

A FLORAL DIVERSITY ASSESSMENT OF CALAYAN ISLAND

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To the People of Calayan Island, this work we dedicate...

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ABSTRACT

Calayan Island is a niche to a vast biodiversity sheltering the newly described Calayan Rail *Gallirallus calayanensis*. This study determined the forest structure, floral composition, different ecosystems, habitats and their current and future condition. This floral resource inventory served as the baseline for future monitoring and scientific undertakings in the area.

The Point – Quarter Method (PQM) was employed representing both overstorey and understorey of the forest vegetation. The undergrowth, epiphytes, vines and forest floor were also assessed. The botanical expedition recorded a total of at least 283 species, 215 genera under 81 families; of which 72 are endemic to the Philippines, 3 endemic to Babuyan Islands, 129 indigenous, 39 exotics and 42 species with insufficient data. Fourteen (14) are found to be threatened species according to the IUCN which were mapped to spot the conservation priority areas to efficiently design conservation strategies.

The area has an average stand density of 425 trees/ha for overstorey and 408 trees/ha for understorey with diversity indices of 1.69 and 1.86 respectively. *Shorea contorta*, *Aphanamixis polystachya*, *Spondias cytherea*, *Knema glomerata*, *Shorea polysperma* and *Agathis philippinensis*, *Knema glomerata*, *Aphanamixis polystachya*, *Palaquim tenuipetiolatum*, *Arthophyllum abernianum*, *Strombosia philippinensis*, and *Cyathocalyx acuminatus* had the highest importance values that would be the future dominant species in the entire island.

Calayan Island is considered to be a secondary forest primarily because of current and potential threats and disturbances devastating the forests; such as kaingin, illegal logging, uncontrolled land conversion and improper extraction of forest products. These highly threaten the remaining forest patches which are still suitable for wildlife habitat.

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DEFINITION OF TERMS

Abiotic

- non-living components of any ecosystem.

Agroforestry

- the practice of combining tree and shrub husbandry, agriculture and animal husbandry in a single farming system, with practical sustainable benefits from their interaction.

Allelopathy

- defined as the biochemical interactions, both stimulating and inhibiting, between all kinds of plants

Angiosperm

- literally a seed in a vessel thus a group of plants whose seeds are borne with a matured ovary.

Biological Diversity/ Biodiversity

- refers to the variability among living organisms, including genetic and structural differences, between individuals and within and between species. And it is the different ecosystems in which they live and of which they are part.

Biomass

- the quantity of organic substance produced on a given area, as in the weight of vegetable matter removed by clipping a quadrat, or the plankton of a given volume of water.

Biotic

- relating to life

Endangered

- species whose prospects of survival and reproduction are in immediate jeopardy.

Endemic

- an organism which is unique to a biome.

Exotic

- organisms that are usually introduced into places where they were previously not found, often by people.

Fauna

- the animals in an area considered as kinds rather than as composing communities.

Felling

- refers to the process of cutting or severing the standing tree, usually at its base.

Flora

- an enumeration of all the species that grow in a region; also, the collective term for all the species that grow in a region.

Forest

- a tract of land dominated by trees and associated flora and fauna.
- a plant community predominantly of trees and other woody vegetation, growing more or less closely together (Sharma, 1992).

Gymnosperms

- literally means “naked seed”, pointing to one of the principal characteristics of all members of this group of vascular plants: ovules and seeds are borne exposed on the surface of sporophylls or analogous structures.

Habitat

- the ecosystem in which organism, populations or species live.

Indigenous

- born, grown or originating in the locality, not imported.

Liana

- a plant that climbs upon other plants, depending upon them for mechanical support; a plant with climbing shoots.

Lycophytes/ Lycophyta

- one of three ancient groups of vascular plants; e.g. clubmosses.

Morphology

- the study of form and its development

Phytogeography

- the study of the geographical distribution of plants

Phylogeny

- the study of evolutionary descent and interrelations of animal groups.

Pteridophytes/Pteridophyta

- a now discarded unit of classification, including all vascular plants except the seed plants.

- division of the plant kingdom; fern and fern allies

Shelterbelts

- several lines of trees and shrubs that reduces wind velocity on either side; resulting to decreased destruction on homes, gardens and agricultural crops and increases the yield from the protected fields.

Spermatophyte

- a seed plant

Threatened

- species that might become endangered within a short period of time.

Windbreak

- row of trees or other means of providing shelter from wind.

