



## Bihar

### 9.4.1 Introduction

*Bihar, situated in the eastern part of India bordering Nepal, has a geographical area of 94,163 sq km, which is 2.86% of the geographical area of the country. Bihar is a part of Gangetic Plains and a number of important rivers, which includes Ganga and Gandak, drain the state. The river Ganges divides the state into two equal halves running West to East. Bihar has a humid subtropical climate. The average annual rainfall varies from 1,000 mm to 2,000 mm and the average annual temperature ranges between 20°C to 28°C. The state has 38 districts of which none are hill or tribal. As per the 2011 census, Bihar has a population of 104.10 million accounting to 8.59 percent of India's population. The rural and urban population constitute 88.71% and 11.29% respectively. The population density of the state is 1106 per sq km which is higher than the national average of 382 persons per sq km. The 19<sup>th</sup> Livestock census 2012 has reported a total livestock population of 32.93 million.*

Table 9.4.1 Land Use Pattern

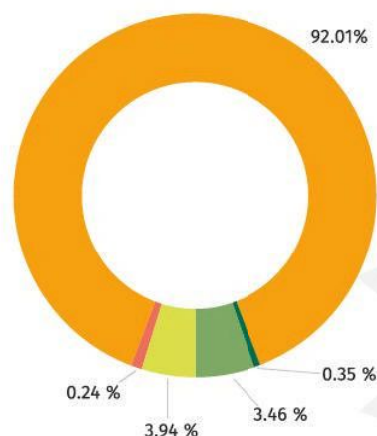
Land Use Types	Area (in 000' ha)	Percentage
Total Geographic Area	9,416	
Reporting area for land utilization	9,360	100.00
Forests	622	6.65
Not available for land cultivation	2,144	22.91
Permanent pastures and other grazing lands	15	0.16
Land under misc. tree crops and groves	247	2.64
Culturable wasteland	45	0.48
Fallow land other than current fallows	120	1.28
Current fallows	913	9.76
Net area sown	5,252	56.12

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

### 9.4.2

#### Forest Cover

Based on interpretation of satellite data pertaining to Oct - Dec 2015, the forest cover in the state is 7,299 sq km which is 7.75% of the State's geographical area. In terms of forest canopy density classes, the state has 332 sq km under very dense forest, 3,260 sq km under moderately dense forest and 3,707 sq km under open forest.



### Forest cover of Bihar

Pie Chart showing forest cover of Bihar

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

#### 9.4.3

### Forest Cover within and outside Green Wash Area

The Recorded Forest Area of the State is 6,877.41 sq km which is 7.30% of the of the Geographic area. The Reserved, Protected and Unclassed Forests are 10.08%, 89.91% and 0.01% respectively of the recorded forest area. Due to non-availability of digitized boundary of recorded forest area from the State, the updated green wash which is 6,001.67 sq km has been used and the analysis of forest cover within and outside this area is depicted below.

Table 9.4.2 Forest Cover within and outside Green Wash area

<b>Forest Cover within Green Wash (Area in sq km)</b>	
Very Dense Forest (VDF)	316
Moderately Dense Forest (MDF)	2,393
Open Forest (OF)	1,958
<b>Total</b>	<b>4,667</b>
<b>Forest Cover outside Green Wash</b>	
Very Dense Forest(VDF)	16
Moderately Dense Forest(MDF)	867
Open Forest(OF)	1,749
<b>Total</b>	<b>2,632</b>
<b>Total Forest Cover</b>	<b>7,299</b>
<b>Tree Cover</b>	<b>2,263</b>
<b>Total Forest &amp; Tree Cover</b>	<b>9,562</b>
Of State's Geographical Area	10.15%
Of India's Forest & Tree Cover	1.19%
Per capita Forest & Tree Cover	0.01 ha

