



CASMB ENVIS Estuaries, Mangroves, Coral Reefs & Lagoons

Major achievements of CASMB ENVIS Centre (2011-2016)

Annamalai University Centre of Advanced Study in Marine Biology



Publications

1. Newsletters

1. Seshaiyana –Vol. 19 (1-4) – 2011-2012

2. Seshaiyana –Vol. 20 (1-4) – 2012-2013

3. Seshaiyana –Vol. 21 (1-4) – 2013-2014

4. Seshaiyana –Vol. 22 (1-4) – 2014-2015

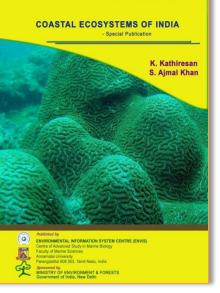
5. Seshaiyana – Vol. 23(1-4) – 2015-2016

Total - 20 issues

2. Special publications

- 1. Sea Snakes of the Coromandel Coast of India 2011
- 2. Bibliography on Indian Estuaries (2006-2010) 2011
- 3. Coastal Ecosystems of India Special publication 2013
- 4. A Catalogue of Estuarine Molluscs in India 2014
- 5. Mangrovekadukal (Tamil booklet) 2015
- 6. Lagoons of India (Status report 2000-2010) 2015
- 7. Mangroves (English –booklet) -2016
- 8. Lagoon Ecosystems of India 2016

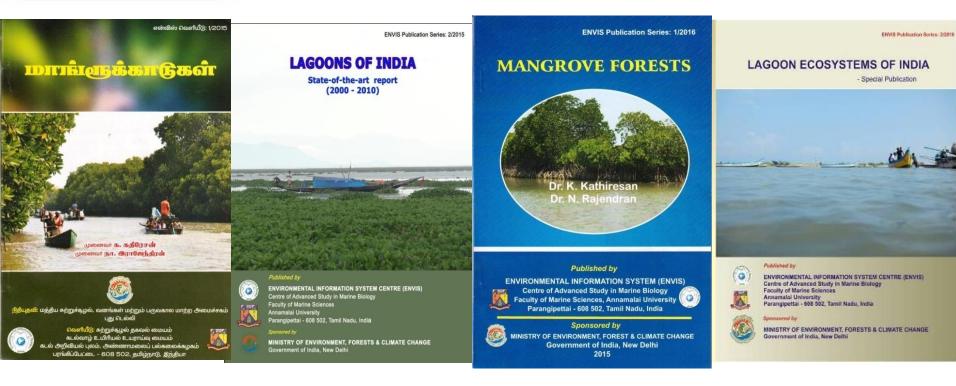




ENVIS Publication Series : 1/March, 2013

A CATALOGUE OF ESTUARINE MOLLUSCS IN INDIA





Among the top 10 highly cited authors and cited papers in world mangrove research, the following two articles are from India, that too from the Centre of Advanced Study in Marine Biology.

- <u>Kathiresan</u>, K. and B.L. Bingham, 2001. Biology of mangroves and mangrove ecosystems. *Advances in Marine Biology*, 40: 81-251; DOI 10.1016/S0065-288(01) 40003-4.
- <u>Kathiresan</u>, K. and N. Rajendran, 2005. Coastal mangrove forests mitigated tsunami. *Estuarine and Coastal Shelf Science*, 65: 601—606; DOI 10.1016/j.ecss.2005.06.022.

(Source: G. Saravanan and J. Dominic. 2013. Bibliometric analysis of mangrove literature from 2001-2012. *Seaweed Res. Utiln.*, 35 (1&2): 226–237, 2013).