Wildlife

- any wild fauna and flora in their naturally associated habitats that are relatively undisturbed or untampered by man and therefore include invertebrates, plants, algae, fungi, etc. in their natural habitat.

I. INTRODUCTION

The Philippines, with a 30,078 hectare-land area, is considered to be one of the 25 global biodiversity hotspots, and second to smallest of the 17 megadiverse countries in the world (Castillo 2005). Its rich biodiversity trapped the interest and concern of national and international scientific communities to conduct researches on biological diversity and to put forward conservation strategies to safeguard its great biological wealth. In response, 209 protected areas were proclaimed under categories as strict nature reserve, wildlife sanctuary, national park, natural monument, natural park, resource reserves, natural biotic areas, and protected landscape and seascape through Republic Act 7586, otherwise known as the National Integrated Protected Areas System (NIPAS) Law. The Babuyan Group of Islands, where Calayan belongs, is not declared as protected area despite its diverse floristic and faunal composition, and the factors that threatens its biodiversity. The complex natural environment of Calayan induces the formation of unique plant species thriving in different ecosystems supporting other forms of life.

The Calayan Island is a niche to both endemic flora and fauna. It is home to 77 bird species, 7 endemics or near endemics, including the newly described Calayan Rail *Gallirallus calayanensis*, 18 mammals, and 12 reptiles (Oliveros *et. al.* 2004). Preparations are underway for subsequent expeditions to Calayan Island to further investigate the rail's population, distribution, and behavior. This consequently creates a need for an intensive study of the rail's habitat, although rapid habitat assessment on the island was already conducted on 2004 by the Babuyan Islands Expedition, but solely for the purpose of habitat characterization, and in Calayan, only one area was assessed. This, combined with the threat of unsustainable use of the precious forest of the island is the rationale for this study.

This floral diversity assessment determines the forest structure and composition, different ecosystems, succession stages and the current habitat condition of the entire island. Threatened species were mapped to directly spot the floral conservation priority areas and to design efficient conservation measures specific to the island. This botanical databank serves as the baseline for future monitoring and research undertakings in the area.

II. METHODS

A. Biophysical characteristics/ site description

The study site (Figure 1) is located at Calayan Island (N 19° 20' E 121°27'), the largest, at 19, 600 hectares, of the four inhabited islands of the Calayan Island-municipality, known as the Babuyan Islands. Larger part of the Calayan Island is gently sloping to undulating (3-30% slope). The nearly level lands (0.3% slope) are mostly settlement areas and rice/crop fields. Numerous rivers and creeks drain the island.

The island municipality experiences rainy season all throughout the year except in the months of March and April. According to the data provided by the Calayan climatic station, the mean monthly rainfall in the island is 2 545.2 mm while the mean rainfall annual rainfall is 212.10 mm. Typhoons often occur in the months of June to November. In the months of

June and July, the mean daily temperature reaches up to 32.70°C. Relative humidity starts from 82% in the months of April and



Figure 1. Location map of Calayan Island

May and reaches up to 86% in August and September. Transportation to and from the island is made possible by motorized bancas called "*lampitan*". On a fair weather, the island can be reached in about 7 hours from Aparri.

According to the soil survey conducted by the Bureau of Soils and Water Management, the soil types that occur in Calayan are the Buguey, Zaragosa, Bolinao and the Mayon Series. The central part of the island is believed to be a non-active volcano. The center of the island is comprised of Pliocene-Quaternary Igneous rock while the margins of the island consist of Pliocene-Pleistocene Sedimentary rock.

In 2002, the island's population is 8,451. (Oliveros et al. 2004). Their main source of potable water comes from deep wells drawn by hand pumps or jetmatic. Calayanos make use of common irrigating facilities for vegetable and crop production. Majority of the population's main source of livelihood is agriculture. Their produce includes rice, corn, root crops, fruits, vegetables, poultry egg, poultry meat, beef, cara-beef, swine and fish. The industrial activities in the island include furniture making, rice milling and boat-making. Despite the fact that the furniture sets and mats produced are of good quality, furniture industries are still not in regular operation since the demands are low. The 25 rice mills in the Calayan Island Proper are just enough to cater the milling services of local farmers. The Calayanos' boat-making skills produced 3 cargo boats that had been plying between the island and the mainland. Deposits of perlite and white clay are found in the southern and eastern portions of Calayan Island. Pebble quarrying is also on-going in this island. (Physio- socio – economic profile of Calayan 2003).

