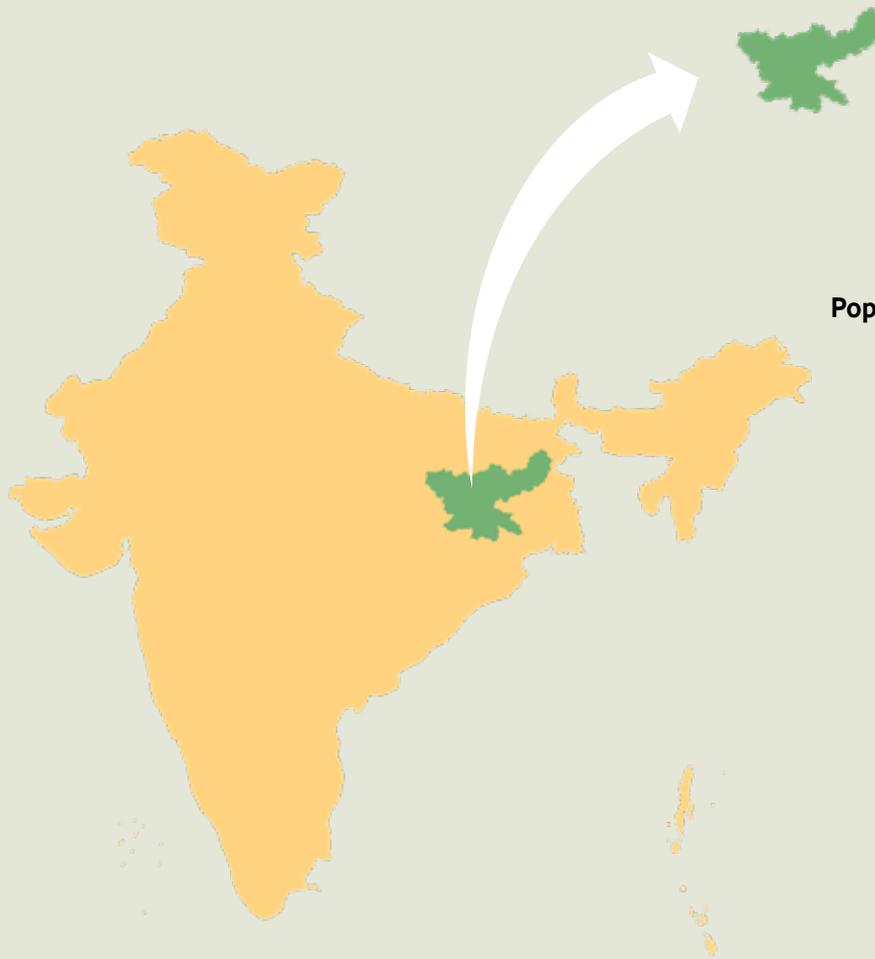


JHARKHAND



Geographical Area

79,716 km²

Geographical Coordinates

Latitude 22°00' N to 24°37' N

Longitude 83°15' E to 87°01' E

Population (as per Census 2011)

32.99 million

Urban 7.93 million (24.05 %)

Rural 25.06 million (75.95 %)

Tribal 8.65 million (26.21 %)

Average Population Density

414 per km²

Livestock Population

(as per 19th Livestock Census)

18.05 million

No. of Districts

24

No. of Hill Districts

0

No. of Tribal Districts

17

Table 10.11.1 Land Use Pattern

Land Use Types	Area (in '000 ha)	Percentage
Geographical Area	7,972	
Reporting area for land utilization	7,970.08	100.00
Forests	2,239.48	28.10
Not available for land cultivation	1,275.84	16.01
Permanent pastures and other grazing lands	131.13	1.64
Land under misc. tree crops and groves	126.18	1.58
Culturable wasteland	382.44	4.80
Fallow land other than current fallows	1,068.00	13.40
Current fallows	1,368.44	17.17
Net area sown	1,378.57	17.30

