



## Research article

# Tree species diversity in tropical forests of Barak valley in Assam, India

Nepolion Borah<sup>1\*</sup>, Debajit Rabha<sup>2</sup> and Florida Devi Athokpam<sup>2</sup>

<sup>1</sup>School of Environmental Sciences, Jawaharlal Nehru University, New Delhi, India

<sup>2</sup>Department of Ecology and Environmental Science, Assam University Silchar, Assam, India

\*Corresponding Author: [nepolionborah@gmail.com](mailto:nepolionborah@gmail.com)

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**Abstract:** To enumerate the tree species diversity of tropical forests, 89 belt-transects was laid in different reserve forests and private forests of the Barak Valley, Assam, Northeast India. A total of 222 tree species were recorded from 152 genera and 65 families. Euphorbiaceae was the most species rich family with 23 species. Out of 65 families, 30 families were recorded with only one species while 10 families were recorded with two species. *Artocarpus chama* was the most abundant and frequently occurred species. *Podocarpus nerifolia* was the only gymnosperm tree recorded in this study while *Caryota urena* and *Pleomele spicata* were the monocot tree species. Five threatened species were recorded from the Valley.

**Keywords:** Belt-transect - Threatened species - Frequency - Barak valley.

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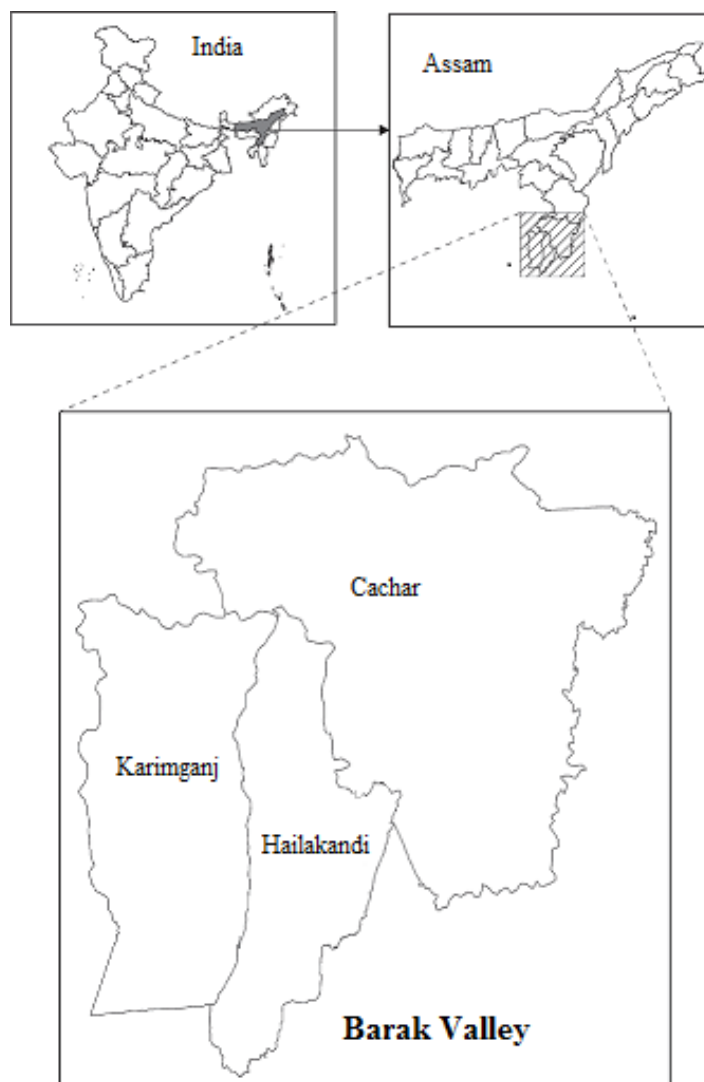
## INTRODUCTION

Assam is part of Indo-Burma the biodiversity hotspot regions, which is situated in the north-eastern corner of Indian subcontinent and considered one of the richest occurrences of angiosperm plants. The Southern part of Assam, which is popularly known as Barak Valley, consists of three districts namely Cachar, Karimganj and Hailakandi. The vegetation of this region is mostly represented by tropical moist evergreen and tropical moist semi-evergreen forest types (Champion & Seth 1968). The forests of this region are relatively unexplored harbouring rich plant diversity. The vegetation of this region has been free from anthropogenic disturbances over centuries. But due to rapid population growth and development activities, some parts of the forests are under huge anthropogenic pressure such as over exploitation of species for timber, fuel-wood, fodder, bamboo cutting, settlement etc. (Borah & Garkoti 2011). The floristic composition is one of the major anatomical characters of the forest community (Dansereau 1960). So it is very important to know the species composition and its distribution of these forests to take proper management strategies.

