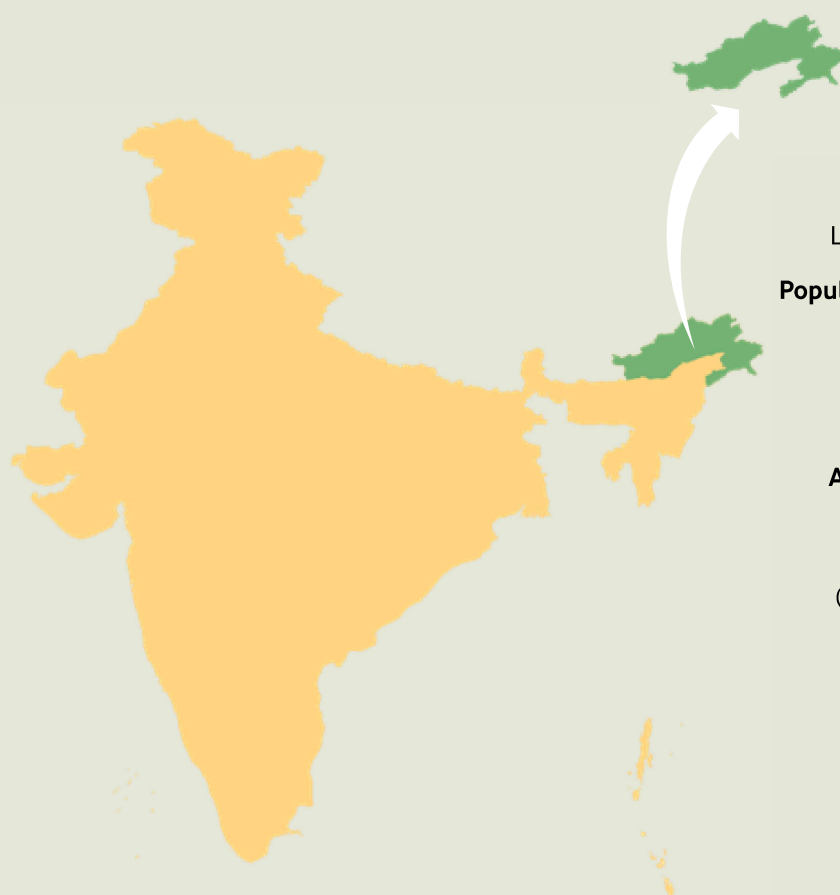


ARUNACHAL PRADESH



Geographical Area
83,743 km²

Geographical Coordinates
Latitude 26°28' N to 29°30' N
Longitude 91°30' E to 97°30' E

Population (as per Census 2011)
1.38 million
Urban 0.32 million (22.94 %)
Rural 1.06 million (77.06 %)
Tribal 0.95 million (68.79 %)

Average Population Density
17 per km²

Livestock Population
(as per 19th Livestock Census)
1.41 million

No. of Districts
25

No. of Hill Districts
25

No. of Tribal Districts
25

Table 10.2.1 Land Use Pattern

Land Use Types	Area (in '000 ha)	Percentage
Geographical Area	8,374	
Reporting area for land utilization	7,153.64	100.00
Forests	6,643.10	92.86
Not available for land cultivation	61.98	0.87
Permanent pastures and other grazing lands	17.74	0.25
Land under misc. tree crops and groves	33.75	0.47
Culturable wasteland	60.88	0.85
Fallow land other than current fallows	60.65	0.85
Current fallows	32.94	0.46
Net area sown	242.60	3.39

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

10.2.1 Forest Cover

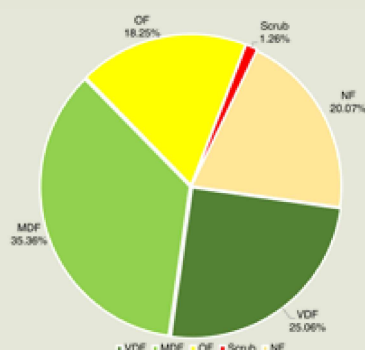


Table 10.2.2 Forest Cover of Arunachal Pradesh

(km ²)		
Class	Area	% of Calculated Area by Sol
VDF	20,985.32	25.06
MDF	29,615.09	35.36
OF	15,281.16	18.25
Total	65,881.57	78.67
Scrub	1,058.98	1.26