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

10.11.1 Forest Cover

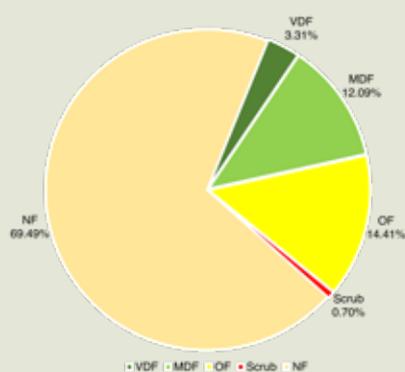


Table 10.11.2 Forest Cover of Jharkhand

(km ²)		
Class	Area	% of Calculated Area by Sol
VDF	2,635.35	3.31
MDF	9,640.99	12.09
OF	11,489.44	14.41
Total	23,765.78	29.81
Scrub	558.32	0.70

Figure 10.11.1 Forest Cover of Jharkhand

Table 10.11.3 District- wise Forest Cover in Jharkhand

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			
Bokaro	2,883	59.04	231.40	281.97	572.41	19.85	2.33	29.09
Chatra	3,718	254.32	838.17	706.90	1,799.39	48.40	-15.23	34.45
Deoghar	2,477	0.03	13.18	192.45	205.66	8.30	0.38	13.94
Dhanbad	2,040	0.00	43.62	177.58	221.20	10.84	2.19	14.13
Dumka	3,761	0.02	252.54	336.28	588.84	15.66	11.34	31.00
East Singhbhum	3,562	53.52	587.20	428.26	1,068.98	30.01	-3.43	22.79
Garhwa	4,093	129.75	419.54	906.31	1,455.60	35.56	22.93	41.54
Giridih	4,962	77.20	333.39	489.61	900.20	18.14	0.77	31.07
Godda	2,266	13.52	275.09	141.87	430.48	19.00	1.62	13.56
Gumla	5,360	308.47	587.15	559.79	1,455.41	27.15	5.50	7.75
Hazaribagh	3,555	233.20	467.06	941.28	1,641.54	46.18	4.33	21.62
Jamtara	1,811	0.00	20.28	87.21	107.49	5.94	1.09	4.00
Khunti	2,535	77.18	358.61	515.92	951.71	37.54	0.92	4.05
Kodarma	2,540	76.98	359.87	258.89	695.74	27.39	-1.79	7.83
Latehar	4,291	485.48	1,291.23	606.49	2,383.20	55.54	-2.37	7.39
Lohardaga	1,502	170.65	219.34	113.18	503.17	33.50	0.82	5.44
Pakur	1,811	2.83	168.77	114.53	286.13	15.80	1.08	21.87
Palamu	4,393	68.02	544.14	605.76	1,217.92	27.72	6.33	82.92
Ramgarh	1,341	31.18	113.29	197.09	341.56	25.47	1.10	15.20
Ranchi	5,097	63.57	349.76	727.13	1,140.46	22.38	4.58	21.52
Sahibganj	2,063	18.12	262.43	311.90	592.45	28.72	0.08	57.16
Saraikela Kharsawan	2,657	22.47	213.75	345.82	582.04	21.91	3.09	18.09
Simdega	3,774	22.37	342.69	881.45	1,246.51	33.03	-3.51	17.57
West Singhbhum	7,224	467.43	1,348.49	1,561.77	3,377.69	46.76	14.66	34.34
Grand Total	79,716	2,635.35	9,640.99	11,489.44	23,765.78	29.81	58.81	558.32

*Area figure calculated without normalization factor.



