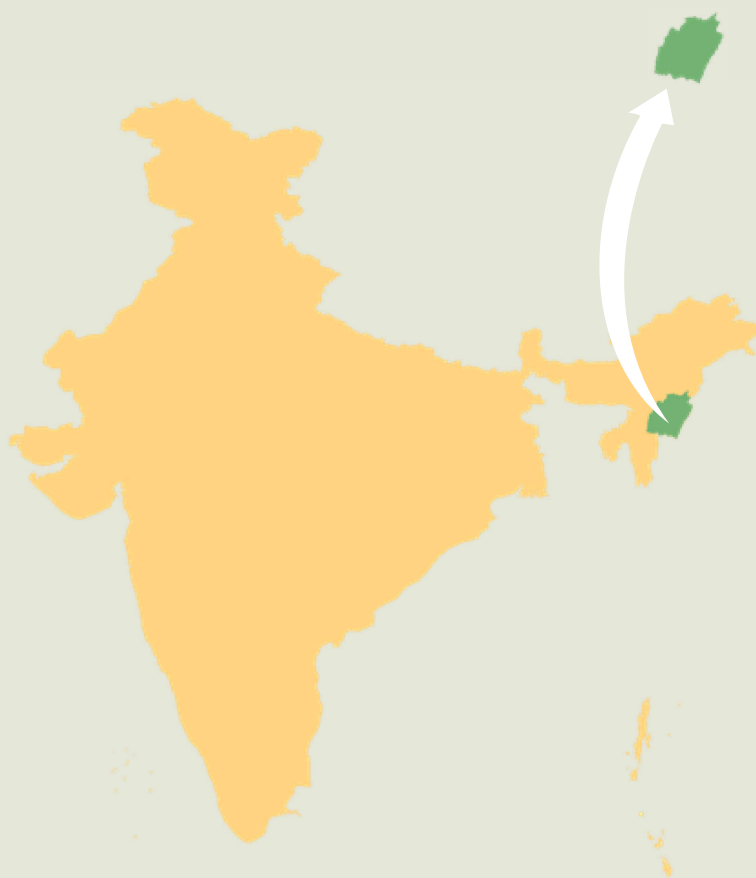


MANIPUR

**Geographical Area**22,327 km²**Geographical Coordinates**

Latitude 23°50' N to 25°42' N

Longitude 92°59' E to 94°46' E

Population (as per Census 2011)

2.86 million

Urban 0.84 million (29.21 %)

Rural 2.02 million (70.79 %)

Tribal 1.17 million (40.88 %)

Average Population Density115 per km²**Livestock Population**(as per 19th Livestock Census)

0.70 million

No. of Districts

16

No. of Hill Districts

16

No. of Tribal Districts

16

Table 10.16.1 Land Use Pattern

Land Use Types	Area (in '000 ha)	Percentage
Geographical Area	2,233	
Reporting area for land utilization	2,087.54	100.00
Forests	1,659.80	79.51
Not available for land cultivation	26.90	1.29
Permanent pastures and other grazing lands	1.37	0.07
Land under misc. tree crops and groves	5.95	0.28
Culturable wasteland	0.74	0.03
Fallow land other than current fallows	0.06	0.00
Current fallows	0.14	0.01
Net area sown	392.58	18.81

Source: Land Use Statistics, Ministry of Agriculture and Farmer's Welfare, GOI, (2021-22).

10.16.1 Forest Cover

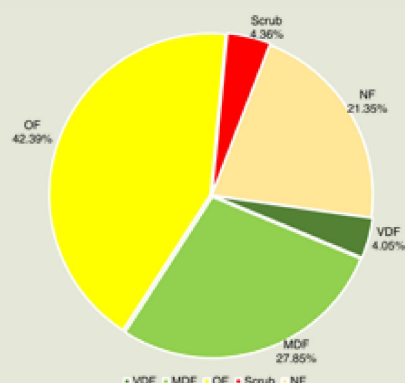


Figure 10.16.1 Forest Cover of Manipur

Table 10.16.2 Forest Cover of Manipur

(km ²)		
Class	Area	% of Calculated Area by Sol
VDF	904.05	4.05
MDF	6,217.55	27.85
OF	9,463.86	42.39
Total	16,585.46	74.29
Scrub	973.65	4.36

