



Timber-Yielding Plant Resources of Nagaon District, Assam

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Abstract

Timber-yielding plant species represent an important natural resource and significantly contribute to the livelihoods of rural communities particularly in Northeast India. This study recorded 43 species of 18 families of the timber-yielding plant species from Nagaon district, Assam. Among them Fabaceae and Moraceae were represented by the highest number of species followed by Meliaceae and Myrtaceae. In terms of uses, furniture-making makes up the largest category among the species recorded. The overall study has revealed a close connection of the local communities and timber resources, also emphasizing on the need of conservation and sustainable use of the plant resources.

Keywords: *Timber-yielding plants, forest resources, species diversity, Nagaon district, Assam.*

Introduction

Forests are one of the most important natural resources because they provide all the necessary products for livelihood. It provides a wide range of ecological services, including biodiversity conservation, climate regulation, soil protection, and support for rural livelihoods [1] [2]. Timber-yielding plants are a major part of forest vegetation and have been used by humans since ancient times for various purposes, such as building houses, making agricultural tools, and producing fuelwood. Timber remains an important resource for both domestic and commercial use in almost every part of India [3]. Northeastern India is recognized as one of the richest biodiversity regions in the world because of its diverse climatic conditions and topographic variations [4]. The climate of Northeast India is characterized by high rainfall, warm temperatures, and pronounced seasonal variations, all of which strongly influence forest composition and vegetation patterns [5]. Assam is the very part of a region that supports different forest types, such as tropical evergreen, semi-evergreen, moist deciduous, and riverine forests, which harbour numerous economically important timber species [6] [7]. Species such as *Tectona grandis*, *Gmelina arborea*, *Dalbergia sissoo*, and *Terminalia spp.* have long been valued for their timber quality and commercial importance. The Nagaon district, situated in central Assam, represents a unique landscape influenced by the Brahmaputra floodplains and the adjoining foothills of Karbi Anglong. This ecological diversity creates suitable habitats for a wide range of timber species in the region. However, increasing human pressure in the form of agricultural expansion, urbanization, and overexploitation has gradually reduced forest resources in the region. Despite the economic significance of these plant resources, systematic documentation of timber-yielding species in the Nagaon district remains limited [8]. Therefore, the present study was carried out in the Nagaon District to document these species and analyze their distribution, habitat, and utility to contribute to their sustainable management and conservation.

Materials and Methods

The present study was conducted in Nagaon district, Assam (26°00'–26°45' N, 92°30'–93°30' E) during the year 2024–2025. The district is influenced by the Brahmaputra River in the north and Karbi Anglong in the south. It has a humid subtropical climate with hot summers, mild winters, and heavy monsoon rains. The

annual rainfall ranges between 1,800 and 2,500 mm, which supports the growth of varied vegetation and mixed secondary forests [5]. The district also includes ecologically important protected areas that support diverse vegetation and wildlife and contribute significantly to the conservation value of the region [9].

Data collection and Species identification

Systematic field inventories and documentation are fundamental components of forest monitoring programs for assessing species composition, forest resources, and long-term ecological changes [10]. Field surveys were conducted at different administrative blocks of Nagaon district namely Kaliabor, Kampur, Samaguri, Raha, Batradava, Dhing and Nagaon Sadar. The survey was conducted between September 2024 and August 2025. During the survey, timber-yielding plant species were observed and recorded directly from their natural habitats, plantations, and village groves. Information regarding local names, common uses, and habitat preferences was also collected through interactions with local residents and forest personnel. For the proper identification of species, standard regional floras and forestry manuals were consulted [11] [12]. The current nomenclature was verified using the available taxonomic databases. The local Assamese names and major timber uses of the recorded species were obtained through interactions with local residents, experienced timber users, and forest personnel. Voucher observations, field notes, and photographs were maintained throughout the survey to facilitate accurate documentation and subsequent verification of species identity.

Data analysis

The recorded data were compiled and analyzed using descriptive statistical methods. Species were grouped according to habitat, family, and major utilization categories to determine their relative distribution within the district. The number of species in each category was converted to percentages to facilitate comparisons among the different groups. Bar diagrams were prepared to illustrate habitat-wise distribution, family composition, and utilization patterns of the recorded timber-yielding plant species [13] [14] [15].