Figure 10.2.1 Forest Cover of Arunachal Pradesh

Table 10.2.3 District-wise Forest Cover in Arunachal Pradesh

(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			
Anjaw ^H	6,175.48	1,221.83	2,092.55	923.05	4,237.43	68.62	-8.00	74.65
Changlang ^H	5,247.74	2,001.01	1,488.32	944.54	4,433.87	84.49	50.16	16.45
Dibang Valley ^H	9,706.04	1,127.79	3,405.24	1,922.05	6,455.08	66.51	-7.44	70.68
East Kameng ^H	4,420.73	1,347.87	1,598.42	867.95	3,814.24	86.28	-29.33	75.63
**East Siang ^H & Siang ^H	4,857.31	1,212.11	1,942.18	1,034.86	4,189.15	86.24	-1.75	54.48
Kamle ^H	1,339.33	415.77	536.95	364.88	1,317.60	98.38	-5.63	1.00
Kra Daadi ^H	2,394.28	602.37	822.66	241.14	1,666.17	69.59	-4.27	11.71
Kurung Kumey ^H	4,580.70	1,363.71	1,650.30	534.61	3,548.62	77.47	-21.70	52.18
Lepa Rada ^H	793.38	262.97	280.83	154.92	698.72	88.07	-10.66	1.91
Lohit ^H	3,179.69	651.54	1,208.44	533.17	2,393.15	75.26	-2.54	18.10
Longding ^H	963.82	159.63	247.26	223.19	630.08	65.37	-9.80	28.75
Lower Dibang Valley ^H	3,700.43	568.59	1,403.75	619.00	2,591.34	70.03	12.66	28.96
Lower Siang ^H	1,937.79	622.49	579.06	517.16	1,718.71	88.69	-9.02	1.71
Lower Subansiri ^H	1,961.20	778.50	736.78	247.99	1,763.27	89.91	-14.99	5.82
Namsai ^H	1,160.22	112.64	344.73	282.97	740.34	63.81	7.84	12.52
Pakke Kessang ^H	1,971.76	657.15	817.57	308.63	1,783.35	90.44	-11.46	9.67
Papum Pare ^H	3,451.19	971.56	1,436.02	769.59	3,177.17	92.06	-5.40	5.53
Shi Yomi ^H	2,992.06	939.23	863.57	428.18	2,230.98	74.56	35.45	42.07
Tawang ^H	2,460.79	328.64	421.98	405.36	1,155.98	46.98	-6.84	263.15
Tirap ^H	1,056.44	421.02	257.92	161.23	840.17	79.53	-37.78	21.85
Upper Siang ^H	6,702.54	1,607.91	2,520.93	1,279.73	5,408.57	80.69	2.54	127.20
Upper Subansiri ^H	5,992.05	1,856.39	2,508.89	1,187.40	5,552.68	92.67	16.23	57.18
West Kameng ^H	5,036.98	1,418.12	1,919.89	974.47	4,312.48	85.62	-9.43	77.07
West Siang ^H	1,661.27	336.48	530.85	355.09	1,222.42	73.58	-20.01	0.71
Grand Total	83,743.22	20,985.32	29,615.09	15,281.16	65,881.57	78.67	-91.17	1,058.98

* Area figure calculated without normalization factor.

** Combined forest cover is provided for East Siang & Siang.



10.2.2 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 10.2.4 Forest Cover Inside and Outside Recorded Forest Area (or Green Wash) in Arunachal Pradesh

Forest Cover Inside the Recorded Forest Area (or Green Wash)				Forest Cover Outside the Recorded Forest Area (or Green Wash)				(km ²)
VDF	MDF	OF	Total	VDF	MDF	OF	Total	
19,637.05	26,699.94	11,836.97	58,173.96	1,348.27	2,915.15	3,444.19	7,707.61	
33.75%	45.90%	20.35%		17.49%	37.82%	44.69%		

