9.17

Manipur

9.17.1 Introduction

Manipur is a hilly State in northeastern India covering an area of 22,327 sq km, which constitutes 0.68% of the geographical area of the country. Physiographically, Manipur can be characterized in two distinct physical regions – an outlying area of rugged hills and narrow valleys, and the inner area of flat plain, with associated land forms. Manipur has a tropical climate with average annual rainfall ranging from 1,250mm to 2,700mm and the average annual temperature ranging from 14.5°C to 38°C. The State is drained by Imphal and Bara rivers. The state has 9 districts, all of which are hilly as well as tribal. As per the 2011 census, Manipur has a population of 2.86 million of which urban and rural population are 29.20% and 70.80% respectively. The average population density of the state is 128 persons per sq km. The Livestock population of the State as per 19th Livestock Census, 2012 is 0.70 million.

Table 9.17.1 Land Use Pattern

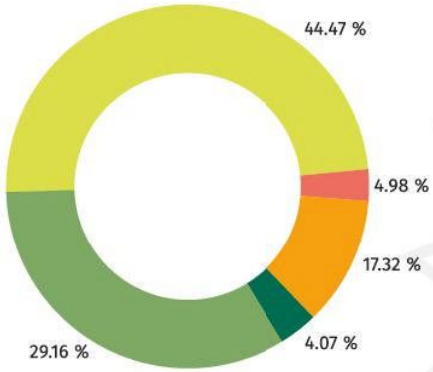
Land Use Types	Area (in 000' ha)	Percentage
Total Geographic Area	2,233	
Reporting area for land utilization	2,111	100
Forests	1,699	80.48
Not available for land cultivation	27	1.28
Permanent pastures and other grazing lands	1	0.05
Land under misc. tree crops and groves	6	0.28
Culturable wasteland	1	0.05
Fallow land other than current fallows	0	0
Current fallows	0	0
Net area sown	377	17.86

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

9.17.2

Forest Cover

Based on interpretation of satellite data pertaining to Oct-Dec 2015, the Forest Cover in the State is 17,346 sq km which is 77.69% of the State's geographical area. In terms of forest canopy density classes, the state has 908 sq km under Very Dense Forest, 6,510 sq km under Moderately Dense Forest and 9,928 sq km under Open Forest.



Forest cover of Manipur

Pie Chart showing forest cover of Manipur

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

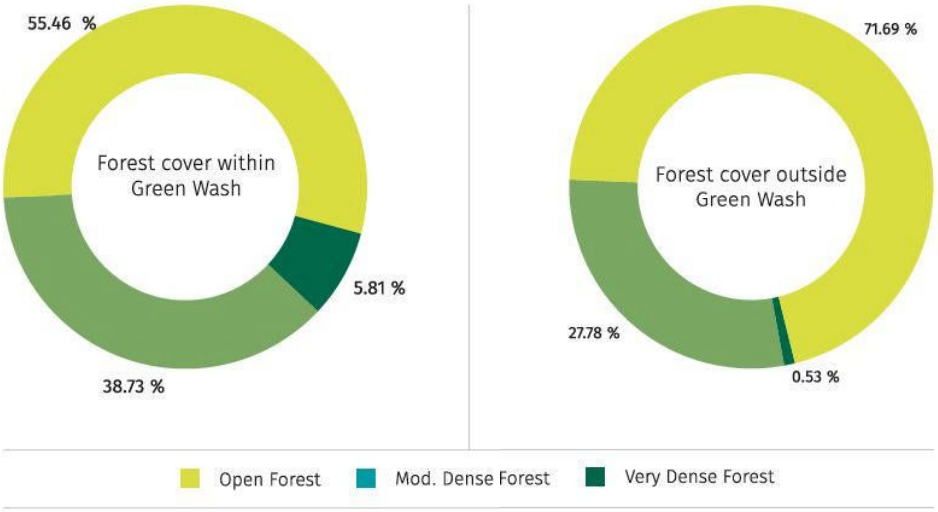
9.17.3

Forest Cover within and outside Green Wash Area

The State has reported a recorded forest area of 17,418 sq km which is 78.01% of the State's geographic area. The Reserved, Protected and Unclassed Forests are 8.42%, 23.95% and 67.63%.Due to non-availability of digitized boundary of recorded forest area from the State, the updated green wash which is 17,542 sq km has been used and the analysis of forest cover within and outside this area is depicted below.

