



Odisha

9.21.1 Introduction

Odisha is located on the east coast of the country covering an area of 1,55,707 sq km, which constitutes 4.74% of the geographical area of the country. Physiographically, the state can be divided into four regions, viz, Northern Plateau, Eastern Ghats, Central Tableland, and Coastal Plains. The average annual rainfall varies from about 1,200 mm to about 1,600 mm and the average annual temperature ranges between 25 °C to 28 °C. The state is drained by a number of important rivers, which includes Mahanadi, Brahmani and Baitarni. The state has 30 districts, among which 12 are tribal districts. The state does not have any hill districts. As per the 2011 census, Odisha has a population of 41.97 million accounting to 3.47% percent of India's population. The rural, urban and tribal population constitutes 83.32%, 16.68% and 22.85% respectively. The population density of the state is 270 per sq km, which is lower than the national average of 382 persons per sq km. The 19th Livestock census 2012 has reported a total livestock population of 20.73 million.

Table 9.21.1 Land Use Pattern

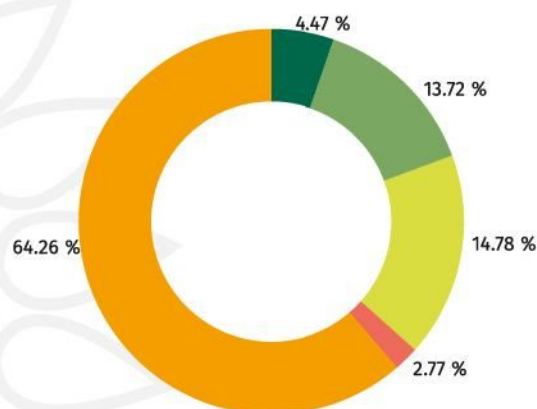
Land Use Types	Area (in 000' ha)	Percentage
Total Geographic Area	15,571	
Reporting area for land utilization	15,467	100.00
Forests	5,814	37.58
Not available for land cultivation	2332	15.08
Permanent pastures and other grazing lands	524	3.39
Land under misc. tree crops and groves	216	1.40
Culturable wasteland	575	3.72
Fallow land other than current fallows	634	4.10
Current fallows	877	5.67
Net area sown	4,495	29.06

Source: Land Use Statistics, Ministry of Agriculture, GOI, 2013-14.

9.21.2

Forest Cover

Based on interpretation of satellite data pertaining to Oct-Dec 2015, the forest cover in the State is 51,345 sq km which is 32.98% of the State's geographical area. In terms of forest canopy density classes, the state has 6,967 sq km under very dense forest, 21,370 sq km under moderately dense forest and 23,008 sq km under open forest.



Forest cover of Odisha

Pie Chart showing forest cover of Odisha

■ Non Forest
 ■ Scrub
 ■ Open Forest
 ■ Mod. Dense Forest
 ■ Very Dense Forest

9.21.3

Forest Cover within and outside Recorded Forest Area

The recorded forest area of the Odisha state is 61,204.17 sq km which constitutes 39.31% of the State's Geographical area. The Reserved Forests including proposed Reserves, Protected and Unclassed including Private Forests are 58.90%, 40.75% and 0.35% respectively of the recorded forest area. However, as the digitized boundary of recorded forest area from the State covers only 44,603 sq km, the analysis of forest cover within and outside this area is depicted below.

Table 9.21.2 Forest Cover within and outside Recorded Forest Area

Forest Cover within Recorded Forest Area (Area in sq km)	
Very Dense Forest (VDF)	6,082
Moderately Dense Forest (MDF)	15,603
Open Forest (OF)	12,431
Total	34,116
Forest Cover outside Recorded Forest Area	
Very Dense Forest	885
Moderately Dense Forest	5,767
Open Forest	10,577
Total	17,229
Total Forest Cover	51,345
Tree Cover	3,993
Total Forest & Tree Cover	55,338
Of State's Geographical Area	35.54%
Of India's Forest & Tree Cover	6.90%
Per capita Forest & Tree Cover	0.13 ha

