



## Kerala

### 9.14.1 Introduction

*Kerala is a coastal State which is situated in southern most part of the country along Arabian Sea. The geographical area of the state is 38,852 sq km which is 1.18% of the country's total geographical area. Situated in the humid tropical belt, the state is characterized by high rainfall and humidity. The rainfall of the state varies from 1,520 to 4,075mm and the temperature ranges from 19.8°C to 36.7°C. The state comprises of 14 districts among which 10 districts are hill districts and 9 tribal districts. As per the 2011 Census, Kerala has a population of 33.41 million, which makes 2.7% population of the country. The urban, rural and tribal population of the state is 15.94, 17.47 and 0.48 million respectively. The average population density of the state tends to be 860 per sq km. According to 19<sup>th</sup> Live Stock Census, 2012 the livestock population is 2.73 million.*

Table 9.14.1 Land Use Pattern

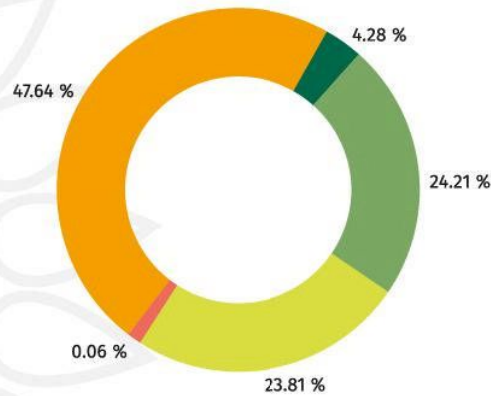
Land Use Types	Area (in 000' ha)	Percentage
Total Geographic Area	3,886	
Reporting area for land utilization	3,886	100
Forests	1,082	27.84
Not available for land cultivation	526	13.53
Permanent pastures and other grazing lands	0	0.00
Land under misc. tree crops and groves	3	0.08
Culturable wasteland	97	2.50
Fallow land other than current fallows	57	1.47
Current fallows	71	1.83
Net area sown	2,051	52.77

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

### 9.14.2

#### Forest Cover

Based on interpretation of satellite data pertaining to Oct-Dec 2015, the forest cover in the State is 20,321 sq km which is 52.30% of the State's geographical area. In terms of forest canopy density classes, the state has 1,663 sq km under very dense forest, 9,407 sq km under moderately dense forest and 9,251 sq km under open forest.



**Forest cover of Kerala**

Pie Chart showing forest cover of Kerala

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

**9.14.3**

**Forest Cover within and outside Recorded Forest Area**

The recorded forest area of the state is 11,309 sq km which is 29.11% of the state's geographical area. All the recorded forests in the state are Reserved Forests. However as the digitized boundary of recorded forest area from the State covers only 10,432 sq km, the analysis of forest cover within and outside this area is depicted below.

**Table 9.14.2 Forest Cover within and outside Recorded Forest Area**

Forest Cover within Recorded Forest Area (Area in sq km)	
Very Dense Forest (VDF)	1,362
Moderately Dense Forest (MDF)	4,542
Open Forest (OF)	2,242
<b>Total</b>	<b>8,146</b>
Forest Cover outside Recorded Forest Area	
Very Dense Forest	301
Moderately Dense Forest	4,865
Open Forest	7,009
<b>Total</b>	<b>12,175</b>
<b>Total Forest Cover</b>	<b>20,321</b>
<b>Tree Cover</b>	<b>2,959</b>
<b>Total Forest &amp; Tree Cover</b>	<b>23,280</b>
Of State's Geographical Area	59.92%
Of India's Forest & Tree Cover	2.90%
Per capita Forest & Tree Cover	0.07 ha

