

## **A Study on Population Dynamics and Forest Degradation in Assam**

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### **ABSTRACT**

The biological and environmental processes driving changes in the population structure such as birth rate, death rate and migration in return cause a complementary change in the environment of any particular location. Assam the most populous state among all the North Eastern states cannot be exempted by this cause and effect relationship of man and environment. Physiographically plain area in the state is higher as compare to other states of the North East and thus exhibits the highest level of interaction of both dynamics ie population and environment respectively. In the parameters of population dynamics' here, migration plays a significant role. The growing pressure of human population is the prime factor for forest degradation and change in landuse pattern of the state.

The paper attempts to investigate the causes resulting degradation of forest cover due to increasing population pressure in Assam. It also provide some possibilities and prospects of sustainable environment management. The study is based on secondary data collected from relevant sources and explained with meaningful analysis. The study provides some proposals where land resources can be utilized in a planned way so that vacant or fallow land can be fruitfully used in a sustainable way. Thus proper landuse planning leading to resource based enrichment for environmental upgradation is the prerequisite for any developmental process.

**Key words:** Forest degradation, landuse, migration, population dynamics, sustainable

### **INTRODUCTION**

Population, which acts both as a producer and consumer of resources, plays a very important role in any developmental process. The socio-economic progress of any area greatly depends on the quality of it's population. The developmental plan towards achieving sustainability in the growth process require a clear scenario of population dynamics. In the present era of technological civilization any

planning, programmes and policies of the society towards better livelihood are converging with population dynamics. The dynamic aspect provide information pertaining to the changing trend of population characteristics.

Forests are the most important natural resources which constitute a vital segment of biospheric environment and plays an important role in maintaining global ecosystems at various levels. The growing pressure of human population is generally assumed to be the prime

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factor of environmental change in general and change in landuse in particular. Consequently forest cover decreasing due to increasing demand of food, fuel woods and timber woods as well shortage of arable land also been notified. Globally it is estimated that more than 1.6 billion people depend on forest derived goods and services. Apart from this population growth causing huge structural changes in the landuse pattern of the state as forested areas

being cleared for construction, new quarries appeared in due course of time, transport network got multiplied, roads getting widened all resulting a gradual decline of the forested land in the state.

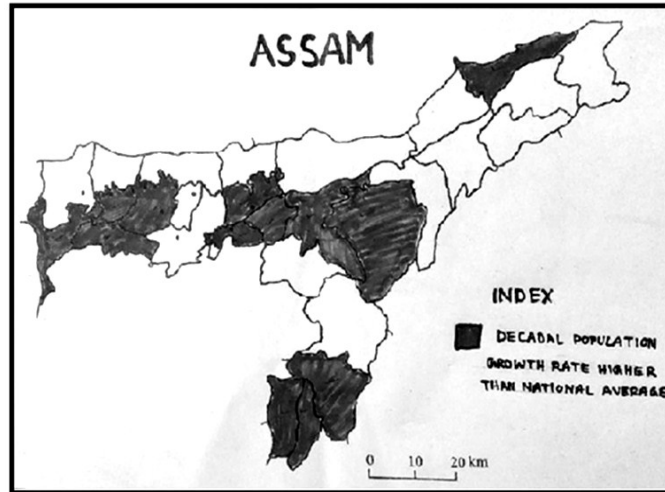
During 1901-1951 and 2.1% during 1951-2001. As a result the state's population to the country's total has increased from 1.38% in 1901 to 2.6% in 2001.