SCOPUS

India is topping in terms of publication & citations in the field of mangroves

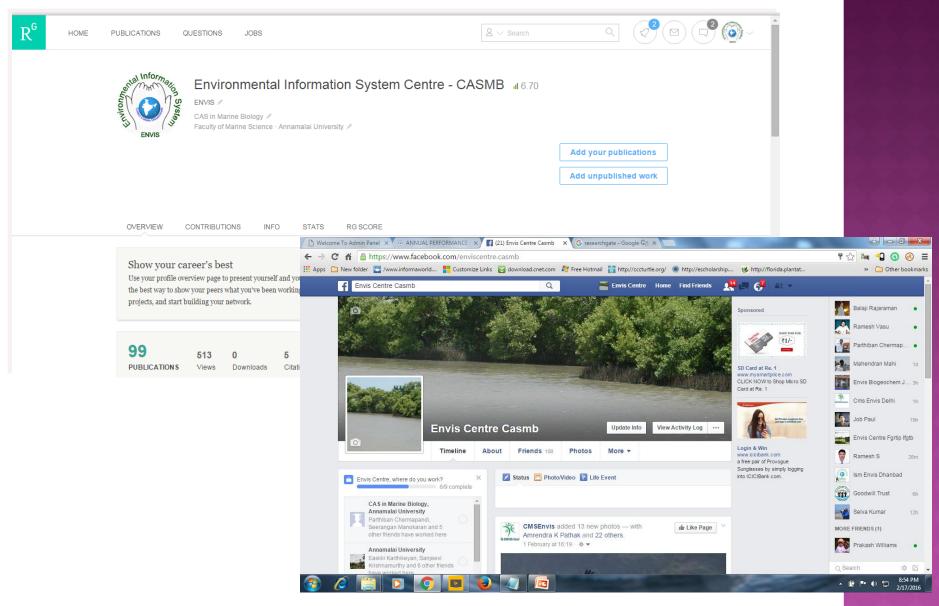
Our centre has significantly contributed

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«	10,657 document results 📶 Analyze results Show all abstracts
Search within results Search	All Download B Export III View citation overview 99 View Cited t
Jearch	Document title
Refine results Limit to Exclude	Vertical migration by Cerithidea decollata (Mollusca, Potamididae): Addi 1 subtraction
Year 🕱	View at Publisher 🖵 Show abstract Related documents
□ 2013 (266) > □ 2012 (925) > □ 2011 (817) >	Degradation potential and microbial community structure of heavy oil-er consortia from mangrove sediments in Okinawa, Japan
2010 (734) > 2009 (662) >	View at Publisher 🖵 Show abstract Related documents
View more	Locating suitable mangrove plantation sites along the Saudi Arabia Red
Author Name	View at Publisher 📮 Show abstract Related documents
Kathiresan, K. (76)	A study of the characteristics of aeolian sand activity and the effects of A post-office system in a coastal dune area in southern China
Dahdouh-Guebas, F. (67) >	View at Publisher 📮 Show abstract Related documents
□ Tam, N.F.Y. (62) > □ Alongi, D.M. (55) >	The relationship of spatial-temporal changes in fringe mangrove extent use: Case study of Kien Giang coast, Vietnam
View more	View at Publisher 📮 Show abstract Related documents
Subject Area	Sediment accretion and organic carbon burial relative to sea-level rise a

Visitors and Users (online and physical)

	Website users and visitors	Physical users and visitors	Total users
2011-2012	5645	1415	7060
2012-2013	2352	351	2703
2013-2014	20378	1867	22245
2014-2015	203285	1130	204415
2015-2016	238395	578	238973
Total	4,70,055	5,154	4,75,396

Created "Researchgate" and facebook accounts for CASMB ENVIS Centre (2014-2015)



Internal review meeting

1st review meeting - 12.08.14 (2014 - 2015)

2nd review meeting - 07.07.15 (2015 - 2016)

3rd review meeting - 09.09.15 (2015 - 2016)

4th review meeting will be on June 2016 (2016 - 2017)

