MANGROVE COVER

03

Introduction

3.1

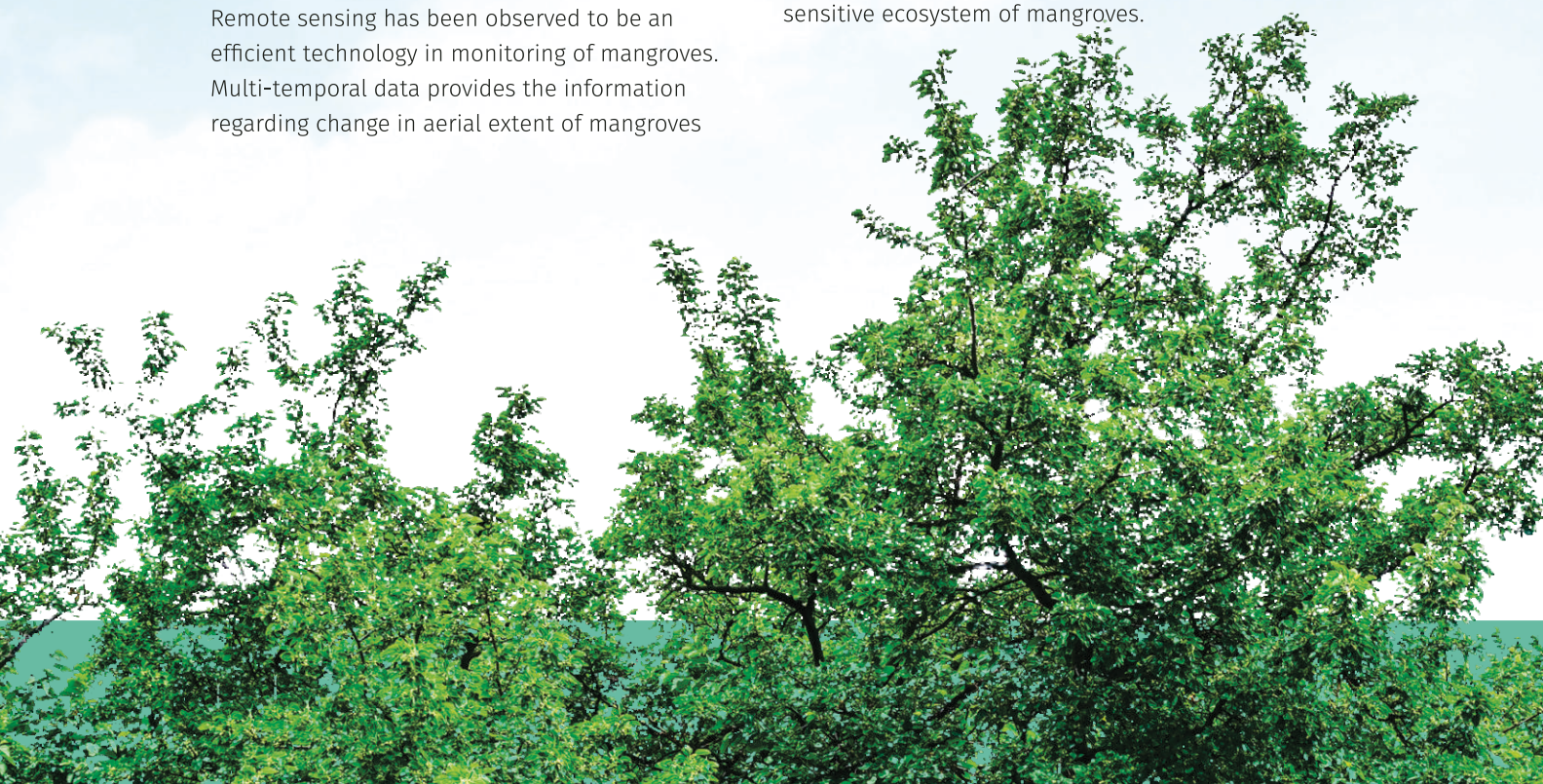
Mangroves are a diverse group of salt tolerant plant communities found in tropical and sub-tropical intertidal region of the world receiving rainfall between 1,000 to 3,000 mm and temperature ranging from 26°-35°C. Mangroves are commonly found throughout the world between latitudes 24°N and 38°S within tropical and subtropical sheltered coastal areas subjected to tidal influences. Mangroves are the most productive and biologically important forest having complex ecosystems.

They are highly specialized plants exhibiting a variety of adaptations in morphology, anatomy and physiology. Prominent among these adaptations are presence of pneumatophores, buttress, stilt roots, vivipary etc.

Mangroves also provide breeding and nursing grounds for marine and pelagic species, food, medicine, fuel and building materials for local communities. Their protective role from natural calamities in coastal areas has been widely recognized.

Remote sensing has been observed to be an efficient technology in monitoring of mangroves. Multi-temporal data provides the information regarding change in aerial extent of mangroves including inaccessible areas. Satellite data analysis along with the Geographical Information System (GIS) platform provides an opportunity to monitor changes in the mangroves.