**Table 1.** District-wise population of Assam with Decadal Increase and Population Density

SL No	District	Population	Decadal Increase	Population Density (person/km <sup>2</sup> )			
				1971	1991	2001	2011
1	Nagaon	28,23,768	22.00%	302	494	604	711
2	Dhubri	19,49,258	24.44%	310	473	584	896
3	Sonitpur	19,24,110	15.55%	171	208	315	370
4	Cachar	17,36,617	20.19%	221	321	381	459
5	Barpeta	16,93,622	21.43%	294	427	506	742
6	Kamrup	15,17,542	15.69%	256	460	579	489
7	Tinsukia	13,27,929	15.47%	-	254	303	350
8	Dibrugarh	13,26,335	11.92%	201	308	347	392
9	Kamrup Metropolitan	12,53,938	18.34%	-	-	-	1313
10	Karimganj	12,28,686	21.90%	316	457	555	679
11	Sivasagar	11,51,050	9.44%	251	340	395	431
12	Jorhat	10,92,256	9.31%	185	306	354	383
13	Golaghat	10,66,888	12.75%	-	236	270	305
14	Lakhimpur	10,42,137	17.22%	126	330	391	458
15	Goalpara	10,08,183	22.64%	233	266	451	553
16	Morigaon	9,57,423	23.34%	-	375	455	617
17	Karbi Anglong	9,56,313	17.58%	37	64	78	92
18	Baksa	9,50,075	10.74%	-	-	-	387
19	Darrang	9,28,500	22.19%	241	373	432	586
20	Kokrajhar	8,87,142	5.21%	150	255	294	269
21	Udalguri	8,31,668	9.61%	-	-	-	413
22	Nalbari	7,71,639	11.99%	351	450	504	733
23	Bongaigaon	7,38,804	20.59%	-	322	361	676
24	Dhemaji	6,86,133	19.97%	-	148	176	212
25	Hailakandi	6,59,296	21.45%	-	338	409	497
26	Chirang	4,82,162	11.34%	-	-	-	251
27	Dima Hasao	2,14,102	13.84%	16	31	38	44

source: Provisional population total census 2001 and 2011 and Statistical Handbook of Assam

\*Census in 1981 not held in Assam.



MAP-1: Districts of Assam with population growth rate higher than national average.

India has a decadal population growth rate of 17.64% for the year 2001-2011. Assam has this decadal growth rate comparatively lower than the national average i.e. 16.93% for the same year. There are 13 districts of Assam having population growth rate higher than national average comprising almost 50% of the total geographical area. It is observed that Assam registered a higher decadal growth rate of 35% during the decade of 1951-61 than the national average growth rate of 21.6% which is second highest in North East after Tripura 78.7%. This

was partially a result of sudden population influx into the region. During devastated civil war period to independence of Bangladesh in 1971 about 10 million people left from East Pakistan for the adjoining areas of India. Infact Assam and Nagaland have experienced large scale influx of immigrants initially settled in char areas and gradually encroached forested land for cultivation and settlement. Following tables give a clear view of population dynamics of the state from 1951 to 1991 and 2001

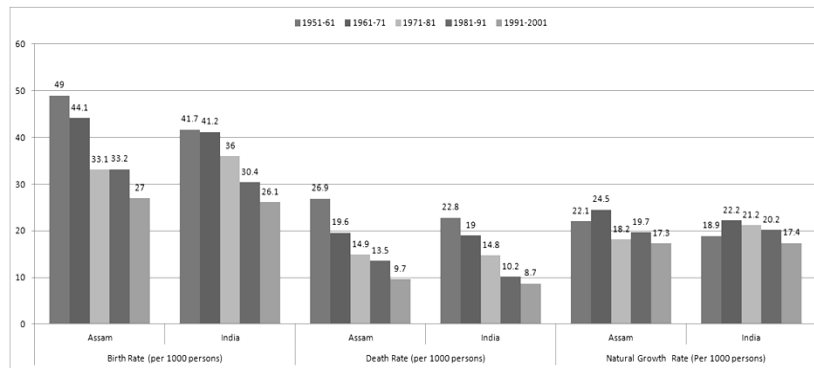
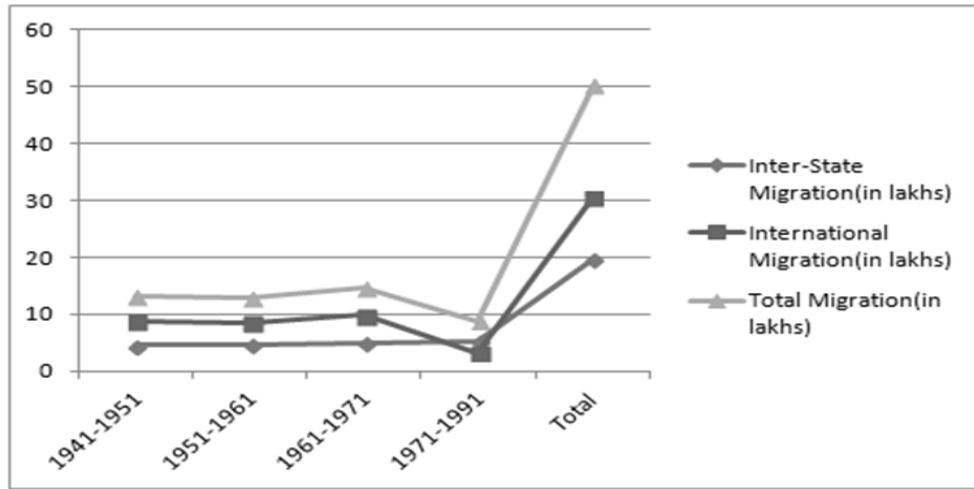