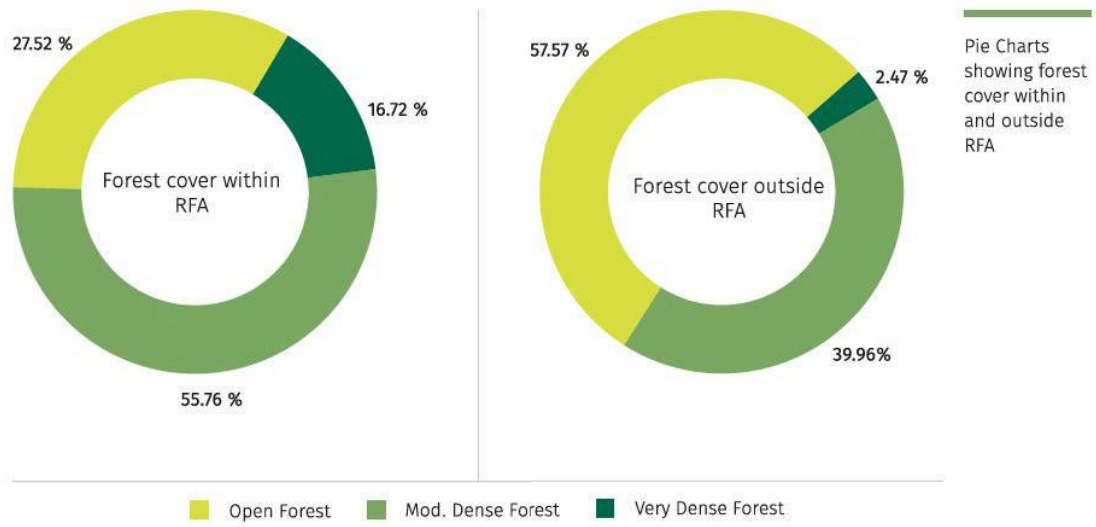


Table 9.14.3 Altitude-wise Forest Cover (Area in sq km)

Altitude Zone (m)	Geographical Area	VDF	MDF	OF	Total Forest
0-500	28,678	172	5,111	7,333	12,616
500-1000	6,478	705	2,913	1,302	4,920
1000-2000	3,441	742	1,333	589	2,664
2000-3000	255	44	50	27	121
<b>Total</b>	<b>38,852</b>	<b>1,663</b>	<b>9,407</b>	<b>9,251</b>	<b>20,321</b>

(Based on SRTM, Digital Elevation Model)

Table 9.14.4 Forest Cover in different Patch Size Classes

S.No.	Patch Size Range (sq km)	No. of Patches	Area(sq km)	%age
1.	≥ 0.01 ≤ 1.0	32,038	2,083	10.25
2.	> 1.0 ≤ 10	523	1,309	6.44
3.	> 10 ≤ 100	42	1,006	4.95
4.	> 100 ≤ 500	3	687	3.38
5.	> 500 ≤ 1000	2	1,180	5.81
6.	> 1000 ≤ 5000	2	14,056	69.17
	<b>Total</b>	<b>32,610</b>	<b>20,321</b>	<b>100</b>

Table 9.14.5 Growing Stock

	Growing Stock	% Contribution to country
Growing Stock in Recorded Forest Area	167.085 m cum	3.96
Growing Stock in TOF	51.898 m cum	3.24
Potential Production of industrial wood from TOF	2.36 m cum	3.17
Bamboo bearing area within forest area of the state	3,484 sq km	2.22
Total number of culms	834 millions	2.97
Total green weight equivalent of culms	7,220 (000' tonnes)	3.82

9.14.4

### Carbon Stock in forest

The total Carbon stock of forests in the State is 255,881 million tonnes (938,230 million tonnes of CO<sub>2</sub> equivalent) which is 3.61% of total forest carbon of the country.

9.14.5

### Decadal Change in water bodies within Forest

An increase of 71 sq km has been observed in the water body coverage within forest compared to 2005. The graphical and tabular comparison is depicted below.

Extent of water bodies within forest

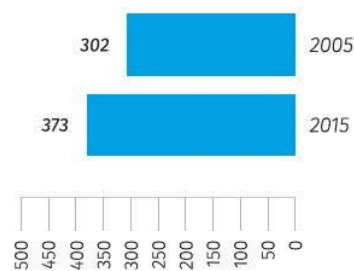


Table 9.14.6 Water bodies within Forest for the years 2005 and 2015

Area/Coverage	2005	2015
Extent of water bodies (sq km) within Forest	302	373
% of water bodies to Forest Cover	1.75	1.84