Table 10.16.3 District- wise Forest Cover in Manipur

(km ²)								
District	Calculated Area by Sol	2023 Assessment				% of Calculated Area by Sol	Change w.r.t. 2021 Raster based*	Scrub
		Very Dense Forest	Mod. Dense Forest	Open Forest	Total			
Bishnupur ^H	471.50	0.00	0.93	19.91	20.84	4.42	-1.17	2.52
Chandel ^H	2,094.75	8.41	655.83	1,142.12	1,806.36	86.23	-22.32	89.89
Churachandpur ^H	2,419.75	8.02	772.32	1,131.42	1,911.76	79.01	-78.00	122.11
Imphal East ^H	456.75	0.00	5.68	56.76	62.44	13.67	-5.26	14.11
Imphal West ^H	440.25	0.00	4.80	27.08	31.88	7.24	-1.49	0.67
Jiribam ^H	155.25	0.00	25.09	90.72	115.81	74.60	-1.93	0.90
Kakching ^H	265.25	0.00	0.84	20.17	21.01	7.92	-2.90	3.75
Kamjong ^H	2,478.75	79.48	823.63	1,248.39	2,151.50	86.80	-21.29	102.17
Kangpokpi ^H	1,436.25	62.56	226.67	516.25	805.48	56.08	-31.57	92.81
Noney ^H	1,265.25	21.22	548.67	535.71	1,105.60	87.38	-16.79	57.71
Pherzawl ^H	2,299.75	34.99	834.24	1,120.70	1,989.93	86.53	-59.89	72.01
Senapati ^H	1,842.50	182.83	427.00	777.00	1,386.83	75.27	81.61	112.87
Tamenglong ^H	3,143.25	390.81	1,120.82	1,158.14	2,669.77	84.94	-38.43	106.79
Tengnoupal ^H	1,166.50	1.86	278.55	625.44	905.85	77.66	1.55	93.97
Thoubal ^H	339.50	0.00	0.00	10.43	10.43	3.07	-0.95	2.71
Ukhrul ^H	2,051.75	113.87	492.48	983.62	1,589.97	77.50	144.00	98.66
Grand Total	22,327.00	904.05	6,217.55	9,463.86	16,585.46	74.29	-54.83	973.65

*Area figure calculated without normalization factor.

**Table 10.16.4 Division-wise Forest Cover in Manipur**

Division	Digitized Division Boundary Area #	2023 Assessment				% of Digitized Division Boundary Area	Change w.r.t. 2021 Raster based*	Scrub
		Very Dense Forest	Mod. Dense Forest	Open Forest	Total			
Bishnupur FD	654.27	0.15	12.64	87.19	99.98	15.28	-4.65	8.70
Central FD	929.23	0.00	17.78	118.87	136.65	14.71	-6.79	29.03
EFD Ukhrol	4,526.92	193.11	1,303.95	2,226.66	3,723.72	82.26	122.96	200.69
Jiribam FD	1,413.56	71.39	469.69	676.18	1,217.26	86.11	-13.11	41.04
NFD Kangpokpi	1,196.84	76.20	238.76	441.55	756.51	63.21	-29.84	57.78
Senapati FD	1,713.78	168.35	392.93	724.71	1,285.99	75.04	84.34	108.39
Southern FD, CCP	4,541.43	42.97	1,537.29	2,135.72	3,715.98	81.82	-136.41	189.48
Tengnoupal FD	3,250.47	10.27	924.98	1,761.23	2,696.48	82.96	-21.93	180.47
Thoubal FD	811.40	0.00	5.27	82.94	88.21	10.87	-5.95	32.75
Western FD, Tamenglong	3,279.96	340.10	1,288.37	1,173.05	2,801.52	85.41	-40.31	124.55
Area Which Does not fall in any Division	91.94	1.51	25.89	35.76	63.16	68.70	-3.14	0.77
Grand Total	22,409.80	904.05	6,217.55	9,463.86	16,585.46	74.01	-54.83	973.65

#As per the division boundary shape file provided by State Forest Department.