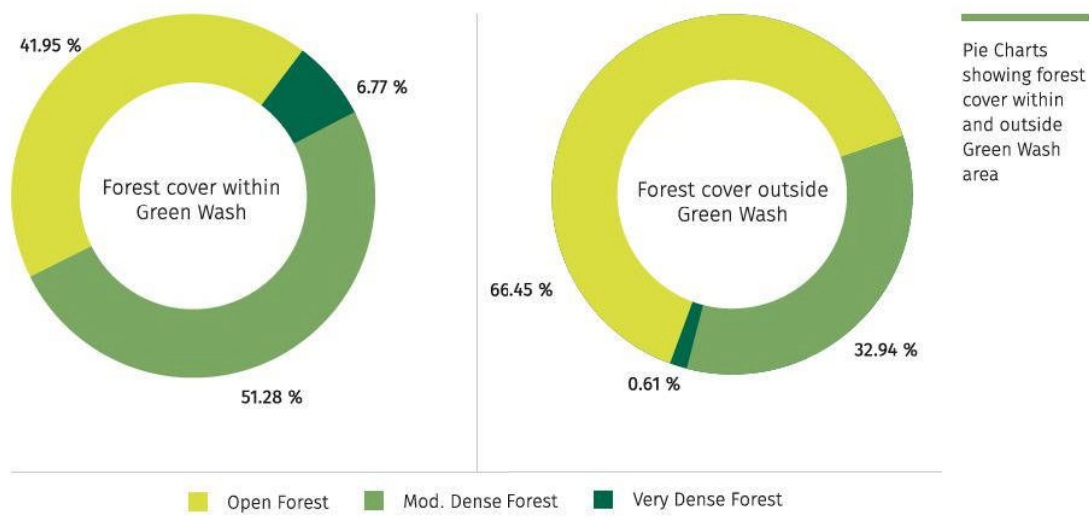


Table 9.4.3 Altitude-wise Forest Cover (Area in sq km)

Altitude Zone (m)	Geographical Area	VDF	MDF	OF	Total
0-500	93,821	329	3,119	3,575	7,023
500-1000	342	3	141	132	276
<b>Total</b>	<b>94,163</b>	<b>332</b>	<b>3,260</b>	<b>3,707</b>	<b>7,299</b>

(Based on SRTM, Digital Elevation Model)

Table 9.4.4 Forest Cover in different Patch Size Classes

S.No.	Patch Size Range (sq km)	No. of Patches	Area (sq km)	%age
1.	$\geq 0.01 \leq 1.0$	29,504	2,028	27.78
2.	$> 1.0 \leq 10$	162	358	4.90
3.	$> 10 \leq 100$	14	315	4.32
4.	$> 100 \leq 500$	6	1,481	20.30
5.	$> 500 \leq 1000$	2	1,366	18.71
6.	$> 1000 \leq 5000$	1	1,751	23.99
	<b>Total</b>	<b>29,689</b>	<b>7,299</b>	<b>100.00</b>

Table 9.4.5 Growing Stock

	Growing Stock	% Contribution to country
Growing Stock in Recorded Forest Area	28,500 m cum	0.68
Growing Stock in TOF	37,471 m cum	2.34
Potential Production of industrial wood from TOF	1.94 m cum	2.60
Bamboo bearing area within forest area of the state	1,004 sq km	0.64
Total number of culms	353 millions	1.26
Total green weight equivalent of culms	1,692 (000' tonnes)	0.90

#### 9.4.4

### Carbon Stock in forest

The total Carbon stock of forests in the State is 55,397 million tonnes (203,122 million tonnes of CO<sub>2</sub> equivalent) which is 0.78 % of total forest carbon of the country.

#### 9.4.5

### Decadal Change in water bodies within Forest

A decrease of 8 sq km has been observed in the water body coverage within Forest compared to 2005. The graphical and tabular comparison is depicted below.

