

9.3 ASSAM

9.3.1 Introduction

Assam is situated in the middle of the north-eastern part of India and is gateway to this region sharing borders with West Bengal and six north eastern states as well as with Bangladesh and Bhutan. It has a geographical area of 78,438 km² which constitutes 2.39% of the country's total area. The state is famous for its tea gardens and one horned Rhinoceros of Kaziranga. It is situated between 24° 07' N - 28° 00' N latitude and 89° 42' E - 96° 02' E longitude. Topographically, the state can be divided into three parts, viz. the Brahmaputra valley, the Surma valley and the

mountainous Assam ranges. The state has subtropical climate with temperature ranging from 5°C to 32°C and mean annual rainfall varying from 1,500 mm to 3,750 mm.

The population of the state is 31.17 million (*Census 2011*). Rural and urban population accounts for 85.92% and 14.08% respectively. The population density is 397 persons per km². The livestock population of the state is 17.23 million (*Livestock Census 2007*).

Land use pattern in the state is given in Table 9.3.1.

Table 9.3.1: Land Use Pattern

Land Use	Area in '000 ha	Percentage
Total geographical area	7,844	
Reporting area for land utilization	7,850	100.00
Forests	1,853	23.60
Not available for cultivation	2,626	33.45
Permanent pastures and other grazing lands	160	2.04
Land under misc. tree crops and groves	196	2.50
Culturable wasteland	77	0.98
Fallow lands other than current fallows	59	0.75
Current fallows	126	1.61
Net area sown	2,753	35.07

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

9.3.2 Recorded Forest Area

The recorded forest area of Assam is 26,832 km² accounting for 34.21% of its geographical area. According to their legal status, Reserved Forests constitute 66.58% and Unclassed Forests 33.42% of the total forest area.

9.3.3 Protected Areas

The protected area network of Assam includes 5 National Parks and 18 Wildlife Sanctuaries covering an area of 0.40 million ha constituting 4.98% of the geographical area. The state has three Tiger Reserves,

Namely, Kaziranga, Manas and Nameri. Kaziranga National Park and Manas Wildlife Sanctuary are in the list of World Heritage sites.

9.3.4 Forest Cover

The forest cover in the state, based on interpretation of satellite data of Nov 2008-

Jan 2009 is 27,673 km² which is 35.28% of the state's geographical area. In terms of forest canopy density classes, the state has 1,444 km² supporting very dense forest, 11,404 km² moderately dense forest and 14,825 km² open forest. The forest cover of the state is shown in Fig.9.3.

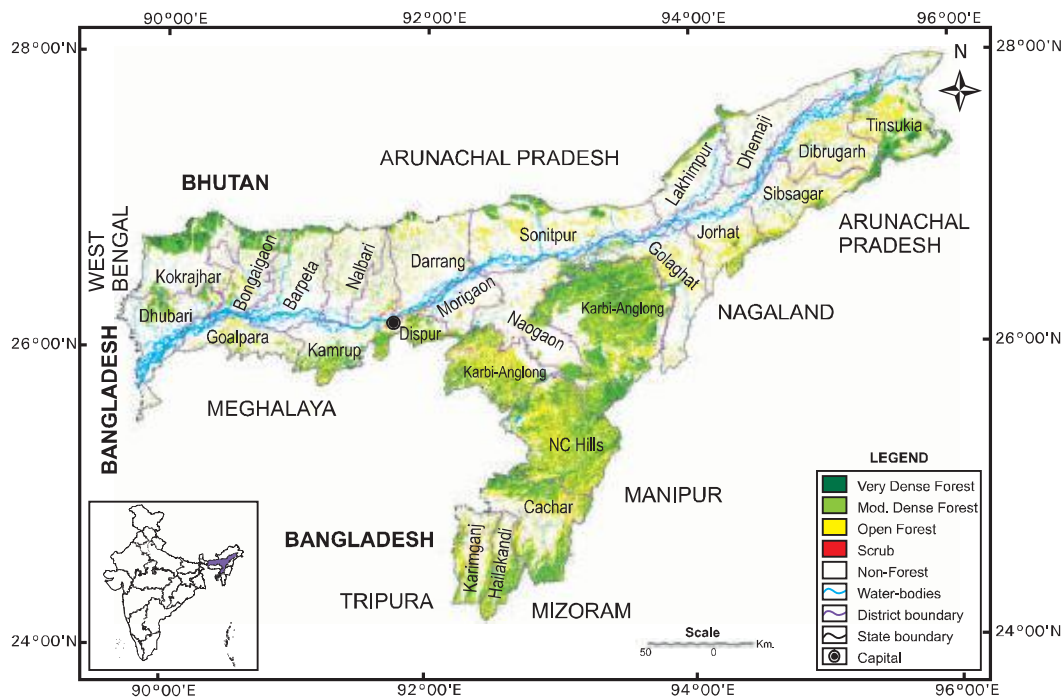
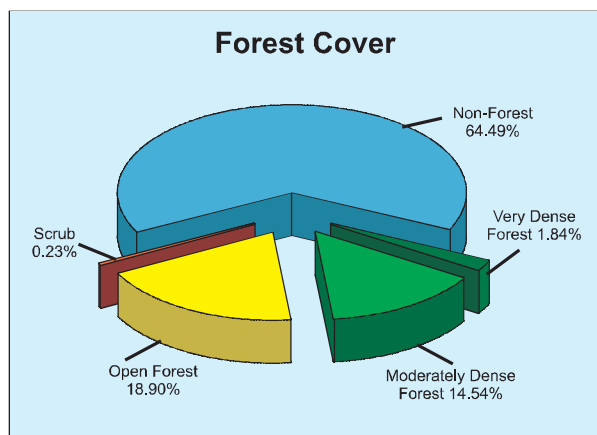