*Area figure calculated without normalization factor.

10.16.2 Forest Cover Inside and Outside Recorded Forest Area (or Green Wash)

The Forest Cover inside and outside Recorded Forest Area (RFA) has been analysed in different categories and presented in table given below.

Table 10.16.5 Forest Cover Inside and Outside Recorded Forest Area (or Green Wash) in Manipur

(km ²)							
Forest Cover Inside the Recorded Forest Area (or Green Wash)				Forest Cover Outside the Recorded Forest Area (or Green Wash)			
VDF	MDF	OF	Total	VDF	MDF	OF	Total
893.52	5,744.86	8,152.43	14,790.81	10.53	472.69	1,311.43	1,794.65
6.04%	38.84%	55.12%		0.59%	26.34%	73.07%	

*In case of Manipur, Green Wash boundaries have been used.

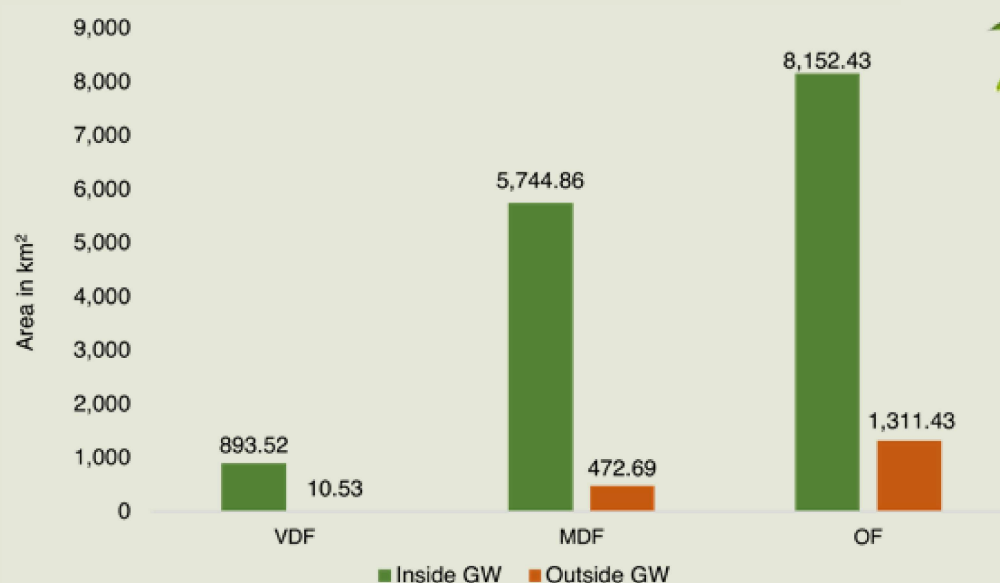


Figure 10.16.2 Forest Cover Inside and Outside of Green Wash in Manipur

Table 10.16.6 Forest Cover Change Matrix Inside RFA/GW for Manipur between 2021 Raster based and 2023 Assessments

Class	2023 Assessment inside RFA/GW					(km²)
	VDF	MDF	OF	Scrub	NF	Total ISFR 2021 inside RFA / GW Raster based*
VDF	882.54	4.13	0.31	0.00	6.89	893.87
MDF	10.57	5,488.95	155.57	1.48	119.79	5,776.36
OF	0.41	236.77	7,524.24	55.68	350.95	8,168.05
Scrub	0.00	9.88	347.38	334.65	48.55	740.46
NF	0.00	5.13	124.93	309.44	1,458.37	1,897.87
Total ISFR 2023 inside RFA / GW	893.52	5,744.86	8,152.43	701.25	1,984.55	17,476.61
Net Change	-0.35	-31.50	-15.62	-39.21	86.68	

*Area figure calculated without normalization factor.