A good number of scientific literatures are available on angiosperm flora of Assam (Kanjilal *et al.* 1934–1940, Hooker 1872–1887, Rao & Verma 1969, 1976, Choudhury 1982, Dam & Dam 1984). For a modern floristic assessment, it is important to know the tree wealth of a forest along with their ecological amplitude as they are the backbone of any forest and provides the microclimate suitable for the survival of other small plants as well as animals (Bajpai *et al.* 2015, Dular 2015). When we see the tree diversity exclusively, very few studies are available from the state (Sarkar & Devi 2014, Rabha 2014). The literature dealing with the tree diversity and their ecological standings is either very old (Choudhury 1982, Dam & Dam 1984) or focused to a specific area (Borah & Garkoti 2011, Borah 2012, Borah *et al.* 2014). Thus, the present study was performed to enumerate the tree species composition and their ecological status from the tropical forests of this region.

## MATERIAL AND METHODS

Geographically Barak Valley of Northeast India (Fig. 1) is surrounded by North Cachar Hills and Jaintia Hills in the north, in east by Manipur, in the south by Mizoram and in the west by Tripura and Sylhet district of Bangladesh.



**Figure 1.** Map of Barak valley, Assam, India.

The soil of the region is sandy clay loam and sandy loam in texture and slightly acidic in nature (pH ranges from 5.35 to 6.1) with an average bulk density of  $1.08 \text{ g cm}^{-3}$  and water holding capacity of 38.75% (Athokpam *et al.* 2013). The area has a tropical monsoon climate with high annual precipitation and high temperature. Climate during April–October is characterized by rainy season with an average rainfall 2330.50 mm. The region is characterized by moderate temperature with monthly average temperature ranging from  $11.9\text{--}32.7 \text{ }^{\circ}\text{C}$  (Borah 2012). Climatically, the year may be divided into four seasons. December to February is the winter season, followed by spring or early summer from March to April/May, then June to September is the South West Monsoon rainy season or late summer, and October and November constitute the post monsoon or autumn season (Athokpam & Garkoti 2013).

Different reserve forest of Barak Valley are Innerline Reserve Forest, Barak Reserve Forest, Borail Reserve Forest, Sonai Reserve Forest, Upper Jiri Reserve Forest, Katakhal Reserve Forest, Longai Reserve Forest, Badshahi-tilla Reserve Forest, Duhalia Reserve Forest, Patharia Reserve Forest, Tilbhoom Reserve Forest and Singla Reserve Forest.

Present study was carried out during the years 2010 to 2013 by laying 89 belt-transects of  $10 \text{ m} \times 500 \text{ m}$  sized in different reserve forests and private forests of Barak Valley. Out of 89 transects 35 were delimited in Cachar, 29 in Karimganj and 15 in Hailakandi districts. The belt transects were laid in such way that it covers different microclimates of the studied forest so that different types of vegetation comes within transects. After laying transect, all the plant species of  $>10 \text{ cm}$  GBH trees sampled and some specimens of each species were brought to laboratory to prepare herbarium following Jain & Rao (1977). The species were identified with the help of ‘Flora of Assam’ (Kanjilal *et al.* 1934–1940) and the herbarium of Botanical Survey of India, Shillong.

Species nomenclatures were followed as per “Assam’s Flora (present status of vascular plants)” (Chowdhury *et al.* 2005). After identifying all the species, physiognomy type, growth form and IUCN status were studied by available literature. The frequency and abundance were estimated as follows-

$$\text{Frequency} = \frac{\text{Number of transects in which a species occurs}}{\text{Total number of transects sampled}} \times 100$$

$$\text{Abundance} = \frac{\text{Total number of individuals of a species in all transects}}{\text{Total number of transects in which that species occurred}}$$

## RESULTS AND DISCUSSION

**Table 1.** Number of genus (GN) and species (SN) in different families recorded in Barak valley, Assam, India.

S. No.	Family Name	GN	SN	S. No.	Family Name	GN	SN
1	Euphorbiaceae	15	23	34	Simaroubaceae	2	2
2	Lauraceae	7	17	35	Urticaceae	2	2
3	Moraceae	4	14	36	Agavaceae	1	1
4	Verbenaceae	5	10	37	Alangiaceae	1	1
5	Mimosaceae	4	9	38	Araliaceae	1	1
6	Rubiaceae	9	9	39	Arecaceae	1	1
7	Caesalpiniaceae	5	8	40	Bixaceae	1	1
8	Meliaceae	6	8	41	Boraginaceae	1	1
9	Myrsinaceae	3	7	42	Bromeliaceae	1	1
10	Myrtaceae	3	7	43	Burseraceae	1	1
11	Sapindaceae	5	7	44	Cannabaceae	1	1
12	Anacardiaceae	4	5	45	Capparaceae	1	1
13	Rutaceae	5	5	46	Datisceae	1	1
14	Annonaceae	4	4	47	Ebenaceae	1	1
15	Clusiaceae	2	4	48	Ehretiaceae	1	1
16	Dipterocarpaceae	3	4	49	Elaeagnaceae	1	1
17	Magnoliaceae	2	4	50	Fagaceae	1	1
18	Papilionaceae	4	4	51	Juglandaceae	1	1
19	Sterculiaceae	3	4	52	Leeaceae	1	1
20	Symplocaceae	1	4	53	Lythraceae	1	1
21	Bignoniaceae	3	3	54	Moringaceae	1	1
22	Fagaceae	2	3	55	Oxalidaceae	1	1
23	Myristicaceae	2	3	56	Podocarpaceae	1	1
24	Sapotaceae	3	3	57	Rhamnaceae	1	1
25	Theaceae	3	3	58	Rhizophoraceae	1	1
26	Apocynaceae	2	2	59	Sabiaceae	1	1
27	Bombacaceae	1	2	60	Saurauiceae	1	1
28	Combretaceae	1	2	61	Sonneratiaceae	1	1
29	Dilleniaceae	1	2	62	Styraceae	1	1
30	Elaeocarpaceae	1	2	63	Thymelaeaceae	1	1
31	Flacourtiaceae	2	2	64	Tiliaceae	1	1
32	Malvaceae	2	2	65	Ulmaceae	1	1
33	Memecylaceae	1	2				