Biotic pressures and natural calamities are the main threats to mangrove ecosystems. Growing industrial areas along the coastlines and discharge of domestic and industrial sewage are polluting these areas. Many studies have highlighted these problems and intensive conservation efforts are needed to conserve the sensitive ecosystem of mangroves.



Status of Mangrove Cover

3.2

Mangrove cover is spread over an area of 4,740 sq km in India accounting for nearly three percent of the world's mangrove vegetation. Sundarbans in West Bengal accounts for almost half of the total area under mangrove in India. The Forest Survey of India has been assessing the mangrove cover using remote sensing data since 1987. In the first assessment, the estimated extent of the mangrove cover was 4,046 sq km which was carried out at 1:1 million scale. Subsequently, from 1989 to 1999 the mangrove cover was assessed regularly on a two-year cycle at 1:250,000 scale. Assessment from 2001 onwards has been carried out at 1:50,000 scale. States/UTs wise mangrove cover as assessed by FSI in different assessments is given in Table 3.1. This assessment pertains only to the mangrove cover and does not include the tidal creeks and water bodies within the mangrove forests.

Table 3.1 Mangrove Cover Assessment in States/ UTs since 1987 *(Area in km²)*

States/UTs	State of Forest Report												
	1987	1989	1991	1993	1995	1997	1999	2001	2003	2005	2009	2011	2013
Andhra Pradesh	495	405	399	378	383	383	397	333	329	354	353	352	352
Goa	0	3	3	3	3	5	5	5	16	16	17	22	22
Gujarat	427	412	397	419	689	901	1,031	911	916	991	1,046	1,058	1,103
Karnataka	0	0	0	0	2	3	3	2	3	3	3	3	3
Kerala	0	0	0	0	0	0	0	0	8	5	5	6	6
Maharashtra	140	114	113	155	155	124	108	118	158	186	186	186	186
Orissa	199	192	195	195	195	211	215	219	203	217	221	222	213
Tamil Nadu	23	47	47	21	21	21	21	23	35	36	39	39	39
West Bengal	2,076	2,109	2,119	2,119	2,119	2,123	2,125	2,081	2,120	2,136	2,152	2,155	2,097
A&N Islands	686	973	971	966	966	966	966	789	658	635	615	617	604
Daman & Diu	0	0	0	0	0	0	0	0	1	1	1	2	1.63
Puducherry	0	0	0	0	0	0	0	1	1	1	1	1	1
Total	4,046	4,255	4,244	4,256	4,533	4,737	4,871	4,482	4,448	4,581	4,639	4,663	4,628

Mangrove Cover: 2015 Assessment

3.3

Mangrove show conspicuous tone and texture on the satellite images, which have been used in the mapping of mangrove cover of the country. The mangrove cover in this assessment has been categorized into Very Dense, Moderately Dense and Open categories. The density as mentioned pertains to the same density classes as described for the forest cover classes in Chapter 2. Table 3.2 presents status of mangrove cover in 2015 assessment and also the change with respect to previous assessment.

The current assessment shows that mangrove cover in the country is 4,740 sq km, which is 0.14 percent of the country's total geographical area. The Very Dense mangrove comprises 1,472 sq km (31.05 percent) of the mangrove cover, Moderately Dense mangrove is 1,391 sq km (29.35 percent) while Open mangroves constitute an area of 1,877 sq km (39.60 percent). There has been a net increase of 112 sq km in the mangrove cover of the country as compared to 2013 assessment.

Table 3.2: Mangrove Cover Assessment 2015

(Area in km²)

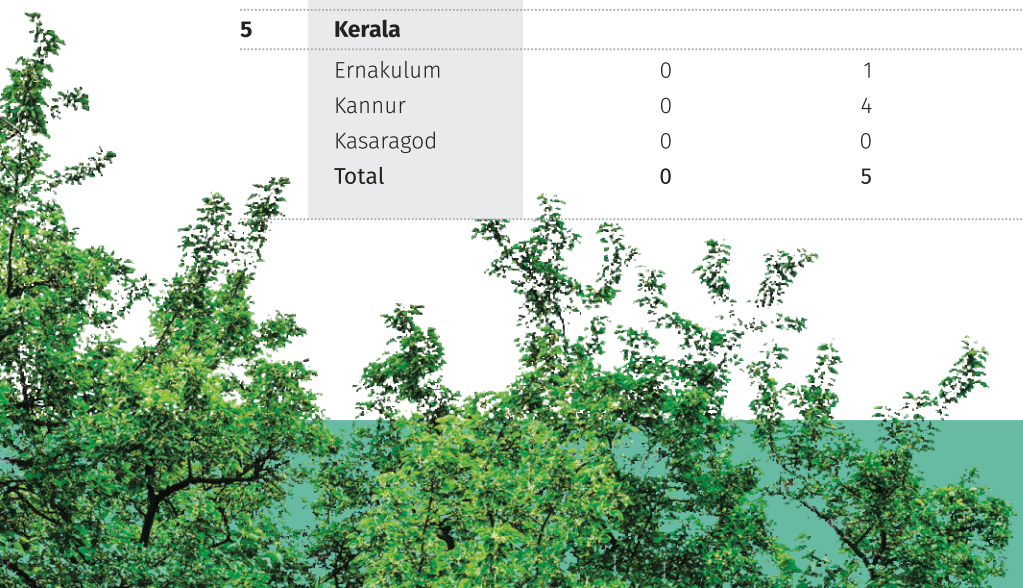
Sl.No.	States/UTs	Very Dense Mangrove	Moderately Dense Mangrove	Open Mangrove	Total Mangrove	Change with respect to ISFR 2013
1.	Andhra Pradesh	0	129	238	367	15
2.	Goa	0	20	6	26	4
3.	Gujarat	0	174	933	1,107	4
4.	Karnataka	0	3	0	3	0
5.	Kerala	0	5	4	9	3
6.	Maharashtra	0	79	143	222	36
7.	Odisha	82	95	54	231	18
8.	Tamil Nadu	1	18	28	47	8
9.	West Bengal	990	700	416	2,106	9
10.	A&N Islands	399	168	50	617	13
11.	Daman & Diu	0	0	3	3	1
12.	Puducherry	0	0	2	2	1
	Total	1,472	1,391	1,877	4,740	112