Fig 2. Decade-wise Birth and Death Rates for Assam and India per thousand population 1951-2001

Note : \* Based on Expert Committee Population Projection,RGI  
 source: Census of India 1961,1971 and Compendium of India's Fertility and Mortality Indicators, SRS,  
 Registrar General of India



**Fig 3.** Migration to Assam 1951-1991 (Based on Place of Birth Data)

(Source: census of India 1951,1971 and 1991)

Rural population also lay a great impact on forest coverage of any area as about 20 persons in a rural setting consumed an estimated 3060 kgs of fuel wood to meet about two third of their annual energy requirements. In the state the rural population in 1991 was 19,926,527 and in 2011 it has increased to 26,807,034. About 85% of the total population lives in villages and thus their dependencies on forest resources causing cosequent decrease in the forest coverage of that particular areas.

Population density is an useful indicator for the form and intensity of interactions with their ecosystems, as increasing have long been considered both a cause and a consequence of ecosystem modification. It is observed that population density in Assam was 102 in 1951 to 397 in 2011. It indicates that there was about four times increase in the density of population during six decades in the state.

#### Depleting Forest Resources in the State

The state of Assam is enriched with extensive forest resources. It has valuable forest products and also endowed with different species of flora and fauna. On the basis of soil and climate the natural vegetation of Assam can be broadly classified into -i) Tropical Wet and Semi Evergreen forest, ii) Tropical Moist Decideous, iii) Sub Tropical Broad leaved and iv) Swamp Forest. There are about 51 different types and subtypes of forests occurring in the region.

In predominant rural society like Assam the economy is based on forest products like timber, fuel wood, food, fibre, fodder etc. Assam is one of the least urbanised state in India. According to 1971 census Assam has 21,995 villages that increased to 26,247 in 2011, along with the no population of the villages also goes on inclining. The fuel wood demand along with other forest products

accelerates as population pressure increases. It is an established fact that the clearing of forest areas in frequent intervals for survival of the nearby areas of forest land results into a loss of primary forest cover. It is also notable that a

large portion of rural population depends on livestock farming and in dearth of available grazing fields these people start to encroach the forested land.

