

9.21 ORISSA

9.21.1 Introduction

Orissa is located on the east coast of the country having 155,707 km² geographical area which constitutes 4.74% area of the country. It lies in the tropical zone between latitudes of 17°47'N and 22°34' N and longitudes of 81°22' E and 87°29' E. Physiographically, the state can be divided into four regions, *viz.*, Northern Plateau, Eastern Ghats, Central Tableland and Coastal Plains. The state is drained by three major rivers, Mahanadi, Brahmani and Baitarni. The famous Hirakud Dam on river Mahanadi is one of the longest dams in the world. The state is rich in mineral resources including coal, iron, bauxite, chromite and

nickel. The annual rainfall varies between 1,200 mm to 1,600 mm and the mean annual temperature ranges between 25°C to 27.5°C.

As per *Census 2011*, the total population of the state is 41.95 million which constitutes 3.47% of the country's population of which the rural population constitutes 83.32% and urban population 16.68%. The population density is 269 persons per km². The livestock population as per *Livestock Census 2007* of the state is 23.06 million.

Land use pattern of the state is given in Table 9.21.1.

Table 9.21.1: Land Use Pattern

Land Use	Area in '000 ha	Percentage
Total geographical area	15,571	
Reporting area for land utilization	15,571	100.00
Forests	5,813	37.33
Not available for cultivation	2,138	13.73
Permanent pastures and other grazing lands	494	3.17
Land under misc. tree crops and groves	342	2.20
Culturable wasteland	375	2.41
Fallow lands other than current fallows	229	1.47
Current fallows	576	3.70
Net area sown	5,604	35.99

Source: *Land Use Statistics, Ministry of Agriculture, GOI, 2008-09.*

9.21.2 Recorded Forest Area

The recorded forest area of the state is 58,136 km² which is 37.34% of its geographical area. The Reserved Forests constitute 45.29%, Protected Forests 26.70% and Unclassed Forests constitute 28.01%.

9.21.3 Protected Areas

Orissa has 2 National Parks and 18 Wildlife Sanctuaries covering 9110.78 km² which constitutes 5.85% of the state's geographical area. The Similipal Tiger Reserve covers 2200 km² and also forms a part of the Similipal

Biosphere Reserve. The Gahirmatha Wildlife Sanctuary, a mangrove eco-system, is a famous nesting ground of the Olive Ridley sea turtle. Chilka lake which is one of the Asia's largest brackish water lake with an area of 0.11 million ha, is a Ramsar site.

- January 2009, is 48,903 km² which is 31.41% of the state's geographical area. In terms of forest canopy density classes, the state has 7,060 km² area under very dense forest, 21,366 km² area under moderately dense forest and 20,477 km² area under open forest. The forest cover of the state is shown in Fig. 9.21.

9.21.4 Forest Cover

The forest cover in the state, based on interpretation of satellite data of October 2008