Extent of  
waterbodies  
within forest

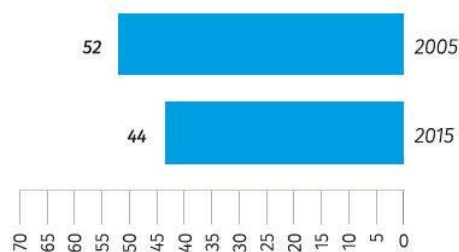


Table 9.4.6 Water bodies within Forest for the years 2005 and 2015

Area/Coverage	2005	2015
Extent of water bodies (sq km) within Forest	52	44
% of water bodies to Forest Cover	0.76	0.60

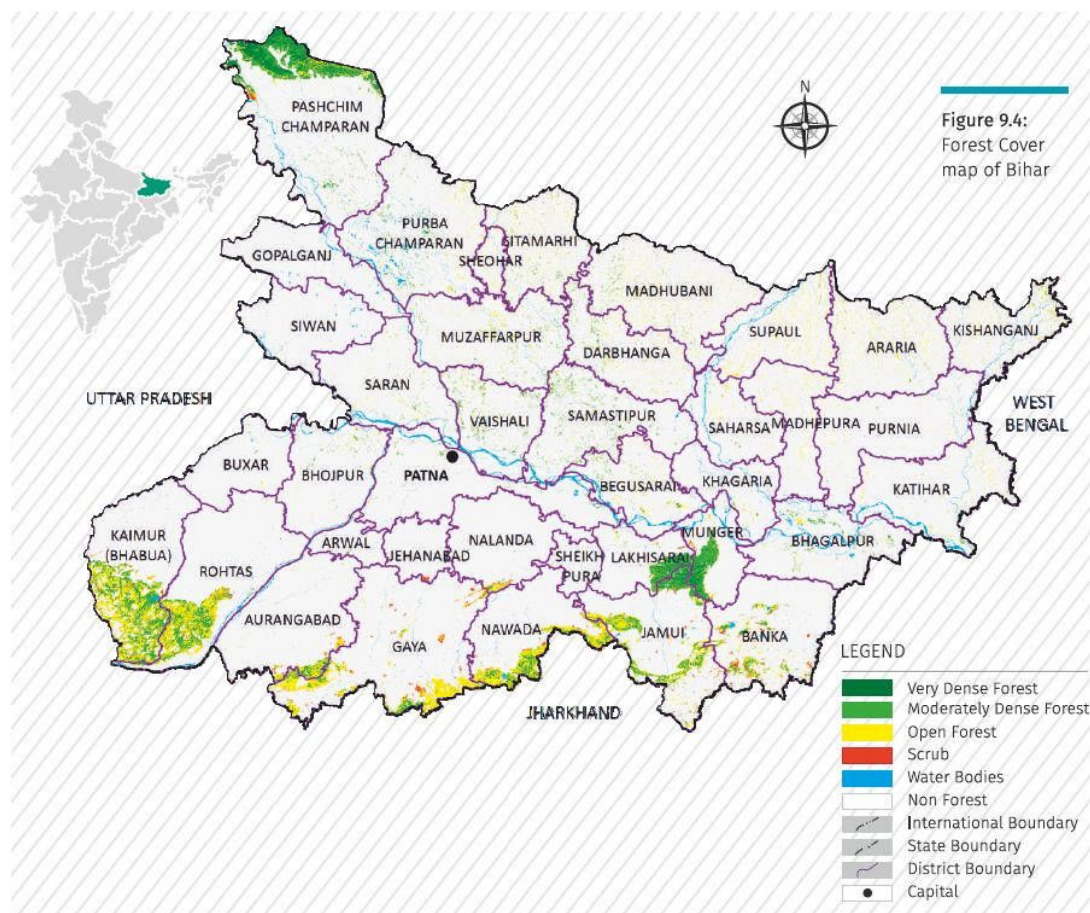


Table 9.4.7 District- wise Forest Cover

(area in sq km)

