

9.23 RAJASTHAN

9.23.1 Introduction

Rajasthan, the largest state of the country, is located in the north-western part of the country. It has a geographical area of 342,239 km² which constitutes 10.41% area of the country's geographical. It lies between latitude 23°4' to 30°11' N and longitude 69°29' to 78°17' E and shares international border with Pakistan in the west. Physiographically, the state can be divided into four major regions, namely, the western desert with barren hills, level rocky/sandy plains, the Aravalli hills and south-eastern plateau. The state has varied climate from semi-arid to arid. The temperature in the state ranges from sub

zero to 50°C. The average rainfall ranges from 480 mm to 750 mm being as low as 150 mm in arid region and 1,000 mm in south-eastern plateau.

The population of the state is 68.62 million (*Census 2011*) which constitutes 5.67% of the country's population. Of this, 75.11% is rural and 24.89% urban population. Population density is 201 persons per km². Rajasthan has the second largest livestock population of the country, which is 56.66 million (*Livestock Census 2007*).

Land use pattern of the state is given in Table 9.23.1.

Table 9.23.1: Land Use Pattern

Land Use	Area in '000 ha	Percentage
Total geographical area	34,224	
Reporting area for land utilization	34,270	100.00
Forests	2,728	7.96
Not available for cultivation	4,265	12.45
Permanent pastures and other grazing lands	1,699	4.96
Land under misc. tree crops and groves	18	0.05
Culturable wasteland	4,336	12.65
Fallow lands other than current fallows	2,108	6.15
Current fallows	1,565	4.57
Net area sown	17,551	51.21

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

9.23.2 Recorded Forest Area

The recorded forest area of the state is 32,639 km² which is 9.54% of the state's geographical area. Reserved Forests constitute 38.16%, Protected Forests 53.36% and Unclassed Forests 8.48% area.

9.23.3 Protected Areas

Rajasthan has 5 National Parks and 25 Wildlife Sanctuaries covering 9,326 km² which constitutes 2.70% of the state's geographical area. Rajasthan has two Tiger Reserves, namely, Ranthambhore and Sariska.

Keoladeo, Ghana National Park, Bharatpur is of international importance for its rich avifauna and migratory birds. It is one of the

heritage sites of the world and also a Ramsar site. Sambhar Lake has also been designated under Ramsar Convention.

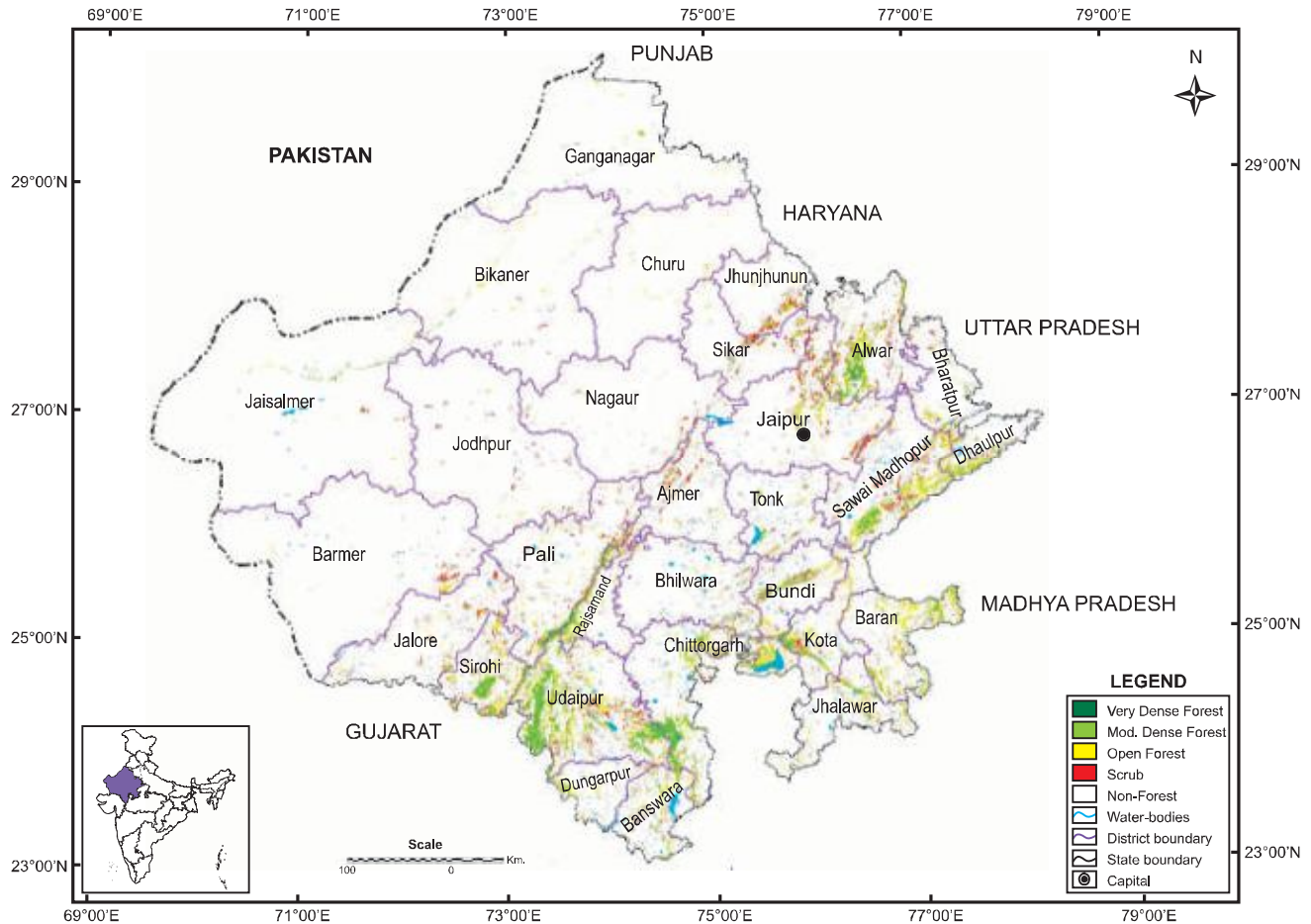
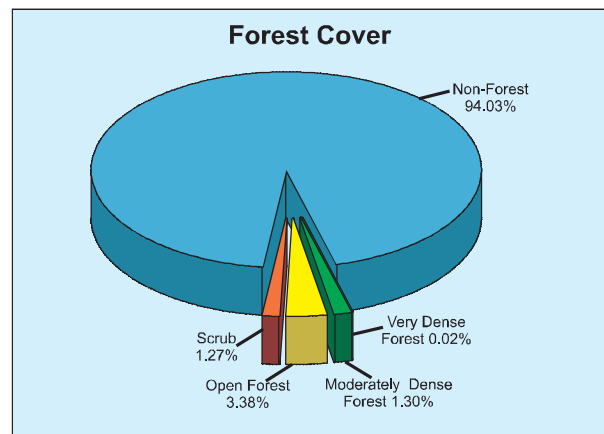


