

Traditional Uses of Forest Plants in Calbayog Pan-as Hayiban Protected Landscape (CPHPL)

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Abstract — This study documented the traditional uses of forest plants in Calbayog Pan-as Hayiban Protected Landscape (CPHPL), Samar, Philippines from February to March 2025. Using descriptive research design with key informant interview, participatory rural appraisal particularly transects walk and focus group discussions, it reveals 122 plant species (55 families, 95 genera) across (4) four barangays, documented (5) five IUCN-Red Listed of Threatened Species. *Donax cunniformis* (Mamban) showed the widest distribution, while economically important species like *Cocos nucifera* (Lubi) and *Musa acuminata* (Saging) demonstrated moderate presence. The study documented the local communities' traditional uses of forest plants served critical roles in food (130 species), construction (79 species), and traditional medicine (72 species). The study highlights the urgent need to integrate traditional knowledge with conservation strategies to protect both biodiversity and cultural heritage.

Keywords — *Ethnobotany, Forest Plants, Traditional Knowledge, Conservation, Philippines, CPHPL, Medicinal Plants, Biodiversity, Indigenous Practices, Sustainable Use*

I. Introduction

Plants are fundamental to life on Earth, sustaining ecosystems through oxygen production, carbon sequestration, water regulation, and biodiversity support (Penaluna et al., 2017; Oldfield et al., 2019). They encompass diverse forms from algae and mosses to flowering plants and trees thriving in nearly every habitat worldwide.

The Calbayog Pan-as Hayiban Protected Landscape (CPHPL) in Samar, Philippines, is a key biodiversity area where forest plants support local health, livelihoods, and cultural traditions. However, indigenous knowledge of these plants is at risk of being lost without proper

documentation. Previous studies in the Philippines (Dapar et al., 2022; Olowa et al., 2021) highlight the importance of this research in preserving traditional plant uses and informing conservation strategies.

This study systematically documents the medicinal, nutritional, handicraft, and cultural uses of forest plants in CPHPL, addressing gaps in existing traditional uses. By integrating local knowledge into conservation planning, this research contributes to the sustainable management of CPHPL's plant resources while safeguarding cultural heritage.

Literature Review

Traditional Uses Documentation in the Philippines

Despite the abundance of indigenous knowledge in the Philippines, only a limited number of traditional uses of forest plants have been systematically documented. Such documentation is crucial, as it provides baseline data for phytochemical and pharmacological research Yan Yang, Wenhua Ling, (2025). For instance, recorded 71 medicinal plant species from 40 families used by traditional healers in Pagadian City, Zamboanga del Sur. The most frequently utilized plant parts were leaves, primarily prepared as decoctions, with cancer and kidney ailments being the most commonly treated conditions. However, nine additional species remained uncollected due to accessibility constraints, highlighting gaps in traditional documentation that warrant further research.

Similarly, Chua-Barcelo et al. (2022) examined medicinal plants sold in Baguio City's street markets, identifying 59 species from 29 families. Using use-value (UV) analysis, they found that the Lamiaceae family was the most significant, with *Angelica keiskei* being the most valued species. Leaves were again the predominant plant part used, primarily prepared as decoctions to treat ailments such as cough. This study underscores the role of urban markets in preserving traditional knowledge and providing accessible healthcare alternatives.

Pharmaceutical Potential of Medicinal Plants

Several studies have explored the pharmacological applications of Philippine medicinal plants. Boy et al. (2018) highlighted the Department of Health's endorsement of 10 medicinal plants, including *Allium sativum* (garlic) for hypertension and *Psidium guajava* (guava) for diarrhea, emphasizing their potential for drug development. However, the authors noted that many plant species remain understudied despite their traditional uses.

Supporting this, Valle et al. (2015) investigated the antibacterial properties of 12 indigenous plants against drug-resistant bacteria. Ethanol extracts from *Piper betle* (betel), *Psidium guajava*, and *Ehretia microphylla* exhibited strong antibacterial activity, particularly against methicillin-resistant *Staphylococcus aureus* (MRSA). These findings validate traditional uses and suggest promising avenues for developing plant-based antimicrobials.

II. Methodology

The study sites

This study was conducted in eight (8) sampling areas in the Calbayog Pan-as Hayiban Protected Landscape (CPHPL). Specifically, Parcel I (Pan-as) included Dawo, Bayo, Pilar (Pan-as area), and Manuel Barral Sr., with forest cover spanning an area of 2,680 hectares and ranging from 20 to 620 meters above sea level.

The Calbayog Pan-as Hayiban Protected Landscape was one of the protected areas in the Philippines in 1998. It spanned a total land area of 7,832 hectares and was located between the two political districts of Tinambacan and Oquendo. The area contained two (2) ecosystem types: terrestrial and freshwater. This area was characterized by rolling to very steep terrain, with slope categories ranging from 40 to 50%. The site had geographical coordinates of 125°25'00" longitude and 12°13'00" latitude.

CPHPL was a part of the Samar Island Natural Park (SINP). The SINP was a protected area established by Presidential Proclamation No. 442 in August 2003, which fell under the NIPAS Act of 1992 (DENR-PAWB, 2004).