Species diversity analysis

Species diversity was quantified using standard ecological indices. The Shannon-Wiener diversity index (H') was used to measure species diversity, considering both richness and proportional representation [16] [13]. Simpson's index (D) and Simpson's diversity value ($1 - D$) were also calculated to assess the dominance and stability of species distribution [17] [18]. The distribution of species among the recorded families was further assessed using Pielou's Evenness Index (E) to estimate the degree of uniformity in species representation [19]. The calculated diversity indices were used to interpret the composition and distribution of timber-yielding plant species in the study area.

Results

Habitat wise distribution of timber-yielding species

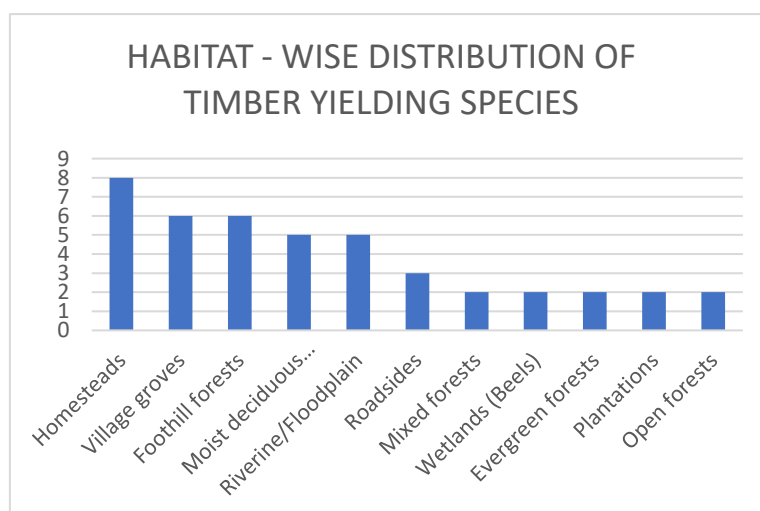


Fig 1: Bar graph of habitat-wise distribution of timber yielding species

During our field survey, we recorded 43 timber-yielding plant species growing under a wide range of habitat conditions in the Nagaon district. These species are found in homesteads, village groves, plantations, riverbanks, wetlands, roadside plantations, foothill forests, mixed forests, and moist deciduous forests (Figure 1). Homesteads and village groves supported the largest number of species, indicating the reliance of local communities on timber trees. Riverine habitats and wetlands also contributed to many characteristic species, such as *Barringtonia acutangula* and *Dillenia indica*. Foothill forests support valuable timber trees, such as *Dipterocarpus macrocarpus* and *Mesua ferrea*. Comparable habitat heterogeneity has been documented in the tropical forests of Northeast India [12] [11].

Use-wise distribution of timber-yielding species

We documented a wide range of uses for the recorded timber species based on field observations and discussions with local residents of the region. Most species were valued for more than one purpose, although one use generally dominated the others. Furniture making accounted for the largest number of species, with 16 species regularly used for making household furniture such as tables, chairs, beds, cupboards, and doors (Figure 2). Similar utilization patterns have been reported in studies on forest resource dependence in Assam and other tropical regions [8].

Construction timber was the second largest category. Eight species are commonly used in house construction, roofing frames, beams, and fencing, especially in rural villages where locally available timber continues to be an affordable building material. Eight other species were mainly used for packing cases and boxes. Seven species supplied wood suitable for plywood and other small-scale industries, and six species served as fuelwood. Four species were commonly used for making agricultural implements, including tool handles and farm equipment. The information gathered during the survey shows that timber trees continue to support the daily needs of rural communities. In many villages, the same tree provides construction timber, fuelwood, and household materials, making these species valuable both economically and culturally. The wide range of uses recorded during the survey showed the multipurpose role of timber plants in sustaining rural livelihood systems [20].