Fig 9.3 Forest cover map of Assam



District-wise forest cover in different canopy density classes along with the changes compared to 2009 assessment are given in Table 9.3.2.

Table 9.3.2: District-wise Forest Cover (Area in km²)

District	Geographical Area	2011 Assessment				Percent of GA	Change	Scrub
		Very Dense Forest	Mod. Dense Forest	Open Forest	Total			
Barpeta ^T	3,245	35	179	183	397	12.23	-4	2
Bongaigaon	2,510	33	267	221	521	20.76	3	3
Cachar ^T	3,786	81	975	1,180	2,236	59.06	5	18
Darrang ^T	3,481	12	91	367	470	13.50	-16	2
Dhemaji ^T	3,237	7	124	160	291	8.99	1	10
Dhubari ^T	2,798	21	201	196	418	14.94	1	10
Dibrugarh ^T	3,381	29	165	564	758	22.42	0	0
Goalpara ^T	1,824	1	71	265	337	18.48	1	8
Golaghat	3,502	6	122	397	525	14.99	4	0
Hailakandi	1,327	13	373	400	786	59.23	0	5
Jorhat ^T	2,851	2	113	498	613	21.50	3	0
Kamrup ^T	4,345	68	612	753	1,433	32.98	1	26
Karbi Anglong ^H	10,434	566	3,819	3,554	7,939	76.09	-19	24
Karimganj	1,809	3	318	539	860	47.54	4	48
Kokrajhar ^T	3,169	208	716	220	1,144	36.10	-19	2
Lakhimpur ^T	2,277	4	118	171	293	12.87	5	6
Morigaon ^T	1,704	6	41	86	133	7.81	1	4
North Cachar Hills ^H	4,888	135	1,553	2,562	4,250	86.95	-6	1
Naogaon ^H	3,831	40	353	403	796	20.78	7	8
Nalbari ^T	2,257	4	70	208	282	12.49	0	0
Sibsagar ^T	2,668	8	144	543	695	26.05	2	1
Sonitpur ^T	5,324	56	280	624	960	18.03	7	0
Tinsukia ^T	3,790	106	699	731	1,536	40.53	0	4
Grand Total	78,438	1,444	11,404	14,825	27,673	35.28	-19	182

Reasons for change detected in 2011 assessment:

Reason for changes observed in current assessment are enumerated hereunder -

- a) Prevalent shifting cultivation practices /extension of encroachment in some areas.
- b) The positive changes are attributed mainly to:
 - i. The improvement of forest cover (shade trees) in tea gardens.
 - ii. Natural regeneration /plantation.
 - iii. Re-growth in areas affected by shifting cultivation.

