



Sikkim

9.24.1 Introduction

The state Sikkim lies in North-East India having an extent of 7,096 sq km which constitutes 0.22% of country's geographical area. Physiographically, the state falls in the lesser, central and Tethys Himalaya. The climate ranges from subtropical to temperate and annual rainfall varies from 2,700mm to 3,200mm. The temperature in the state ranges from sub-zero during winter to 28°C during summer. Teesta is the major river flowing through the state. As per Census 2011, the State is divided into four districts, all of which are tribal as well as hilly. As per Census 2011, the population of the state is 0.61 million which is 0.05% of the country's population. The rural and urban populations constitute 74.85% and 25.15% respectively. The population density is 86 persons per sq km. The 19th Livestock Census, 2012 reported livestock population of the state as 0.29 million.

Table 9.24.1 Land Use Pattern

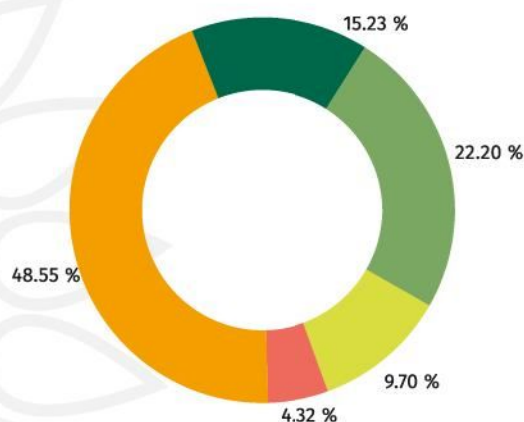
Land Use Types	Area (in 000' ha)	Percentage
Total Geographic Area	710	
Reporting area for land utilization	443	100
Forests	336	75.85
Not available for land cultivation	10	2.26
Permanent pastures and other grazing lands	-	-
Land under misc. tree crops and groves	4	0.90
Culturable wasteland	4	0.90
Fallow land other than current fallows	5	1.13
Current fallows	7	1.58
Net area sown	77	17.38

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

9.24.2

Forest Cover

Based on interpretation of satellite data pertaining to Oct-Dec 2015, the forest cover in the State is 3,344 sq km which is 47.13% of the State's geographical area. In terms of forest canopy density classes, the state has 1,081 sq km under very dense forest, 1,575 sq km under moderately dense forest and 688 sq km under open forest.



**Forest cover
of Sikkim**

Pie Chart
showing forest
cover of Sikkim

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

9.24.3

Forest Cover within and outside Green Wash Area

The State has reported a recorded forest area of 5,841 sq km which is of 82.31% of the Geographical area of the State. The Reserved and Protected Forests are 93.34% and 6.66% respectively, of the recorded forest area. Due to non-availability of digitized boundary of recorded forest area from the State, the updated green wash which is 2,747 sq km has been used and the analysis of forest cover within and outside this area is depicted below.

Table 9.24.2 Forest Cover within and outside Green Wash Area

Forest Cover within Green wash Area (Area in sq km)	
Very Dense Forest (VDF)	952
Moderately Dense Forest (MDF)	1,069
Open Forest (OF)	337
Total	2,358
Forest Cover outside Green wash Area	
Very Dense Forest	129
Moderately Dense Forest	506
Open Forest	351
Total	986
Total Forest Cover	3,344
Tree Cover	35
Total Forest & Tree Cover	3,379
Of State's Geographical Area	47.62%
Of India's Forest & Tree Cover	0.42%
Per capita Forest & Tree Cover	0.55 ha