Table 10.16.7 Forest Cover Change Matrix Outside RFA/GW for Manipur between 2021 Raster based and 2023 Assessments

Class	2023 Assessment outside RFA/GW					(km²)
	VDF	MDF	OF	Scrub	NF	Total ISFR 2021 outside RFA / GW Raster based*
VDF	10.47	0.05	0.00	0.00	0.16	10.68
MDF	0.06	453.03	21.58	0.06	9.42	484.15
OF	0.00	18.22	1,211.99	19.42	57.55	1,307.18
Scrub	0.00	0.85	55.00	162.45	18.11	236.41
NF	0.00	0.54	22.86	90.47	2,698.10	2,811.97
Total ISFR 2023 outside RFA/GW	10.53	472.69	1,311.43	272.40	2,783.34	4,850.39
Net Change	-0.15	-11.46	4.25	35.99	-28.63	

*Area figure calculated without normalization factor.



Table 10.16.8 Altitude-Wise Forest Cover in Manipur

(km ²)						
Altitude Zone (m)	Calculated Area by Sol	VDF	MDF	OF	Total	Scrub
0-500	3,303	13.48	1,098.17	1,895.95	3,007.60	65.87
500-1000	9,066	31.87	2,098.52	3,559.45	5,689.84	425.69
1000-2000	9,342	507.40	2,905.10	3,933.52	7,346.02	475.13
2000-3000	616	351.30	115.76	74.94	542.00	6.96
Total	22,327	904.05	6,217.55	9,463.86	16,585.46	973.65

(based on SRTM, Digital Elevation Model, 30 m, 2016).

Table 10.16.9 Forest Cover in Different Slope Classes in Manipur

(km ²)						
Slope (in degrees)	Calculated Area by Sol	VDF	MDF	OF	Total	Scrub
0-5	2,934	27.23	224.01	483.86	735.10	44.89
5-10	2,361	86.12	539.52	1,084.77	1,710.41	119.95
10-15	3,630	146.32	944.70	1,753.92	2,844.94	193.05
15-20	4,275	171.16	1,230.55	2,089.08	3,490.79	217.54
20-25	3,902	158.29	1,245.94	1,870.96	3,275.19	183.36
25-30	2,753	126.61	980.66	1,251.14	2,358.41	118.95
>30	2,472	188.32	1,052.17	930.13	2,170.62	95.91
Total	22,327	904.05	6,217.55	9,463.86	16,585.46	973.65

(based on SRTM, Digital Elevation Model, 30 m, 2016).