Table 9.17.2 Forest Cover within and outside Green Wash Area

Forest Cover within Green wash (Area in sq km)	
Very Dense Forest (VDF)	898
Moderately Dense Forest (MDF)	5,983
Open Forest (OF)	8,568
Total	**15,449**
Forest Cover outside Green Wash	
Very Dense Forest	10
Moderately Dense Forest	527
Open Forest	1,360
Total	**1,897**
Total Forest Cover	**17,346**
Tree Cover	**220**
Total Forest & Tree Cover	**17,566**
Of State's Geographical Area	78.68%
Of India's Forest & Tree Cover	2.19%
Per capita Forest & Tree Cover	0.61 ha



Pie Charts showing forest cover within and outside Green Wash

Table 9.17.3 Altitude-wise Forest Cover (Area in sq km)

Altitude Zone(m)	Geographical Area	VDF	MDF	OF	Total
0-500	3,303	11	1,018	2,043	3,072
500-1000	9,066	28	2,162	3,903	6,093
1000-2000	9,342	518	3,195	3,895	7,608
2000-3000	616	351	135	87	573
Total	**22,327**	**908**	**6,510**	**9,928**	**17,346**

(Based on SRTM, Digital Elevation Model)

Table 9.17.4 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	3,364	265	1.53
2.	> 1.0 ≤ 10	100	255	1.47
3.	> 10 ≤ 100	4	165	0.95
4.	> 100 ≤ 500	0	0	0.00
5.	> 500 ≤ 1000	0	0	0.00
6.	> 1000 ≤ 5000	0	0	0.00
7.	> 5000 ≤ 10000	0	0	0.00
8.	> 10000	1	16,661	96.05
	Total	**3,469**	**17,346**	**100.00**

Table 9.17.5 Growing Stock		
	Growing Stock	% Contribution to country
Growing Stock in Recorded Forest Area	53.200 m cum	1.26
Growing Stock in TOF	7.750 m cum	0.48
Potential Production of industrial wood from TOF	0.36 m cum	0.48
Bamboo bearing area within forest area of the state	10,687 sq km	6.81
Total number of culms	2,340 millions	8.33
Total green weight equivalent of culms	15,469 (000' tonnes)	8.20

9.17.4

Carbon Stock in forest

The total Carbon stock of forests in the State is 143.091 million tonnes (524.667 million tonnes of CO_2 equivalent) which is 2.02% of total forest carbon of the country.

9.17.5

Decadal Change in water bodies within Forest

An increase of 26 sq km has been observed in the water body coverage within Forest compared to 2005. The graphical and tabular comparison is depicted below.

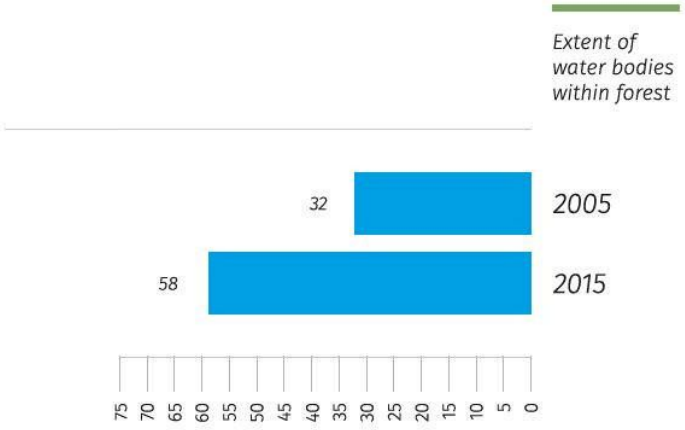


Table 9.17.6 Water bodies within Forest for the years 2005 and 2015		
Area/Coverage	2005	2015
Extent of water bodies (sq km) within Forest	32	58
% of water bodies to Forest Cover	0.19	0.33