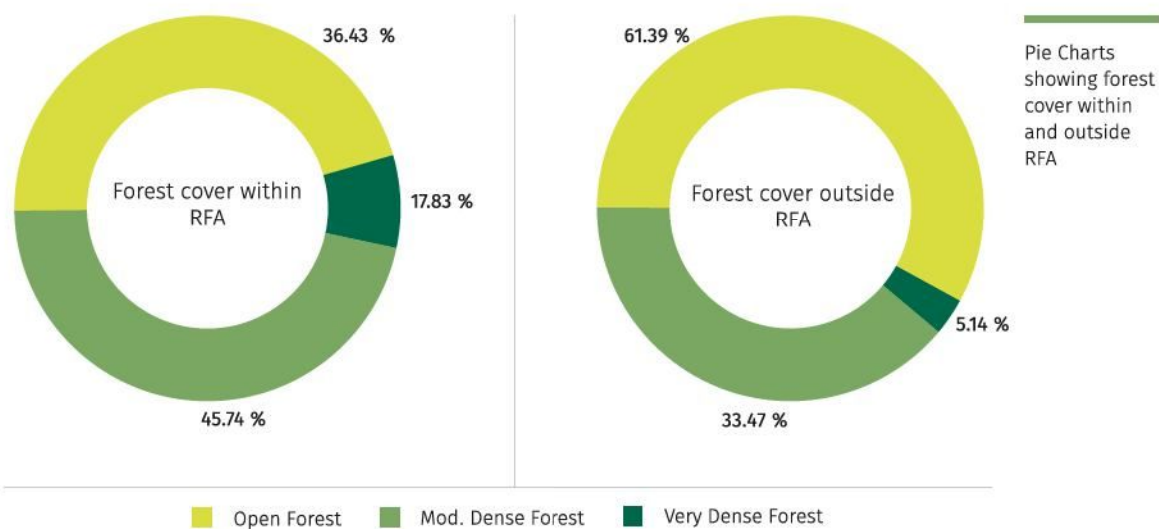


Table 9.21.3 Altitude-wise Forest Cover (Area in sq km)

Altitude Zone(m)	Geographical Area	VDF	MDF	OF	Total
0-500	1,19,476	3,415	12,912	16,274	32,601
500-1000	34,706	3,455	8,139	6,488	18,082
1000-2000	1,525	97	319	246	662
Total	1,55,707	6,967	21,370	23,008	51,345

(Based on SRTM, Digital Elevation Model)

Table 9.21.4 Forest Cover in different Patch Size Classes

S. No.	Patch Size Range in (sq km)	No. of Patches	Area (sq km)	%age
1	$\geq 0.01 \leq 1.0$	37,175	1,338	2.61
2	$> 1.0 \leq 10$	1,344	3,690	7.19
3	$> 10 \leq 100$	174	5,158	10.05
4	$> 100 \leq 500$	22	4,511	8.79
5	$> 500 \leq 1000$	6	4,461	8.69
6	$> 1000 \leq 5000$	5	14,580	28.40
7	$> 5000 \leq 10000$	1	5,480	10.67
8	> 10000	1	12,127	23.60
	Total	38,728	51,345	100.00

Table 9.21.5 Growing Stock

	Growing Stock	% Contribution to country
Growing Stock in Recorded Forest Area	258.013 m cum	6.12
Growing Stock in TOF	81.503 m cum	5.08
Potential Production of industrial wood from TOF	3.38 m cum	4.54
Bamboo bearing area within forest area of the state	12,109 sq km	7.72
Total number of culms	1,585 millions	5.64
Total green weight equivalent of culms	9,864 (000' tonnes)	5.23

9.21.4

Carbon Stock in forest

The total Carbon stock of forests in the State is 452.903 million tonnes (1660.644 million tonnes of CO₂ equivalent) which is 6.40% of total forest carbon of the country.

9.21.5

Decadal Change in water bodies within Forest

An increase of 57 sq km has been observed in the water body coverage within Forest compared to 2015. The graphical and tabular comparison is depicted below.