Photo: FSI Repository

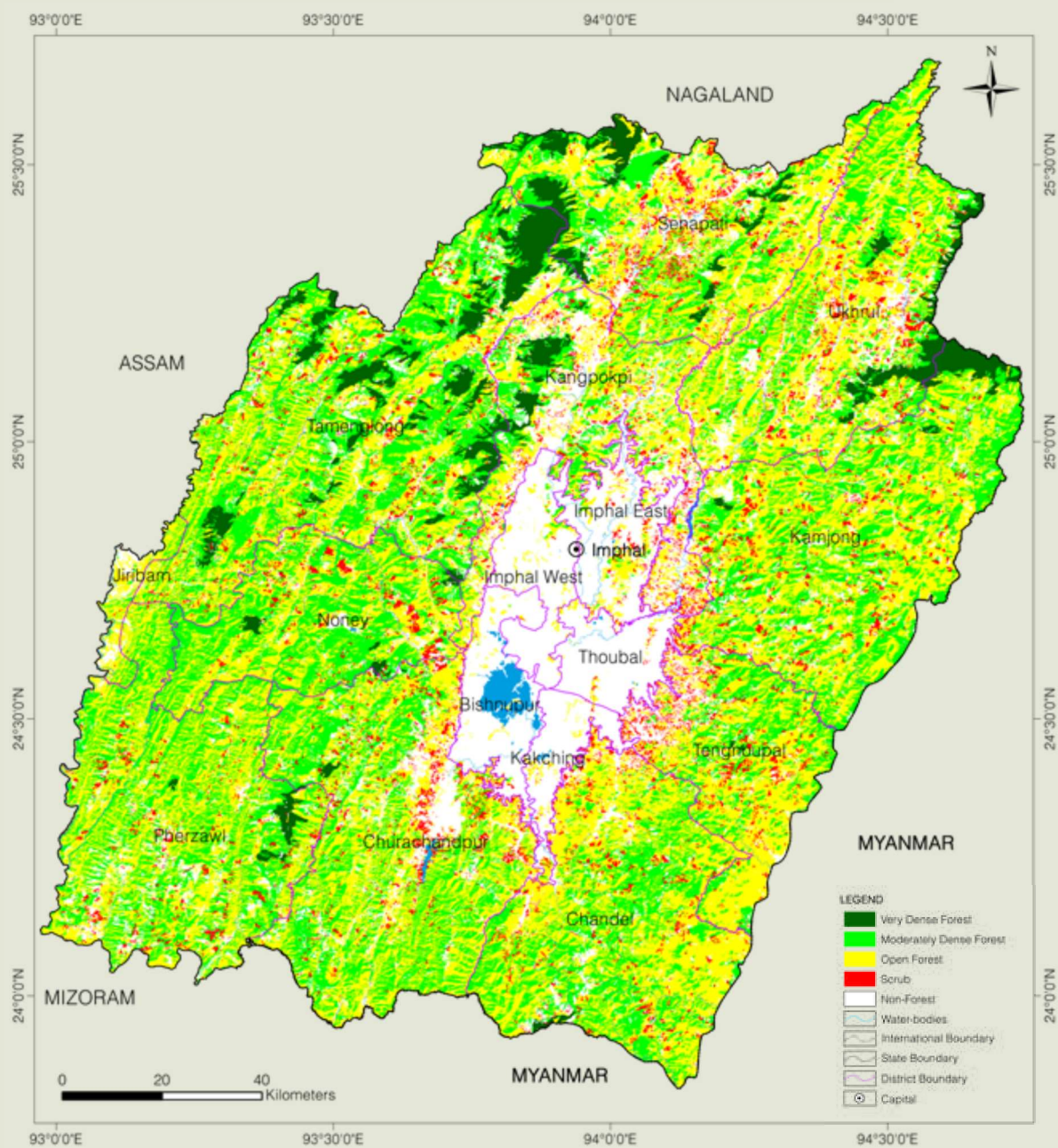


Figure 10.16.3 Forest Cover Map of Manipur



10.16.3 Forest Types

The area under different Forest Types in Manipur (as per the Champion & Seth Forest Classification, 1968) based on the Forest Cover Map (FCM), ISFR-2023, is presented in the following table.

Table 10.16.10 Area Statistics of the Forest Types Found in Manipur

(km ²)			
Sl. No.	Forest Type	Area	% of the total mapped area*
1	2B/C1/2S1 Pioneer Euphorbiaceous scrub	973.65	5.49
2	2B/C2 Cachar semi-evergreen forest	2,826.42	15.93
3	2/2S1 Secondary moist bamboo brakes	1,248.28	7.02
4	3C/C3b East Himalayan moist mixed deciduous forest	4,451.11	25.08
5	8B/C1 East Himalayan subtropical wet hill forest	6,073.13	34.23
6	8B/C2 <i>Khasi</i> subtropical wet hill forest	410.18	2.31
7	9/C2 Assam subtropical pine forest	705.58	3.98
8	11B/C1b <i>Buk</i> oak forest	507.09	2.86
9	11B/C2 Naga hills wet temperate forest	235.12	1.33
10	12/DS1 Montane bamboo brakes	15.40	0.09
Sub Total		17,445.96	98.32
11	TOF/ Plantation	113.15	0.64
Total (Forest Cover & Scrub)		17,559.11	98.96
Grassland forest types (outside forest cover)			
12	4D/2S2 Eastern wet alluvial grassland	135.93	0.77
13	9/C2/DS1 Assam subtropical pine savannah	48.83	0.27
Sub Total		184.76	1.04
Grand Total		17,743.87	100.00

*Forest Types have been assigned to the natural forest formations under forest cover and scrub categories shown in the forest cover mapping (ISFR, 2023). Grassland forest types outside forest cover have also been mapped. The total mapped area, therefore, is sum of forest cover, scrub and grassland forest types (found in non-forest).