A total of 222 tree species were recorded from present study belonging to 152 genera and 65 families. Out of 65 families, Euphorbiaceae was the most species rich family (15 genus and 23 species) followed by Lauraceae (7 genus and 17 species), Moraceae (4 genus and 14 species) etc. (Table 1). Among them 30 families contained only one species while 10 families contained 2 species. Out of 222 species, 146 species were evergreen tree while 76 species were deciduous tree species. Among the recorded species, 18% were large, 43% were medium and 39% were small size trees. *Artocarpus chama* was the most abundant and frequently occurred species (Table 2). In the present study five species were recorded in the IUCN Red List of Threatened Species. Out of 5 threatened species *Dipterocarpus turbinatus* was critically endangered, and 2 species were vulnerable namely *Saraca asoca* and *Aquilaria malaccensis*, 1 species was Lower Risk/least concern namely *Mangifera sylvatica* and other 1 species was data deficient namely, *Hydnocarpus kurzii*. *Podocarpus nerifolia* was the only

gymnosperm tree species recorded in this study while *Caryota urena* and *Pleomele spicata* were the monocot tree species. Some of these species were recorded only in few numbers. A good number of endemic, primitive angiosperm and threatened species were not recorded in this survey which were recorded from this region in earlier works of Hooker (1972–1887), Kanjilal (1934–1940), Chowdhury *et al.* (2005) etc. In earlier surveys some species like *Canarium bengalensis*, *Quercus semiserrata*, *Garcinia keeniana*, *Embelia parviflora*, *Calliandra umbrosa*, *Magnolia pterocarpa*, *Caesalpinia digyna*, *Ixonanthes khasiana*, *Acranthera tomentosa* etc. were recorded from this region but in present study these were not recorded. This may be due to that the population of these species become very less or distribution of these species restricted to only some particular pockets or these species may be loss from this region. The main cause behind this is destruction and degradation of forest area by rapid urbanization, human settlement, industrialization (mainly tea industry and paper mills), shifting cultivation, rubber plantation, reckless and ruthless exploitation of plants of potential economic importance, fuel wood collection, raising of artificial forests by monoculture of some important species such as *Tectona grandis* etc. Socioeconomic condition might be responsible for enhanced utilization of the forest resources and this may eventually lead to a species-poor state (Murali *et al.* 2014). It is very important to take proper management strategies for those less abundant and less frequently occurred species, otherwise these species will also lost from this region in near future.

**Table 2.** Physiognomic type (PhT), growth form (GrF), abundance (Ab) and frequency in % (Fr) of encountered species in Barak valley, Assam, India. (E-evergreen, D-deciduous, L-large tree, M-medium sized tree, S-small tree)