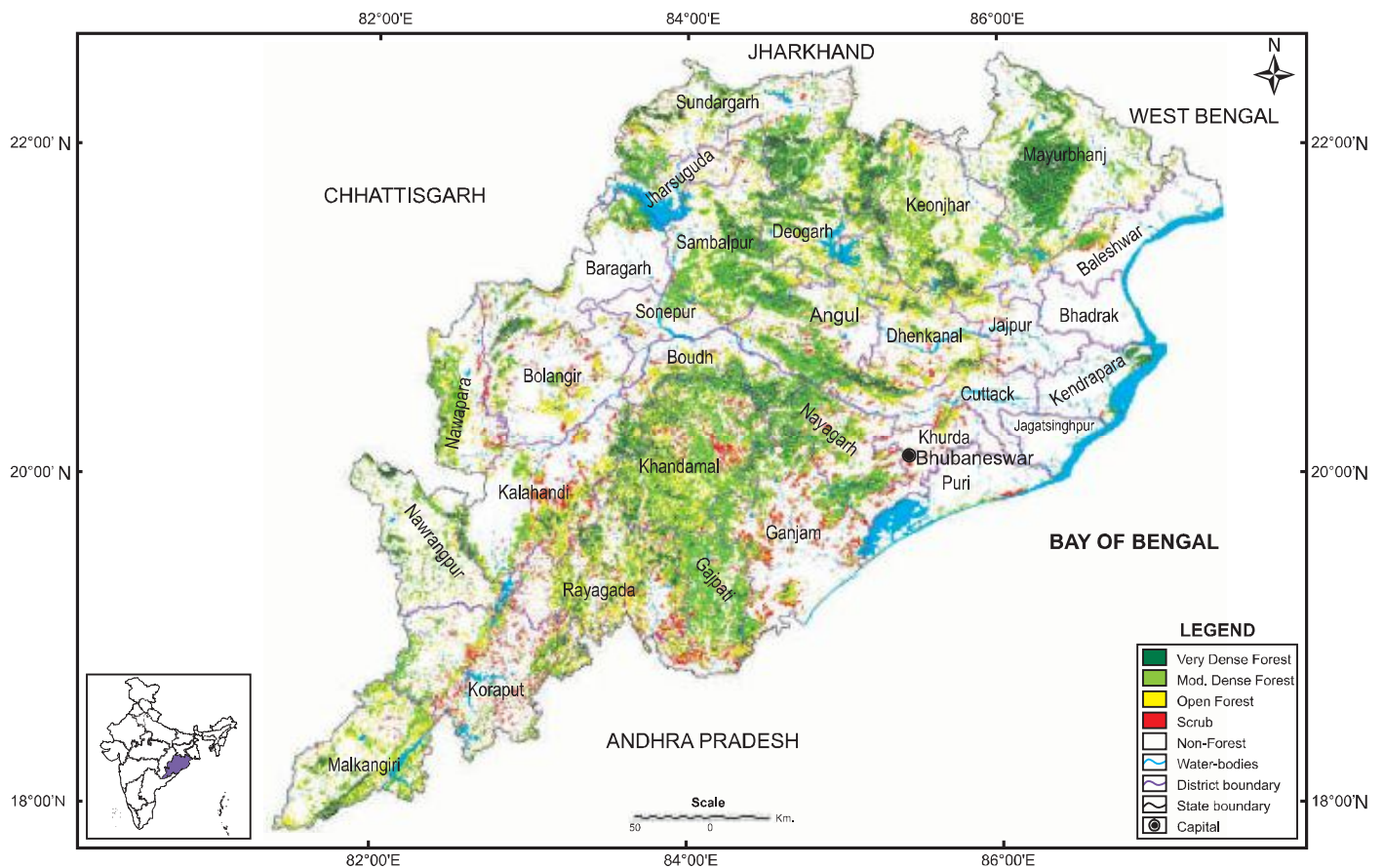
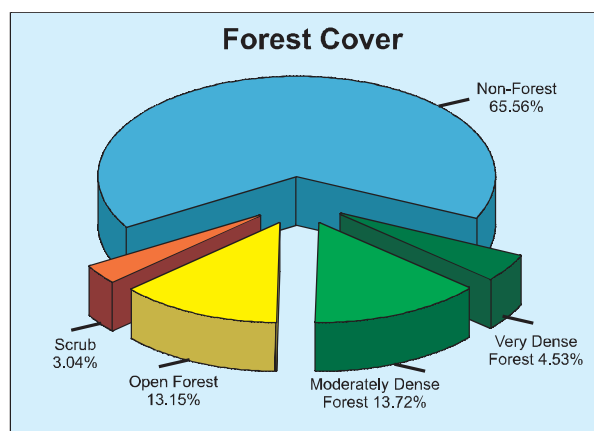


Fig 9.21 Forest cover map of Orissa



District-wise forest cover in different canopy density classes and scrub along with the

changes compared to 2009 Assessment are given in Table 9.21.2.

Table 9.21.2: District-wise Forest Cover

(Area in km²)

District	Geographical Area	2011 Assessment				Percent of GA	Change	Scrub
		Very Dense Forest	Mod. Dense Forest	Open Forest	Total			
Angul	6,375	363	1,353	951	2,667	41.84	-2	134
Baleshwar ^T	3,806	23	126	155	304	7.99	3	51
Baragarh	5,837	176	372	348	896	15.35	-1	79
Bhadrak	2,505	1	10	13	24	0.96	0	0
Bolangir	6,575	72	221	644	937	14.25	3	232
Boudh	3,098	263	544	448	1,255	40.51	0	79
Cuttack	3,932	46	216	405	667	16.96	8	119
Deogarh	2,940	155	620	566	1,341	45.61	0	14
Dhenkanal	4,452	172	343	827	1,342	30.14	-2	153
Gajpati ^T	4,325	90	1,518	879	2,487	57.50	2	267
Ganjam	8,206	156	1,037	800	1,993	24.29	28	672
Jagatsinghpur	1,668	0	7	16	23	1.38	1	1
Jajpur	2,899	6	69	180	255	8.80	0	53
Jharsuguda	2,081	4	144	151	299	14.37	-1	44
Kalahandi ^T	7,920	369	749	1,213	2,331	29.43	25	454
Kendrapara	2,644	81	87	26	194	7.34	0	6
Keonjhar ^T	8,303	308	1,401	1,507	3,216	38.73	-13	55
Khandamal ^T	8,021	660	2,642	2,167	5,469	68.18	-15	358

Forest and Tree Resources in States and Union Territories

District	Geographical Area	2011 Assessment				Percent of GA	Change	Scrub
		Very Dense Forest	Mod. Dense Forest	Open Forest	Total			
Khurda	2,813	23	191	180	394	14.01	19	139
Koraput ^T	8,807	101	719	874	1,694	19.23	16	612
Malkangiri ^T	5,791	157	711	1,318	2,186	37.75	-9	36
Mayurbhanj ^T	10,418	1,340	1,711	941	3,992	38.32	2	33
Nawapara	3,852	85	481	663	1,229	31.91	-8	112
Nawangpur ^T	5,291	188	463	491	1,142	21.58	7	35
Nayagarh	3,890	186	973	506	1,665	42.80	-1	231
Puri	3,479	0	56	44	100	2.87	5	44
Rayagada ^T	7,073	453	896	1,767	3,116	44.05	-10	458
Sambalpur ^T	6,657	533	1,735	1,041	3,309	49.71	2	49
Sonepur	2,337	3	200	121	324	13.86	0	70
Sundargarh ^T	9,712	1,046	1,771	1,235	4,052	41.72	-11	144
Grand Total	155,707	7,060	21,366	20,477	48,903	31.41	48	4,734

