

## 9.17 MANIPUR

## 9.17.1 Introduction:

Manipur is one of the hilly states of the north eastern part of the country with an area of 22,327 km<sup>2</sup> which is 0.68% of country's geographical area. It shares international border with Myanmar and lies between the latitudes of 23°50' N and 25°42' N and the longitudes of 92°59' E and 94°46' E. Geographically, the state comprises flat plateau of alluvial valley and the hill territory. The annual temperature in the state ranges from 14.5°C to 38°C and the average rainfall

ranges from 1,250 mm to 2,700 mm. November to February are the dry months.

The population of the state is 2.72 million (*Census 2011*) which constitutes 0.22% of the country's population. Of this, the rural population is 69.79% and the urban population is 30.21%. The population density is 122 persons per km<sup>2</sup>. The livestock population is 0.79 million (*Livestock Census 2007*).

Land use pattern is given in Table 9.17.1.

Table 9.17.1: Land Use Pattern

Land Use	Area in '000 ha	Percentage
Total geographical area	2,233	
Reporting area for land utilization	1,965	100.00
Forests	1,693	86.16
Not available for cultivation	27	1.37
Permanent pastures and other grazing lands	1	0.05
Land under misc. tree crops and groves	6	0.31
Culturable wasteland	1	0.05
Fallow lands other than current fallows	0	0.00
Current fallows	0	0.00
Net area sown	236	12.01

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

## 9.17.2 Recorded Forest Area

The recorded forest area of the state is 17,418 km<sup>2</sup> which is 78.01% of its geographical area. The Reserved Forests constitute 8.42%, Protected Forests 23.95% and Unclassed Forests 67.63% of the RFA.

## 9.17.3 Protected Areas

Manipur has one National Park and one Wildlife Sanctuary covering an area of 224 km<sup>2</sup> which constitutes 1.01% of the state's geographical area. The Manipur Brow-antlered deer is an endemic species for which a conservation project was initiated in 1973. Loktak lake with an area of 26,600 ha is a wetland of international importance which has been designated as a Ramsar site.

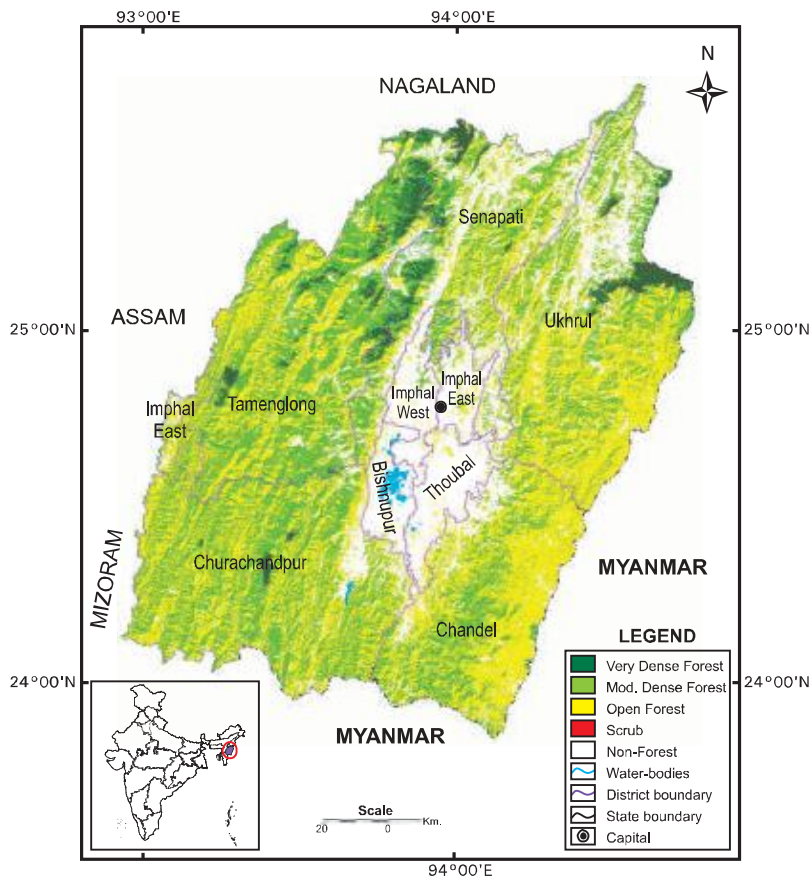
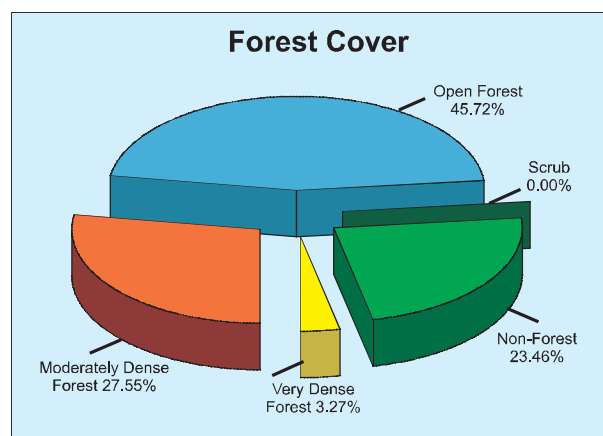


Fig 9.17 Forest cover map of Manipur

### 9.17.4 Forest Cover

The forest cover in the state, based on interpretation of satellite data of January-February 2009, is 17,090 km<sup>2</sup> which is 76.54% of the state's geographical area. In terms of forest canopy density classes, the state has 730 km<sup>2</sup> area under very dense forest, 6,151 km<sup>2</sup> area under moderately dense forest and 10,209 km<sup>2</sup> area under open forest. The forest cover of the state is shown in Fig. 9.17.