S.No.	Species Name	Family	PhT	GrF	Ab	Fr
1	<i>Acacia auriculiformis</i> A. Cunn. ex Benth.	Mimosaceae	E	M	1.50	2.25
2	<i>Acacia sinuata</i> (Lour.) Merr.	Mimosaceae	D	M	2.50	2.25
3	<i>Actinodaphne angustifolia</i> Nees	Lauraceae	E	M	18.00	12.36
4	<i>Actinodaphne obovata</i> (Nees) Bl.	Lauraceae	E	S	18.50	13.48
5	<i>Adenanthera pavonina</i> L.	Mimosaceae	D	S	1.00	2.25
6	<i>Aegle marmelos</i> (L.) Corr.	Rutaceae	D	M	3.00	3.37
7	<i>Ailanthus integrifolia</i> Lam.	Simaroubaceae	D	M	63.00	30.34
8	<i>Alangium chinensis</i> (Lour.) Rehder	Alangiaceae	E	S	1.50	1.12
9	<i>Albizia chinensis</i> (Osbeck) Merr.	Mimosaceae	D	M	67.00	37.08
10	<i>Albizia lebbeck</i> (L.) Benth.	Mimosaceae	D	M	57.00	29.21
11	<i>Albizia lucidior</i> (Steud.) Nielson ex Hara	Mimosaceae	E	L	19.00	15.73
12	<i>Albizia odoratissima</i> (L. f.) Benth.	Mimosaceae	D	M	8.00	6.74
13	<i>Albizia procera</i> (Roxb.) Benth.	Mimosaceae	D	M	44.50	26.97
14	<i>Allophylus triphyllus</i> (Burm. f.) Merr.	Sapindaceae	E	M	11.00	8.99
15	<i>Alseodaphne owdenii</i> Parker	Lauraceae	E	M	43.50	31.46
16	<i>Alseodaphne andersonii</i> (King ex Hook. f.) Kostel.	Lauraceae	E	L	10.50	8.99
17	<i>Alstonia scholaris</i> (L.) R.Br.	Apocynaceae	E	L	46.50	43.82
18	<i>Amoora hiernii</i> Visw. & Ramech.	Meliaceae	E	L	3.00	3.37
19	<i>Ananas</i> sp.	Bromeliaceae	E	S	4.00	1.12
20	<i>Annona reticulata</i> L.	Annonaceae	E	S	2.00	4.49
21	<i>Anthocephalus chinensis</i> (Lam.) A. Rich. ex Walp.	Rubiaceae	E	L	14.00	17.98
22	<i>Aporusa aurea</i> Hook. f.	Euphorbiaceae	E	S	21.00	16.85
23	<i>Aporusa octandra</i> (Buch.-Ham. ex D. Don) Vick.	Euphorbiaceae	E	S	21.00	12.36
24	<i>Aquilaria malaccensis</i> Lam.	Thymelaeaceae	D	M	7.50	11.24
25	<i>Ardisia calorata</i> Roxb.	Myrsinaceae	D	S	2.50	2.25
26	<i>Artocarpus chama</i> Buch.-Ham.	Moraceae	D	L	396.0	97.75
27	<i>Artocarpus heterophyllus</i> Lam.	Moraceae	E	M	3.00	3.37
28	<i>Artocarpus lacucha</i> Buch.-Ham.	Moraceae	D	L	141.0	74.16
29	<i>Averrhoa carambola</i> L.	Oxalidaceae	E	M	1.50	3.37
30	<i>Baccaurea ramiflora</i> Lour.	Euphorbiaceae	E	S	79.50	41.57
31	<i>Bauhinia purpurea</i> L.	Caesalpinaceae	D	M	12.00	2.25
32	<i>Bauhinia variegata</i> L.	Caesalpinaceae	D	M	76.00	29.21
33	<i>Bischofia javanica</i> Bl.	Euphorbiaceae	E	M	4.50	5.62
34	<i>Bixa orellana</i> L.	Bixaceae	D	M	5.00	3.37
35	<i>Bombax ceiba</i> L.	Bombacaceae	D	L	67.50	40.45
36	<i>Bombax insigne</i> Wall.	Bombacaceae	D	L	12.00	12.36
37	<i>Bridelia monoica</i> (Lour.) Merr.	Euphorbiaceae	D	S	32.00	14.61