Awareness campaign

1. Cleanliness campaign - 02.10.14 - No. of participants - 117

2. Coastal cleanup day - 19.09.15 - No. of participants - 155

3. The Science Express Climate Action Special (SECAS) at Kumbakonam - 04 06.03.16 - No. of visitors - 36.687

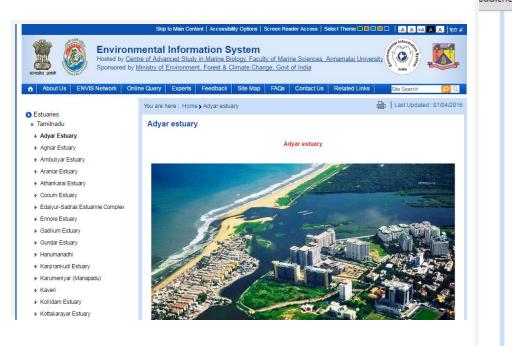


Generation of funds

ENVIS has so far generated funds to the tune of Rs.1,28,864/- by selling one third of printed publications with nominal charges.

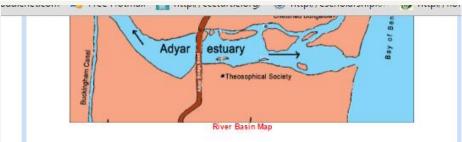
Database – Website

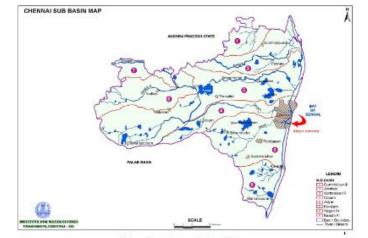
1. Distribution of estuaries, mangroves, coral reefs and lagoons in India (*River basin map, Map* - Outline structure, *Image* – Satellite or Google earth image, *Photo* – Original photo of particular region, Environmental parameters, Biological characteristics – dominant benthic fauna, dominant phytoplankton, dominant zooplankton, important shell fishes, important fin fishes and dominant flora, Environmental status – Industrial effluent discharges, sewage discharges, hazardous waste dumping and municipal solid waste dumping).



Fish known to occur in the Adyar estuarine reach: historical records in relation to the	e present

	Species	1916*	1937	1950	1967	1982	Present
	Class: Chondrichthyes (Cartilaginous Fishes)						
	Order: Rajiformes (Rays)						
	Family: Rhinobatidae (Guitarfishes)						
1	Grey Guitarfish Rhinobatus obtusus Muller & Henle	-	-	-	-	-	+
	Family: Dasyatidae (Stingrays)						
2	Honeycombed Stingray Dasyatis uarnak (Forsskal)	-	-	-	-	-	+
3	Taeniura sp. Muller & Henle	-	-	-	-	-	+
	Class: Osteichthyes (Bony Fishes)						
	Order: Clupeiformes (Herrings and allies)						
	Family: Clupeidae (Sardines and Shads)						
4	Kelee Shad Hilsa kelee (Cuvier)	-	-	-	-	-	+
5	Bloch's Gizzard Shad Nematalosa nasus (Bloch)	-	-	-	-	-	+
6	Goldstripe Sardinella Sardinella gibbosa (Bleeker)	-	+	+	-	-	+
7	Fringescale Sardinella Sardinella fimbriata (Valenciennes)	-	-	-	-	+	-
8	White Sardinella Sardinella albella (Valenciennes)	-	-	-	-	+	-
9	White Sardine Escualosa thoracata (Valenciennes)	-	-	-	-	-	+
	Family: Chirocentridae						
10	Wolf Herring Chirocentrus dorab (Forsskal)	-	-	-	-	+	-
	Family: Engraulidae (Anchovies)	1	1	1	1	1	





Physico-chemical entities

Physico-chemical parameters of Adyar Estuary (Mean ± SE) during July 2010- June

2011.