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

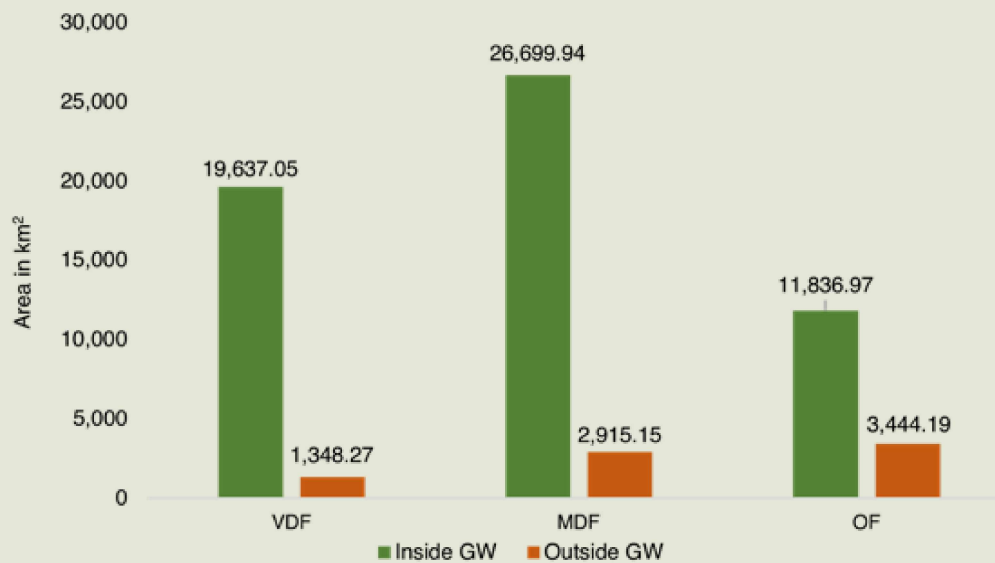


Figure 10.2.2 Forest Cover Inside and Outside of Green Wash in Arunachal Pradesh



Table 10.2.5 Forest Cover Change Matrix Inside RFA/GW for Arunachal Pradesh between 2021 Raster based and 2023 Assessments

Class	2023 Assessment inside RFA/GW					(km ²)
	VDF	MDF	OF	Scrub	NF	Total ISFR 2021 inside RFA / GW Raster based*
VDF	18,811.88	644.64	105.40	0.68	70.41	19,633.01
MDF	687.69	25,540.34	399.37	5.31	234.51	26,867.22
OF	137.48	514.96	10,643.77	47.90	375.47	11,719.58
Scrub	0.00	0.00	67.43	315.45	28.00	410.88
NF	0.00	0.00	621.00	75.64	4,424.67	5,121.31
Total ISFR 2023 inside RFA/GW	19,637.05	26,699.94	11,836.97	444.98	5,133.06	63,752.00
Net Change	4.04	-167.28	117.39	34.10	11.75	

*Area figure calculated without normalization factor.

Table 10.2.6 Forest Cover Change Matrix Outside RFA/GW for Arunachal Pradesh between 2021 Raster based and 2023 Assessments

Class	2023 Assessment outside RFA/GW					(km ²)
	VDF	MDF	OF	Scrub	NF	Total ISFR 2021 outside RFA / GW Raster based*
VDF	1,308.43	30.27	13.43	0.63	20.11	1,372.87
MDF	33.39	2,812.09	41.52	8.14	76.15	2,971.29
OF	6.45	72.79	3,047.17	50.87	231.49	3,408.77
Scrub	0.00	0.00	45.41	458.65	30.52	534.58
NF	0.00	0.00	296.66	95.71	11,311.34	11,703.71
Total ISFR 2023 outside RFA/GW	1,348.27	2,915.15	3,444.19	614.00	11,669.61	19,991.22
Net Change	-24.60	-56.14	35.42	79.42	-34.10	

*Area figure calculated without normalization factor.

Table 10.2.7 Altitude-wise Forest Cover in Arunachal Pradesh

Altitude Zone (m)	Calculated Area by Sol					(km ²)
		VDF	MDF	OF	Total	Scrub
0-500	10,586.00	1,513.41	2,974.68	2,604.76	7,092.85	104.38
500-1000	10,945.39	3,052.87	4,135.03	2,510.73	9,698.63	42.48
1000-2000	23,601.17	8,003.61	9,686.40	4,149.84	21,839.85	61.69
2000-3000	18,023.58	5,909.68	7,880.78	2,600.41	16,390.87	104.85
3000-4000	13,557.10	2,223.54	4,122.52	2,624.96	8,971.02	340.19
> 4000	7,029.98	282.21	815.68	790.46	1,888.35	405.39
Total	83,743.22	20,985.32	29,615.09	15,281.16	65,881.57	1,058.98