Fig. 9.23 Forest Cover Map of Rajasthan

9.23.4 Forest Cover

The forest cover in the state, based on interpretation of satellite data of October-December 2008, is 16,087 km² which is 4.70% of the state's geographical area. In terms of forest canopy density classes, the state has 72 km² area under very dense forest, 4,448 km² area under moderately dense forest and 11,567 km² area under open forest. The forest cover of the state is shown in Fig. 9.23.



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District-wise forest cover in different canopy density classes along with the changes compared to 2009 Assessment and scrub are given in Table 9.23.2.

Table 9.23.2: 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			
Ajmer	8,481	0	38	239	277	3.27	1	218
Alwar	8,380	59	336	810	1,205	14.38	-2	255
Banswara ^T	5,037	0	83	293	376	7.46	1	85
Baran	6,992	0	149	941	1,090	15.59	1	113
Barmer	28,387	0	3	169	172	0.61	3	106
Bharatpur	5,066	0	34	204	238	4.70	2	90
Bhilwara	10,455	0	34	191	225	2.15	3	129
Bikaner	27,244	0	28	180	208	0.76	11	39
Bundi	5,550	0	146	307	453	8.16	0	145
Chittorgarh ^T	10,856	0	595	1,092	1,687	15.54	-2	159
Churu	16,830	0	5	85	90	0.53	1	6
Dhaulpur	3,033	0	82	337	419	13.81	0	56
Dungarpur ^T	3,770	0	44	208	252	6.68	0	42
Ganganagar	20,634	0	30	160	190	0.92	13	3
Jaipur	14,069	13	114	504	631	4.49	0	431
Jaisalmer	38,401	0	47	120	167	0.43	5	34
Jalore	10,640	0	13	195	208	1.95	0	177
Jhalawar	6,219	0	83	314	397	6.38	1	91
Jhunjhunun	5,928	0	24	171	195	3.29	2	188
Jodhpur	22,850	0	3	90	93	0.41	0	104
Kota	5,443	0	154	461	615	11.30	0	103
Nagaur	17,718	0	11	108	119	0.67	0	99
Pali	12,387	0	216	446	662	5.34	4	268
Rajsamand	3,860	0	131	293	424	10.98	2	51
Sawai Madhopur	10,528	0	260	1,040	1,300	12.35	1	470
Sikar	7,732	0	32	161	193	2.50	1	184
Sirohi ^T	5,136	0	300	616	916	17.83	-1	198
Tonk	7,194	0	33	134	167	2.32	1	56
Udaipur ^T	13,419	0	1,420	1,698	3,118	23.24	3	457
Grand Total	342,239	72	4,448	11,567	16,087	4.70	51	4,357

NB: Boundaries of three districts (Dausa, Hanumangarh and Karauli) not available. Their data are given jointly with that of parent districts.