Table 10.11.4 Division-wise Forest Cover in Jharkhand

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			
Bokaro	2,686.78	42.01	195.35	250.61	487.97	18.16	2.14	27.29
Chaibasa	2,846.32	1.80	185.70	471.67	659.17	23.16	4.30	11.13
Chatra North	1,472.96	58.29	375.66	291.14	725.09	49.23	-19.14	11.34
Chatra South	1,925.06	128.95	331.85	378.57	839.37	43.60	-0.48	9.55
Deoghar	2,468.45	0.00	13.73	190.19	203.92	8.26	0.44	12.56
Dhalbhum	3,253.39	36.80	490.93	379.34	907.07	27.88	-3.66	18.09
Dhanbad	2,023.38	0.00	43.30	167.19	210.49	10.40	0.76	15.57
Dumka	3,735.27	0.02	253.61	329.33	582.96	15.61	8.95	34.82
Elephant Sanctuary Dalma	411.66	27.82	132.19	65.32	225.33	54.74	0.00	4.01
Garhwa North	2,445.14	39.89	54.40	417.03	511.32	20.91	11.58	35.59
Garhwa South	1,487.37	35.26	266.75	485.72	787.73	52.96	2.44	5.15
Giridih East	3,089.69	76.05	275.68	351.87	703.60	22.77	-0.32	16.16
Giridih West	1,205.94	0.07	24.64	48.43	73.14	6.06	-0.47	8.58
Godda	2,223.51	12.16	262.91	132.79	407.86	18.34	1.53	13.39
Gumla	4,203.24	191.82	330.86	402.33	925.01	22.01	2.19	6.97
Hazaribag East	1,717.11	85.72	169.88	277.29	532.89	31.03	-0.06	4.00
Hazaribag West	2,768.79	116.67	240.66	595.39	952.72	34.41	-0.79	18.04
Hazaribag WL	1,019.45	135.06	340.23	247.50	722.79	70.90	-1.24	3.75
Jamtara	1,794.22	0.00	20.11	85.27	105.38	5.87	0.72	4.63
Khunti	3,943.36	80.83	447.30	690.59	1,218.72	30.91	0.49	16.72
Koderma	1,439.24	53.49	270.87	212.98	537.34	37.33	-2.11	6.42
Kolhan	1,123.00	34.28	329.12	372.64	736.04	65.54	3.01	13.03
Latehar	2,700.30	160.66	745.30	377.58	1,283.54	47.53	-3.07	6.31
Lohardaga	1,878.08	225.99	345.49	147.30	718.78	38.27	0.67	4.78
Medani Nagar	4,302.48	65.50	521.59	571.45	1,158.54	26.93	2.36	80.73
Pakur	1,806.53	2.84	176.82	117.88	297.54	16.47	1.06	22.06
Porahat	2,277.39	134.69	454.56	586.50	1,175.75	51.63	2.28	14.72
PTR Buffer	1,168.51	303.40	329.31	190.36	823.07	70.44	0.00	0.91
PTR Core	807.14	129.27	386.28	97.49	613.04	75.95	0.00	0.00
Ramgarh	1,630.38	35.87	124.98	250.84	411.69	25.25	1.09	16.46
Ranchi	3,681.33	57.20	258.41	544.16	859.77	23.35	2.27	13.14
Ranchi WL	587.42	7.40	67.63	91.84	166.87	28.41	0.03	1.09
Sahibganj	2,021.65	19.72	267.67	317.45	604.84	29.92	0.16	58.40
Saraikela	2,513.85	11.82	178.69	330.63	521.14	20.73	2.45	18.35
Saranda	952.24	297.36	379.31	124.60	801.27	84.15	-0.22	4.82
Simdega	3,755.14	22.03	337.17	877.95	1,237.15	32.95	-5.70	17.57
Area which Does not fall in any division	364.91	4.61	12.05	20.22	36.88	10.11	0.05	2.19
Grand Total	79,730.68	2,635.35	9,640.99	11,489.44	23,765.78	29.81	13.71	558.32

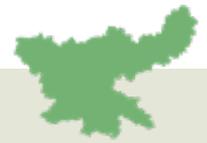
#As per the division boundary shapefile provided by State Forest Department.

*Area figure calculated without normalization factor.