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EnvironmentalParameters	Pre-Monsoon	Monsoon	Post-Monsoon	Summer
Atmospherictemperature(°C)	30.00±0.57	27.33±0.33	28.66±1.20	29.00±0.57
Surfacewatertemperature(°C)	31.33±0.88	28.66±0.66	28.66±0.66	30.00±0.00
pН	7.53±0.14	7.06±0.14	7.1±0.17	7.86±0.13
Salinity(%)	22.00±2.08	25.66±2.02	25.66±2.40	15.66±2.33
DissolvedOxygen(mg/l)	1.81±0.90	5.76±0.63	4.77±0.67	1.97±0.61
Nitrite(mg/l)	0.22±0.39	0.12±0.21	0.22±0.38	0.16±0.28
Ammonia(mg/l)	5.50±1.32	2.16±0.92	1.80±1.11	6.66±0.33
Phosphate(mg/l)	5.33±1.33	0.57±0.23	0.58±0.22	3.33±0.88

DETAILS OF MANGROVES

Location	
Name of the Mangrove	SUNDARBANS
River	Hooghly river basin
Place	
State	West Bengal
Coast	East Coast
Latitude	21°13'–22°40' N
Longitude	88°03'–89°07'E
Important Land Marks	Parts of the mangroves with Bangladesh
Key Physical Characters	
Total Area of Mangrove	4250 sq. km. / 2123 sq. km. (West Bengal)
Water Temperature	13°–36°C
Key Chemical Characters	
pН	6.4-8.7
Salinity	0–15 ppt
Dissolved Oxygen	2.39–8.9 ml/l
	Name of the Mangrove River Place State Coast Latitude Longitude Important Land Marks Yeter Temperature Key Chemical Characters pH Salinity

Alectis indicus Ambassis commersoni Anguilla bengalensis Anguilla bicolor Anodontostoma chacunda Anodontostoma thailandiae Aorichthys aor Aplocheilus panchax Apocryptes bato Arius arius Arius caelatus Arius gagora Arius platystomus Arius subrostratus Awaouichthys menoni Batrichthys grunniens Boleophthalmus boddarti Brachygobius nanus Carangoides ciliarius Caranx ignobilis Caranx sexfasciatus Carcharhinus limbatus Carcharhinus melanopterus Chanda nama Chanos chanos Chelonodon cutcutia Chelonodon patoca Chillosctoma gasciatum Coilia dussumieri Coilia neglecta Coilia ramacarati Coilia raynaldi

Fin fishes Aetobatus nari nari



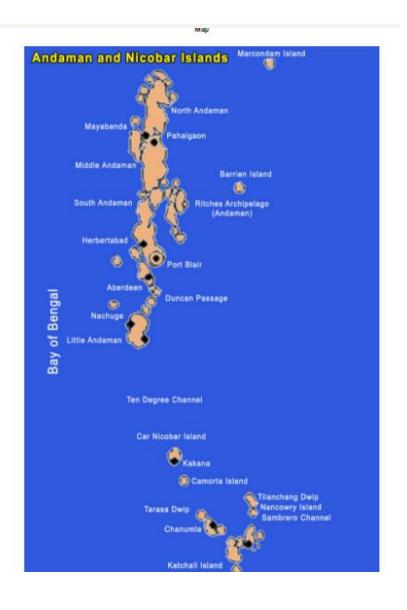
Photos



Andaman Nicobar islands

Andam	an a	nd Nicobar
Name of the area	1	Andaman and Nicobar (group of islands)
Place :	:	Champell bay
Latitude :	1	6°-14'N
Longitude :	:	91°-94'E
Key Phy	/sical	Characters
Tidal amplitude	1	2.5meter
Water temperature:	1	24-32°c
Chem	ical C	haracters
pH :	1	7.2-8.1
Salinity :	:	29.73 and 32.81 ppt in Southern Andaman 33 ppt
Major F	lora	and Fauna
Zooplankton		List of chaetognath species recorded from the Andaman Sea.
		Eukrohnia fowleri Ritter-Zahony, 1909 - Not evaluated
		Krohnitta balagopalia (Nair etal.,2008) - Not available