Extent of
water bodies
within forest

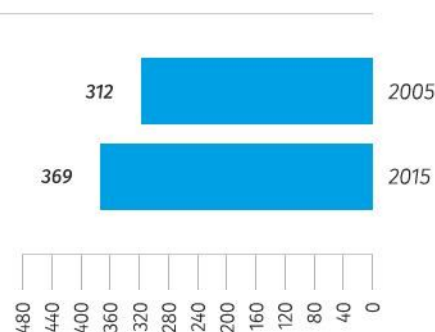


Table 9.21.6 Water bodies within Forest for the years 2005 and 2015

Area/Coverage	2005	2015
Extent of water bodies (sq km) within Forest	312	369
% of water bodies to Forest Cover	0.64	0.72

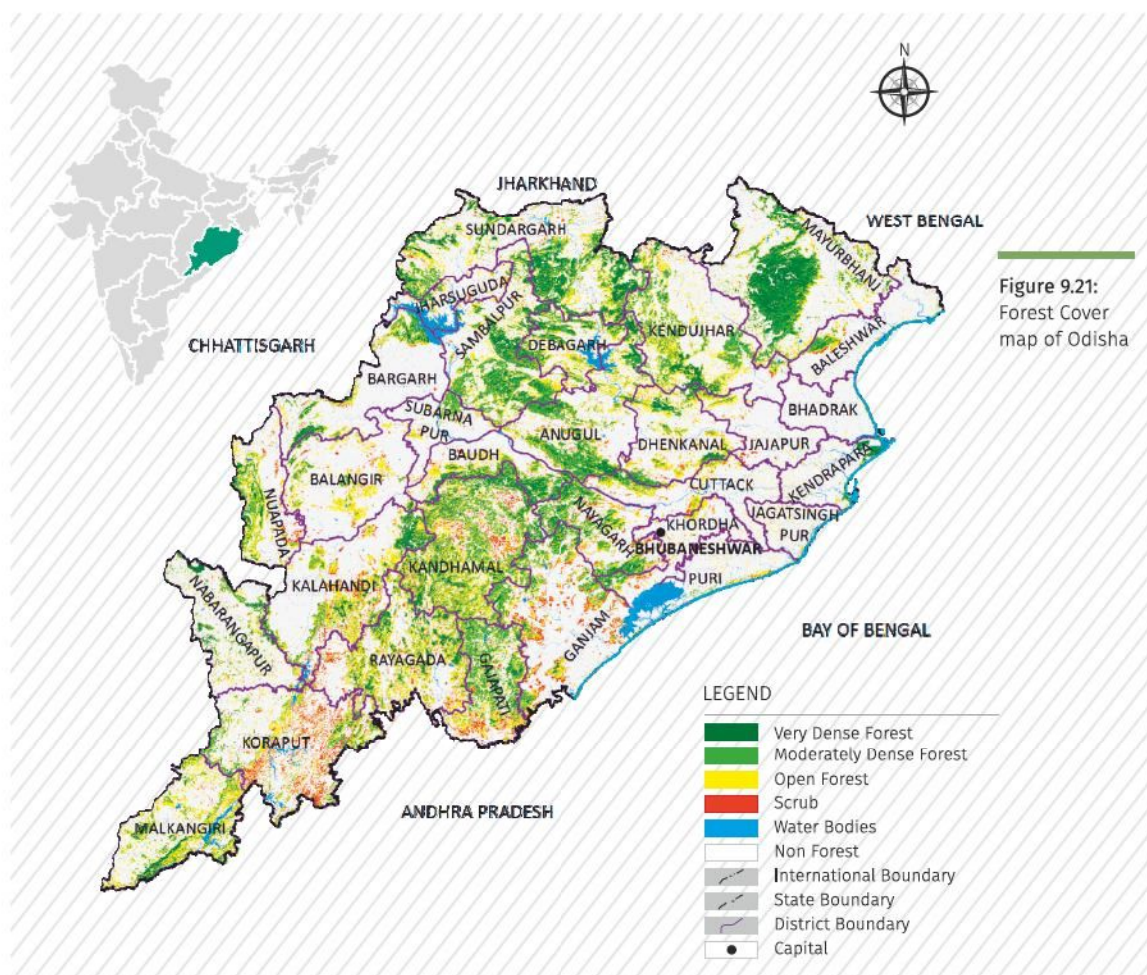


Figure 9.21:
Forest Cover
map of Odisha

Table 9.21.7 District- wise Forest Cover						(area in sq km)		
District	Geographical Area	2017 Assessment				% of GA	Change *	Scrub
		Very Dense Forest	Mod. Dense Forest	Open Forest	Total			
Anugul	6,375	371	1,380	1,004	2,755	43.22	43	84
Balangir	6,575	70	224	837	1,131	17.2	151	142
Baleshwar ^T	3,806	23	127	230	380	9.98	30	48
Bargarh	5,837	176	371	484	1,031	17.66	88	47
Boudh	3,098	263	546	480	1,289	41.61	27	57
Bhadrak	2,505	0	9	66	75	2.99	2	0
Cuttack	3,932	53	226	517	796	20.24	11	68
Debagarh	2,940	191	667	614	1,472	50.07	-3	14
Dhenkanal	4,452	174	418	825	1,417	31.83	9	82
Gajapati ^T	4,325	84	1,490	946	2,520	58.27	12	262
Ganjam	8,206	164	1,075	864	2,103	25.63	15	655

District	Geographical Area	2017 Assessment				% of GA	Change *	Scrub
		Very Dense Forest	Mod. Dense Forest	Open Forest	Total			
Jagatsinghapur	1,668	0	5	131	136	8.15	6	0
Jajapur	2,899	6	72	225	303	10.45	3	50
Jharsuguda	2,114	3	140	179	322	15.23	9	36
Kalahandi ^T	7,920	362	729	1,327	2,418	30.53	36	362
Kandhamal ^T	8,021	661	2,588	2,143	5,392	67.22	16	380
Kendrapara	2,644	84	88	133	305	11.54	14	2
Kendujhar ^T	8,303	289	1,404	1,519	3,212	38.68	4	55
Khordha	2,813	21	186	250	457	16.25	0	92
