

# Inventory of tree-level vegetation in the Bohulo camp tourism area

*Muh.Lutfi Aulia Saesar A.S Ibrahim<sup>1</sup>, Nabila H. Muhsin<sup>1</sup>, Amanda Nuraini Putri Zakaria<sup>1</sup>, Dewi Wahyuni K. Baderan<sup>1</sup>, Sukirman Rahim<sup>1</sup>.*

<sup>1</sup>Bachelor of Environmental Science Program, Faculty of Mathematics and Natural Sciences, Universitas Negeri Gorontalo, Gorontalo, Indonesia

**Abstract.** This study aimed to inventory tree-level vegetation in the Bohulo Camp tourism area, located in Dulamayo Village, Gorontalo Regency. A field survey method was employed, involving direct observation and recording of tree species within the study site. Species identification was conducted based on morphological characteristics, followed by ecological index analysis. The vegetation structure was assessed using the Shannon–Wiener diversity index ( $H'$ ), species evenness ( $E$ ), and species richness ( $R$ ) to describe community composition and stability. The results recorded 29 tree species comprising a total of 202 individual trees. Dominant species included *Myristica* sp., *Swietenia* sp., *Chisocheton* ceramicus, and *Ailanthus* sp. The Shannon–Wiener diversity index ( $H' = 3.2209$ ) indicates a high level of species diversity. The evenness value ( $E = 0.9565$ ) suggests a relatively uniform distribution of individuals among species, while the species richness index ( $R = 5.2748$ ) reflects considerable variation in species composition. Overall, the findings indicate that the Bohulo Camp tourism area possesses a stable tree vegetation structure and strong ecological potential to support sustainable nature-based tourism management

## 1 Introduction

Indonesia is a country rich in natural resources, possessing high biodiversity, as well as abundant historical and cultural heritage. This wealth of natural resources can drive economic growth if managed well and in accordance with the needs and interests of the community (Simatupang & Mulyadi, 2022). Gorontalo Regency is one of the regions in Gorontalo Province, where Gorontalo Regency possesses various tourism objects, including nature tourism, artificial tourism, and historical tourism, which, if managed and developed properly and appropriately, will become attractive tourist destinations to visit (Hidayat et al., 2024). One of the tourist attractions in Gorontalo Regency is Bohulo Camp and Eatery, located in Dulamayo Village, Telaga District, Gorontalo Regency (Hidayat et al., 2024). Plant inventory is the recording and collection of data from research on plants; data collection is

---

<sup>1</sup> Corresponding author: [471424002@mahasiswa.ung.ac.id](mailto:471424002@mahasiswa.ung.ac.id)

carried out by classifying and determining plants according to their morphological characteristics (Santoso, 2016). The plant inventory process aims to determine the identity of plants that were previously unknown. Plant inventory is also an activity aimed at grouping a type of plant found in a region. This activity is carried out to provide information used as a reference for species of this family present in the region, to understand their distribution and identify them (Hasanah et al., 2023).

Inventory can be carried out in several stages, namely describing the plant and using a list of possible plants to be identified; all morphological parts must be described, namely roots, stems, leaves, flowers, fruits, and seeds (Ramdhayani, et al 2019). By definition, plant morphology does not only describe the shape and arrangement of the body but is also tasked with determining the function of each part in the life of the plant (Ramdhayani, et al 2019).

Tree-level plant inventory is a fundamental step in the management of forests and green areas because it provides comprehensive information regarding the composition, structure, and distribution of tree species in a region. This activity is important for understanding ecosystem dynamics, assessing vegetation health, and determining appropriate conservation strategies. Good inventory becomes the foundation for data-based decision-making in biological resource management (Soedjito, 2019).

Vegetation inventory helps local governments and conservation agencies design more targeted and effective restoration programs. Periodic inventory activities can improve the quality of conservation area management by providing accurate, up-to-date data for long-term evaluation (Mahmud & Tanjung, 2023).

