mangrove rehabilitation and eco-tourism development and management in the Red Sea Coast, Egypt.
5. Karthik K., Sharavanan P.S., (2015), "Utilization and Impacts of Biotechnology on Phytoremediation processes and Biodiversity conservation", *International Letters of Natural Sciences* Vol. 38 (2015) pp 6-8, Switzerland.
6. Koriba, K. (1958). *On the Periodicity of Tree-Growth in the Tropics, with Reference to the Mode of Branching, the Leaf-Fall, and the Formation of Resting Bud.* *Gard. Bull. Straits. Settle*, 11-81.
7. Mandal R.N., Naskar K.R., (2008), "Diversity and Classification of Indian Mangroves: a review", *Tropical Ecology* 49 (2): 131-146, *International Society for Tropical Ecology*.
8. Nair V., (2002), 'Status of the Flora and Fauna of Gulf of Kutch, India', prepared for National Institute of Oceanography, Goa.
9. Pandey C.N., Pandey R., 'The Status of Mangroves in Gujarat', *GEER foundations, Indroda Nature Park, Gandhinagar*
10. Pandey C.N., Pandey R., Jain B.K. "Reproductive phenology of *Rhizophora mucronata* Lamk, mangrove species of *Rhizophoraceae* in the Gulf of Kachchh, Gujarat, India", *GEE & Research (GEER) Foundation, Gandhinagar, Gujarat*.
11. Patel Ajay, Singh Vijay, Khalid Mehmood, Kathota J., Kalubarme M.H., Pandya C.H., Joshi Nischal, Brahmabhatt Lomesh, 'Mapping and Monitoring of mangroves in the coastal districts of Gujarat State using Remote Sensing and Geo-informatics', pg-22.
12. Singh. H. S. (1994). *Status report on Mangrove in Gujarat State.* Gandhinagar: Gujarat Forest Department.
13. Untawale, A.G., Dhargalkar, V.K. (1994), 'Eco-tourism potential along the Indian coasts', from proceeding of Seminar by National Institute of Oceanography.
14. Wafar, M.V.M., (1993), 'Coral Reef Survey in India', proceedings of seventh International Coral Reef Symposium; Vol.1.

Footnotes

1. Pandey C.N., Pandey R., Jain B.K. "Reproductive phenology of *Rhizophora mucronata* Lamk, mangrove species of *Rhizophoraceae* in the Gulf of Kachchh, Gujarat, India", *GEE & Research (GEER) Foundation, Gandhinagar, Gujarat*.
2. <http://drs.nio.org/drs/bitstream/handle/2264/87/Gulf%20of%20Kachchh.pdf?sequence=2>
3. http://shodhganga.inflibnet.ac.in:8080/jspui/bitstream/10603/3029/8/08_chapter%201.pdf
4. http://www.niobioinformatics.in/mangroves/MAN_GCD/fact.htm
5. http://montezagia3.blogspot.in/2011_09_01_archive.html
6. http://www.nmmconline.com/c/document_library/get_file?uuid=18f53998-58af-4bf9-af15-9d0fa9b79908&groupId=10156
7. ¹ Arunprasath A., Gomathinayagam M., (2015), "Ecological Importance of *Rhizophoraceae*- A true mangrove family", *International Letters of Natural Sciences*, Vol. 43, pp-1
8. http://www.niobioinformatics.in/mangroves/MAN_GCD/fact.htm
9. An article on, "Mangrove Description in India" (<http://www.fao.org/forestry/mangrove/vegetation/en/ind/>)
10. <http://www.selfacumen.com/monsoon-productions-mangroves/>