38	<i>Bridelia Montana</i> (Roxb.) Willd.	Euphorbiaceae	D	S	9.00	6.74
39	<i>Bridelia vomentisa</i> Bl.	Euphorbiaceae	D	S	0.50	1.12
40	<i>Butea monosperma</i> (Lam.) Taub.	Papilionaceae	E	S	1.00	2.25
41	<i>Callicarpa arborea</i> Roxb.	Verbenaceae	E	S	91.00	42.70
42	<i>Callistemon citrinus</i> (Curtis.) Stapf	Myrtaceae	E	S	0.50	1.12
43	<i>Camellia sinensis</i> (L.) O. Cuntz	Theaceae	E	S	2.50	5.62
44	<i>Carallia branchiata</i> (Lour.) Merr.	Rhizophoraceae	E	M	76.00	44.94
45	<i>Caryota urena</i> L.	Arecaceae	E	M	9.50	11.24
46	<i>Cassia fistula</i> L.	Caesalpiniaceae	D	M	8.50	8.99
47	<i>Cassia javanica</i> L.	Caesalpiniaceae	D	M	1.50	2.25
48	<i>Cassia siamea</i> Lam.	Caesalpiniaceae	D	M	12.50	5.62
49	<i>Castanopsis indica</i> (Roxb.) DC.	Fagaceae	E	M	33.00	19.10
50	<i>Castanopsis purpurella</i> (Miq.) Balak.	Fagaceae	E	M	140.5	66.29
51	<i>Cedrela microcarpa</i> C. DC.	Meliaceae	D	M	3.50	4.49
52	<i>Celtis australis</i> L.	Ulmaceae	D	M	9.50	11.24
53	<i>Chukrasia tabularis</i> A. Juss.	Meliaceae	D	L	8.50	4.49
54	<i>Cinnamomum cacharensis</i> Parker	Lauraceae	E	S	18.00	8.99
55	<i>Cinnamomum glaucescens</i> (Nees) Hand.-Mazz.	Lauraceae	E	L	31.50	26.97
56	<i>Cinnamomum tamala</i> (Buch.-Ham.) Nees & Eberm.	Lauraceae	E	S	4.00	7.87
57	<i>Cordia dichotoma</i> Forst. f.	Boraginaceae	E	M	46.00	29.21
58	<i>Crateva religiosa</i> G. Forst.	Capparaceae	E	S	2.00	3.37
59	<i>Croton joufra</i> Roxb.	Euphorbiaceae	D	M	44.00	29.21
60	<i>Cryptocarpa</i> sp.	Lauraceae	E	M	9.00	5.62
61	<i>Cryosophyllum roxburghii</i> G. Don	Sapotaceae	E	L	24.00	8.99
62	<i>Cynometra polyandra</i> Roxb.	Caesalpiniaceae	E	L	238.0	50.56
63	<i>Derris rubusta</i> (Roxb. ex DC.) Benth.	Papilionaceae	D	M	1.50	2.25
64	<i>Desmos longiflorus</i> (Roxb.) Safford.	Annonaceae	E	S	25.00	19.10
65	<i>Dillenia indica</i> L.	Dilleniaceae	E	L	48.00	44.94
66	<i>Dillenia pentagyna</i> Roxb.	Dilleniaceae	E	L	14.00	19.10
67	<i>Diospyros toposia</i> Buch.-Ham.	Ebenaceae	E	L	28.50	20.22
68	<i>Dipterocarpus turbinatus</i> Gaertn.	Dipterocarpaceae	E	L	158.0	15.73
69	<i>Duabanga grandiflora</i> (Roxb. ex DC.) Walp.	Sonneratiaceae	D	L	111.5	51.69
70	<i>Dysoxylum alliaria</i> (Buch.-Ham.) Balak.	Meliaceae	E	M	16.50	8.99
71	<i>Dysoxylum binectariferum</i> (Roxb.) Hook. f.	Meliaceae	E	M	172.0	59.55
72	<i>Dysoxylum gobara</i> (Buch.-Ham.) Merr.	Meliaceae	E	M	133.5	38.20
73	<i>Elaeagnus</i> sp.	Elaeagnaceae	E	S	74.50	38.20
74	<i>Elaeocarpus floribundus</i> Bl.	Elaeocarpaceae	E	M	32.50	23.60
75	<i>Elaeocarpus sphaericus</i> (Gaertn.) K. Schum.	Elaeocarpaceae	E	M	7.50	5.62
76	<i>Embelia nutans</i> Wall.	Myrsinaceae	E	S	8.00	6.74
77	<i>Embelia ribes</i> Burm. f.	Myrsinaceae	D	S	20.50	12.36
78	<i>Embelia tsjeriam-cottam</i> DC.	Myrsinaceae	E	S	17.00	11.24
79	<i>Endospermum antiquorum</i> L.	Euphorbiaceae	E	M	13.50	15.73
80	<i>Engelhardtia spicata</i> Lech. ex Bl.	Juglandaceae	E	S	1	1.12
81	<i>Erythrina variegata</i> L.	Papilionaceae	D	M	23.50	16.85
82	<i>Eugenia grandis</i> Wight	Myrtaceae	E	M	7.00	4.49
83	<i>Euphoria longan</i> (Lour.) Steud.	Sapindaceae	E	S	3.00	4.49
84	<i>Eurya acuminata</i> DC.	Theaceae	E	S	104.0	50.56
85	<i>Evodia meliaefolia</i> Benth.	Rutaceae	D	M	10.00	10.11
86	<i>Excoecaria oppositifolia</i> Griff.	Euphorbiaceae	E	S	15.50	10.11
87	<i>Ficus auriculata</i> Lour.	Moraceae	E	S	18.00	15.73
88	<i>Ficus benghalensis</i> L.	Moraceae	E	L	2.50	5.62
89	<i>Ficus heterophylla</i> L. f. var. <i>repens</i> Willd.	Moraceae	E	S	7.50	3.37
90	<i>Ficus hirta</i> Vahl	Moraceae	E	S	28.00	19.10
91	<i>Ficus hispida</i> Vahl	Moraceae	E	S	72.00	38.20
92	<i>Ficus lepidosa</i> Wall.	Moraceae	E	S	116.5	46.07
93	<i>Ficus racemosa</i> L.	Moraceae	D	M	90.50	55.06
94	<i>Ficus religiosa</i> L.	Moraceae	D	L	32.50	37.08
95	<i>Ficus semicordata</i> Buch.-Ham. ex J. E. Sm	Moraceae	E	S	1.50	1.12
96	<i>Flacourtia indica</i> (Burm. f.) Merr.	Flacourtiaceae	D	S	3.00	4.49



