





## MANGROVE COVER



Mangroves are salt-tolerant, evergreen, broadleaved trees having aerial roots known as pneumatophores or stilt roots and viviparous germinated seedlings found mainly in tropical and sub-tropical inter-tidal regions of the world. These are trees or shrubs that have the common trait of growing in shallow and muddy salt water or brackish water, especially along quiet shorelines and in estuaries. Typically they produce tangled masses of arching roots that are exposed during low tides. Mangroves do not appear on sandy beaches and rocky shores. A muddy substratum of varying depth and consistency is necessary for their growth.

Mangrove forests are considered as the most productive and biodiverse wetlands on earth. These provide critical habitat for a diverse marine and terrestrial flora and fauna. Healthy mangrove forests are key to a healthy marine ecology. In fact, mangrove forests fix more carbon dioxide per unit area than phytoplankton in tropical oceans. Yet, these unique coastal tropical forests are among the most threatened habitats in the world. They may be disappearing more quickly than inland tropical rainforests and with little public notice.

Mangroves perform a number of vital ecological functions in nutrient recycling, maintenance of hydrological regime, coastal protection and fish-fauna production, all of which are vital for the sustenance of human and animal life. Economically too, mangroves provide firewood, timber, fodder, fruits, medicines, honey etc. Of late, mangroves importance has increased because of their protective role during the recent tsunami.

### 4.1 Status of Mangroves in India

Mangroves in India account for about 5 percent of the world's mangrove vegetation and are spread over an area of about 4,500 km<sup>2</sup> along the coastal States/UTs of the country. Sundarbans in West Bengal accounts for a little less than half of the total area under mangroves in India. The Forest Survey of India is assessing the mangroves using remote sensing since beginning. It published its first assessment in 1987 and area estimated was 4,046 km<sup>2</sup> (scale of assessment - 1:1 million). Thereafter, mangroves were assessed regularly on a two-year cycle from 1989 to 1999 where scale of assessment was 1:250,000. Assessment for 2001 & for 2003 was done on 1:50,000 scale. State/UT wise mangrove cover as assessed by FSI in different assessments is given in Table 4.1. West Bengal has the maximum of mangrove cover in the country, followed by Gujarat and Andaman & Nicobar Islands.

### 4.2 Mangrove Cover Assessment 2005

Mangroves mapping has been done by utilizing their unique reflectance characteristics. In the present assessment, mangrove cover has also been categorized into very dense mangrove (canopy density of more than 70%), moderately dense mangrove (canopy density between 40-70%) and open mangrove (canopy density between 10-40%). Table 4.2 presents State/UT wise status of mangrove cover as estimated in 2005 assessment.

**Table 4.1: State/UT wise mangrove cover assessment**

 (area in km<sup>2</sup>)

Sl. No.	State/UT	Assessment Year								
		1987	1989	1991	1993	1995	1997	1999	2001	2003
1.	Andhra Pradesh	495	405	399	378	383	383	397	333	329
2.	Goa	0	3	3	3	3	5	5	5	16
3.	Gujarat	427	412	397	419	689	901	1031	911	916
4.	Karnataka	0	0	0	0	2	3	3	2	3
5.	Maharashtra	140	114	113	155	155	124	108	118	158
6.	Orissa	199	192	195	195	195	211	215	219	203
7.	Tamil Nadu	23	47	47	21	21	21	21	23	35
8.	West Bengal*	2,076	2,109	2,119	2,119	2,119	2,123	2,125	2,081	2120
9.	Andaman & Nicobar	686	973	971	966	966	966	966	789	658
10.	Pondicherry	0	0	0	0	0	0	0	1	1
11.	Kerala	0	0	0	0	0	0	0	0	8
12.	Daman & Diu	0	0	0	0	0	0	0	0	1
	<b>Total</b>	<b>4,046</b>	<b>4,255</b>	<b>4,244</b>	<b>4,256</b>	<b>4,533</b>	<b>4,737</b>	<b>4,871</b>	<b>4,482</b>	<b>4,448</b>

\* As per the West Bengal forest department, mangrove area in Sundarban is 4,200 km<sup>2</sup> (approximately) which is almost double the area estimates by FSI. This is mainly because West Bengal forest department includes the area of water body also besides mangroves vegetation. But for change detection, it is prudent not to include water area.

The current assessment shows that mangrove cover in the country is 4,445 km<sup>2</sup>, which is 0.14% of the country's total geographic area. The very dense mangrove comprises 1,147 km<sup>2</sup> (25.8 % of mangrove cover), moderately dense mangrove is 1,629 km<sup>2</sup> (36.6 %) while open mangrove covers an area of 1,669 km<sup>2</sup> (37.6%).