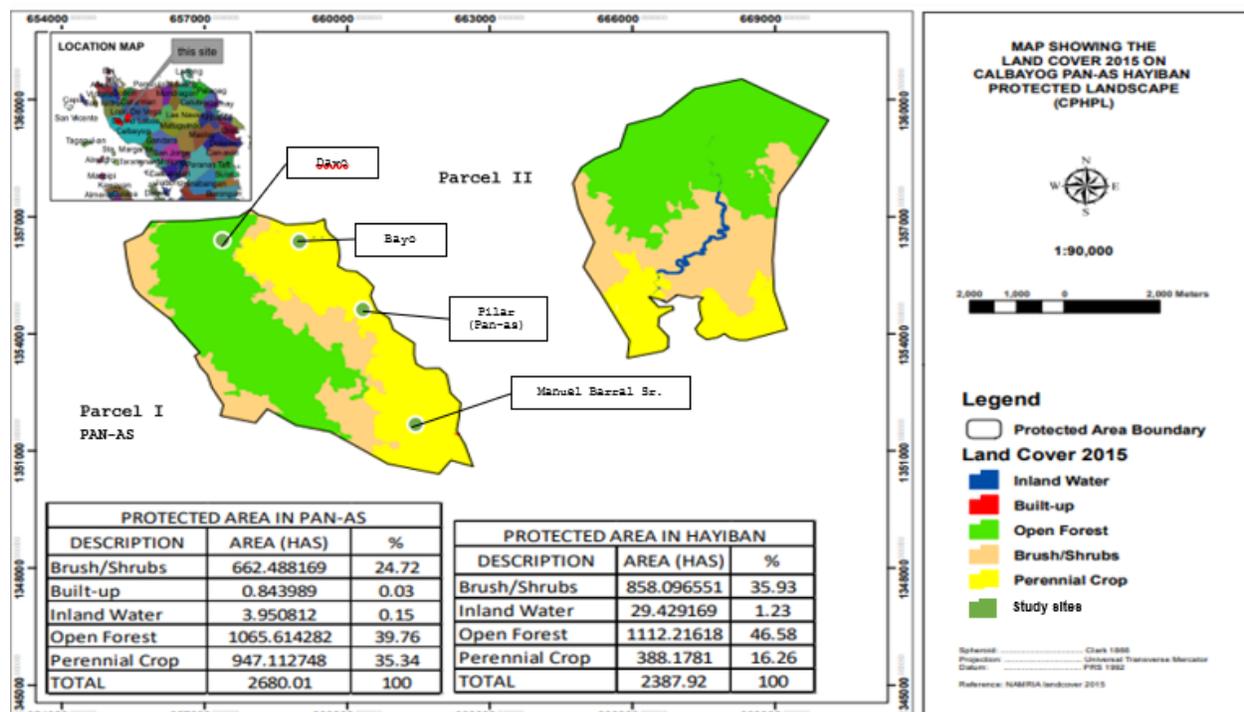


Figure 1. Map of the Calbayog Pan-as Hayiban Protected Landscape with the sampling areas (Source: NAMRIA, 2015)

Research Design

In this study, a descriptive research design was used to address the research objectives. The researchers also conducted field observations and performed actual sampling using the prepared research instrument. Additionally, the Participatory Rural Appraisal (PRA) method was employed to gather plant specimens and data on plant diversity.

To further understand the traditional knowledge of the community, Key Informant Interview and Focus Group Discussions (FGDs) were conducted. These discussions provided valuable insights into the local uses of plants, as well as the conservation practices of the community toward forest plants and their forest environment.

Data Gathering Procedure

On collection of Forest Plants

To gather and identify forest plant species in the study sites, the researcher was accompanied by two or more informants or guides. Each transect spanned a predefined distance, with a 5-meter sampling width on both the left and right sides (totaling a 10-meter-wide survey corridor), recording geographic coordinates every fifty meters and noting the types of environmental features at each point. After selecting a starting point and a straight line for the transect, a local community member guided the walk during the transect walk. It was important for the individual walking the transect to maintain the same direction by standing still at each point, thereby avoiding deviations to ensure the transect remained as straight as possible (Rojas et al., 2021).

During the walk, researchers and informants collaboratively identified plants, discussing local names, traditional uses (e.g., medicinal, food, craft), and ecological significance. Voucher specimens were collected for species requiring further taxonomic verification, with photographs taken of morphological features (leaves, flowers, fruits, bark) to support identification.

On Preservation and Identification of Samples

Herbarium Voucher Preparation

These tools, such as pruning shears, plastic bags, silica gel, a camera, field notebooks, measuring tape, and a GPS, were used during the fieldwork. Herbaceous plants were entirely gathered and placed in labeled plastic bags, while for shrubs and trees, branches approximately 30 cm in length with healthy leaves, flowers, and fruits (2 to 3 samples) were collected for herbarium vouchers. Samples were preserved using denatured alcohol to prevent fungal growth, along with plant tags and unique collection numbers. They were dried using a laboratory oven. Fruits and flowers were stored in sealed plastic tubes containing 70% ethanol, following Collis, et al., (2023) methodology. Essential field data, including morphological details, local names, collection date

and location, habitat, and economic uses, were recorded in field notebooks to facilitate subsequent identification.