Endengered aportea	Dugong, tartaica, marino marinnaia etc.,
Archeologically/Ecologically Important Places	
Islands	570 islands, out of which only 38 are permanently inhabited
	several hundred meter separated by Lagoon Coral reef stretch 11,000 sq.km
	Andaman and Nicobar 27.000 sq. km
List of Corals	
	Family : ACROPORIDAE
	Acropora aspera - Vulnerable
	Acropora austera - Near threatened
	Acropora cytherea - Least concern
	Acropora carduus - Near threatened
	Acropora cerealis - Least concern
	Acropora chesterfieldensis - Least concern
	Acropora clathrata - Least concern
	Acropora cophodactyla - Data deficient
	Acropora digitifera - Near threatened
	Acropora divaricata - Near threatened
	Acropora donei - Vulnerable
	Acropora echinata - Vulnerable
	Acropora efflorescens - Data deficient
	Acropora formosa - Near threatened
	Acropora gemmifera - Least concern
	Acropora globiceps - Vulnerable
	Acropora granulosa - Near threatened
	Acropora gravida - Near threatened



Gulf of Mannar Lagoons

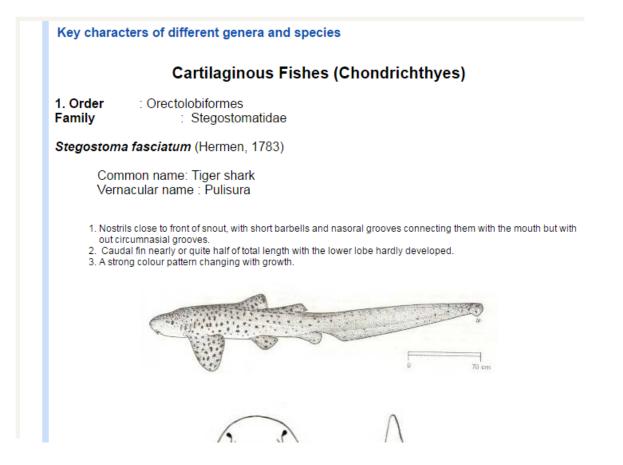
Gulf of Mannar lagoon				
Location Det	ماله			
Location Dec	ans			
Place :	:	Mandapam		
District :	:	Ramanathapuram		
State :	:	Tamil Nadu		
Latitude :	:			
Longitude :	:	78°10′–79°15′ E		
Important Land Marks :	:	Rameswaram		
Key Physical Ch	arac	tore		
Rey Fliysical Cli	arac			
Water temperature :	:	24–34.5°C		
Nature of the substratum :	:	Sandy clay		
Chemical Char	acte	rs		
pH :	:	8.0-8.5		
Salinity :		25–45 ppt		
Dissolved Oxygen :		1.0-6.0 mg/l		
2.ccc.icc.oxygon:				
Biological Characters				

Мар



Water temperature :	:	24–34.5°C
Nature of the substratum :	:	Sandy clay
Chemical Char	acte	rs
pH :	:	8.0-8.5
Salinity :		25–45 ppt
Dissolved Oxygen :	:	1.0–6.0 mg/l
Biological Char	acte	ers
Phytoplankton :	:	Biddulphia
	- :	Ceratium trichoceros
	:	Cetatium massiliense
	:	Chaetoceros
	:	Chroococcus
	:	Coscinodiscus
	:	Lyngbya sp.
	:	Merismopedia sp.
	:	Microcoleus
	:	Nitzschia longissima
	:	Noctiluca miliaris
	:	Phormidium sp.
	:	Rhizosolenia
	:	Spirulina sp.
	:	Thalassiothrix
	:	Thallossionema
	:	Trichodesmium
Zoorlankten		Brachionus sp.
Zooplankton :	:	Brachionus sp.