Table 10.11.5 Forest Cover in Municipal Areas of Jharkhand

Sl. No.	Name of Urban Local Body	Area as per Digitized Boundary*	2023 Assessment				% of Total Forest Cover w.r.t. Area of Digitized Boundary	Scrub
			Very Dense Forest	Mod. Dense Forest	Open Forest	Total Forest Cover		
1	Dhanbad	227.28	0.00	0.73	6.90	7.63	3.36	0.38
2	Jamshedpur	219.55	0.00	5.05	6.58	11.63	5.30	0.11
3	Deoghar	161.33	0.00	0.06	11.45	11.51	7.13	0.00
4	Ramgarh	138.17	0.70	5.42	14.30	20.42	14.78	4.11
5	Chas	83.37	0.00	0.00	1.06	1.06	1.27	0.59
6	Vishrampur	58.39	0.00	0.19	6.72	6.91	11.83	1.69
7	Jumritelaiya	51.13	0.06	2.39	12.78	15.23	29.79	0.08
8	Simdega	40.38	0.00	0.05	1.11	1.16	2.87	0.08
9	Chhatarpur	30.18	0.00	0.00	0.21	0.21	0.70	0.00
10	Manjhiyaon	27.62	0.00	0.00	0.91	0.91	3.29	0.62
11	Khunti	26.60	0.00	0.06	0.92	0.98	3.68	0.00
12	Lohardaga	23.24	0.00	0.11	0.04	0.15	0.65	0.00
13	Medininagar	23.20	0.00	0.00	0.22	0.22	0.95	0.00
14	Nagar Untari	20.77	0.00	0.34	1.65	1.99	9.58	0.00
15	Hazaribag	19.33	0.00	0.13	0.67	0.80	4.14	0.00
16	Phusro	19.28	0.00	0.45	3.41	3.86	20.02	0.01
17	Chakuliya	19.16	0.00	0.67	3.61	4.28	22.34	0.39
18	Basukainath	17.12	0.00	0.16	0.06	0.22	1.29	0.00
19	Giridih	16.47	0.00	0.11	1.35	1.46	8.86	0.00
20	Kodarma	14.96	0.14	1.63	6.54	8.31	55.55	0.00
21	Latehar	14.46	0.00	0.41	0.35	0.76	5.26	0.00
22	Jamtara	14.00	0.00	0.00	0.04	0.04	0.29	0.00
23	Dumka	13.34	0.00	0.83	0.47	1.30	9.75	0.00
24	Chatra	13.12	0.00	0.02	1.43	1.45	11.05	0.00
25	Hussainabad	12.98	0.00	0.00	0.00	0.00	0.00	0.00
26	Garhwa	12.63	0.00	0.00	0.02	0.02	0.16	0.28
27	Gumla	12.31	0.00	0.00	0.11	0.11	0.89	0.00
28	Mihijam	12.17	0.00	0.00	0.03	0.03	0.25	0.00
29	Chakradharpur	9.90	0.00	0.00	1.46	1.46	14.75	0.00
30	Pakur	8.92	0.00	0.00	0.04	0.04	0.45	0.00
31	Godda	8.76	0.00	0.00	0.00	0.00	0.00	0.00
32	Madhupur	8.14	0.00	0.01	1.26	1.27	15.60	0.00
33	Kapali	7.05	0.00	0.00	0.00	0.00	0.00	0.00
34	Seraikela	6.85	0.00	0.00	0.00	0.00	0.00	0.00
35	Chirkunda	6.52	0.00	0.00	0.20	0.20	3.07	0.00
36	Sahibganj	5.14	0.00	0.00	0.14	0.14	2.72	0.00
37	Chaibasa	4.40	0.00	0.00	0.07	0.07	1.59	0.00
38	Rajmahal	4.42	0.00	0.00	0.23	0.23	5.20	0.00
Grand Total		1,412.64	0.90	18.82	86.34	106.06	7.51	8.34

*Shapefile of digitized boundary as provided by Urban Development & Housing Department.



10.11.2 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 10.11.6 Forest Cover Inside and Outside Recorded Forest Area (or Green Wash) in Jharkhand

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
1,447.53	5,261.05	5,793.95	12,502.53	1,187.82	4,379.94	5,695.49	11,263.25
11.58%	42.08%	46.34%		10.54%	38.89%	50.57%	