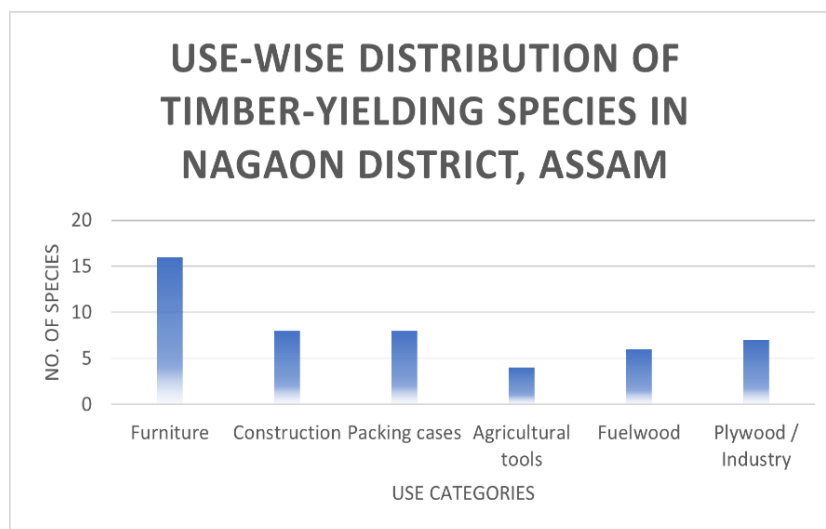


Fig 2: Bar graph of the Use-wise distribution

Family-wise distribution of timber species

Among the 18 recorded families, Fabaceae and Moraceae were the most dominant, each contributing five species to the total recorded flora (Figure 3). The greater representation of Fabaceae may be due to its wide ecological adaptability, rapid growth, and multiple economic uses, which have also been reported in other floristic studies from Northeast India [20] [13] [14]. Similarly, Moraceae showed strong representation owing to the abundance of economically important species such as *Artocarpus heterophyllus* and *Ficus* species, which are commonly maintained in village groves and homestead areas. The families Meliaceae and Myrtaceae were represented by four species each. Members of Meliaceae, such as *Azadirachta indica* and *Toona ciliata*, are

well known for their durable timber and medicinal importance, while species of Myrtaceae, such as *Syzygium cumini* and *Eucalyptus* spp., are valued for both timber and fuelwood purposes [21] [3]. Combretaceae and Phyllanthaceae contributed three species each. The other 12 families were represented by one or two species each, collectively contributing to nearly 44% of the total species richness.

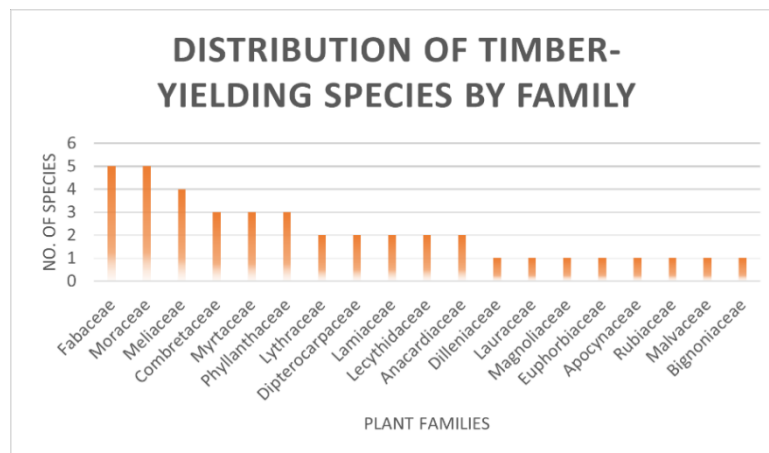


Fig 3: Bar graph of the distribution of species by family

Species Diversity Indices

To understand the diversity of timber-yielding plants in the Nagaon district, we calculated three commonly used ecological indices. The Shannon–Wiener Diversity Index (H') was 2.75; an H' value between 2 and 3 often represents moderate species diversity [13]. Values within this range are generally associated with forest communities containing a reasonable number of species without strong dominance by only a few taxa. The Simpson's Diversity Index ($1 - D$) was 0.915, showing that the recorded species were fairly well distributed and that no single species dominated the flora. Instead, several species contributed to the overall composition of the community, resulting in a balanced distribution across several habitats. The Evenness Index (E) was 0.73, suggesting that species were not equally distributed among all families

