

## 9.14 KERALA

### 9.14.1 Introduction

The coastal state of Kerala is situated in southern most part of the country along Arabian Sea. The geographical area of state is 38,863 km<sup>2</sup> and its lies between latitude 8°17'N-12°47'N and longitude 74°52'E - 77°24'E. Physiographically, the state can be divided into coastal, midland and highland zones. Situated in the humid tropical belt, the state is characterized by high rainfall and humidity. The annual rainfall varies from 1,520 mm to 4,075 mm, and the temperature ranges from 19.8°C to 36.7°C.

The population of the state is 33.39 million (*Census 2011*) which constitutes 2.76% of the country's population. Of this, rural population is 52.28% and urban population 47.72%. The population density is 859 persons per km<sup>2</sup>. The livestock population is 3.59 million (*Livestock Census 2007*).

Land use pattern of the state is given in Table 9.14.1.

**Table 9.14.1: Land Use Pattern**

Land Use	Area in '000 ha	Percentage
Total geographical area	3,886	
Reporting area for land utilization	3,887	100.00
Forests	1,082	27.84
Not available for cultivation	500	12.86
Permanent pastures and other grazing lands	0	0.00
Land under misc. tree crops and groves	6	0.15
Culturable wasteland	96	2.46
Fallow lands other than current fallows	46	1.18
Current fallows	68	1.75
Net area sown	2,089	53.76

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

### 9.14.2 Recorded Forest Area

The recorded forest area in the state is 11,265 km<sup>2</sup> which constitutes 28.99% of state's geographical area. Reserved Forests constitute 98.74% and Protected Forests 1.26% of the recorded forest areas.

2,379 km<sup>2</sup> which constitutes 6.12% of the state's geographical area. Sashtam Kotta and Ashtamudi are wetlands of national importance located in Kollam district with an area of 3.75 km<sup>2</sup> and 32 km<sup>2</sup> respectively. A part of the Nilgiri Biosphere Reserve also falls in Kerala.

### 9.14.3 Protected Areas

Kerala has 6 National Parks and 15 Wildlife Sanctuaries covering cumulative area of

### 9.14.4 Forest cover

The forest cover in the state based on interpretation of satellite data of February

2009, is 17,300 km<sup>2</sup> which is 44.52% of the state's geographical area. In terms of forest canopy density classes, the state has 1,442 km<sup>2</sup> area under very dense forest, 9,394 km<sup>2</sup> area under moderately dense forest and 6,464

km<sup>2</sup> area under open forest. The density class-wise distribution of the forest cover of the state is shown in Fig. 9.14. Proportion of different forest density classes is depicted in the pie diagram in percentage terms.