97	<i>Garciniacowa</i> Roxb. ex DC.	Clusiaceae	E	M	11.50	13.48
98	<i>Garcinia xanthochymus</i> Hook. f.	Clusiaceae	E	M	67.00	33.71
99	<i>Garuga pinnata</i> Roxb.	Burseraceae	D	M	80.50	49.44
100	<i>Glochidion khasicum</i> Hook. f.	Euphorbiaceae	E	S	17.50	7.87
101	<i>Glochidion lanceolarium</i> (Roxb.) Voigt	Euphorbiaceae	E	S	31.50	24.72
102	<i>Gmelina arborea</i> Roxb.	Verbenaceae	D	L	83.00	50.56
103	<i>Grewia nervosa</i> (Lour.) Panigr.	Tiliaceae	D	S	88.50	23.60
104	<i>Glycosmis arborea</i> (Roxb.) Corr.	Rutaceae	D	S	8.50	7.87
105	<i>Gynocardia odorata</i> R. Br.	Flacourtiaceae	E	L	44.00	16.85
106	<i>Haldinia cordifolia</i> (Roxb.) Ridsd.	Rubiaceae	D	L	3.00	3.37
107	<i>Heteropanax fragrans</i> Seem.	Araliaceae	E	S	7.50	8.99
108	<i>Hibiscus macrophyllus</i> Roxb.	Malvaceae	D	M	27.50	20.22
109	<i>Holarrhena pubescens</i> (Buch.-Ham.) Wall. ex G. Don	Apocynaceae	D	S	67.00	21.35
110	<i>Hydnocarpus kurzii</i> (King) Warb.	Flacourtiaceae	E	M	73.00	21.35
111	<i>Ixora</i> sp.	Rubiaceae	E	S	2.00	1.12
112	<i>Knema augustifolia</i> (Roxb.) Warb.	Myristicaceae	E	M	34.00	12.36
113	<i>Knema linifolia</i> Roxb.	Myristicaceae	E	M	41.00	20.22
114	<i>Kydia calycina</i> Roxb.	Malvaceae	D	S	12.00	15.73
115	<i>Lagerstroemia reginae</i> Roxb.	Lythraceae	D	M	67.00	37.08
116	<i>Lansea coromondelica</i> (Houtt.) Merr.	Anacardiaceae	D	S	23.50	22.47
117	<i>Leea indica</i> (Burm. f.) Merr.	Leeaceae	E	S	40.00	23.60
118	<i>Litsea cubeba</i> (Lour.) Pers.	Lauraceae	E	S	0.50	1.12
119	<i>Litsea laeta</i> Nees Hook. f.	Lauraceae	E	M	16.00	6.74
120	<i>Litsea monopetala</i> (Roxb.) Pers.	Lauraceae	E	M	124.0	57.30
121	<i>Litsea salicifolia</i> (Roxb. ex Nees) Hook. f.	Lauraceae	E	S	87.50	39.33
122	<i>Litsea</i> sp.	Lauraceae	E	S	46.00	30.34
123	<i>Macaranga denticulata</i> (Bl.) Muell. Arg	Euphorbiaceae	E	S	65.00	22.47
124	<i>Macaranga</i> sp.	Euphorbiaceae	E	S	9.00	1.12
125	<i>Macaranga peltata</i> Roxb.	Euphorbiaceae	E	S	129.5	51.69
126	<i>Maesa indica</i> (Roxb.) A. DC.	Myrsinaceae	D	S	7.00	7.87
127	<i>Maesa montana</i> A. DC.	Myrsinaceae	D	S	4.00	4.49
128	<i>Maesa paniculata</i> A. DC.	Myrsinaceae	D	S	6.50	4.49
129	<i>Mallotus ferrugineus</i> (Roxb.) Muell. Arg	Euphorbiaceae	E	S	243.0	60.67
130	<i>Mallotus philippinensis</i> (Lamk) Muell. Arg	Euphorbiaceae	E	S	3.00	2.25
131	<i>Mallotus roxburghianus</i> Muell. Arg	Euphorbiaceae	E	S	96.50	42.70
132	<i>Mangifera indica</i> L.	Anacardiaceae	E	L	24.00	31.46
133	<i>Mangifera sylvatica</i> Roxb.	Anacardiaceae	E	L	6.50	8.99
134	<i>Manihot esculenta</i> Crantz	Euphorbiaceae	E	S	5.50	5.62
135	<i>Melia azedarach</i> L.	Meliaceae	D	M	4.00	5.62
136	<i>Meliosma pinnata</i> (Roxb.) Maxim	Sabiaceae	E	M	7.50	6.74
137	<i>Memecylon celastrinum</i> Kurz	Memecylaceae	E	S	15.50	11.24
138	<i>Memecylon umbellatum</i> Burm. f.	Memecylaceae	E	S	8.50	8.99
139	<i>Mesua ferrea</i> L.	Clusiaceae	E	L	168.5	49.44
140	<i>Mesua floribuanda</i> (Wall.) Kostel.	Clusiaceae	E	L	77.00	35.96
141	<i>Meyna spinosa</i> Roxb. ex Link	Rubiaceae	D	S	2.00	2.25
142	<i>Michelia baillonii</i> (Pierre) Finet & Gagnep.	Magnoliaceae	E	M	7.00	4.49
143	<i>Michelia champaca</i> L.	Magnoliaceae	E	M	53.00	32.58
144	<i>Michelia glabra</i> Parment	Magnoliaceae	E	M	7.00	7.87
145	<i>Micromelum minutum</i> (Forst. f.) Wight & Arn.	Rutaceae	E	S	16.00	8.99
146	<i>Milusa globosa</i> (DC.) Panigr. & Mishra	Annonaceae	D	S	17.00	5.62
147	<i>Mitragyna rotundifolia</i> (Roxb.) O. Kuntze	Rubiaceae	D	S	175.0	55.06
148	<i>Moringa oleifera</i> Lam.	Moringaceae	D	S	2.50	3.37
149	<i>Morus macroura</i> Miq.	Moraceae	E	S	15.00	11.24
150	<i>Myristica</i> sp.	Myristicaceae	E	S	1.00	1.12
151	<i>Neocinnamomum caudatum</i> (Nees) Merr.	Lauraceae	E	M	7.00	8.99
152	<i>Lepisanthes</i> sp.	Sapindaceae	E	S	5.00	4.49
153	<i>Oreocnide integrifolia</i> (Gaud.) Miq.	Urticaceae	E	S	9.00	8.99
154	<i>Oroxylum indicum</i> (L.) Vent.	Bignoniaceae	D	S	108.0	62.92
155	<i>Ostodes paniculata</i> Bl.	Euphorbiaceae	E	M	15.50	8.99