**In case of Jharkhand, RFA boundaries have been used.*

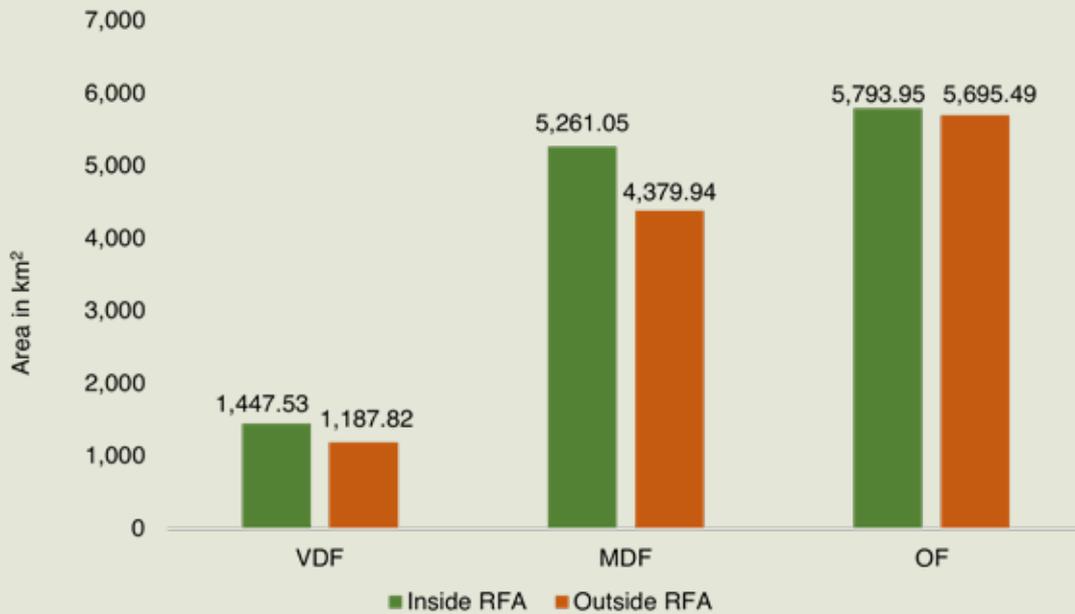


Figure 10.11.2 Forest Cover Inside and Outside of RFA in Jharkhand

Table 10.11.7 Forest Cover Change Matrix inside RFA/GW for Jharkhand between 2021 Raster based and 2023 Assessments

Class	2023 Assessment inside RFA/GW					Total ISFR 2021 inside RFA / GW Raster based*
	VDF	MDF	OF	Scrub	NF	
VDF	1,443.53	0.58	0.06	0.27	0.49	1,444.93
MDF	3.95	5,250.61	0.80	0.42	5.10	5,260.88
OF	0.05	8.09	5,694.56	22.52	18.78	5,744.00
Scrub	0.00	0.24	55.95	226.50	5.28	287.97
NF	0.00	1.53	42.58	2.48	6,312.15	6,358.74
Total ISFR 2023 inside RFA/GW	1,447.53	5,261.05	5,793.95	252.19	6,341.80	19,096.52
Net Change	2.60	0.17	49.95	-35.78	-16.94	

**Area figure calculated without normalization factor.*



Table 10.11.8 Forest Cover Change Matrix outside RFA/GW for Jharkhand between 2021 Raster based and 2023 Assessments

Class	2023 Assessment outside RFA/GW					Total ISFR 2021 outside RFA / GW Raster based*
	VDF	MDF	OF	Scrub	NF	
VDF	1,182.44	0.07	0.01	0.06	0.80	1,183.38
MDF	5.36	4,366.85	0.36	0.36	7.95	4,380.88
OF	0.02	11.64	5,639.44	8.14	33.66	5,692.90
Scrub	0.00	0.40	25.06	287.33	6.55	319.34
NF	0.00	0.98	30.62	10.24	49,001.14	49,042.98
Total ISFR 2023 outside RFA/GW	1,187.82	4,379.94	5,695.49	306.13	49,050.10	60,619.48
Net Change	4.44	-0.94	2.59	-13.21	7.12	

*Area figure calculated without normalization factor.

Table 10.11.9 Altitude-wise Forest Cover in Jharkhand

Altitude Zone (m)	Calculated Area by Sol	VDF	MDF	OF	Total	Scrub
0-500	61,272	1,069.69	6,670.64	8,461.18	16,201.51	530.25
500-1000	18,051	1,499.42	2,843.43	2,989.98	7,332.83	27.67
1000-2000	393	66.24	126.92	38.28	231.44	0.40
Total	79,716	2,635.35	9,640.99	11,489.44	23,765.78	558.32