SL No	District	Geographical Area	2011 Assessment			Total Forested area	% of Geographical area
			Very Dense Forest	Moderate Dense Forest	Open Forest		
1	Barpeta	3245	35	179	183	397	12.23
2	Bongaigaon	2510	33	267	221	521	20.76
3	Cachar	3786	81	975	1180	2236	59.06
4	Darrang	3481	12	91	367	470	13.5
5	Dhemaji	3237	7	124	160	291	8.99
6	Dhubri	2798	21	201	196	418	14.94
7	Dibrugarh	3381	29	165	564	758	22.42
8	Goalpara	1824	1	71	265	337	18.48
9	Golaghat	3502	6	122	397	525	14.99
10	Hailakandi	1327	13	373	400	786	59.23
11	Jorhat	2851	2	113	498	613	21.5
12	Kamrup	4345	68	612	753	1433	32.98
13	Karbi anglong	10434	566	3819	3554	7939	76.09
14	Karimganj	1809	3	318	539	860	47.54
15	Kokrajhar	3169	208	716	220	1144	36.1
16	Lakhimpur	2277	4	118	171	293	12.87
17	Morigaon	1704	6	41	86	133	7.81
18	NC Hills	4888	135	1553	2562	4250	86.95
19	Nagaon	3831	40	353	403	796	20.78
20	Nalbari	2257	4	70	208	282	12.49
21	Sibsagar	2668	8	144	543	695	26.05
22	Sonitpur	5324	56	280	624	960	18.03
23	Tinsukia	3790	106	699	731	1536	40.53
	TOTAL	78438	1444	11404	14825	27673	35.28

Source: Indian State Forest report 2011.

Overexploitation of forest resources for the sake of economic development has swallowed much of Assam's rich forest during 1980's and 1990's. Assam Remote Sensing Application Centre(ARSAC), based on satellite data of late 1980's revealed that the state of Assam as a whole has an existing forest cover of 21.98% which was 25.2% during 1980-82. So in about half of the decade there was a loss of 3.3% of forest coverage.

Encroachment is one of the main cause of depletion of valuable forest resorces in

Assam. Most of the forest areas of the state are under extreme stress due to large scale encroachment. Assam's forest area gradually declined in 2001-2015 it lost 91km<sup>2</sup> of forest and the state is most affected state of the region in terms of degradation of dense forest during this period. Moreover, Assam has the second highest encroachment of forest land in India after Madhya Pradesh. The encroachment position in various forest divisions of Assam has been summarized in the following tables.

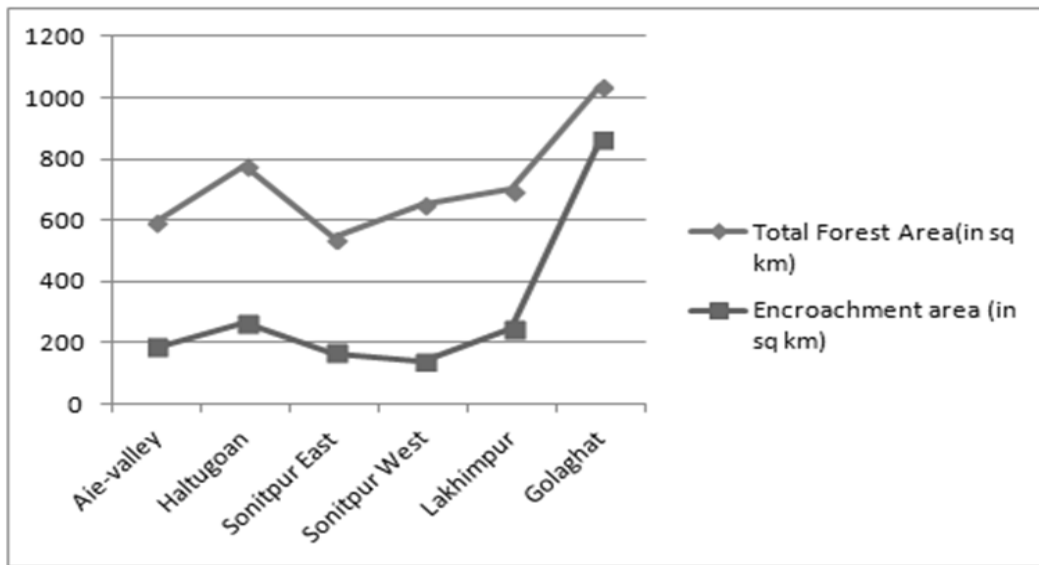
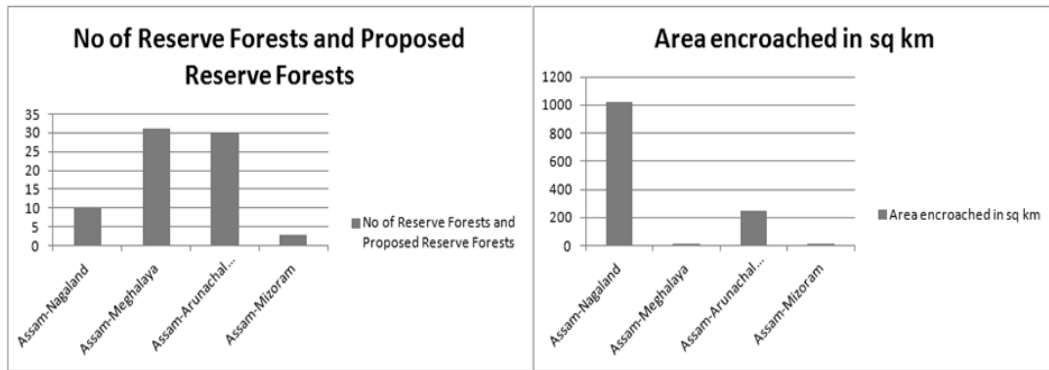