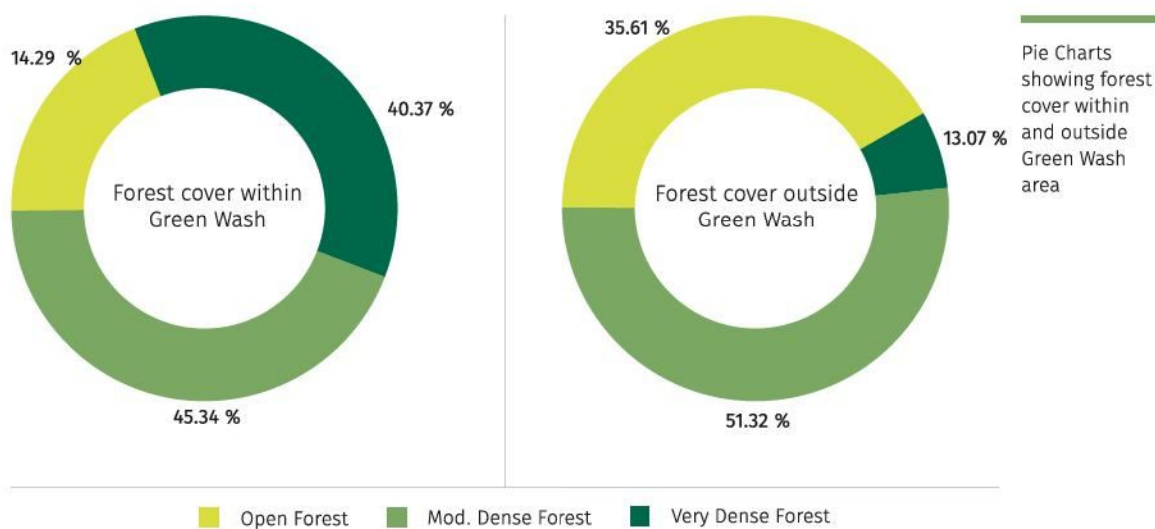


Table 9.24.3 Altitude-wise Forest Cover (Area in sq km)

Altitude Zone	Geographical Area	VDF	MDF	OF	Total
0-500	50	20	18	2	40
500-1000	375	6	150	103	259
1000-2000	1,306	260	597	247	1,104
2000-3000	1,155	566	411	97	1,074
>3000	4,210	229	399	239	867
Total	7,096	1,081	1,575	688	3,344

(Based on SRTM, Digital Elevation Model)

Table 9.24.4 Forest Cover in different Patch Size Classes

S. No.	Patch Size Range in (sq km)	No. of Patches	Area (sq km)	%age
1	$\geq 0.01 \leq 1.0$	675	48	1.43
2	$> 1.0 \leq 10$	13	37	1.11
3	$> 10 \leq 100$	4	119	3.56
4	$> 100 \leq 500$	0	0	0.00
5	$> 500 \leq 1000$	0	0	0.00
6	$> 1000 \leq 5000$	1	3,140	93.90
	Total	693	3,344	100.00

Table 9.24.5 Growing Stock

	Growing Stock	% Contribution to country
Growing Stock in Recorded Forest Area	26.280 m cum	0.62
Growing Stock in TOF	1.951 m cum	0.12
Potential Production of industrial wood from TOF	0.08 m cum	0.11
Bamboo bearing area within forest area of the state	553 sq km	0.35
Total number of culms	135 millions	0.48
Total green weight equivalent of culms	305 (000' tonnes)	0.16

9.24.4

Carbon Stock in forest

The total Carbon stock of forests in the State is 48,534 million tonnes (177,958 million tonnes of Co₂ equivalent) which is 0.69 % of total forest carbon of the country.

9.24.5

Decadal Change in water bodies within Forest

An increase of 2 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

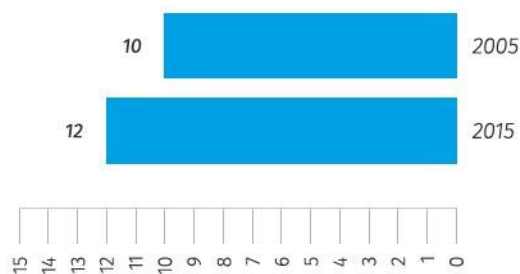


Table 9.24.6 Water bodies within Forest for the years 2005 and 2015

Area/Coverage	2005	2015
Extent of water bodies (sq km) within Forest	10	12
% of water bodies to Forest Cover	0.30	0.36