District	Geo-graphical Area	2017 Assessment				% of GA	Change *	Scrub
		Very Dense Forest	Mod. Dense Forest	Open Forest	Total			
Araria	2,830	0	8	148	156	5.51	-1	0
Arwal	638	0	2	3	5	0.78	-1	0
Aurangabad	3,305	0	62	95	157	4.75	2	16
Banka	3,020	0	104	136	240	7.95	8	47
Begusarai	1,918	0	29	54	83	4.33	3	0
Bhagalpur	2,569	0	49	19	68	2.65	4	17
Bhojpur	2,395	0	21	15	36	1.5	1	0
Buxar	1,703	0	3	3	6	0.35	-4	0
Darbhanga	2,279	0	43	93	136	5.97	0	0
Gaya	4,976	0	141	464	605	12.16	0	0
Gopalganj	2,033	0	2	3	5	0.25	0	62
Jamui	3,098	29	351	261	641	20.69	5	0
Jehanabad	931	0	0	0	0	0	0	20
Kaimur (Bhabua)	3,332	0	520	551	1,071	32.14	6	5

District	Geo-graphical Area	2017 Assessment				% of GA	Change *	Scrub
		Very Dense Forest	Mod. Dense Forest	Open Forest	Total			
Katihar	3,057	0	6	55	61	2	0	0
Khagaria	1,486	0	3	18	21	1.41	0	0
Kishanganj	1,884	0	17	85	102	5.41	2	0
Lakhisarai	1,228	17	147	19	183	14.9	1	4
Madhepura	1,788	0	1	50	51	2.85	1	3
Madhubani	3,501	0	39	158	197	5.63	0	0
Munger	1,419	38	226	21	285	20.08	2	7
Muzaffarpur	3,172	0	48	94	142	4.48	0	0
Nalanda	2,355	0	7	25	32	1.36	0	8
Nawada	2,494	0	189	323	512	20.53	2	17
Pashchim Champaran	5,228	248	551	105	904	17.29	1	10
Patna	3,202	0	21	5	26	0.81	0	0
Purbi Champaran	3,968	0	66	89	155	3.91	-1	0
Purnia	3,229	0	5	48	53	1.64	0	0
Rohtas	3,881	0	335	371	706	18.19	-5	12
Saharsa	1,687	0	4	30	34	2.02	0	0
Samastipur	2,904	0	108	49	157	5.41	0	0
Saran	2,641	0	26	31	57	2.16	2	0
Sheikhpura	689	0	1	0	1	0.15	0	0
Sheohar	349	0	2	17	19	5.44	0	0
Sitamarhi	2,294	0	37	109	146	6.36	0	0
Siwan	2,219	0	2	5	7	0.32	1	0
Supaul	2,425	0	4	126	130	5.36	0	0
Vaishali	2,036	0	80	29	109	5.35	16	0
<b>Grand total</b>	<b>94,163</b>	<b>332</b>	<b>3,260</b>	<b>3,707</b>	<b>7,299</b>	<b>7.75</b>	<b>45</b>	<b>228</b>

\*Change compared to updated 2015 assessment.

Table 9.4.8: Forest Cover Change Matrix						(area in sq km)
Class	2017 Assessment					Total ISFR 2015 updated
	VDF	MDF	OF	Scrub	NF	
Very Dense Forest	248	0	0	0	0	248
Moderately Dense Forest	84	3,240	38	0	0	3,362
Open Forest	0	20	3,617	7	0	3,644
Scrub	0	0	12	110	0	122
Non Forest	0	0	40	111	86,636	86,787
<b>Total ISFR 2017</b>	<b>332</b>	<b>3,260</b>	<b>3,707</b>	<b>228</b>	<b>86,636</b>	<b>94,163</b>
<b>Net Change</b>	<b>84</b>	<b>-102</b>	<b>63</b>	<b>106</b>	<b>-151</b>	

#### 9.4.6

### Reasons for change detected in 2017 assessment

A net positive change of 45 sq km observed in the state could be attributed to plantations and conservation.