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

Table 10.11.10 Forest Cover in Different Slope Classes in Jharkhand

Slope (in degrees)	Calculated Area by Sol	VDF	MDF	OF	Total	Scrub
0-5	65,120	1,222.03	4,726.39	6,927.89	12,876.31	327.79
5-10	8,083	687.55	2,245.60	2,240.78	5,173.93	102.53
10-15	3,260	390.09	1,272.05	1,111.02	2,773.16	56.60
15-20	1,790	205.94	755.78	643.93	1,605.65	35.35
20-25	915	88.10	395.47	352.64	836.21	21.63
25-30	390	30.51	169.96	156.77	357.24	10.52
>30	158	11.13	75.74	56.41	143.28	3.90
Total	79,716	2,635.35	9,640.99	11,489.44	23,765.78	558.32

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

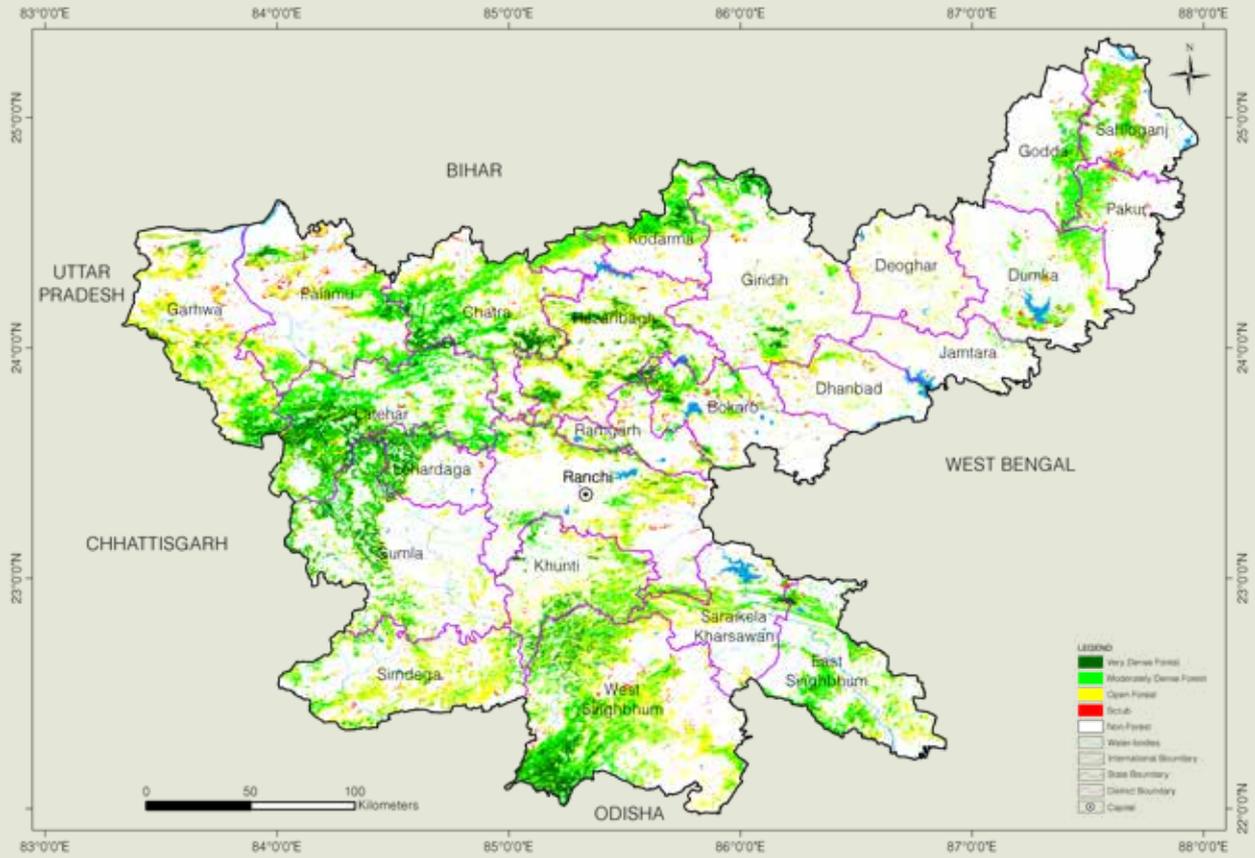


Figure 10.11.3 Forest Cover Map of Jharkhand

10.11.3 Forest Types

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

Table 10.11.11 Area Statistics of the Forest Types Found in Jharkhand

(km ²)			
Sl. No.	Forest Type	Area	% of the total mapped area*
1	3C/C2e (ii) Moist peninsular low level sal	573.13	2.35
2	3C/C2e (iii) Moist peninsular valley sal	65.09	0.27
3	5B/C1c Dry peninsular sal forest	13,183.65	54.20
4	5B/C2 Northern dry mixed deciduous forest	8,308.01	34.16
5	5/DS1 Dry deciduous scrub	779.20	3.20
6	5/E2 <i>Boswellia</i> forest	11.62	0.05
7	5/E5 <i>Butea</i> forest	1.08	0.00
8	5/E9 Dry bamboo brakes	137.95	0.57
Sub Total		23,059.73	94.80
9	TOF/ Plantation	1,264.37	5.20