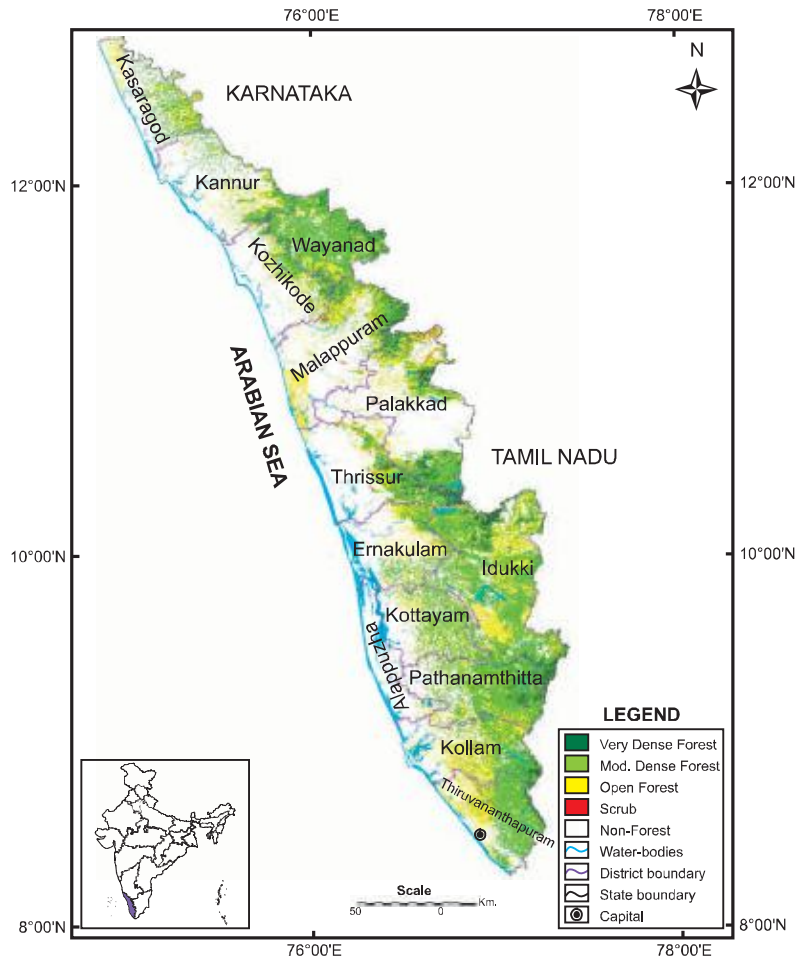
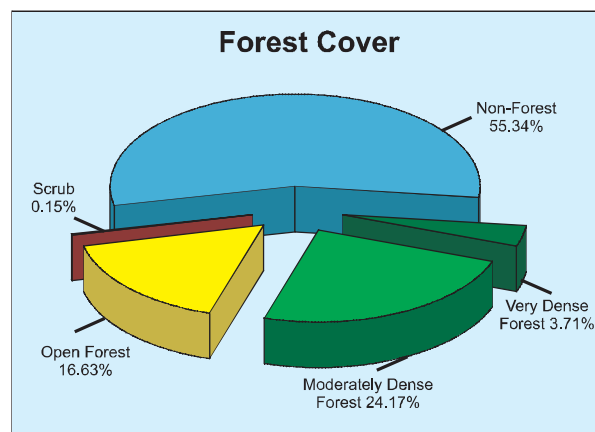


Fig 9.14 Forest cover map of Kerala



## Forest and Tree Resources in States and Union Territories

District-wise forest cover in different canopy density classes along with the changes compared to 2009 Assessment and scrub are given in Table 9.14.2.

**Table 9.14.2: District-wise Forest Cover** (Area in km<sup>2</sup>)

District	Geographical Area	2011 Assessment				Percent of GA	Change	Scrub
		Very Dense Forest	Mod. Dense Forest	Open Forest	Total			
Alappuzha	1,414	0	12	26	38	2.69	0	0
Ernakulam <sup>TH</sup>	2,407	12	298	385	695	28.87	-1	1
Idukki <sup>TH</sup>	5,019	350	2,159	1,421	3,930	78.30	-2	5
Kannur <sup>TH</sup>	2,966	21	351	269	641	21.61	0	0
Kasaragod <sup>TH</sup>	1,992	0	307	285	592	29.72	0	1
Kollam <sup>TH</sup>	2,491	75	632	623	1,330	53.39	-7	0
Kottayam	2,203	12	542	335	889	40.35	-6	1
Kozhikode <sup>H</sup>	2,344	32	288	271	591	25.21	0	0
Malappuram <sup>TH</sup>	3,550	144	406	659	1,209	34.06	-2	9
Palakkad <sup>TH</sup>	4,480	276	693	606	1,575	35.16	0	35
Pathanamthitta	2,642	144	1,147	464	1,755	66.43	-3	0
Thiruvananthapuram <sup>TH</sup>	2,192	55	824	470	1,349	61.54	-1	0
Thrissur	3,032	181	388	362	931	30.71	-2	5
Waynad <sup>TH</sup>	2,131	140	1,347	288	1,775	83.29	0	1
<b>Grand Total</b>	<b>38,863</b>	<b>1,442</b>	<b>9,394</b>	<b>6,464</b>	<b>17,300</b>	<b>44.52</b>	<b>-24</b>	<b>58</b>

The table reveals that there is a loss of forest cover to the extent of 24 km<sup>2</sup> as compared to previous assessment.