District wise Mangroves Cover

The district wise mangrove cover in coastal States/UTs is given in Table 3.3

Table 3.3: District wise Mangroves Cover *(Area in km²)*

Sl.No.	States/UTs/ Districts	Very Dense Mangrove	Moderately Dense Mangrove	Open Mangrove	Total	Change w.r.t. 2013 Assessment
1	**Andhra Pradesh**					
	East Godavari	0	62	122	184	-4
	Guntur	0	28	22	50	1
	Krishna	0	39	87	126	17
	Nellore	0	0	5	5	0
	Prakasham	0	0	1	1	0
	West Godavari	0	0	1	1	1
	Total	**0**	**129**	**238**	**367**	**15**
2	**Goa**					
	North Goa	0	17	3	20	3
	South Goa	0	3	3	6	1
	Total	**0**	**20**	**6**	**26**	**4**
3	**Gujarat**					
	Ahmedabad	0	1	32	33	-3
	Amreli	0	0	2	2	0
	Anand	0	0	8	8	0
	Bharuch	0	15	27	42	-2
	Bhavnagar	0	6	11	17	6
	Jamnagar	0	28	145	173	6
	Junagarh	0	0	1	1	0
	Kuchchh	0	118	668	786	-3
	Navsari	0	0	13	13	0
	Porbandar	0	0	1	1	0
	Rajkot	0	1	3	4	0
	Surat	0	5	16	21	0
	Vadodara	0	0	3	3	0
	Valsad	0	0	3	3	0
	Total	**0**	**174**	**933**	**1,107**	**4**
4	**Karnataka**					
	Uttar Kannada	0	1	0	1	0
	Udipi	0	2	0	2	0
	Total	**0**	**3**	**0**	**3**	**0**
5	**Kerala**					
	Ernakulum	0	1	1	2	2
	Kannur	0	4	2	6	1
	Kasaragod	0	0	1	1	0
	Total	**0**	**5**	**4**	**9**	**3**



Sl.No.	State/UTs / Districts	Very Dense Mangrove	Moderately Dense Mangrove	Open Mangrove	Total	Change w.r.t. 2013 Assessment
6	**Maharashtra**					
	Mumbai city	0	0	2	2	0
	Mumbai Suburb	0	24	24	48	5
	Raigarh	0	10	67	77	15
	Ratnagiri	0	15	14	29	6
	Sindhudurg	0	5	2	7	4
	Thane	0	25	34	59	6
	Total	**0**	**79**	**143**	**222**	**36**
7	**Odisha**					
	Baleshwar	0	0	2	2	0
	Bhadrak	0	9	21	30	9
	Jagatsinghpur	0	2	6	8	1
	Kendrapara	82	84	24	190	7
	Puri	0	0	1	1	1
	Total	**82**	**95**	**54**	**231**	**18**
8	**Tamil Nadu**					
	Cuddalore	0	0	7	7	0
	Nagapattinam	0	8	12	20	1
	Pudukkottai	0	1	0	1	1
	Ramanathapuram	1	1	1	3	0
	Thanjavur	0	8	4	12	4
	Thiruvallur	0	0	1	1	1
	Toothukudi	0	0	3	3	1
	Total	**1**	**18**	**28**	**47**	**8**
9	**West Bengal**					
	Medinipur	0	0	3	3	0
	North 24 Pargana	13	11	2	26	1
	South 24 Pargana	977	689	411	2,077	8
	Total	**990**	**700**	**416**	**2,106**	**9**
10	**A&N Islands**					
	Andamam	399	167	50	616	15
	Nicobar	0	1	0	1	-2
	Total	**399**	**168**	**50**	**617**	**13**
11	**Daman & Diu**					
	Daman&Diu	0	0	3	3	1
	Total	**0**	**0**	**3**	**3**	**1**
12	**Puducherry**					
	Puducherry	0	0	1	1	1
	Yanam	0	0	1	1	0
	Total	**0**	**0**	**2**	**2**	**1**
	Grand Total	**1,472**	**1,391**	**1,877**	**4,740**	**112**