Comparison with the previous assessment (satellite data of Oct-Dec 2006) shows a gain of 48 km² of forest cover.

reveals that there has been a decrease of 13 km² in very dense forest, 28 km² in moderately dense forest and an increase of 89 km² in open density forest.

The change matrix given in Table 9.21.3

Table 9.21.3: Forest Cover Change Matrix (Area in km²)

2009 Assessment	2011 Assessment					Total 2009
	VDF	MDF	OF	Scrub	NF	
Very Dense Forest	7,055	0	0	0	18	7,073
Moderately Dense Forest	0	21,235	0	46	113	21,394
Open Forest	0	0	19,789	142	457	20,388
Scrub	0	69	298	4,485	0	4,852
Non Forest	5	62	390	61	101,482	102,000
Total 2011	7,060	21,366	20,477	4,734	102,070	155,707
Net Change	-13	-28	89	-118	70	0

Reasons for Change in Forest Cover

The increase in forest cover is mainly due to conservation measures and improvement in scrub areas owing to plantation of Bamboo and Teak species.

9.21.5 Altitude Zone-wise Forest Cover

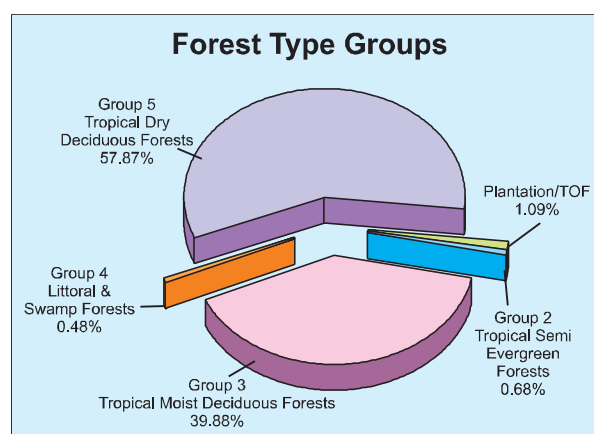
Forest cover of the state in different altitude zones is given in Table 9.21.4.

Altitude Zone	VDF	MDF	OF	Total
0-500m	3,440	12,805	14,201	30,446
500-1000m	3,515	8,237	6,108	17,860
1000-2000m	105	324	168	597
Total	7,060	21,366	20,477	48,903

(Based on SRTM, Digital Elevation Model)

9.21.6 Forest Cover in Different Forest Types

As per Champion & Seth Classification, the state has 18 forest types belonging to four forest type groups, viz. Tropical Semi-evergreen, Tropical Moist Deciduous, Littoral & Swamp and Tropical Dry Deciduous Forests. Percentage-wise distribution of forest cover in different forest type groups is given in the pie diagram.



9.21.7 Tree Cover

Tree cover of the state has been estimated using sample data of TOF inventory collected over a period of six years, i.e. 2004-10. The estimated tree cover in the state is 4,301 km²

which is 2.76% of the geographical area of the state. Five districts of the state (Baudh, Bhadrak, Gajapati, Nawrangapur and Sambalpur) have been inventoried. The forest and tree cover of the state is presented in Table 9.21.5.

Category	Area	% of Geographical Area
Tree Cover	4301	2.76
Forest Cover	48,903	31.41
Forest and Tree Cover	53204	34.17

9.21.8 Growing Stock

The growing stock in the recorded forest area has been estimated on the basis of current

forest cover map, forest type map and forest inventory data. For trees outside forests (TOF), the same has been estimated using TOF inventory data. It is presented in Table 9.21.6.

Table 9.21.6: Growing Stock (million cum)

Forest	TOF	Total
285.191	73.624	358.815

9.21.9 Bamboo Resources

The extent of bamboo bearing area in the forests of the state is 10,518 km². Density-wise

details, number of culms by soundness and equivalent green weight are given in following tables:

Table 9.21.7: Bamboo bearing area by density in recorded forest area (Area in km²)

Recorded Forest Area	Pure bamboo	Dense bamboo	Scattered bamboo	Clumps hacked	Bamboo regeneration	No bamboo
58,136	35	2,479	5,230	1,066	1,708	47,618

Table 9.21.8: Estimated number of bamboo culms and equivalent green weight

Number of culms (in millions)				Equivalent Green Weight (in 000' tonnes)		
Green	Dry	Decayed	Total	Green	Dry	Total
720	169	54	943	3336	1404	4740