B. Methods

Point Quarter Method (PQM)

The most efficient technique for vegetation analysis in forest ecosystems, the point quarter method, was employed in this study. Reconnaissance surveys were conducted to establish the best sampling points, representing both the overstorey and understorey of the forest vegetation in the entire project site. Sampling points were established by constructing a baseline that served as the reference point (direction) of the transect lines with 100 m intervals. Each sampling point was divided into 4 equal quadrants with maximum distance of 50 m (meters) from the sampling point. Two sample trees nearest the sampling point were then measured for every quadrant. For the overstorey, trees measured had a minimum DBH (diameter at breast height) of 20 cm while trees with DBH of less than 20 cm but greater than 10 cm represented the understorey. Point-to-plant distance and diameter at breast height were directly measured during field work/ data gathering at the site while density, relative density, dominance, relative dominance, frequency, relative frequency, importance value and species diversity and dominance indices were computed after the data gathering.

The following formulas were used in this study:

$$\text{Total Density} = \frac{\text{Unit Area}}{(\text{Mean Point to Plant Distance})^2}$$

$$\text{Relative Density} = \left(\frac{\text{individual of a species}}{\text{Total individuals of all species}} \right) * 100$$

$$\text{Density} = \text{Density}_{\text{all spp}} * \text{Relative density}_{\text{spp}} * (1/100)$$

$$\text{Average Dominance Value} = \left(\frac{\sum \text{Basal area}_{\text{per spp}}}{\text{Number of trees}_{\text{per spp}}} \right) * 100$$

$$\text{Dominance} = \text{Average dominance value}_{\text{spp}} * \text{Density}_{\text{spp}}$$

$$\text{Relative Dominance} = \left(\frac{\text{Dominance}_{\text{spp}}}{\text{Total Dominance}_{\text{all spp}}} \right) * 100$$

$$\text{Frequency} = \frac{\text{Number of sample points species occurred}}{\text{Total number of sample points}}$$

$$\text{Relative Frequency} = \left(\frac{\text{Frequency}_{\text{spp}}}{\text{Total Frequency}_{\text{all spp}}} \right) * 100$$

$$\text{Importance Value} = \text{Relative Density}_{\text{spp}} + \text{Relative Dominance}_{\text{spp}} + \text{Relative Frequency}_{\text{spp}}$$

$$\text{Index of Dominance} = \frac{\sum (\text{Importance Value}_{\text{per spp}})^2}{\text{Total Importance Value}}$$

Shannon index of general diversity

$$= -\sum \left(\frac{\text{Importance Value}_{\text{per spp}}}{\text{Total Importance Value}} \right) \text{LOG} \left(\frac{\text{Importance Value}_{\text{per spp}}}{\text{Total Importance Value}} \right)$$

Identification and specimen collection

Most plant identification was done directly in the field by the research team. In case of unknown species, plant specimens were collected with notes on their morphological and vegetative characters to ease taxonomic identification. Habitat and ecological conditions were likewise observed. To confirm species identity, wood samples (less than 2 x 3 x 4 in.) were also collected from discarded lumber and identified by Reynaldo F. Parcon of the Forest Products and Paper Science at the College of Forestry and Natural Resources, University of the Philippines at Los Baños. Mr. Dennis Pulan of the Forest Biological Sciences, CFNR- UPLB identified majority of the unknown specimens. Dr. Edwino S. Fernando, Dr. Manuel L. Castillo and Prof. Pastor L. Malabrigo, and Alfredo Alvarez helped to further validate the identity of the species. Local knowledge (local names; Appendix 1) of the community was also employed in the coding system of the unknown specimens.

III. RESULTS AND DISCUSSION

A. Trees and other vegetation

Overstorey trees had a mean DBH of 43 cm while understorey registered a mean DBH of 14.5 cm.

1. Overstorey

Density

Density is the number of individuals/ the number of trees in relation to a unit area (hectare) (Odum, 1971). Of the eighty-one (81) species with minimum DBH of 20 cm, *Shorea contorta* had the highest number of density with 29 individuals per hectare. It comprised 6.80% of the total density of 425 trees per hectare. Next are *Swintonia foxworthyi* with 22 individuals and *Knema glomerata* with 21 individuals and relative density of 5.30% and 4.90% respectively, implying that the three species mentioned are the most numerous among the species found within the area. *Aphanamixis polystachya* is also abundant in the area with a density value of 19 individuals (4.60%). *Teijsmanniodendron abernianum* and *Shorea polysperma* had the same density (15 individuals) and relative density (3.7%). *Diospyros discolor* and *Artocarpus communis* follow with 14 individuals.