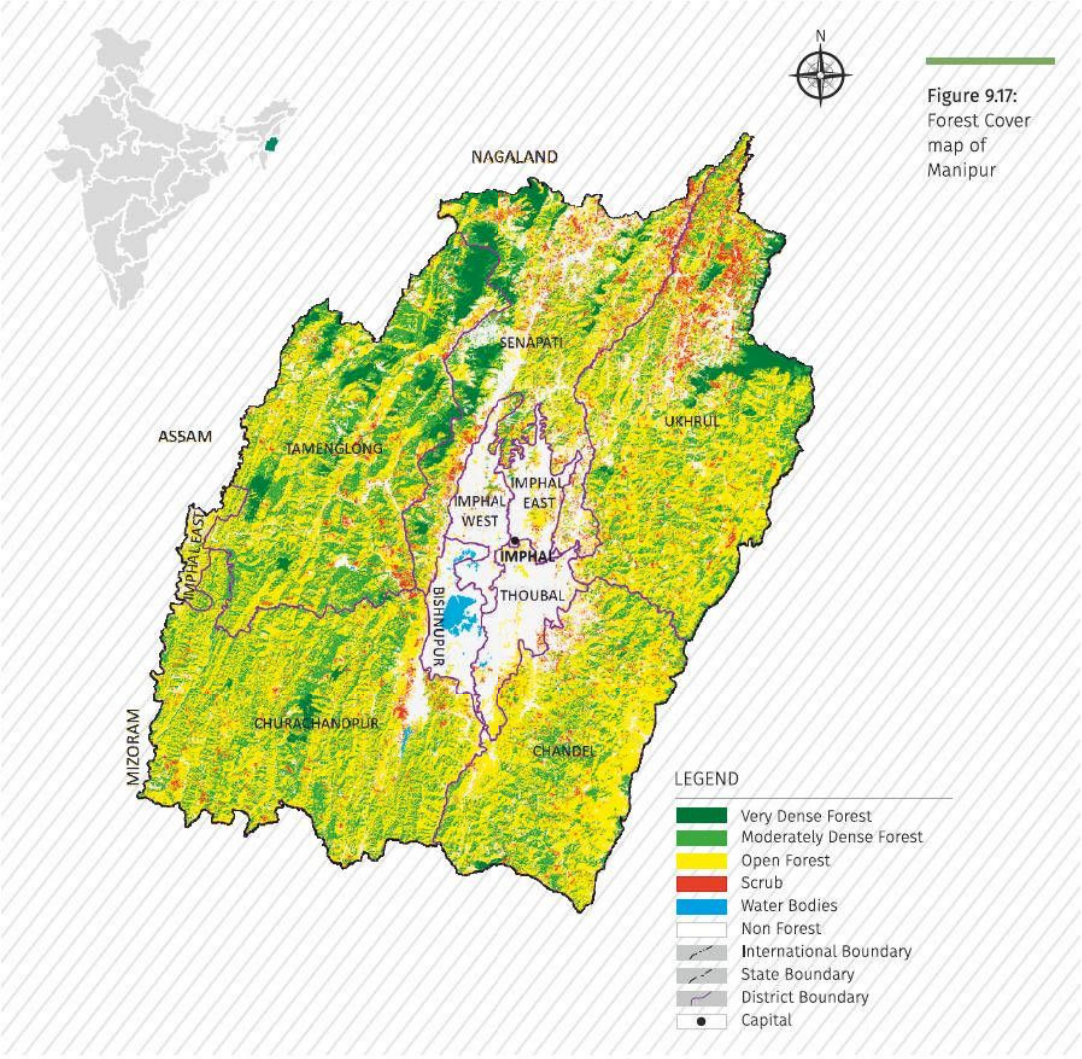


Figure 9.17: Forest Cover map of Manipur

Table 9.17.7 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			
Bishnupur[TH]	496	0	1	21	22	4.44	0	2
Chandel[TH]	3,313	11	970	1,926	2,907	87.75	17	120
Churachandpur[TH]	4,570	42	1,663	2,464	4,169	91.23	-17	143
Imphal East[TH]	709	0	61	217	278	39.21	-2	15
Imphal West[TH]	519	0	16	38	54	10.40	-1	9
Senapati[TH]	3,271	272	751	1,161	2,184	66.77	102	285

Table 9.17.7 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			
Tamenglong[TH]	4,391	390	1,754	1,809	3,953	90.03	13	152
Thoubal[TH]	514	0	2	71	73	14.20	0	11
Ukhrul[TH]	4,544	193	1,292	2,221	3,706	81.56	151	374
Total	**22,327**	**908**	**6,510**	**9,928**	**17,346**	**77.69**	**263**	**1,111**

*Change compared to updated 2015 assessment.

Table 9.17.8 Forest Cover Change Matrix						(area in sq km)
Class	2017 Assessment					Total ISFR 2015 updated
	VDF	MDF	OF	Scrub	NF	
Very Dense Forest	682	41	5	0	1	729
Moderately dense Forest	208	5,276	417	10	53	5,964
Open Forest	18	1,142	8,852	100	278	10,390
Scrub	0	26	458	601	97	1,182
Non Forest	0	25	196	400	3,441	4,062
Total ISFR 2017	**908**	**6,510**	**9,928**	**1,111**	**3,870**	**22,327**
Net Change	179	546	-462	-71	-192	

9.17.6

Reasons for change detected in 2017 assessment

A net increase of 263 sq km has been observed in the state due to conservation and plantation activities as well as regrowth in shifting cultivation areas.