156	<i>Pajanelia longifolia</i> (Willd.) Schum.	Bignoniaceae	E	S	11.00	13.48
157	<i>Palaquium polyanthum</i> Benth.	Sapotaceae	E	M	197.5	47.19
158	<i>Parkia timoriana</i> (DC.) Merr.	Fagaceae	D	M	0.50	1.12
159	<i>Persea bombycina</i> (King ex Hook. f.) Kostel	Lauraceae	E	M	11.00	11.24
160	<i>Phoebe attenuate</i> Nees	Lauraceae	E	M	13.50	8.99
161	<i>Phoebe goalparensis</i> Hutchinson	Lauraceae	E	M	15.50	7.87
162	<i>Phyllanthus emblica</i> L.	Euphorbiaceae	D	M	14.50	8.99
163	<i>Picrasma javanica</i> Bl.	Simaroubaceae	E	S	8.50	5.62
164	<i>Pithecelobium heterophyllum</i> (Roxb.) Benth.	Mimosaceae	D	S	5.00	4.49
165	<i>Pleome lespicata</i> (Roxb.) N.E. Brown	Agavaceae	E	S	38.00	12.36
166	<i>Podocarpus nerifolia</i> D. Don	Podocarpaceae	E	M	34.50	17.98
167	<i>Polyalthia</i> sp.	Annonaceae	E	S	0.50	1.12
168	<i>Premna benghalensis</i> Cl.	Verbenaceae	D	M	16.00	13.48
169	<i>Premna milleflora</i> Cl.	Verbenaceae	D	M	19.50	19.10
170	<i>Psychotria monticola</i> Kurz	Rubiaceae	E	S	16.50	10.11
171	<i>Pterospermum acerifolium</i> (L.) Willd.	Sterculiaceae	D	L	7.50	5.67
172	<i>Pterospermum lanceaefolium</i> Roxb.	Sterculiaceae	E	M	79.00	33.71
173	<i>Pterygota alata</i> (Roxb.) R. Br.	Sterculiaceae	D	L	97.50	44.94
174	<i>Quercus griffithii</i> Hook. f. & Th.	Fagaceae	E	M	18.00	10.11
175	<i>Randia racemosa</i> (Cav.) f. Vill.	Rubiaceae	E	S	7.50	7.87
176	<i>Samanea saman</i> (Jack.) Merr.	Papilionaceae	E	L	5.00	4.49
177	<i>Sapindus attenuatus</i> wall.	Sapindaceae	D	M	8.50	6.74
178	<i>Sapindus mukorossi</i> Gaertn.	Sapindaceae	D	M	0.50	1.12
179	<i>Sapindus</i> sp.	Sapindaceae	D	M	8.50	6.74
180	<i>Sapium baccatum</i> Roxb.	Euphorbiaceae	E	L	136.0	60.67
181	<i>Saprosma ternatum</i> Hook. f.	Rubiaceae	E	S	11.50	8.99
182	<i>Saraca asoca</i> (Roxb.) de Wilde.	Caesalpiniaceae	E	M	33.50	22.47
183	<i>Saurauia roxburghii</i> Wall.	Saurauiaceae	E	S	78.50	32.58
184	<i>Schima wallichii</i> (DC.) Kuntze	Theaceae	E	M	376.5	65.17
185	<i>Schleichera trijuga</i> Willd.	Sapindaceae	D	L	7.00	6.74
186	<i>Semecarpus anacardium</i> L.	Anacardiaceae	E	M	187.5	53.93
187	<i>Shorea robusta</i> Gaertn.	Dipterocarpaceae	E	L	33.50	3.37
188	<i>Spondias pinnata</i> (L. f.) Kurz	Anacardiaceae	D	M	109.5	53.93
189	<i>Sterculia urens</i> Roxb.	Sterculiaceae	D	M	8.00	7.87
190	<i>Sterculia villosa</i> Roxb.	Sterculiaceae	D	M	49.50	35.96
191	<i>Stereospermum personatum</i> (Hassk.) Chatterjee	Bignoniaceae	E	L	191.0	62.92
192	<i>Streblus asper</i> Lour.	Moraceae	E	M	49.00	28.09
193	<i>Styrax serrulatum</i> Roxb.	Styraceae	E	S	10.00	10.11
194	<i>Symplocos cochinchinensis</i> (Lour.) Moore ssp. <i>Cochinchinensis</i> Lour.	Symplocaceae	E	S	6.00	5.62
195	<i>Symplocos khasiana</i> (Cl.) Brand.	Symplocaceae	E	S	10.50	10.11
196	<i>Symplocos</i> sp.	Symplocaceae	E	S	2.50	3.37
197	<i>Symplocos cochinchinensis</i> (Lour.) Mooresp. <i>Laurina</i> (Retz.) Nooteboom	Symplocaceae	E	S	4.00	3.37
198	<i>Syzygium cumini</i> (L.) Skeels	Myrtaceae	E	M	93.00	49.44
199	<i>Syzygium jambos</i> (L.) Alston	Myrtaceae	E	S	30.00	16.85
200	<i>Syzygium kurzii</i> (Duthie) Balak.	Myrtaceae	E	M	16.00	8.99
201	<i>Syzygium oblatum</i> (Roxb.) Wall. ex A.M. & Cowan	Myrtaceae	E	M	1.50	3.37
202	<i>Syzygium praetermissum</i> (Gage) Balak.	Myrtaceae	E	M	73.50	30.34
203	<i>Syzygium syzygioides</i> (Miq.) Merr.	Myrtaceae	E	M	67.00	44.94
204	<i>Magnolia hookeri</i> (Cubitt & Smith) Raju&Nayar	Magnoliaceae	E	S	18.50	16.85
205	<i>Tamarindus indica</i> L.	Caesalpiniaceae	D	M	0.50	1.12
206	<i>Tectona grandis</i> L. f.	Verbenaceae	D	L	145.0	21.35
207	<i>Terminalia bellirica</i> (Gartn.) Roxb.	Combretaceae	D	L	114.5	48.31
208	<i>Terminalia chebula</i> Retz.	Combretaceae	D	L	36.50	29.21
209	<i>Tetrameles nudiflora</i> R. Br.	Datisceae	D	L	109.0	51.69
210	<i>Toona ciliata</i> M. Roem.	Meliaceae	D	M	161.5	66.29
211	<i>Trema orientalis</i> (L.) Bl.	Cannabaceae	E	M	2.00	1.12
212	<i>Trewia nudiflora</i> L.	Euphorbiaceae	D	M	58.00	28.09