10.16.4 Forest Fire

District-wise number of forest fire detected by FSI using SNPP-VIIRS sensors (This includes large, continuous and repeated forest fires) during the fire season 2022-23 & 2023-24.

Table 10.16.11 District-Wise Number of Forest Fire Detected

Sl. No.	District	SNPP-VIIRS Detection during 2022-23	SNPP-VIIRS Detection during 2023-24
1	Bishnupur	5	1
2	Chandel	1,120	461
3	Churachandpur	1,738	767
4	Imphal East	99	4
5	Imphal West	7	0
6	Jiribam	30	14
7	Kakching	20	1
8	Kamjong	862	346
9	Kangpokpi	1,085	317
10	Noney	558	232
11	Pherzawl	696	647
12	Senapati	810	199
13	Tamenglong	1,326	819
14	Tengnoupal	596	266
15	Thoubal	7	1
16	Ukhrul	1,168	423
Total		10,127	4,498

10.16.5 Fire Prone Forest Areas

Forest Cover under different classes of forest fire proneness is given in following table.

Table 10.16.12 Forest Fire Prone Classes

(km ²)			
Sl. No.	Forest Fire Prone Classes	Forest Cover*	% of Total Forest Cover
1	Extremely fire prone	39.45	0.23
2	Very highly fire prone	2,787.33	15.87
3	Highly fire prone	6,799.43	38.72
4	Moderately fire prone	5,016.92	28.57
5	Less fire prone	2,915.98	16.61
Total		17,559.11	100.00

*Forest Cover including Scrub.