Table 1: List of timber-yielding plants found in Nagaon, Assam

Sl. No.	Botanical Name	Family	Local name (Assamese)	Majorly found regions	Habitat/Locality type	Common local uses
1.	<i>Aglaia hiernii</i> King	Meliaceae	<i>Bonsum</i>	Kampur, Samaguri (southern Nagaon)	Karbi Anglong foothills	Furniture, plywood
2.	<i>Albizia lebbeck</i> (L.) Benth.	Fabaceae	<i>Siris</i>	Nagaon Sadar, Raha, Kaliabor	Roadsides, village groves	Furniture, farm tools
3.	<i>Dalbergia sissoo</i> Roxb.	Fabaceae	<i>Sissoo</i>	Raha, Laokhowa area	Riverine plantations	Furniture, beams
4.	<i>Dipterocarpus macrocarpus</i> Vesque	Dipterocarpaceae	<i>Hollong</i>	Kaliabor, Karbi Anglong foothills	Tropical evergreen and semi-evergreen forests	Construction, plywood
5.	<i>Gmelina arborea</i> Roxb.	Lamiaceae	<i>Gomari</i>	Kaliabor, Kampur	Village plantations	Furniture, plywood
6.	<i>Messua ferrea</i> L.	Calophyllaceae	<i>Nahor</i>	Kaliabor, Karbi Anglong foothills	Evergreen forest	Heavy constructions, beams, and railway sleepers

7.	<i>Shorea robusta</i> Gaertn. f.	Dipterocarpaceae	<i>Sal</i>	Kaliabor, Karbi Anglong foothills	Moist deciduous forest	Construction timber
8.	<i>Tectona grandis</i> L.f.	Lamiaceae	<i>Segun</i>	Kaliabor, Samaguri	Forestry plantations	Construction, timber, furniture
9.	<i>Terminalia myriocarpa</i> Van Heurck & Müll.Arg.	Combretaceae	<i>Hilikha</i>	Kampur, Samaguri	Foothill forests	Furniture, packing cases
10.	<i>Acacia catechu</i> (L.f.) Wild.	Fabaceae	<i>Khair</i>	Raha, Batadrava	Dry uplands	Posts, tools
11.	<i>Albizia odoratissima</i> (L.f.) Benth.	Fabaceae	<i>Koroi</i>	Kaliabor, Kampur	Mixed forests	Construction
12.	<i>Artocarpus chaplasha</i> Roxb.	Moraceae	<i>Sam</i>	Kaliabor, foothills forest	Moist deciduous forest	Construction timber, furniture
13.	<i>Artocarpus heterophyllus</i> Lam.	Moraceae	<i>Kothal</i>	Nagaon Sadar, Raha, Dhing, Kaliabor, Samaguri	Homesteads, mixed village forests	Furniture, planks, doors
14.	<i>Azadirachta indica</i> A.Juss.	Meliaceae	<i>Neem</i>	Nagaon Sadar, Raha, Dhing, Kaliabor, Samaguri	Homesteads, roadsides	Furniture, boards
15.	<i>Barringtonia acutangula</i> (L.) Gaertn.	Lecythidaceae	<i>Hijol</i>	Dhing, Laokhowa	Wetlands, beels	Boats
16.	<i>Bischofia javanica</i> Blume	Phyllanthaceae	<i>Uriam</i>	Kampur	Moist foothill areas	Posts, bridges
17.	<i>Bridelia retusa</i> (L.) A. Juss.	Phyllanthaceae	<i>Bon kathal</i>	Samaguri, Kampur	Forest margins	Tool handles
18.	<i>Careya arborea</i> Roxb.	Lecythidaceae	<i>Kumbhi</i>	Raha, Batadrava	Open forests	Tool handles, packing cases, fuelwood
19.	<i>Dillenia indica</i> L.	Dilleniaceae	<i>Outenga</i>	Dhing, Laokhowa	Riverbanks	Packing cases, fuelwood
20.	<i>Duabanga grandiflora</i> (DC.) Walp.	Lythraceae	<i>Khokan</i>	Dhing, floodplain areas	Riverbanks, moist areas	Plywood
21.	<i>Lagerstroemia speciosa</i> (L.) Pers.	Lythraceae	<i>Ajar</i>	Kaliabor, Raha	Moist deciduous forest	Boat building, cabinet
22.	<i>Litsea glutinosa</i> (Lour.) C.B.Rob	Lauraceae	<i>Bhelkar</i>	Kaliabor, Kampur, Samaguri	Moist deciduous forest	Boards and planks, low- grade plywood