Frequency

Frequency shows the evenness of distribution of species in a stand. It gives an overview of regularity and uniformity of distribution of a species (Cain, 1959). Among the 81 species measured in the 88 sampling points, *Shorea contorta* does not only hold the highest density value but also the highest frequency value. It has a relative frequency of 5.57%. *Aphanamixis polystachya* had a relative frequency of 5.23% which is 0.35 higher than *Swintonia foxworthyi*'s 4.88%. It also had a high relative frequency value than *Knema glomerata* which reflected a value of 4.53%. Although both *Swintonia foxworthyi* and *Knema glomerata* had higher number of individuals *Aphanamixis polystachya* occurred more frequently in the sampling points than the two species mentioned. *Shorea polysperma*, *Artocarpus communis* and *Spondias cytherea* have the same relative frequency of 3.14%. This implies that *Shorea contorta* is the most widespread species in the forest of the island followed by *Aphanamixis polystachya*, and *Swintonia foxworthyi*.

Dominance

The total dominance value for all species is 82.97 m²/ha. Of these, the species that occupy the largest area is *Shorea contorta*, having 10.86 m²/ha value. This species does not only have the highest number of individuals but also the highest DBH and basal area. It is followed by *Agathis philippinensis* which occupies about 7.22 m²/ha. Although it does not have high density value, it occupies a much larger space than those species mentioned above in the discussion on density. *Ficus pellocido-punctata*, *Aphanamixis polystachya* and *Spondias cytherea* are also dominant species in the study site with 6.25 m²/ha, 5.66 m²/ha and 5.15 m²/ha dominance values respectively.

Removal of these dominant species would result in major changes not only on populations living within the area but also in their physical environment. On the other hand, elimination of non-dominant species would produce a more subtle change.

Dominant species also indicate huge productivity and they account for the energy flow in a trophic group (Odum 1971).

Importance Value, Diversity Index and Index of Dominance

Of the 81 species inside the plot for overstorey, *Shorea contorta* had the highest importance value with 25.5 %. This value was obtained by adding relative density, relative frequency and relative dominance. This species was followed by *Aphanamixis polystachya*, having a value of 16.70%. *Spondias cytherea* with an IV of 12.45% while *Knema glomerata* has 12.43%. *Shorea polysperma* and *Agathis philippinensis* also indicated high importance values with the latter having 11.33% and the former with 11.98%. These values coincide within the values from other tropical inventories for both lowland and upland forest, which range from 12.5% to 52.4% (Arances 2004).

The diversity index, using Shannon's index, is 1.69. This value indicates that Calayan has a diverse flora since it falls within the range of Shannon's index, which is between 1.5 and 3.5 (Magurran, 1988). It also implies that although Calayan Forest has a low density and dominance values, it is diverse. This can be explained by the low dominance value per species observed in the area and large number of rare species found in it. Since the number of rare species determines the species diversity of an area, the higher the number of rare species, the more diverse an area becomes

The index of dominance was computed to know the concentration of dominance in an area. The higher the value of index dominance, the greater is its dominance concentration. The value computed in this study is 0.029. This supports the idea (on the explanation of value on diversity index) that dominance in the area is not monopolized by a single or few species.

2. Understorey

Density

Data on the understorey showed a total density of 408 trees per hectare. Of these, *Palaquim tenuipetiolatum* is said to be the most abundant species in the area with 24 individuals per hectare (5.79%). *Knema glomerata* registered is the second most numerous species with 17 individuals per hectare (4.27%), while 14 individuals of *Aphanamixis polystachya*, comprising 3.35% of the total density, were noted. There were 12 individuals of *Arthophyllum abernianum* (3.05%) and *Cyathocalyx acuminatus*, *Shorea contorta* and *Trema orientalis* have the same value for relative density and density with 2.74% and 11 individuals respectively.

Frequency

Palaquim tenuipetiolatum has the highest value for relative frequency. It has a value of 5.38%. *Knema glomerata* followed with a relative frequency of 4.04%. *Aphanamixis polystachya* and *Arthophyllum abernianum* showed the same value of 3.03%, while *Cyathocalyx acuminatus*, *Shorea contorta*, *Swintonia foxworthyi* and *Strombosia philippinensis* all have 2.69% relative frequencies. These values imply that *P. tenuipetiolatum*, *K. glomerata* and *A. polystachya* are the most frequently-occurring species and they were the most commonly-observed species during data gathering. It also suggests that they are (the most) uniformly distributed within the area.