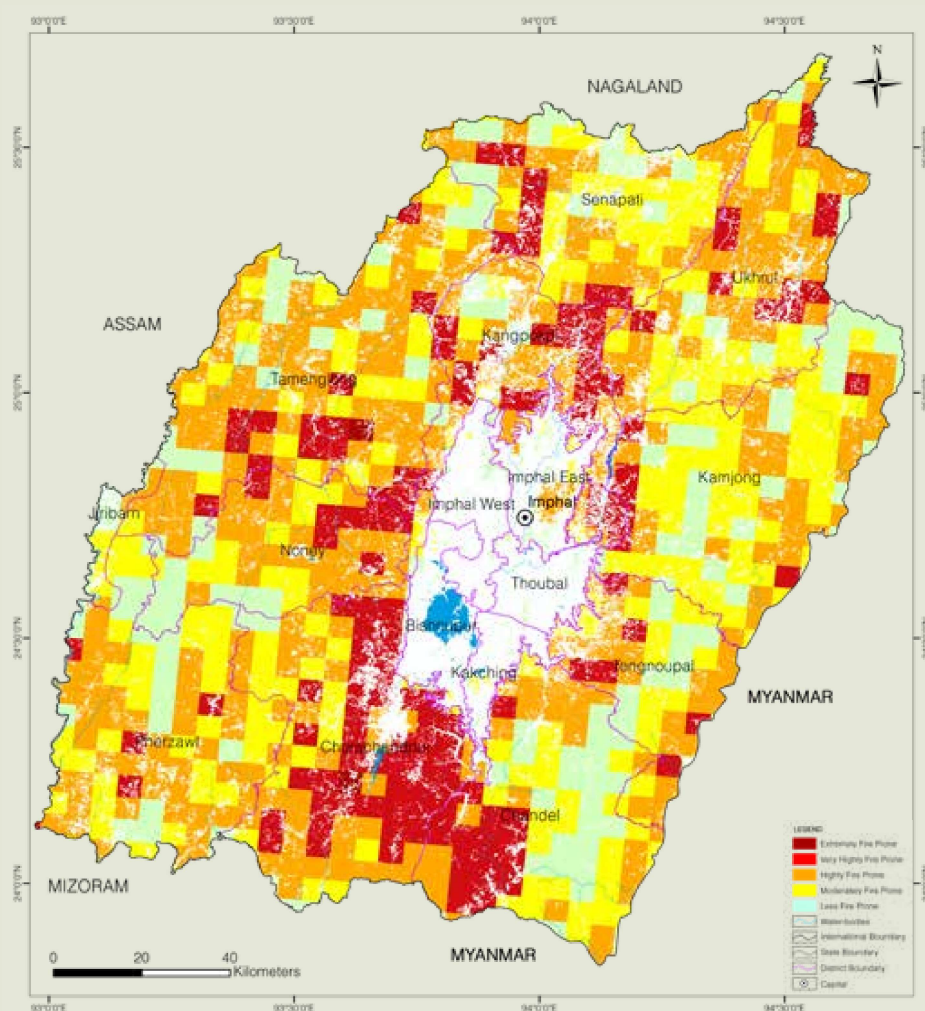


Figure 10.16.4 Fire Prone Forest Areas Under Different Fire Prone Classes

10.16.6 Results Derived from NFI for Manipur

Table 10.16.13 Number of Trees and Their Volume for Top 5 Species in RFA

	Species	No. of Trees (in '000)	Volume (M m ³)
1	<i>Schima wallichii</i>	44,308	7.28
2	<i>Callicarpa arborea</i>	29,123	3.12
3	<i>Quercus species</i>	21,745	3.15
4	<i>Castanopsis species</i>	19,613	3.15
5	<i>Albizia species</i>	15,245	3.06



Table 10.16.14 Number of Trees and Their Volume for Top 5 Species in Rural Area

Sl. No.	Species	No. of Trees (in '000)	Volume (M m ³)
1	<i>Quercus species</i>	5,700	0.577
2	<i>Castanopsis species</i>	4,188	0.162
3	<i>Schima wallichii</i>	3,677	0.655
4	<i>Pinus kesiya</i>	2,121	0.474
5	<i>Alnus species</i>	1,740	0.243

Table 10.16.15 Number of Trees and Their Volume for Top 5 Species in Urban Area

Sl. No.	Species	No. of Trees (in '000)	Volume (M m ³)
1	<i>Mangifera indica</i>	107	0.010
2	<i>Eucalyptus species</i>	51	0.010
3	<i>Syzygium cumini</i>	35	0.004
4	<i>Parkia javanica/ Gleditsia javanica</i>	33	0.004
5	<i>Psidium guajava</i>	28	0.001

Table 10.16.16 Major NTFP Species in Manipur

Sl. No.	Species	Habit	No. of Plants (in '000)
1	<i>Embllica officinalis/ Phyllanthus emblica</i>	Tree	4,63,852
2	<i>Bombax species/ Bombax ceiba</i>	Tree	12,656
3	<i>Cinnamomum tamala</i>	Tree	12,482
4	<i>Parkia javanica/ Gleditsia javanica</i>	Tree	490
5	<i>Aquilaria malaccensis/Aquilaria agallocha</i>	Tree	416
6	<i>Citrus latipes</i>	Tree	208
7	<i>Calamus arborescens</i>	Shrubs	19,17,679
8	<i>Dioscorea species</i>	Climbers	2,20,53,303
9	<i>Thysanolaena latifolia/ Thysanolaena maxima</i>	Herbs	15,77,95,644
10	<i>Kaempferia rotunda</i>	Herbs	30,78,939

Table 10.16.17 Major Invasive Species in the State Inside the RFA in Manipur

Sl. No.	Species	Estimated Extent (km ²)
1	<i>Chromolaena odorata</i>	793.04
2	<i>Mikania micrantha</i>	746.39
3	<i>Lantana camara</i>	486.48
4	<i>Imperata cylindrica</i>	159.94
5	<i>Dioscorea deltoidea</i>	46.65