23.	<i>Mangifera indica</i> L.	Anacardiaceae	<i>Aam</i>	All regions of Nagaon	Homesteads	Packing cases
24.	<i>Michelia champaca</i> L.	Magnoliaceae	<i>Tita sopa</i>	Karbi Anglong foothills forest	Evergreen forest	Carving and decorative items, interior woodwork
25.	<i>Phyllanthus emblica</i> L.	Phyllanthaceae	<i>Amlokhi</i>	All regions of Nagaon	Dry deciduous areas, village groves	Small furniture items, agricultural tools
26.	<i>Syzygium cumini</i> (L.) Skeels	Myrtaceae	<i>Kola Jamu</i>	Raha, Kaliabor	Riverine tracts	Carts, furniture
27.	<i>Syzygium jambos</i> (L.) Alston	Myrtaceae	<i>Bogori jamu</i>	All regions of Nagaon	Homesteads	Fuelwood
28.	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Combretaceae	<i>Bhomora</i>	All regions of Nagaon	Dry deciduous forest	Packing cases
29.	<i>Terminalia chebula</i> Retz.	Combretaceae	<i>Hilikha</i>	All regions of Nagaon	Dry deciduous forest	Packing cases, agricultural tools
30.	<i>Toona ciliata</i> M.Roem.	Meliaceae	<i>Poma</i>	Kampur	Foothill forests	Furniture, Cabinet making, plywood
31.	<i>Trewia nudiflora</i> L.	Euphorbiaceae	<i>Pitali</i>	Dhing, Raha	Floodplains	Packing cases
32.	<i>Albizia procera</i> (Roxb.) Benth.	Fabaceae	<i>Boga Koroi</i>	Kaliabor, Samaguri	Roadsides	Light furniture
33.	<i>Alstonia scholaris</i> (L.) R.Br.	Apocynaceae	<i>Satiyana</i>	Nagaon Sadar	Village outskirts	Packing cases
34.	<i>Neolamarckia cadamba</i> (Roxb.) Bosser	Rubiaceae	<i>Kadam</i>	Raha, Dhing	Moist lowlands	Light construction
35.	<i>Bombax ceiba</i> L.	Malvaceae	<i>Simolu</i>	All regions of Nagaon	Open plains	Plywood, light packing cases
36.	<i>Ficus benghalensis</i> L.	Moraceae	<i>Bor</i>	All regions of Nagaon	Open plains	Fuelwood
37.	<i>Ficus racemosa</i> L.	Moraceae	<i>Dimoru</i>	Raha, Laokhowa	Riverbanks	Boats
38.	<i>Ficus religiosa</i> L.	Moraceae	<i>Ahot</i>	All regions of Nagaon	Open plains	Fuelwood, low-grade timber
39.	<i>Melia azedarach</i> L.	Meliaceae	<i>Ghora Neem</i>	All regions of Nagaon	Homesteads	Toys, furniture
40.	<i>Oroxylum indicum</i> (L.) Kurz	Bignoniaceae	<i>Bhatghila</i>	Kampur, Samaguri	Forest margins	Match boxes

41.	<i>Spondias pinnata</i> (L.f.) Kurz	Anacardiaceae	<i>Amora</i>	Kaliabor	Village groves	Packing cases
42.	<i>Ziziphus mauritiana</i> Lam.	Rhamnaceae	<i>Bogori</i>	Raha, Batadrava	Dry areas	Tool handles
43.	<i>Psidium guajava</i> L.	Myrtaceae	<i>Modhuri</i>	All regions of Nagaon	Homesteads, village orchards	Tool handles

Discussion

The survey revealed that timber-yielding species in the Nagaon district are unevenly distributed across habitats, influenced by ecological conditions and human activity. Homesteads and village groves supported the highest diversity due to deliberate cultivation, while riverine and wetland areas harboured flood-adapted species, and foothill forests adjoining Karbi Anglong preserved native timber trees, underscoring the role of undisturbed habitats in maintaining diversity. Local communities continue to rely on timber, with furniture making as the dominant use, followed by construction and other purposes such as packing, agricultural tools, and fuelwood, highlighting the need for sustainable utilization and planting efforts. The families Fabaceae and Moraceae contributed the most species, reflecting both natural abundance and deliberate planting, while Meliaceae and Myrtaceae were also significant in homesteads and plantations. Other families, though less represented, held ecological and economic importance. Diversity indices (Shannon-Wiener $H' = 2.75$, Simpson's $1 - D = 0.915$, Evenness $E = 0.73$) indicated moderate to high diversity with low dominance but uneven family distribution, which is a typical tropical forest pattern. Overall, the findings emphasize the importance of conserving natural forests, promoting sustainable timber use, and involving local communities in replanting and management to ensure the long-term sustainability of timber resources.