**Table 9.14.3: Forest Cover Change Matrix** (Area in km<sup>2</sup>)

2009 Assessment	2011 Assessment					Total 2009
	VDF	MDF	OF	Scrub	NF	
Very Dense Forest	1,442	0		0	1	<b>1,443</b>
Moderately Dense Forest	0	9,394	0	0	16	<b>9,410</b>
Open Forest	0	0	6,464	0	7	<b>6,471</b>
Scrub	0	0	0	58	0	<b>58</b>
Non-Forest	0	0	0	0	21,481	<b>21,481</b>
<b>Total 2011</b>	<b>1,442</b>	<b>9,394</b>	<b>6,464</b>	<b>58</b>	<b>21,505</b>	<b>38,863</b>
Net Change	-1	-16	-7	0	24	

**Reasons for Change detected in 2011 Assessment**

There is a shift reported from MDF and OF to non-forest resulting in decline in forest cover to the tune of 24 km<sup>2</sup>. This is primarily due to rotational felling of *Eucalyptus*, Teak, *Acacia*

*mangium*, rubber and shade bearing trees in the gardens.

**9.14.5 Altitude Zone-wise Forest Cover**

Forest cover of the state in different altitude zones is given in Table 9.14.4.

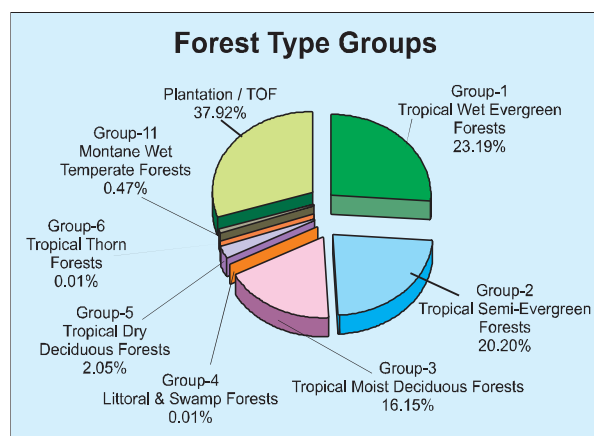
**Table 9.14.4: Altitude Zone-wise Forest Cover** (Area in km<sup>2</sup>)

Altitude Zone	VDF	MDF	OF	Total
0-500m	186	4,658	4,291	<b>9,135</b>
500-1000m	578	3,212	1,348	<b>5,138</b>
1000-2000m	639	1,462	791	<b>2,892</b>
2000-3000m	39	62	34	<b>135</b>
<b>Total</b>	<b>1,442</b>	<b>9,394</b>	<b>6,464</b>	<b>17,300</b>

(Based on SRTM, Digital Elevation Model)

**9.14.6 Forest Cover in Different Forest Types**

Forest type mapping using satellite data was carried out by Forest Survey of India with reference to Champion & Seth Classification. As per this assessment, the state has 13 forest types which belong to the seven forest type groups, viz. Tropical Wet Evergreen, Tropical Semi Evergreen, Tropical Moist Deciduous, Littoral & Swamp, Tropical Dry Deciduous, Tropical Thorn and Montane Wet Temperate Forests. Percentage-wise distribution of forest cover in different forest type groups found in the state is given in the pie diagram.



**9.14.7 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 2,755 km<sup>2</sup> which is

7.09% of the geographical area of the state. Five districts of the state, namely, Ernakulam, Idukki, Kollam, Palakkad and Waynad have been inventoried. The forest and tree cover of the state is presented in Table 9.14.5.

**Table 9.14.5: Forest and Tree Cover** (Area in km<sup>2</sup>)

Category	Area	% of Geographical Area
Tree Cover	2,755	7.09
Forest Cover	17,300	44.52
<b>Forest &amp; Tree Cover</b>	<b>20,055</b>	<b>51.61</b>

### 9.14.8 Growing Stock

The growing stock in the recorded forest area has been estimated on the basis of the 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 9.14.6.

**Table 9.14.6: Growing Stock** (million cum)

Forest	TOF	Total
142.582	49.059	191.641

### 9.14.9 Bamboo

The extent of bamboo bearing area in the forests of the state is 2,882 km<sup>2</sup>. Density-wise

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

**Table 9.14.7: Bamboo bearing area by density in recorded forest area** (Area in km<sup>2</sup>)

Recorded Forest Area	Pure bamboo	Dense bamboo	Scattered bamboo	Clumps hacked	Bamboo regeneration	No bamboo
11,265	0	461	2,105	86	230	8,383

**Table 9.14.8: 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
115	37	5	157	6399	2818	9217