213	<i>Vatica lancaefolia</i> (Roxb.) Bl.	Dipterocarpaceae	E	M	138.0	50.56
214	<i>Oreocnide</i> sp.	Urticaceae	E	S	2.50	4.49
215	<i>Vitex altissima</i> L. f.	Verbenaceae	E	M	49.00	25.84
216	<i>Vitex peduncularis</i> Wall. ex Schauer.	Verbenaceae	E	M	89.00	58.43
217	<i>Vitex pinnata</i> L.	Verbenaceae	E	M	5.50	7.87
218	<i>Vitex</i> sp.	Verbenaceae	E	M	30.50	24.72
219	<i>Wendlandia</i> sp.	Rubiaceae	E	S	4.50	5.62
220	<i>Xerospermum glabratum</i> (Kurz) Radlk.	Sapotaceae	E	L	62.00	21.35
221	<i>Zanthoxylum rhetsa</i> (Roxb.) DC.	Rutaceae	E	M	57.50	40.45
222	<i>Zizyphus mauritiana</i> Lam.	Rhamnaceae	D	M	20.50	13.48

## CONCLUSION

The Barak Valley of Assam has good number of tree species, the major component of the forests ecosystem. Depletion of species number and frequency due to the different anthropogenic pressure are the main disquiet. Utilization of traditional knowledge and legal and full involvement of the local communities in conservation practices might be very effective to conserve the forests in this region. Despite of rich tree species diversity it provides various ecosystem services such as habitat to other species, carbon storage, carbon sequestration etc. and environmental benefits which needs further study.

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