Total (Forest Cover & Scrub)		24,324.10	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). The total mapped areas, therefore, is sum of forest cover and scrub.

10.11.4 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 10.11.12 District-wise Number of Forest Fire Detected

Sl. No.	District	SNPP-VIIRS Detection during 2022-23	SNPP-VIIRS Detection during 2023-24
1	Bokaro	458	242
2	Chatra	489	329
3	Deoghar	28	31
4	Dhanbad	204	176
5	Dumka	420	246
6	East Singhbhum	977	407
7	Garhwa	225	284
8	Giridih	361	231
9	Godda	451	306
10	Gumla	468	260
11	Hazaribagh	682	513
12	Jamtara	32	22
13	Khunti	198	73
14	Kodarma	407	278
15	Latehar	802	710
16	Lohardaga	281	135



Table 10.11.12 District-wise Number of Forest Fire Detected

Sl. No.	District	SNPP-VIIRS Detection during 2022-23	SNPP-VIIRS Detection during 2023-24
17	Pakur	180	63
18	Palamu	305	271
19	Ramgarh	320	238
20	Ranchi	480	252
21	Sahibganj	468	278
22	Saraikela Kharsawan	287	318
23	Simdega	542	27
24	West Singhbhum	2,858	1,835
Total		11,923	7,525

10.11.5 Fire Prone Forest Areas

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

Table 10.11.13 Forest Fire Prone Classes

Sl. No.	Forest Fire Prone Classes	Forest Cover*	% of Total Forest Cover
1	Extremely fire prone	109.46	0.45
2	Very highly fire prone	2,756.20	11.33
3	Highly fire prone	6,926.56	28.48
4	Moderately fire prone	5,948.19	24.45
5	Less fire prone	8,583.69	35.29
Total		24,324.10	100.00

* Forest Cover including Scrub.