Comparison of current assessment with the previous assessment shows a gain of 51 km² of forest cover.

Reasons for Change detected in 2011 Assessment

Gain in forest cover in the present assessment

can be ascribed to massive plantation activities/programmes undertaken by the SFD. Natural re-growth of *Prosopis juliflora* at places has also contributed towards improvement of forest cover in the state.

Table 9.23.3: Forest Cover Change Matrix (Area in km²)

2009 Assessment	2011 Assessment					Total 2009
	VDF	MDF	OF	Scrub	NF	
Very Dense Forest	72		0	0	0	72
Moderately Dense Forest	0	4440	2	0	8	4,450
Open Forest	0	8	11,449	5	52	11,514
Scrub	0	0	5	4,333	9	4,347
Non-Forest	0	0	111	19	321,726	321,856
Total 2011	72	4,448	11,567	4,357	321,795	342,239
Net Change	0	-2	53	10	-61	

The change matrix given in Table 9.23.3 reveals that there has been an increase of 53 km² in open forest and a decrease of 2 km² in the moderately dense forest.

9.23.5 Altitude Zone-wise Forest Cover

Forest cover of the state in different altitude zones is given in Table 9.23.4.

Table 9.23.4: Altitude Zone-wise Forest Cover (Area in km²)

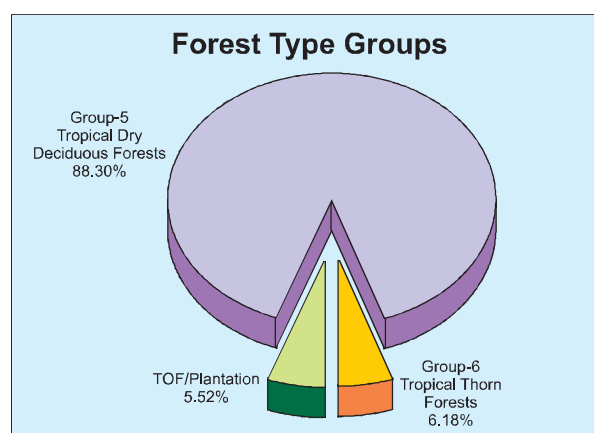
Altitude Zone	VDF	MDF	OF	Total
0-500m	15	2,652	8,936	11,603
500-1000m	57	1,670	2,578	4,305
1000-2000m	0	126	53	179
Total	72	4,448	11,567	16,087

(Based on SRTM, Digital Elevation Model)

9.23.6 Forest Cover in Different Forest Types

Forest type mapping using satellite data has been undertaken by Forest Survey of India with reference to Champion & Seth

Classification. As per this assessment, the state has 20 forest types which belong to two forest type groups, viz. Tropical Dry Deciduous and Tropical Thorn Forests. Distribution of forest cover in different forest type groups found in the state is given in the pie diagram.



9.23.7 Tree Cover

Tree cover of the state has been estimated using TOF inventory data collected over a period of six years, i.e. 2004-10. The estimated

tree cover in the state is 8,272 km² which is 2.42% of its geographical area. A total of 8 districts of the state have been inventoried. The forest and tree cover of the state is presented in Table 9.23.5.

Table 9.23.5: Forest and Tree Cover (Area in km²)

Category	Area	% of Geographical Area
Tree Cover	8,272	2.42
Forest Cover	16,087	4.70
Forest and Tree Cover	24,359	7.12

9.23.8 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 the Table 9.23.6.

Table 9.23.6: Growing Stock (million cum)

Forest	TOF	Total
34.385	81.560	115.945

Note: The growing stock estimate of TOF given in ISFR 2009 was an over estimation due to inclusion of entire desert area of the state with rest of the Western Plain physiographic zone in TOF inventory. In the current assessment problem has been overcome by creating a separate sub-strata for the desert areas. This has generated more precise estimation in the present assessment.

9.23.9 Bamboo

The extent of bamboo bearing area in the recorded forest area of the state is estimated to

be 2,455 km². Their density-wise occurrence, estimated number of culms by soundness and equivalent green weight are given in Tables 9.23.7 and 9.23.8 respectively

Table 9.23.7: 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
32,639	0	516	1,188	333	418	30,185

Table 9.23.8: 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
500	404	122	1,026	1,692	2,722	4,414