## **2 Research Methods**

### **2.1 Time and Location of the Study**

This study was conducted in the Bohulo Camp Tourism Area, located in Dulamayo Village, Telaga District, Gorontalo Regency, Indonesia. The site was selected due to its relatively diverse vegetation and developing secondary forest structure, which makes it suitable for vegetation inventory analysis. Field data collection was carried out on November 16, 2025, during a structured field practice activity conducted by the research team.

### **2.2 Research Design**

This study employed a tree-level vegetation inventory approach using a field survey method. The survey focused on documenting species composition, the number of individuals, and the structural characteristics of the tree stratum within the study area.

The inventory was limited to the tree stratum, as it represents the dominant structural component of the ecosystem and contributes significantly to overall vegetation stability and biodiversity.

Several instruments were used to support data collection, including a Global Positioning System (GPS) device to determine sampling coordinates, measuring tapes to measure tree diameter, and digital cameras for documentation. Plant identification manuals were used to ensure accurate species identification.

### **2.3 Data Collection and Analysis**

Data were collected by recording all tree species and the number of individuals observed at the research site. The recorded data were then analyzed using ecological indices to assess vegetation structure and community stability.

The Shannon–Wiener diversity index ( $H'$ ) was calculated to determine species diversity. The evenness index ( $E$ ) was used to evaluate the distribution of individuals among species and to identify potential dominance patterns. In addition, the species richness index

(R) was calculated to measure the variation in tree species within the study area. These three indices were analyzed integratively to describe the composition, distribution patterns, and structural characteristics of tree-level vegetation in the Bohulo Camp Tourism Area. The results of this analysis provide an assessment of the ecological condition and sustainability potential of the vegetation community in the study site.

### 3 Result and Discussion

#### 3.1 Result

**Table 3.1.** Total Number of Individuals at the Tree Level in the Bohulo Camp Tourism Area

No.	Local Name	Family	Scientific Name	Number of Individuals
1	Kelapa	Arecaceae	<i>Cocos nucifera</i>	5
2	Lemon	Rutaceae	<i>Citrus × limon</i>	1
3	Nangka	Moraceae	<i>Artocarpus heterophyllus</i>	2
4	Awar-awar	Moraceae	<i>Ficus septica</i>	5
5	Panimbulu	Urticaceae	<i>Leucosyke capitellata</i>	7
6	Wonibopale	Ailanthaceae	<i>Ailanthus</i> sp.	13
7	Tohe tutu	Bursaceae	<i>Canarium asperum</i>	6
8	Hulumeo	Moraceae	<i>Artocarpus</i> sp.	8
9	Alpukat	Lauraceae	<i>Persea americana</i>	2
10	Kopi arabika	Rubiaceae	<i>Coffea arabica</i>	4
11	Cemara	Casuarinaceae	<i>Casuarina equisetifolia</i>	2
12	Pepaya	Caricaceae	<i>Carica papaya</i>	2
13	Mahoni	Meliaceae	<i>Swietenia</i> sp.	13
14	Matoa	Sapindaceae	<i>Pometia pinnata</i>	5
15	Palem	Arecaceae	<i>Arecaceae</i> sp.	9
16	Pisang	Musaceae	<i>Musa</i> sp.	9
17	Bitaula	Calophyllaceae	<i>Calophyllum</i> sp.	11
18	Hihito	Sapindaceae	<i>Koordersiodendron pinnatum</i>	12
19	Tulalo poni'i	Meliaceae	<i>Chisocheton ceramicus</i>	13
20	Bangga lo maluo	Myristicaceae	<i>Myristica</i> sp.	14
21	Duyung	Malvaceae	<i>Ceiba pentandra</i>	8
22	Tohupo	Moraceae	<i>Artocarpus elastica</i>	5
23	Mangga	Anacardiaceae	<i>Mangifera indica</i>	5
24	Molonggoile	Bignoniaceae	<i>Radermachera</i> sp.	6
25	Nantu	Myristicaceae	<i>Myristica</i> sp. / <i>Palaquium</i> sp.	4
26	Tenggedi	Elaeocarpaceae	<i>Elaeocarpus cumingii</i>	7
27	Tapu lo tola	Phyllanthaceae	<i>Bischofia javanica</i>	8
28	Pilohibuta	Rutaceae	<i>Euodia minahassae</i>	7
29	Loyo	Anacardiaceae	<i>Dracontomelon mangiferum</i>	9
	<b>Total</b>			<b>202</b>