Fig 4. More than 100 sq km of encroachment area in different forest ranges of Assam 1996

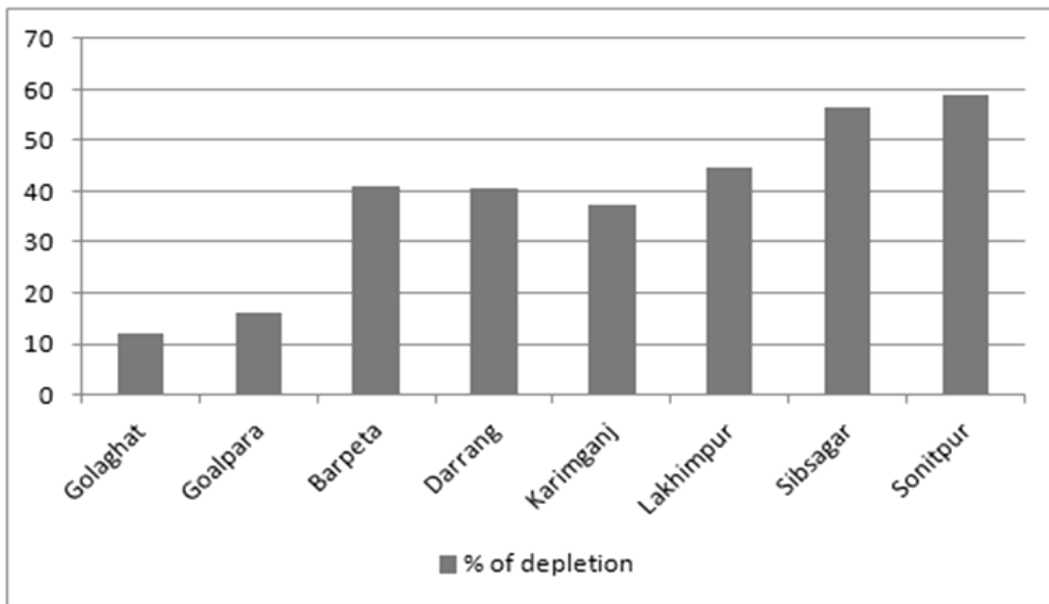
Source: Department of forest, Assam, 1996

A glimps of worse scenario is provided by the fact that Gohpur Reserve Forest has no trace of forast left, The Nambor(south) Reserve Forest has merely left with 3.6%, Doyang Reserve Forest only 2.5% and Diphu Reserve Forest 8.2% of forest area left respectively. Total estimated area under encroachment as per Department of Forest Assam, upto 31-03-2003 was 3555 Sq.Km. In geospatial study of Assam Forest It has been seen that Sibsagar and Sonitpur District have lost more than 50% of its forest coverage.