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



Table 10.2.8 Forest Cover in Different Slope Classes in Arunachal Pradesh

(km ²)						
Slope (in degrees)	Calculated Area by Sol	VDF	MDF	OF	Total	Scrub
0-5	7,415.45	753.85	1,832.36	1,575.49	4,161.70	110.46
5-10	5,576.63	1,408.48	1,905.15	1,034.53	4,348.16	69.35
10-15	8,572.66	2,367.13	3,012.14	1,541.01	6,920.28	103.94
15-20	11,261.99	3,150.70	4,028.99	2,007.33	9,187.02	136.22
20-25	12,496.47	3,442.61	4,528.12	2,226.78	10,197.51	155.41
25-30	12,206.77	3,277.63	4,477.54	2,188.47	9,943.64	153.86
>30	26,213.25	6,584.92	9,830.79	4,707.55	21,123.26	329.74
Total	83,743.22	20,985.32	29,615.09	15,281.16	65,881.57	1,058.98

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

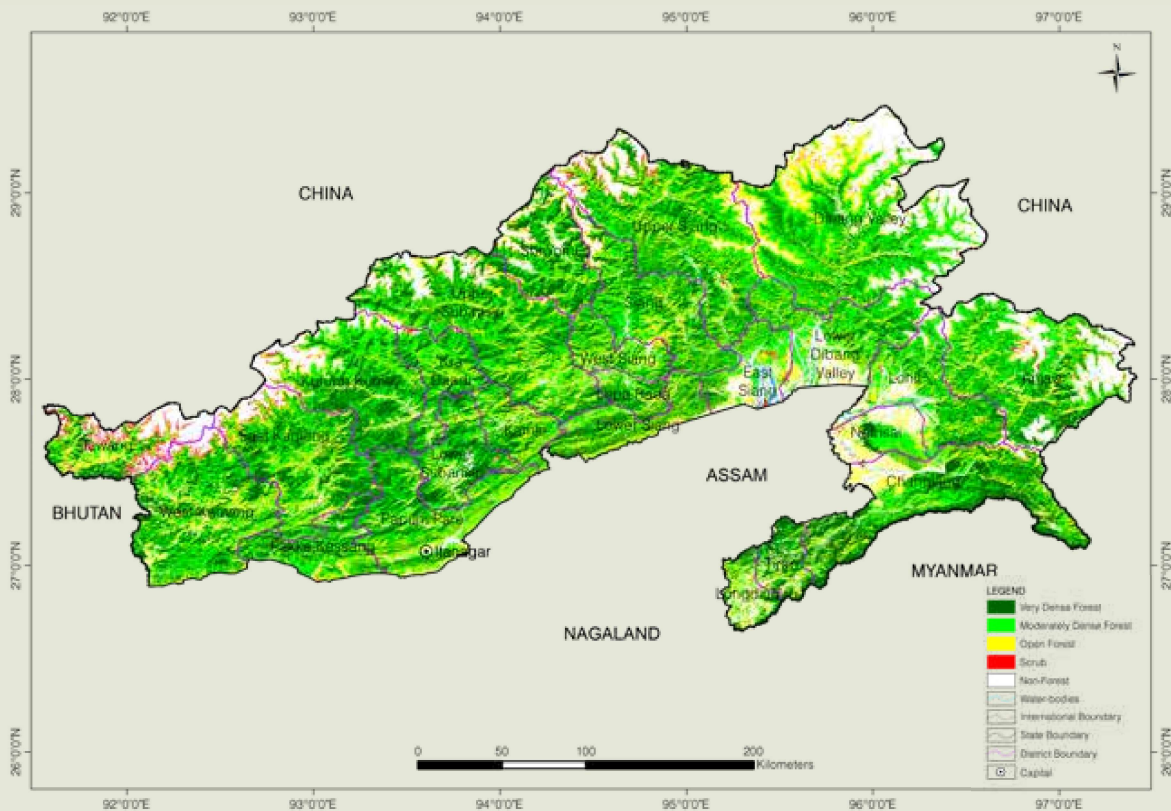


Figure 10.2.3 Forest Cover Map of Arunachal Pradesh



10.2.3 Forest Types

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

Table 10.2.9 Area Statistics of the Forest Types Found in Arunachal Pradesh

(km ²)			
Sl. No.	Forest Type	Area	% of the total mapped area*
1	1B/C1 Assam Valley tropical wet evergreen forest (<i>Dipterocarpus</i>)	1,453.35	2.03
2	1B/C2a Kayea forest	751.37	1.05
3	1/2S1 Pioneer Euphorbiaceous scrub	238.23	0.33
4	2B/ C1a Assam alluvial plains semi-evergreen forest	4,010.17	5.61
5	2B/C1b Eastern sub-montane semi-evergreen forest	2,430.47	3.40
6	2B/C1/1S1 Sub-Himalayan light alluvial semi-evergreen forest	3,996.57	5.59
7	2B/C1/2S2 Eastern alluvial secondary semi-evergreen forest	3,773.66	5.28
8	2/2S1 Secondary moist bamboo brakes	1,114.03	1.56
9	3C/C3/2S2 Secondary Euphorbiaceous scrub	28.34	0.04
10	3/1S2b <i>Terminalia-Duabanga</i>	911.97	1.28
11	8B/C1 East Himalayan subtropical wet hill forest	15,259.14	21.36
12	8B/C2 <i>Khasi</i> subtropical wet hill forest	1,210.22	1.69
13	9/C2 Assam subtropical pine forest	744.38	1.04
14	11B/C1 East Himalayan wet temperate forest	15,681.90	21.95
15	12/C1f Low-level blue pine forest (<i>P. wallichiana</i>)	243.61	0.33