Koraput ^T	8,807	94	740	1,255	2,089	23.72	120	944
Malkangiri ^T	5,791	158	709	1,475	2,342	40.44	20	45
Mayurbhanj ^T	10,418	1,335	1,718	1,027	4,080	39.16	42	34
Nabarangapur ^T	5,291	168	428	507	1,103	20.85	8	47
Nayagarh	3,890	189	965	556	1,710	43.96	28	173
Nuapada	3,852	86	482	705	1,273	33.05	33	109
Puri	3,479	0	54	160	214	6.15	8	11
Rayagada ^T	7,073	422	853	1,851	3,126	44.2	7	349
Sambalpur ^T	6,624	499	1,675	1,106	3,280	49.52	13	40
Subarnapur	2,337	2	187	161	350	14.98	26	29
Sundargarh ^T	9,712	1,019	1,814	1,431	4,264	43.9	107	89
Grand total	1,55,707	6,967	21,370	23,008	51,345	32.98	885	4,306

*Change compared to updated 2015 assessment.

Table 9.21.8 Forest Cover Change Matrix						(area in sq km)
Class	2017 Assessment					Total ISFR 2015 updated
	VDF	MDF	OF	Scrub	NF	
Very Dense Forest	6,929	14	20	4	18	6,985
Moderately Dense Forest	28	21,292	57	18	75	21,470
Open Forest	2	44	21,634	81	244	22,005
Scrub	2	4	572	3,900	73	4,551
Non-Forest	6	16	725	303	99,646	1,00,696
Total ISFR 2017	6,967	21,370	23,008	4,306	1,00,056	1,55,707
Net Change	-18	-100	1,003	-245	-640	

9.21.6

Reasons for change detected in 2017 assessment

The main reasons for a net increase of 885 sq km in forest cover in the State can be attributed to plantation and conservation activities both within and outside the Recorded Forest Areas as well as improvement in interpretation due to better radiometric resolution of the recent satellite data from Resourcesat-2. The reasons for decrease in forest cover observed in some districts can be attributed to developmental activities.