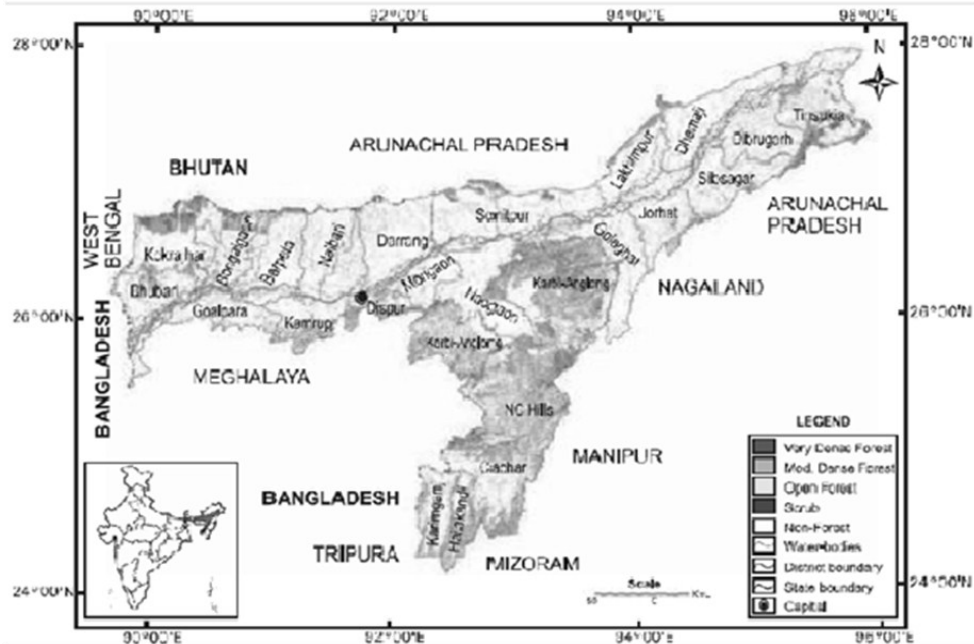
**Fig 5.** Forest area encroached in inter-state border of Assam

(Source: Department of forest, Assam, 1996)



**Fig 6.** Districts with highly depleted forest cover from 1990-2001

(Source: www.fao.orgnet)



MAP 2 Forest cover of Assam ( State Forest Report 2001)

As shown in map-1 there are 13 districts which have decadal population growth rate higher than national average i.e 17.64% for the year 2001-2011. Out of the 13 districts, 9 districts have less than 21% of forest area whereas the situation is very critical in Barpeta, Darrang, Dhemaji, Dhubri, Morigaon and Nalbari. These 6 districts have less than 15% of their geographical area under forest coverage, that clearly depicts an inverse relationship between population growth rate and forest coverage of any particular area.

It is seen that there are 16 districts out of 23 districts of the state in 2001, the forest cover is less than state's average forest cover and less than proposed forest coverage of 33%. There are 7 districts of the state with less than 15% of the forest coverage area they are Morigaon(7.81%), Dhemaji(8.99%), Barpeta (12.23%), Lakhimpur (12.87%), Darrang(13.5%), Dhubri (14.94) and Golaghat (14.99%)

respectively. Among them Dhubri and Barpeta has population density more than 500 persons/km<sup>2</sup> whereas Morigaon and Darrang has population density more than 400 persons/km<sup>2</sup>. Sonitpur and Golaghat although have comparatively less population density but the loss in forest coverage of these two districts is a matter of grave concern. While population growth and density are unquestionably related to forest cover trends. Only about one-tenth that of size of deforested area to forest cover trends. Only about one-tenth that of size of deforested area able to regain due to reforestation efforts and natural growth. Apart from this deforestation effects in overall global environment viz. reduction in carbon fixation, climatic havoc, occurrence of floods, serious threat to bio-diversity and so on.

### RECOMMENDATIONS

- Development of sufficient fodder, fuel and



pasture resources in areas adjoining to forested lands.