16	12/C3a East Himalayan mixed coniferous forest	5,165.02	7.23
17	12/DS1 Montane bamboo brakes	138.03	0.19
18	13/C6 East Himalayan dry temperate coniferous forest	663.89	0.93
19	14/C2 East Himalayan sub-alpine birch/fir forest	7,576.68	10.61
20	15/C1 Birch/ <i>Rhododendron</i> scrub forest	494.39	0.70
21	16/C1 Dry alpine scrub	491.22	0.69
Sub Total		66,376.64	92.89
22	TOF/ Plantation	563.91	0.79
Total (Forest Cover & Scrub)		66,940.55	93.68
Grassland forest type (outside forest cover)			
23	9/C2/DS1 Assam subtropical pine savannah	17.48	0.03
24	12/DS3 Himalayan temperate pastures	256.30	0.36
25	15/C3 Alpine pastures	4,231.29	5.93
Sub Total		4,505.07	6.32
Grand Total		71,445.62	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).



10.2.4 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 10.2.10 District-wise Number of Forest Fire Detected

Sl. No.	District	SNPP-VIIRS Detection during 2022-23	SNPP-VIIRS Detection during 2023-24
1	Anjaw	107	57
2	Changlang	426	290
3	Dibang Valley	79	137
4	East Kameng	90	42
5	East Siang	86	84
6	Kamle	13	16
7	Kra Daadi	17	12
8	Kurung Kumey	5	10
9	Lepa Rada	41	22
10	Lohit	153	130
11	Longding	250	132
12	Lower Dibang Valley	76	94
13	Lower Siang	29	32
14	Lower Subansiri	90	83
15	Namsai	211	120
16	Pakke Kessang	48	54
17	Papum Pare	141	116
18	Shi Yomi	16	6
19	Siang	23	19
20	Tawang	20	42
21	Tirap	88	105
22	Upper Siang	16	24
23	Upper Subansiri	27	32
24	West Kameng	317	337
25	West Siang	78	57
Total		2,447	2,053

10.2.5 Fire Prone Forest Areas

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

Table 10.2.11 Forest Fire Prone Classes

(km ²)			
Sl. No.	Forest Fire Prone Classes	Forest Cover*	% of Total Forest Cover
1	Extremely fire prone	26.52	0.04
2	Very highly fire prone	122.04	0.18
3	Highly fire prone	1,074.78	1.61
4	Moderately fire prone	3,007.80	4.49
5	Less fire prone	62,709.41	93.68
Total		66,940.55	100.00

* Forest Cover including Scrub.