2. Manual on Identification of common fishes of Parangipettai waters



3. Checklist of Flowering Plants and Fern in Mangrove Ecosystems of India

Identification Keys to the Families

Identification Keys to the Families

Species	Acanthaceae
Habit	Shrub, either erect or climbing on the mangrove plants of the river slope
Stem	Woody, slender, twining
Root	Stilt roots with pointed armed at stem and leaves
Leaf	Leaves broad, hard, dark green, wavy margin with sharp spines
Flower	Bisexual, violet or white, cluster raceme with prominent bracts and bracteoles, and petals united
Fruit	Capsule upto 2 cm long

Species	Aizoaceae
Habit	Plants grow in intertidal zones, fully herbaceous with creeping branches
Stem	Reddish or pinkish, green colour in younger plant
Root	·
Leaf	Succulent, reddish, turgid Ecosystem
Flower	Solitary with pink colour upto 1 cm
Fruit	•

Ecosystems of India

Systematics of Flowering Plants and Fern in Mangrove Ecosystems of India

Species	Apocynaceae
Habit	Herbs or shrubs with milky sap
Stem	-
Root	-
Leaf	-

		:	Systematics			
Class	Subclass	Series	Order	Family	Genus	Species
Monocotyledones	-	Calycineae	-	Arecaceae (Palmae)	Nypa Steck	N. frutican (Thunb.) Wurmb.
Monocotyledones	-	Calycineae	-	Arecaceae (Palmae)	Phoenix L.	P. paludos Roxb.
Monocotyledones	-	Glumaceae		Cyperaceae	Fimbristylis Vahl.	F. ferrugines (L.) Vahl.
Monocotyledones	-	Glumaceae	-	Cyperaceae	Scirpus L.	S. littorali Schrad.
Monocotyledones	-	Glumaceae	-	Poaceae (Gramineae)	Porteresia Tateoka	P. coarctat (Roxb.) Tateoka
Monocotyledones	-	Glumaceae	-	Poaceae (Gramineae)	Myriostachya Hook.f.	M. wightian Nees e Steud. Hook.f
Monocotyledones	-	Glumaceae	-	Poaceae (Gramineae)	Aeluropus L.	A. lagopoide (L.) Trin.
Monocotyledones	-	Glumaceae	-	Poaceae (Gramineae)	Urochondra	U. setulos (Trin.) Hubb.
Monocotyledoneae	-	-	Pandanales	Pandanaceae	Pandanus Parkins	P. tectoriu Kuntze

4. Integrated Coastal Zone Management Plan and Coastal Vulnerability Maps of Tamil Nadu (2014 - 2015)

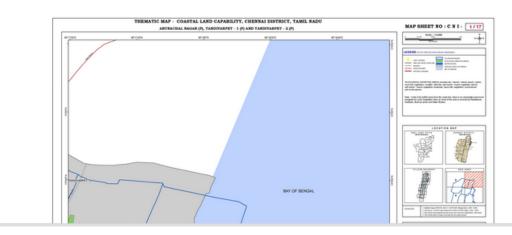
Different type of maps

- 1. Land Capability
- 2. Land Vulnerability
- 3. Landuse
- 4. Sectoral
- a. Agriculture sector
- **b. Ecosystem Sector**
- c. Energy Sector
- d. Fisheries Sector
- e. Forestry Sector
- f. Industries Sector
- g. Infrastructure Sector
- h. Tourism Sector



Land Capability





5. Bhuvan (Point of Interest, Point map, Choropleth Maps, Estuaries of Tamil Nadu & Andhra Pradesh, east coast mangrove region)

About Us

Estuaries

Tamilnadu

Advar Estu

Agniar Estu

Ambulivar E

à Arenier Est

Athankarai

> Cooum Est

> Edaiyur-Sat

> Ennore Est

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Hanumana

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Nambiyar

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Palayakaya

> Pambar

Pantri Estua

Kaveri



	Estuaries of Tamil nadu
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6. Regular updating, subject area, publications, latest news, upcoming events, kid centre, glossary, major activities, bibliography and photos

Economic Advisor's Visit



Evaluation of ENVIS activities by Ms. Vandana Agarwal (05.02.2014), Shri. M. Kannan (23.10.2015) Former Economic Advisers & In-Charge of All ENVIS centres(MOEF&CC)

Annual plan 2016 -2017

Sl.N	Activities	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
0.													
1	Newsletter												
	Seshaiyana –Vol. 24, No. 1												
	Seshaiyana –Vol. 24, No. 2												
	Seshaiyana –Vol. 24, No. 3												
	Seshaiyana –Vol. 24, No. 4												

Publication of the ENVIS newsletter, *Seshaiyana* is to be continued.