Importance Value, Diversity Index and Index of Dominance

Among the 103 species identified under the understorey category, *Palaquim tenuipetiol* has the highest importance value of 17.02%. *Knema glomerata*, similar to density, dominance and frequency values, registered the second highest importance value of 12.11%. This was followed by the 9.69% of *Aphanamixis polystachya*. *Arthophyllum abernianum* (8.98%), *Shorea contorta* (8.81%), *Strombosia philippinensis* (8.56%) and *Cyathocalyx acuminatus* (8.45%) following last. From these values, it can be deduced that the future stand of Calayan will be mostly composed of the species mentioned above if all the other growth factors remain constant (Resource Basic Inventory Manual).

The diversity index of the understorey reflected a value of 1.86. This implies that the study area is diverse as it again falls within the range of the values of Shannon's index. A diverse flora signifies that there are relatively numerous tree species found within Calayan. The computed index of dominance was 0.019. This value, like that in overstorey, manifests that no single/ few species dominate Calayan forest. This also indicates that there are several rare species in the study area

3. Undergrowth

The most dominant undergrowth species are Bamban (*Donax cannaeformis*), juvenile rattans (*Calamus spp.* and *Daemonorops spp.*) and Red odontonema (*Odontonema strictum*). The rest is composed of seedlings of mature trees in the area. In other areas, patches of Yautia (*Xanthosoma violaceum*) can be found. Ferns and fern allies also cover the forest ground.

4. Epiphytes and vines

Epiphytes and vines are widely distributed in the tropical forests. Epiphytic plants are borne on tree boles and branches with no association to the soil while vines are rooted to the soil, even though direct connection to the ground of the whole plant loses with life stages and age. In the study site, epiphytes such as *Drynaria quercifolia* (Family Polypodiaceae), and *Asplenium musaeifolium* and *A. nidus* (Family Asclepiadiaceae) are prominent. Vines of various families are present in the same area, among which are aroids (Family Araceae), climbing palms or rattans (Family Arecaceae), climbing bamboo (Family Poaceae), yams (Family Convolvulaceae) and lianas (Family Cecropiaceae = Tiliaceae). There are specific genera of ferns and their allies namely; *Lygodium*, *Dicranopteris* and *Sellaginella* that resemble vine properties and habits present in the area.

5. Forest floor

The thickness of leaf litter varies even in a single area. Exposed rocks can sometimes be seen, while sharp jagged limestone is mostly present in areas where forest over limestone occurs but was also seen sparingly in other areas.

B. TROPICAL FOREST FORMATIONS AND OTHER VEGETATION TYPES

Forests are generally classified as primary (virgin or old growth) or secondary (second-growth). It is classified according to intensities of human disturbance resulting to certain vegetation modifications. Calderon (1999) stated that a forest is primary if it is either largely

unchanged by man's actions or only the hunting and gathering of forest products by indigenous people is evident. If a forest is either subjected to slight kaingin or to various timber harvesting, it is then classified as secondary. The concept of primary and secondary forests is vague and problematic with different interpretations. The 2004 Babuyan expedition used tree architecture as recommended by Bibby, et al. 1998 as parameter to determine whether an area has a primary forest or otherwise.

How one will classify the forest formations found in Calayan depends upon the reference. In this report, we will be presenting three references and their classification.

In the DENR Administrative Order 05, Series of 2005, the forest type of Calayan is mainly classified as a Natural forest, and further sub classified into Closed forest, Open forest, and Beach forest. A Closed forest is a formation where the trees in the different storeys and the undergrowth cover more than 40% of the ground and is not covered by a continuous dense grass layer. Kataruman, Longog, Longog nga Basit, Macara, Mt. Maramara and Nagsarmingan are classified as such. The upper elevation of Magsidel is also classified as Closed forest.

An Open forest can be found in the rest of the areas except for the lower elevation part of Magsidel and Centro II. Open forests are formations with broken tree layer covering at least 10% but less than 40% of the ground.

Centro II and the lower elevation of Magsidel are classified as beach forest, as they are narrow strips of wooded land found on the sandy and gravelly beaches of the seacoast. Indicator species are *Terminalia catappa*, *Casuarina equisetifolia*, *Barringtonia asiatica*, and *Erythrina orientalis*.