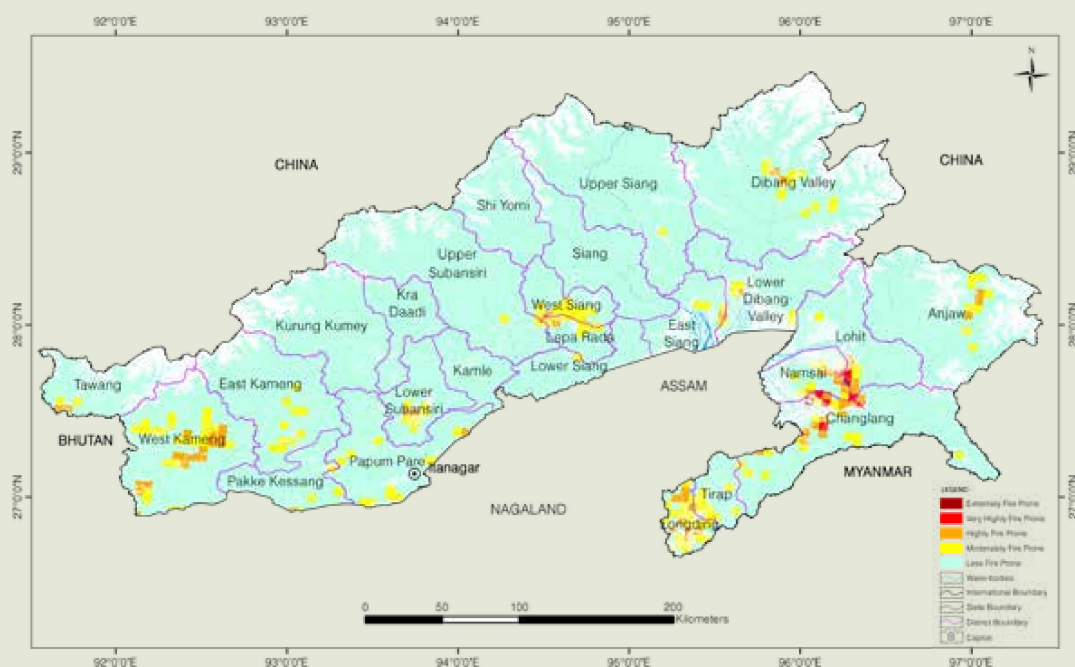


Figure 10.2.4 Fire Prone Forest Areas under Different fire Prone Classes



10.2.6 Results Derived from NFI for Arunachal Pradesh

Table 10.2.12 Number of Trees and their Volume for Top 5 Species in RFA

Sl. No.	Species	No. of Trees (in '000)	Volume (M m ³)
1	<i>Castanopsis species</i>	81,536	51.34
2	<i>Macaranga species</i>	53,663	10.45
3	<i>Ficus species</i>	35,333	11.14
4	<i>Quercus species</i>	34,432	20.41
5	<i>Castanopsis indica</i>	26,233	8.94

Table 10.2.13 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>Castanopsis species</i>	40,446	5.936
2	<i>Macaranga species</i>	24,790	1.602
3	<i>Pinus wallichiana/ Pinus excelsa</i>	19,831	11.563
4	<i>Citrus species</i>	18,884	0.667
5	<i>Areca catechu</i>	15,557	0.334

Table 10.2.14 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>Areca catechu</i>	3	0.0001
2	<i>Mangifera indica</i>	3	0.001
3	<i>Gmelina arborea</i>	2	0.001
4	<i>Psidium guajava</i>	2	0.0001
5	<i>Artocarpus heterophyllus/ Artocarpus integrifolia</i>	2	0.001

Table 10.2.15 Major NTFP Species in Arunachal Pradesh

Sl. No.	Species	Habit	No. of Plants (in '000)
1	<i>Cinnamomum tamala</i>	Tree	2,61,323
2	<i>Oroxylum indicum</i>	Tree	1,37,649
3	<i>Aquilaria malaccensis/Aquilaria agallocha</i>	Tree	26,261
4	<i>Azadirachta indica</i>	Tree	22,566
5	<i>Clerodendrum colebrookeanum</i>	Shrubs	43,73,959
6	<i>Berberis aristata</i>	Shrubs	4,68,638
7	<i>Piper species/ Piper longum/ Piper mullesua/ Piper peepuloides</i>	Climbers	1,27,66,618
8	<i>Rubia cordifolia</i>	Climbers	1,13,380
9	<i>Acorus calamus</i>	Herbs	3,27,30,490
10	<i>Swertia chirayita/ Swertia chirata</i>	Herbs	2,59,58,665



Table 10.2.16 Major Invasive Species in the State Inside the RFA in Arunachal Pradesh

Sl. No.	Species	Estimated Extent (km ²)
1	<i>Chromolaena odorata</i>	2,988.72
2	<i>Mikania micrantha</i>	2,418.45
3	<i>Lantana camara</i>	532.81
4	<i>Imperata cylindrica</i>	437.07
5	<i>Ageratum conyzoides</i>	378.79



Photo: FSI Repository