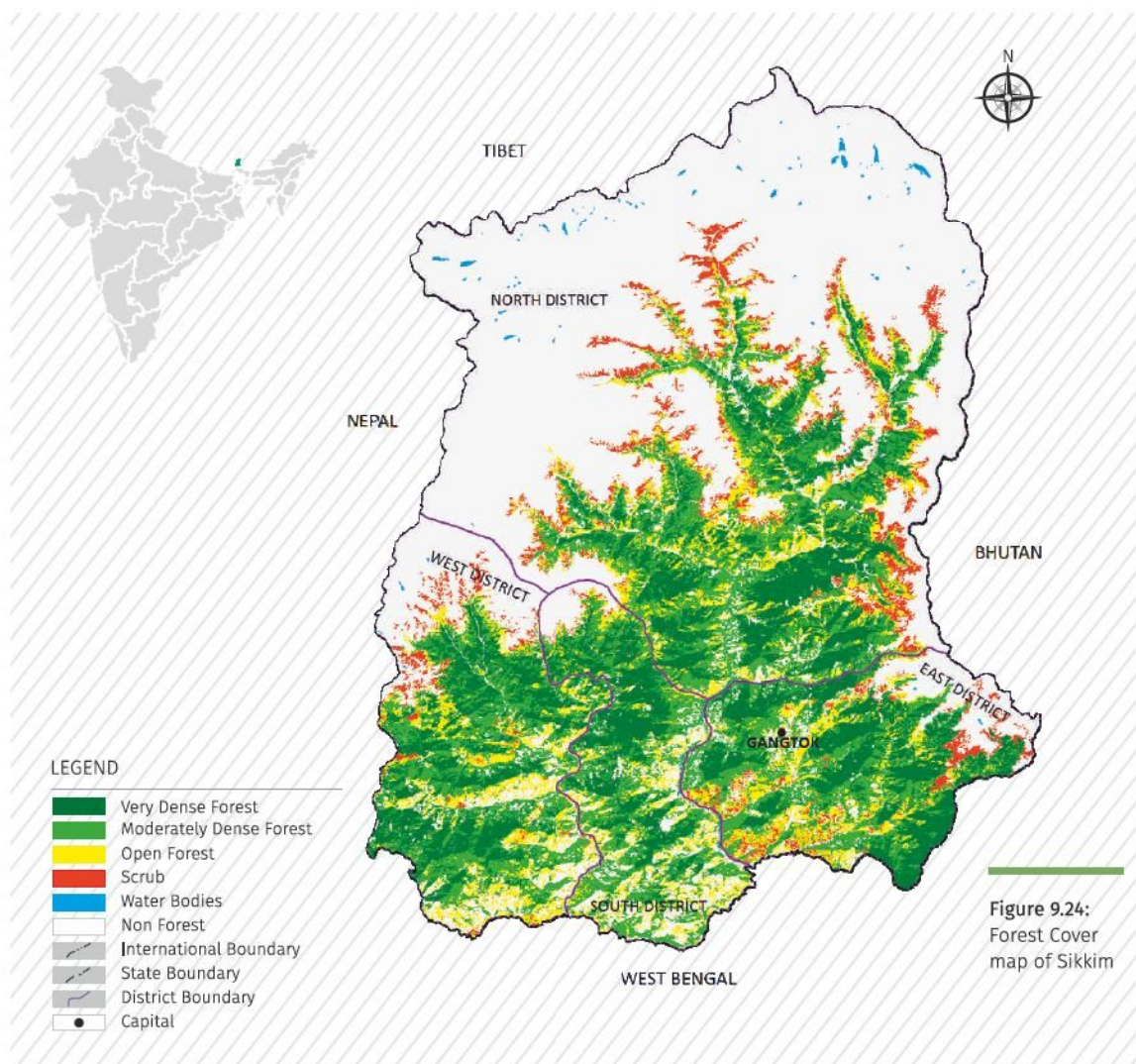


Table 9.24.7 District- wise Forest Cover

(area in sq km)

District	Geographical Area	2017 Assessment			% of GA	Change *	Scrub
		Very Dense Forest	Mod. Dense Forest	Open Forest			
East District TH	954	266	319	128	74.74	14	54
North District TH	4,226	398	600	287	30.41	-31	207
South District TH	750	172	291	109	76.27	3	4
West District TH	1,166	245	365	164	66.38	5	42
Grand Total	7,096	1,081	1,575	688	47.13	-9	307

*Change compared to updated 2015 assessment.

Table 9.24.8 Forest Cover Change Matrix						(area in sq km)
Class	2017 Assessment					Total ISFR 2015 updated
	VDF	MDF	OF	Scrub	NF	
Very Dense Forest	498	1	0	0	0	499
Moderately Dense Forest	582	1,485	54	18	18	2,157
Open Forest	1	86	596	4	10	697
Scrub	0	0	34	262	15	311
Non-Forest	0	3	4	23	3,402	3,432
Total ISFR 2017	1,081	1,575	688	307	3,445	7,096
Net Change	582	-582	-9	-4	13	

9.24.6

Reasons for change detected in 2017 assessment

A net loss of 9 sq km in forest cover observed in the State could be attributed to developmental activities.