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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 9.17.2.

**Table 9.17.2: 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			
Bishnupur <sup>TH</sup>	496	0	1	20	21	4.23	1	0
Chandel <sup>TH</sup>	3,313	0	744	2,085	2,829	85.39	30	0
Churachandpur <sup>TH</sup>	4,570	37	1,683	2,555	4,275	93.54	1	0
Imphal East <sup>TH</sup>	669	0	53	167	220	32.88	4	0
Imphal West <sup>TH</sup>	559	0	24	31	55	9.84	1	0
Senapati <sup>TH</sup>	3,271	233	870	1,080	2,183	66.74	-120	0
Tamenglong <sup>TH</sup>	4,391	279	1,784	1,839	3,902	88.86	-9	0
Thoubal <sup>TH</sup>	514	0	4	52	56	10.89	0	0
Ukhru <sup>TH</sup>	4,544	181	988	2,380	3,549	78.10	-98	1
<b>Grand Total</b>	<b>22,327</b>	<b>730</b>	<b>6,151</b>	<b>10,209</b>	<b>17,090</b>	<b>76.54</b>	<b>-190</b>	<b>1</b>

Comparison of current forest cover assessment with the previous assessment (satellite data of Dec 2006 - Jan 2007) shows a loss of 190 km<sup>2</sup> of forest cover.

### Forest Cover Change

Main reason for the change in forest cover is shifting cultivation which is widely practiced in the state.

**Table 9.17.3: Forest Cover Change Matrix** (Area in km<sup>2</sup>)

2009 Assessment	2011 Assessment					Total 2009
	VDF	MDF	OF	Scrub	NF	
Very Dense Forest	699	2	0	0	0	<b>701</b>
Moderately Dense Forest	28	4,906	445	0	95	<b>5,474</b>
Open Forest	3	1,215	9,448	0	439	<b>11,105</b>
Scrub	0	0	0	1	0	<b>1</b>
Non- Forest	0	28	316	0	4,702	<b>5,046</b>
<b>Total 2011</b>	<b>730</b>	<b>6,151</b>	<b>10,209</b>	<b>1</b>	<b>5,236</b>	<b>22,327</b>
Net Change	29	677	-896	0	190	

The change matrix given in Table 9.17.3 reveals that there has been an increase of 29 km<sup>2</sup> in very dense forest, 677 km<sup>2</sup> in the moderately dense forest and a decrease of 896 km<sup>2</sup> in open forest.

### 9.17.5 Altitude Zone-wise Forest Cover

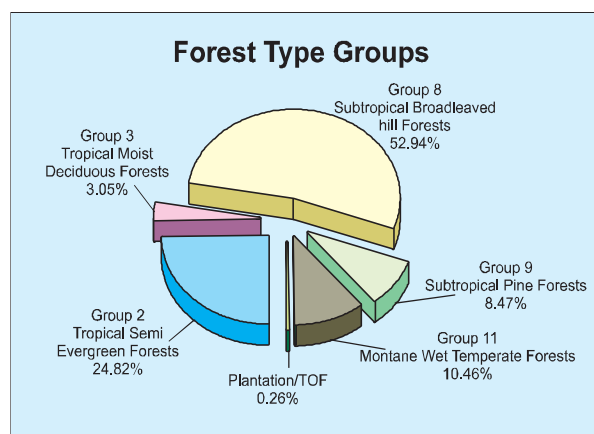
Forest cover of the state in different altitude zones is given in Table 9.17.4.

Altitude Zone	VDF	MDF	OF	Total
0-500m	7	791	2,334	3,132
500-1000m	19	1,925	4,050	5,994
1000-2000m	390	3,257	3,737	7,384
2000-3000m	314	178	88	580
<b>Total</b>	<b>730</b>	<b>6,151</b>	<b>10,209</b>	<b>17,090</b>

(Based on SRTM, Digital Elevation Model)

### 9.17.6 Forest Cover in Different Forest Types

The state has ten forest types as per Champion & Seth Classification system (1968) belonging to five forest type groups, viz. Tropical Semi-evergreen, Tropical Moist Deciduous, Subtropical Broadleaved Hill, Subtropical Pine and Montane Wet Temperate Forests. Percentage-wise distribution of forest cover in different forest type groups found in the state on the basis of the forest cover assessment is given in the pie diagram.



### 9.17.7 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 193 km<sup>2</sup> which is 0.86% of its geographical area. Bishnupur and Imphal West district of the state were inventoried. The forest and tree cover of the state is presented in Table 9.17.5.

Category	Area	% of Geographical Area
Tree Cover	193	0.86
Forest Cover	17,090	76.54
<b>Forest and Tree Cover</b>	<b>17,283</b>	<b>77.40</b>

### 9.17.8 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 forest (TOF) the same has been estimated using TOF inventory data. It is presented in the Table 9.17.6.

**Table 9.17.6: Growing Stock** (million cum)

Forest	TOF	Total
70.878	10.691	81.569

### 9.17.9 Bamboo

The extent of bamboo bearing area in the forests of the state is 9,303 km<sup>2</sup>. Density-wise

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

**Table 9.17.7: 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
17,418	192	5,825	3,101	124	61	8,115

**Table 9.17.8: 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
2035	192	70	2297	11617	2121	13738