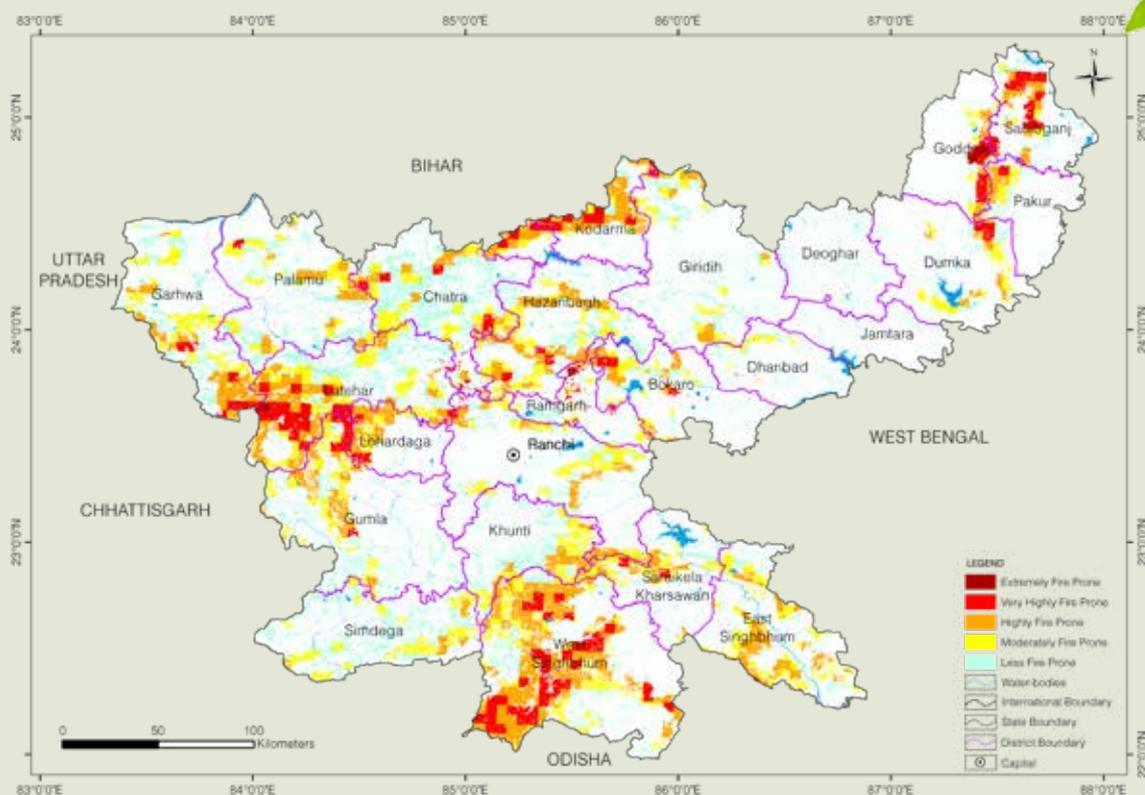


Figure 10.11.4 Fire Prone Forest Areas under Different Fire Prone Classes

10.11.6 Results Derived from NFI for Jharkhand

Table 10.11.14 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>Shorea robusta</i>	2,21,383	48.95
2	<i>Buchanania lanzan/ Buchanania latifolia</i>	25,799	2.46
3	<i>Terminalia elliptica/ Terminalia crenulata</i>	25,190	6.26
4	<i>Anogeissus latifolia/ Terminalia anogeissiana</i>	22,574	3.65
5	<i>Madhuca longifolia/ M. latifolia/ M. indica</i>	19,403	6.86

Table 10.11.15 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>Butea monosperma</i>	24,975	4.867
2	<i>Acacia auriculiformis</i>	24,665	0.723
3	<i>Shorea robusta</i>	22,817	8.666
4	<i>Mangifera indica</i>	14,974	13.449
5	<i>Phoenix sylvestris</i>	10,238	1.865



Table 10.11.16 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>	1,091	0.578
2	<i>Azadirachta indica</i>	888	0.285
3	<i>Moringa species</i>	862	0.125
4	<i>Psidium guajava</i>	656	0.029
5	<i>Cassia siamea/ Senna siamea</i>	654	0.118

Table 10.11.17 Major NTFP species in Jharkhand

Sl. No.	Species	Habit	No. of Plants (in '000)
1	<i>Shorea robusta</i>	Tree	1,09,04,901
2	<i>Diospyros melanoxylon</i>	Tree	38,82,847
3	<i>Buchanania Lanzan</i>	Tree	11,19,332
4	<i>Syzygium cumini</i>	Tree	3,15,476
5	<i>Butea monosperma</i>	Tree	3,09,100
6	<i>Woodfordia fruticosa</i>	Shrubs	34,06,100
7	<i>Asparagus racemosus</i>	Climbers	20,11,476
8	<i>Embelia ribes</i>	Climbers	2,79,372
9	<i>Andrographis paniculata</i>	Herbs	5,57,47,956
10	<i>Rauvolfia serpentina</i>	Herbs	42,29,155

Table 10.11.18 Major Invasive Species in the State inside the RFA in Jharkhand

Sl. No.	Species	Estimated Extent (km ²)
1	<i>Lantana camara</i>	1,912.27
2	<i>Chromolaena odorata</i>	887.52
3	<i>Cassia tora/ Senna tora</i>	92.17
4	<i>Ageratum conyzoides</i>	58.03
5	<i>Mikania micrantha</i>	41.65