The processed herbarium sheets were stored in boxes to safeguard them from insects, direct light (which can cause fading), and extreme temperatures, preserving the specimens.

On the Sample Identification of Plant

Collected specimens were compared and verified using the Field Guide to the Cultivated Plants of the Philippines, A Pictorial Cyclopedic of Philippine Ornamental Plants, and Philippine Native Trees 303. They were then authenticated by a specialist from the University of Eastern Philippines. This expert meticulously verified each specimen, ensuring precise classification and validation of the plant species.

On determining the Traditional Uses of Forest Plants

The Key Informant Interviews (KII), and focus group discussions were employed to collect data through interviews with diverse participants, including health workers, local healers, residents, barangay officials/staff, and other community members. The goal was to document the traditional uses of plants. The researcher ensured that everyone could share their thoughts freely and equally during these discussions (Davis et al., 2021).

Facilitators or moderators guided the discussions and maintained focus. The moderator started by building a good relationship with the participants and taking note of their attendance. Before the discussions began, participants signed consent forms. The moderator explained that all notes and audio recordings would remain confidential, with pseudonyms used instead of real names Basnet, H. B. (2018). It was also made clear that no personal information would be shared.

The researcher invited six to twelve participants for each focus group, following O et al., (2018) recommendations that large groups are hard to manage, while small groups may not provide enough information.

III. Results and Discussion

Table 1
Traditional Uses of Forest Plants in All Sites

Uses of Plants	STUDY SITES			
	Site 1 (N)	Site 2 (N)	Site 3 (N)	Site 4 (N)
Medicinal				
Consumed by dogs as medication	1	1	0	0
Medicinal purposes, herbal medicine for several illnesses (Heated leaves or bark)	6	6	26	4
Aesthetic				

Decorative display	1	2	0	0
Ornamental plant	1	2	2	1
Food				
Fruits and seed are edible	3	3	0	6
Used as candy, jam	1	0	0	0
Used as food by human and animals	21	21	26	25
Food preservation and packaging	0	3	1	1
Cooking ingredient	0	1	1	4
Construction				
Provides materials for construction of house (trunk)	12	9	4	5
Wood used as house material for ceiling, fence, floor, house support, lumber, roof	9	4	3	2
Commercial				
Furniture	2	2	0	0
Native crafts (bag, broom, cushion for a pillow, hat, handle for bolo and hammer, <i>sadok</i> , and, sleeping mat)	1	1	2	1
Weaving ropes	1	1	1	1
Used as firewood	1	4	0	0
Pesticide for bees	1	0	0	0
Substitute for sand paper	0	0	0	0
Snake repellent	0	0	0	0

The forest plants in the Calbayog Pan-as Hayiban Protected Landscape serve a wide range of purposes, reflecting their ecological, economic, and cultural significance to local communities. One of the primary uses of these plants is for medicinal applications, where heated leaves or bark are utilized as herbal remedies for various illnesses. Additionally, some plants are consumed as by animals as a form of traditional veterinary medicine, indicating a deep-rooted knowledge of plant-based healing practices.

Beyond their medicinal value, many plants are also valued for their aesthetic uses. Certain species are cultivated as ornamental plants, enhancing gardens and homes, while others are used in decorative displays, contributing to cultural and environmental beautification. This highlights the role of plants not only in survival but also in enhancing the quality of life through visual appeal.

Another critical category is food consumption, where various plants provide essential nutrition. Edible fruits and seeds are consumed directly or processed into products like candies and jams. Some plants serve as food sources for both humans and animals, while others play a role in traditional food preservation and packaging. Additionally, certain species are used as cooking ingredients, demonstrating their integral role in local diets and culinary traditions.

In terms of construction uses, forest plants are indispensable for building materials. The trunks and wood of certain species are used in constructing houses, including ceilings, fences, flooring, and structural supports. Lumber and roofing materials sourced from these plants are vital for traditional architecture, emphasizing their importance in shelter and infrastructure development.

Finally, forest plants have significant commercial and livelihood uses, supporting local economies through various industries. Wood from these plants is crafted into furniture and household items, while fibers are woven into ropes and textiles. Native crafts, such as bags, brooms, hats, and sleeping mats, provide income for artisans. Some plants are used as firewood, while others serve as natural pesticides, snake repellents, or even substitutes for sandpaper. These diverse applications underscore the economic potential of forest plants while also raising concerns about sustainability.

Overall, the assessment of traditional uses reveals that these plants are deeply intertwined with the daily lives of local communities, serving medicinal, aesthetic, nutritional, construction, and commercial purposes. Sustainable management strategies must be implemented to ensure their conservation while continuing to support traditional and economic uses. Further research and community-based conservation efforts can help preserve this valuable botanical heritage for future generation.

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