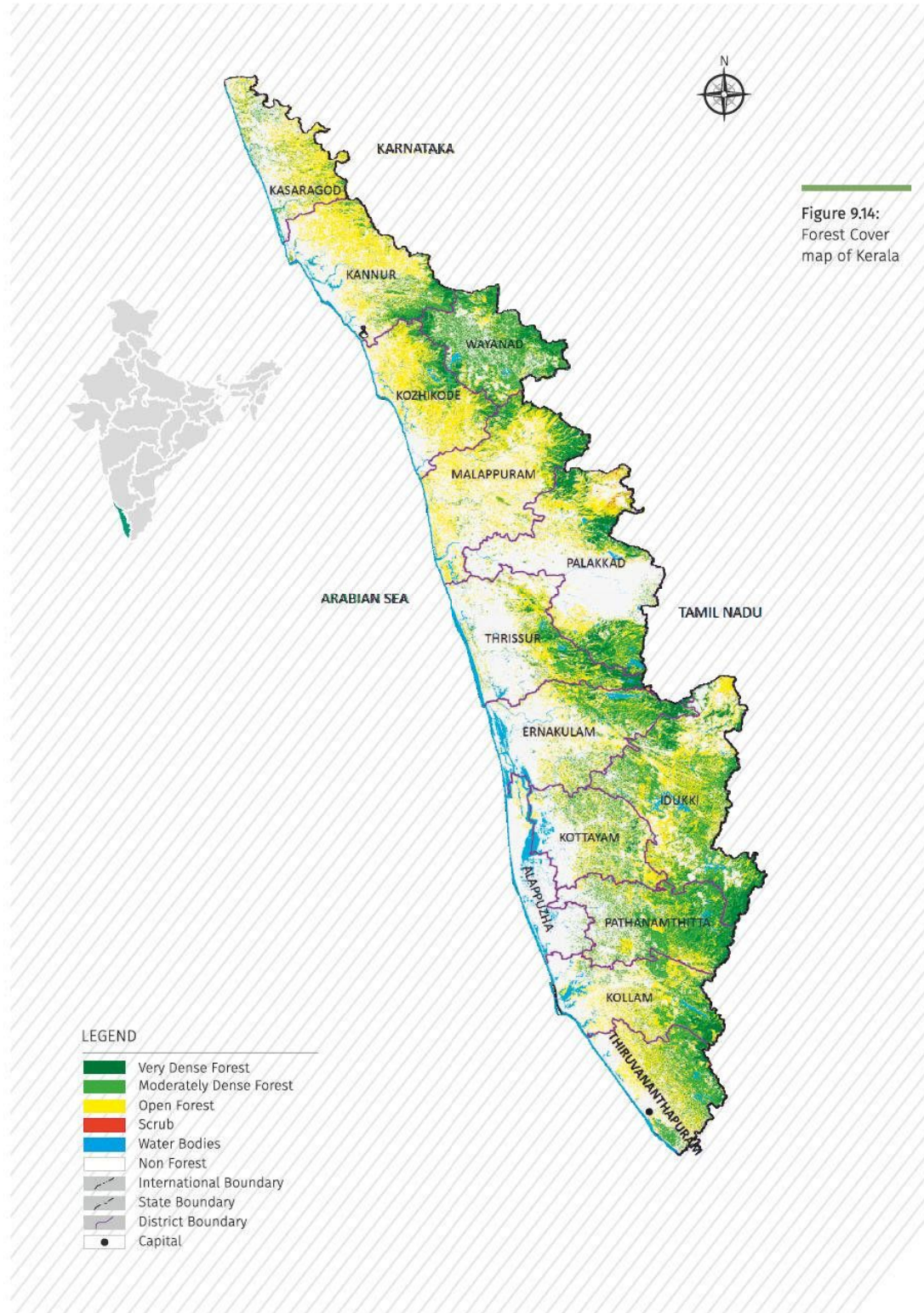


Figure 9.14:  
Forest Cover  
map of Kerala

Table 9.14.7 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			
Alappuzha	1,415	0	27	41	68	4.81	-36	0
Ernakulam <sup>TH</sup>	3,063	113	626	534	1,273	41.56	31	0
Idukki <sup>TH</sup>	4,356	251	1,704	1,184	3,139	72.06	-74	1
Kannur <sup>TH</sup>	2,961	58	486	1,017	1,561	52.02	226	0
Kasaragod <sup>TH</sup>	1,989	1	290	656	947	47.61	86	0
Kollam <sup>TH</sup>	2,483	104	625	627	1,356	54.61	-37	0
Kottayam	2,206	12	521	434	967	43.83	84	0
Kozhikode <sup>H</sup>	2,345	71	410	1,003	1,484	63.28	433	0
Malappuram <sup>TH</sup>	3,554	143	424	1,244	1,811	50.96	336	1
Palakkad <sup>TH</sup>	4,482	319	681	826	1,826	40.74	63	20
Pathanamthitta	2,652	162	1,229	439	1,830	69.00	8	0
Thiruvananthapuram <sup>TH</sup>	2,189	57	701	569	1,327	60.62	12	0
Thrissur	3,027	181	464	507	1,152	38.06	31	1
Wayanad <sup>TH</sup>	2,130	191	1,219	170	1,580	74.18	-120	0
<b>Total</b>	<b>38,852</b>	<b>1,663</b>	<b>9,407</b>	<b>9,251</b>	<b>20,321</b>	<b>52.30</b>	<b>1,043</b>	<b>23</b>

\*Change compared to updated 2015 assessment.

Table 9.14.8 Forest Cover Change Matrix (area in sq km)

Class	2017 Assessment				Total ISFR 2015 updated
	VDF	MDF	OF	Scrub	
Very Dense Forest	1,508	20	0	0	1,529
Moderately Dense Forest	155	8,681	84	0	9,328
Open Forest	0	516	6,960	0	8,421
Scrub	0	0	2	22	36
Non-Forest	0	190	2,205	1	19,538
<b>Total ISFR 2017</b>	<b>1,663</b>	<b>9,407</b>	<b>9,251</b>	<b>23</b>	<b>38,852</b>
Net Change	134	79	830	-13	-1,030

### 9.14.6

## Reasons for change detected in 2017 assessment

The main reason for net increase of 1,043 sq km in forest cover in the State can be attributed to commercial plantations outside forest areas as well as improvement in interpretation due to better radiometric resolution of the recent satellite data from Resourcesat-2.