Table 9.3.3 Forest Cover Change Matrix (Area in km²)

2009 Assessment	2011 Assessment					Total 2009
	VDF	MDF	OF	Scrub	NF	
Very Dense Forest	1,444	9	0	0	8	1,461
Moderately Dense Forest	0	11,353	79	0	126	11,558
Open Forest	0	21	14,369	2	281	14,673
Scrub	0	0	0	176	3	179
Non-Forest	0	21	377	4	50,165	50,567
Total 2011	1,444	11,404	14,825	182	50,583	78,438
Net Change	-17	-154	152	3	16	

The change matrix given in Table 9.3.3 reveals that there has been a decrease of 17 km² in very dense forest and 154 km² in moderately dense forest and an increase of 152 km² in the open forest.

9.3.5 Altitude Zone-wise Forest Cover

Forest cover of the state in different altitude zones is given in Table 9.3.4.

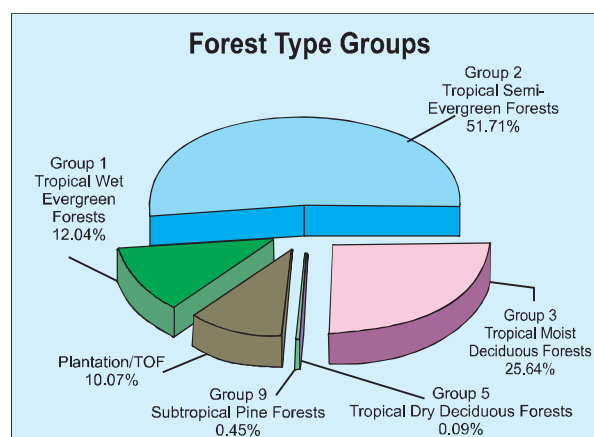
Table 9.3.4: Altitude Zone-wise Forest Cover (Area in km²)

Altitude Zone	VDF	MDF	OF	Total
0-500m	1,034	8,871	11,976	21,881
500-1000m	325	2,177	2,502	5,004
1000-2000m	85	356	347	788
Total	1,444	11,404	14,825	27,673

(Based on SRTM, Digital Elevation Model)

9.3.6 Forest Cover in Different Forest Types

Forest type mapping using satellite data has been undertaken by Forest Survey of India with reference to Champion & Seth Classification. As per this assessment, the state has 18 forest types belonging to five forest type groups, viz. Tropical Wet Evergreen, Tropical Semi Evergreen, Tropical Moist Deciduous, Tropical Dry Deciduous and Subtropical Pine Forests. Percentage-wise distribution of forest cover of the state in various forest type groups is given in the pie diagram.



9.3.7 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 1,564 km² which is 1.99% of geographical area of the state. Eight

districts of the state, namely, Bongaigaon, Dibrugarh, Goalpara, Jorhat, Karimganj, Nalbari, Sibsagar and Tinsukia have been inventoried during this period. The forest and tree cover of the state is presented in Table 9.3.5.

Table 9.3.5: Forest and Tree Cover (Area in km²)

Category	Area	% of Geographical Area
Tree Cover	1,564	1.99
Forest Cover	27,673	35.28
Forest & Tree Cover	29,237	37.27

9.3.8 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 forests (TOF), the same has been estimated using TOF Inventory data. It is presented in the Table 9.3.6.

Table 9.3.6: Growing Stock (million cum)

Forest	TOF	Total
173.494	41.336	214.830

9.3.9 Bamboo Resources

The extent of bamboo bearing area in the forests of the state is 7,238 km². Density-

wise details, estimated number of culms by soundness and equivalent green weight are given in Table 9.3.7 and Table 9.3.8 respectively.

Table 9.3.7: Bamboo bearing area by density in recorded forest area (Area in km²)

Recorded Forest Area	Pure bamboo	Dense bamboo	Scattered bamboo	Clumps hacked	Bamboo regeneration	No bamboo
26,832	105	4,049	2,878	166	40	19,594

Table 9.3.8: Estimated number of culms and equivalent green weight

Number of culms (in millions)				Equivalent Green Weight (in 000' tonnes)		
Green	Dry	Decayed	Total	Green	Dry	Total
2046	201	94	2341	9985	2301	12286