Sl.No.	Activities	Apr	Ma	Jun	Jul	Aug.	Sep.	Oct.	Nov.	Dec.	Jan	Feb.	Ma
		•	у.	•	•						•		r.
1	State –of-the –art report	- ,											
	Coral reefs of India												
	(2000 - 2015)	Draft Preparation				D	raft sul	omitte	Pub	Publishing the repor			
			_]	Editori	al Boa	rd			-	-
2	Bibliography												
	Indian coral reefs (2000-												
	2015)	Comp				oilation					Publication		

Coral reefs - Strikingly different and stunningly beautiful lurid fishes and other organisms including the corals themselves make it a living monument of vividness and exquisiteness.
 Coral reefs significantly contribute to livelihoods of coastal communities in India. The awesome diversity of this environment has not yet been fully studied.
 In India - Gulf of Kachchh, Lakshadweep, Gulf of Mannar, Palk Bay, Andaman and Nicobar

Islands and the recently identified patchy reefs of Ratnagiri coasts in Maharastra State and Gaveshani Bank (off Mangalore Coast, Karnataka).

>Our center - state-of-the-art reports on coral ecosystem up to the year 2000

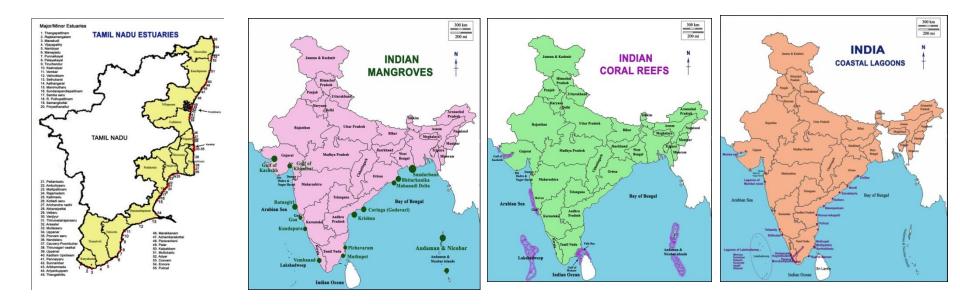
> Update the state of art report up to the year 2015.

➢ Research findings in the research publication and reports available in various parts of the country including the works done by several of the scientists from various institutes, actively engaged in this line of research work.

> conservators, policy makers, researchers and other user community to understand the present scenario of the coral ecosystems of the Indian subcontinent and to take policy decisions for effective management.

Sl.No.	Activities	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	Poster / Pamphlet												
	preparation												

Poster and pamphlets having basic and important information about ecology, biology and values of estuaries, mangroves, coral reefs and lagoons will be prepared.



Sl.No.	Activities	Apr	Ma	Jun	Jul	Aug.	Sep.	Oct.	Nov.	Dec.	Jan	Feb.	Ma
		•	у.	•	•						•		r.
2	Video and photograph												

Our website is now-a-days becoming a center of attraction for the all stakeholders, because of its extensive collection of references and visuals like Maps, Images, Photographs and few video clippings of the Estuaries, Mangroves, and Lagoons.

Further, these video visuals in our web site would enlighten the common people besides children and it would also promote and enhance Eco Tourism in all the coastal wetlands. The new video clippings taken would be incorporated in our website every now and then



Annual plan

ſ	Sl.No.	Activities	Apr	Ma	Jun	Jul	Aug.	Sep.	Oct.	Nov.	Dec.	Jan	Feb.	Ma
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	1	Awareness programme												

Awareness programme regarding protection of estuaries, mangroves, coral reefs and lagoons will be conducted for school students, college students, research scholars and common people.

Database

Information on estuaries and mangroves will be collected from west coast of India (Kerala, Karnataka, Goa, Maharashtra and Gujarat) besides Andaman, Nicobar and Lakshadweep islands. This information will be uploaded in our website.