**Table 3.2.** Diversity, Evenness, and Species Richness Indices at the Tree Level

Vegetation Stratum	Total Individuals (N)	Shannon–Wiener Index (H')	Evenness (E)	Richness Index (R)
Tree Level	202	3.2209	0.9565	5.2748

**3.2 Discussion**

The inventory of tree-level vegetation in the Bohulo Camp Tourism Area indicates that the ecosystem exhibits relatively high structural complexity and diversity. The Shannon–Wiener diversity index ( $H' = 3.2209$ ) falls within the high diversity category, suggesting that the tree community is composed of numerous species with no single species overwhelmingly dominating the structure. High diversity values generally reflect ecological stability and resilience in secondary forest ecosystems.

The evenness index ( $E = 0.9565$ ) further supports this interpretation, indicating a nearly uniform distribution of individuals among species. An even distribution pattern suggests balanced interspecific competition and stable resource utilization within the ecosystem. Such conditions are commonly associated with well-established secondary forests that have undergone natural regeneration processes.

The species richness index ( $R = 5.2748$ ) demonstrates considerable variation in tree species composition. High richness values may be influenced by environmental factors such as adequate light penetration, soil fertility, and favorable microclimatic conditions. The relatively large number of individuals ( $N = 202$ ) also indicates that the tree stratum plays a dominant role in shaping the overall vegetation structure of the area.

Ecologically, the presence of diverse tree species contributes significantly to ecosystem functions, including habitat provision, nutrient cycling, carbon sequestration, and hydrological regulation. The balanced species composition suggests that the Bohulo Camp Tourism Area retains ecological integrity despite its function as a tourism site. However, continued monitoring is essential to ensure that tourism activities do not alter vegetation dynamics or reduce species diversity over time.

**4 Conclusion**

The tree-level vegetation inventory in the Bohulo Camp Tourism Area identified 29 species comprising 202 individuals, indicating a structurally complex and diverse plant community. The high Shannon–Wiener diversity index ( $H' = 3.2209$ ), combined with a high evenness value ( $E = 0.9565$ ) and substantial species richness ( $R = 5.2748$ ), demonstrates that the tree stratum exhibits stable ecological conditions with no excessive species dominance. These findings suggest that the tree layer constitutes the primary structural and functional component of the ecosystem and contributes significantly to maintaining ecological balance in the area. The results provide a scientific baseline for sustainable tourism management and future ecological monitoring within the Bohulo Camp Tourism Area.

**References**

1. R.Q. Hasanah, R. Rini, A. Supriyatna, Inventory and identification of Cyperaceae family plants around the integrated laboratory of UIN Sunan Gunung Djati Bandung. *Konstanta J. Math. Nat. Sci.* **1**, 114–122 (2023)
2. A. Hidayat, S. Anapia, W. Hulalata, D. Asriani, M.S. Hamidun, N. Mustaqimah, Analysis of the manager's role in developing the Bohulo Camp and Eatery tourism area

- and its contribution to environmental conservation, in Proceedings of the National Seminar on Biology and Science (2024)
3. R. Mahmud, A. Tanjung, Analysis of vegetation inventory in forest restoration (Forest Insight Press, Bandung, 2023)
  4. E. Ramdhayani, W. Noviati, I.D. Lestari, Mentoring on plant inventory at SMP Negeri 1 Moyo Utara as a science learning resource. *J. Local Community Dev.* **2**, 65–69 (2019)
  5. D. Simatupang, M. Mulyadi, Development strategy for the Sultan Sulaiman Badrul Alamsyah museum tourism site in Tanjung Pinang City. *J. Culinary Manag.* **1**, 29–33 (2022)
  6. H. Soedjito, Fundamentals of biodiversity inventory (Flora Institute, Malang, 2019)
  7. M. Ben Rabha, M.F. Boujmil, M. Saadoun, B. Bessaïs, *Eur. Phys. J. Appl. Phys.* (to be published)