- Afforestation of medicinal and aromatic plants provide sustenance to the tribal or indigenous people residing in and around forest areas.
- Raising awareness among communities about the benefits of more sedentary land use system.
- Environmental awareness camps, celebration of Van Mahotsav and Sacred Plant Day by Local Government Bodies or Panchayats.
- Introduction of Social Forestry Programmes and Establishments of Eco-Camps in Selected regions of the state can create employment opportunities with a sustainable natural environment.

## CONCLUSION

Demographic factors have always adversely affected natural resources. Massive population increase and organized group encroachment in the Reserve Forest areas causing a huge loss of forest resources in the state. It is clearly evident that some districts with higher population density are in the verge of total extinction of forest coverage if the pace of reckless population increase goes on unchecked. To find ways and mechanisms that conserve our threatened forest cover, in spite of stringent Forest Laws, community awareness and co-operation can be proved more effective for a sustainable forest resource of the state.

## REFERENCES

- Agarwal A.K. 2002 : Demographic Features and Migration in North-East-India. Pp 39-73. In *India's North East-The process of change and Development* Samanta R.K.(BR Publishing, Delhi, pp. 39-73.
- Alam. K. 2010, *Polemics of Migration in Population Dynamics of Assam*. Pp 193-201. In *Population and Development in North-East*,(ed Deb Bimal J.) Concept Publishing Company, New Delhi.
- GopalKrishnan. R 1991 :*The North-East India : 'Land, Economy and People'*, Har Anand Publication, New Delhi.
- Khataniar A. 2014: Migration as a factor of deforestation in North-East India and its socio-economic impact with special reference to Assam. Pp 67-71 International Conference on Trends in Economics, Humanities and Management'14,(ed Strouhal Jiri). Aug 13-14, Pattaya, Thailand.
- Purkayastha S.2008: 'Population Dynamics and distribution in North-East India'.Pp 57-70, Hill Geographer, XXIV, ISSN 0970 - 5023.
- Roy A. K., Sengupta S. 2008: *Population Dynamics in North East India*, Om Publications, New Delhi.
- Saikia A.,2014: 'Over-Exploitation of forests – A Case study from north-East India',Pp 7-17. *SpringersBriefs in Geoghaphy*, ISSN 978-3-319-01407.
- Saikia Arupjyoti 2011: *Forest and Ecological History of Assam*,Pp 1826-2000. Oxford University Press, England ,UK.
- Sharma N, Madhusudan, M.D, Sinha A.: 2012 *Socio Economic Drivers of Forest Cover Change in Assam. A Historical Perspective* Vol XLVII, Issue No. 5, 04 Feb, *Economic and Political Weekly*.
- Srivastava S.,Singh T.P.,Singh H. et al 2002: *Assessment of large scale deforestation in Sonitpur district of Assam*,Pp 1479-1484, vol 82, *Current Science* Assosiation.
- Taher Mohammed 2016: *Understanding India's North East*, Rashmi Prakash Guwahati – 21

- Tiwari K. M. 1983: Social Forestry for Rural Development, International Book Distribution Lucknow, U.P – 226001
- SFR 1991, State Forest Report 1997. FSI, Ministry of Environment & Forest, Government of India, Dehra Dun.
- SFR 2001, State Forest Report 1997. FSI, Ministry of Environment & Forest, Government of India, Dehra Dun.
- SFR 2011, State Forest Report 1997. FSI, Ministry of Environment & Forest, Government of India, Dehra Dun.

**Websites**

- [www.ceser.in](http://www.ceser.in).
- [www.assamforest.in](http://www.assamforest.in)
- [www.asmenvis.nic.in](http://www.asmenvis.nic.in)
- [www.mdoner.gov.in](http://www.mdoner.gov.in)
- [www.census2011.co.in](http://www.census2011.co.in)
- [www.isbeid.gov.in](http://www.isbeid.gov.in)
- [www.ifs.nic.in](http://www.ifs.nic.in)
- [www.yourarticlelibrary.com](http://www.yourarticlelibrary.com)
- <https://in.m.wikipedia.org/wiki/Assam>
- <https://books.google.in>