Fig 4: a) *Artocarpus heterophyllus* Lam. b) *Mangifera indica* L. c) *Phyllanthus emblica* L. d) *Psidium guajava* L. e) *Toona ciliata* M. Roem. f) *Tectona grandis* L.f.

Conclusion

This study documented 43 timber-yielding plant species belonging to 18 families from different parts of the Nagaon district in Assam. The survey showed that the district supports a rich assemblage of timber species distributed across a variety of habitats, including foothill forests, wetlands, riverine areas, plantations, village groves, and homesteads. The predominance of Fabaceae and Moraceae reflects both the ecological conditions of the area and the dependence of local communities on these resources. The diversity values obtained during this study suggest that the timber flora is moderately diverse and relatively stable, although the distribution of species among families is not uniform. Several commercially valuable species continue to be harvested for furniture, construction, and other household purposes, making them important for rural livelihoods. Simultaneously, continuous extraction without adequate regeneration could gradually reduce the availability of these species in the future.

The present study adds to the available information on the timber flora of Assam and provides a useful reference for future ecological studies, forest management programs, and biodiversity conservation initiatives in the Nagaon district. Further investigations on the population status, regeneration ecology, and conservation assessment of economically important timber species would contribute to their long-term conservation.

Declaration

Conflict of Interest: The authors declare no conflicts of interest.

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References

- [1] Odum, E. P., & Barrett, G. W. (2005). *Fundamentals of ecology* (5th ed.). Brooks/Cole.
- [2] Food and Agriculture Organization of the United Nations. (2016). *State of the world's forests 2016*. FAO.
- [3] Negi, S. S. (2002). *Handbook of Indian forestry*. International Book Distributors.
- [4] Myers, N., Mittermeier, R. A., Mittermeier, C. G., da Fonseca, G. A. B., & Kent, J. (2000). Biodiversity hotspots for conservation priorities. *Nature*, 403(6772), 853–858. <https://doi.org/10.1038/35002501>
- [5] Barthakur, M. (1986). *Weather and climate of North-East India*. North Eastern Hill University Press.
- [6] Choudhury, A. U. (1996). *Survey of Assam forests*. Assam Science Technology and Environment Council.
- [7] Nath, A. J., Das, G., & Das, A. K. (2009). Vegetation structure and regeneration status of forests in Assam. *Tropical Ecology*, 50(2), 245–256.
- [8] Dutta, G., & Devi, A. (2013). Plant diversity, population structure, and regeneration status in disturbed tropical forests in Assam, northeast India. *Journal of Forestry Research*, 24(4), 715–720. <https://doi.org/10.1007/s11676-013-0409-y>
- [9] Nath, S. K., & Sarma, S. K. (2012). The status of Laokhowa Wildlife Sanctuary, Assam, India. *International Journal of Applied Biology and Pharmaceutical Technology*, 3(3), 237–241.
- [10] Food and Agriculture Organization of the United Nations. (2018). *National forest monitoring systems: Monitoring and measurement*. FAO.
- [11] Kanjilal, U. N., Kanjilal, P. C., Das, A., & De, R. N. (1934–1940). *Flora of Assam* (Vols. I–IV). Government of Assam.
- [12] Champion, H. G., & Seth, S. K. (1968). *A revised survey of the forest types of India*. Government of India Press.
- [13] Magurran, A. E. (2004). *Measuring biological diversity*. Blackwell Publishing.
- [14] Kent, M. (2012). *Vegetation description and data analysis: A practical approach* (2nd ed.). Wiley-Blackwell.
- [15] Zar, J. H. (2010). *Biostatistical analysis* (5th ed.). Pearson.
- [16] Shannon, C. E., & Weaver, W. (1949). *The mathematical theory of communication*. University of Illinois Press.
- [17] Simpson, E. H. (1949). Measurement of diversity. *Nature*, 163(4148), 688.
- [18] Krebs, C. J. (1999). *Ecological methodology* (2nd ed.). Benjamin Cummings.
- [19] Pielou, E. C. (1966). The measurement of diversity in different types of biological collections. *Journal of Theoretical Biology*, 13, 131–144.
- [20] Food and Agriculture Organization of the United Nations. (2020). *Global forest resources assessment 2020*. FAO.
- [21] Tewari, D. N. (1995). *A monograph on teak (Tectona grandis Linn. f.)*. International Book Distributors.