Compared with 2003 assessment, there has been a marginal decrease in mangrove cover of the country mainly because of the tsunami that hit Andaman & Nicobar Islands on 26 December 2004. Gujarat has shown an increase in mangrove cover mainly because of plantations and protection measures.

The district wise mangrove cover in each State/UT is given Table 4.3.

### 4.3 District wise mangrove cover

**Table 4.2: State/UT wise mangrove cover in 2005**

 (area in km<sup>2</sup>)

Sl. No.	State/UT	Very Dense Mangrove	Moderately Dense Mangrove	Open Mangrove	Total	Change w.r.t. 2003 assessment
1.	Andhra Pradesh	0	15	314	329	0
2.	Goa	0	14	2	16	0
3.	Gujarat	0	195	741	936	20
4.	Karnataka	0	3	0	3	0
5.	Kerala	0	3	5	8	0
6.	Maharashtra	0	58	100	158	0
7.	Orissa	0	156	47	203	0
8.	Tamil Nadu	0	18	17	35	0
9.	West Bengal	892	895	331	2,118	-2
10.	Andaman & Nicobar	255	272	110	637	-21
11.	Daman & Diu	0	0	1	1	0
12.	Pondicherry	0	0	1	1	0
	<b>Total</b>	<b>1,147</b>	<b>1,629</b>	<b>1,669</b>	<b>4,445</b>	<b>-3</b>

Table 4.3: District wise mangrove cover in 2005

(area in km<sup>2</sup>)

Sl. No.	State/UT and District	Very Dense Mangrove	Moderately Dense Mangrove	Open Mangrove	Total	Change w.r.t. 2003 assessment
1.	Andhra Pradesh					
	East Godawari	0	7	181	188	0
	Guntur	0	3	44	47	0
	Krishna	0	5	88	93	0
	Prakasam	0	0	1	1	0
	Total	0	15	314	329	0
2.	Goa					
	North Goa	0	10	1	11	0
	South Goa	0	4	1	5	0
	Total	0	14	2	16	0
3.	Gujarat					
	Ahmedabad	0	2	4	6	4
	Bharuch	0	22	14	36	3
	Bhavnagar	0	6	8	14	0
	Jam Nagar	0	28	122	150	9
	Kuchchh	0	127	580	707	0
	Navsari	0	0	1	1	0
	Porbander	0	1	0	1	0
	Rajkot	0	1	1	2	0
	Surat	0	7	10	17	4
	Valsad	0	1	1	2	0
	Total	0	195	741	936	20
4.	Karnataka					
	Udipi	0	2	0	2	0
	Kannad Uttar	0	1	0	1	0
	Total	0	3	0	3	0
5.	Kerala					
	Kannur	0	3	4	7	0
	Ernakulam	0	0	1	1	0
	Total	0	3	5	8	0
6.	Maharashtra					
	Mumbai City	0	0	2	2	0
	Mumbai Suburb	0	20	20	40	0
	Raigarh	0	9	38	47	0
	Ratnagiri	0	9	12	21	0
	Sindhudurg	0	1	0	1	0
	Thane	0	19	28	47	0
	Total	0	58	100	158	0

(contd.)

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Sl. No.	State/UT and District	Very Dense Mangrove	Moderately Dense Mangrove	Open Mangrove	Total	Change w.r.t. 2003 assessment
7.	Orissa					
	Baleshwar	0	0	4	4	0
	Bhadrak	0	17	3	20	0
	Jagatsinghpur	0	2	2	4	0
	Kendrapara	0	137	38	175	0
	Total	0	156	47	203	0
8.	Tamil Nadu					
	Chidambaranar	0	0	2	2	0
	Cuddalore	0	5	2	7	0
	Nagapattinam	0	8	9	17	0
	Ramanathapuram	0	1	0	1	0
	Thanjavur	0	4	4	8	0
	Total	0	18	17	35	0
9.	West Bengal					
	Midinipur	6	1	2	9	0
	24 Pargana North	16	10	2	28	0
	24 Pargana South	870	884	327	2081	-2
	Total	892	895	331	2118	-2
10.	Andaman & Nicobar					
	Andaman	255	262	108	625	-6
	Nicobar	0	10	2	12	-15
	Total	255	272	110	637	-21
11.	Daman & Diu					
	Diu	0	0	1	1	0
	Total	0	0	1	1	0
12.	Pondicherry					
	Yanam	0	0	1	1	0
	Total	0	0	1	1	0
	Grand Total	1,147	1,629	1,669	4,445	-3