E. S. Fernando classified forest formations of the Philippines into twelve but we will discuss only those pertinent to the island's formations. Longog and Longog nga Basit are classified as Semi-evergreen rainforest because the area is characteristically dominated by *Shorea contorta*, occurring in low to medium elevation (10-499 masl) (Appendix 2). Malangsi is dominated by *Pterocarpus indicus*, and possibly *Toona calantas*, falling under the Semi-deciduous forest. Beach forests, occurring along gravelly and sandy coast (0-166 masl) and dominated by *Cocos nucifera*, a hydrochore species, are found in the coasts of Centro II and Magsidel while the higher elevations of the latter, as with Kataruman, to the highest point surveyed, namely Mt. Maramara, is classified as Lower montane rainforest. *Shorea polysperma* is dominant in the three aforementioned areas, and associate species are oaks (*Lithocarpus*), laurels (*Litsea*), and *Syzygium spp.* This classification can be contested since lower montane rainforests in the Philippines occurs in elevations ranging from 400 to 950 meters, but it cannot be classified as anything else due to the species present. Tree fern species (*Cyathea*) were also observed in this area. The rest of the areas sampled are classified as Forest over limestone, where exposed limestone is evident of this type of forest, otherwise known as the Molave forest. *Vitex parviflora* should be the dominant species in this forest formation but it was not found in the area, only its associates (Table 2) dominate. It is characterized by open canopy with emergent overstories, fluted, interrupted and parasol-shaped crowns and abundant rattans (*Calamus* and *Daemonorops spp.*) and climbing bamboos (*Dinochloa spp.*).

Basing on the work of Torquebiao (1986) and Jones et. al. (1995), Bibby et. al. classified a forest into three types basing on tree architecture. Trees growing in the close canopy of a

Primary Forest tends to branch above half its height. Falling under this category are the forest patches in Dibay, Kataruman, and Longog nga Basit. The rest of the areas, save for Cabuuan, Dadao, Mt. Maramara, Nagsarminan and Takinlagwak, are classified as Open-canopied areas, as most of the trees sampled are branching below half its height. None of the areas fell under Regenerating forest, which is characterized by trees branching above half its height but having scars.

Table 1. Classification of forests according to Fernando, DAO 05-2005 and Bibby, et. al.

Area	Location	Forest Classification		
		DAO 05-2005	E. S. Fernando	Bird Census
Cabudadan	19°17' N 121°29' E	Open forest	Forest over limestone	B
Cabuuan	19°20' N 121°26' E	Open forest	Forest over limestone	B
Centro II	19°16' N 121°27' E	Beach forest	Beach forest	B
Dadao	19°16' N 121°30' E	Open forest	Semi-evergreen rainforest	B
Dibay	19°21' N 121° 24' E	Open forest	Forest over limestone	A
Dilam/ Rarasi	19°21' N 121°29' E	Open forest	Forest over limestone	B
Kasaluran	----	Open forest	Forest over limestone	B
Kataruman	19°20' N 121°23' E	Closed forest	Lower montane rainforest/ forest over limestone	A
Longog	19°19' N 121° 26' E	Closed forest	Semi-evergreen rainforest	B
Longog nga Basit	19°20' N 121°25' E	Closed forest	Semi-evergreen rainforest	A
Macara	19°17' N 121°30' E	Closed forest	Forest over limestone	B
Magsidel	19°18' N 121°26' E	Closed forest/ Beach forest	Lower montane rainforest/ Beach forest	B
Malangsi	----	Closed forest	Semi-deciduous forest	B
Mt Maramara	19°20' N 121°29' E	Closed forest	Lower montane rainforest	A
Nagsarminan	19°20'51" N 121°25'14" E	Closed forest	Forest over limestone	B
Piled	19°20'59" N 121°5'18" E	Open forest	Forest over limestone	B
Takinlagwak	19°21' N 121°27' E	Open forest	Forest over limestone	A

Table 2. Indicator species found in the island per forest type as classified by Fernando

Forest type	Indicator species
Beach forest	<i>Barringtonia asiatica</i> (L.) Kurz
	<i>Casuarina equisetifolia</i> Forst.
	<i>Cocos nucifera</i> L.
	<i>Cratoxylum blancoi</i> Merr.
	<i>Erythrina variegata</i> L.
	<i>Hibiscus tiliaceus</i> L.
	<i>Pandanus tectorius</i> Soland.
	<i>Pongamia pinnata</i> (L.) Merr.
	<i>Terminalia catappa</i> L.
Lowland evergreen	<i>Anisoptera thurifera</i> (Blanco) Blume
Rainforest	<i>Hopea foxworthyi</i> Elm.
Semi-evergreen rainforest	<i>Shorea contorta</i> Vid.
Forest over limestone	<i>Diospyros ferrea</i> (Willd.) Bakh.
	<i>Heritiera sylvatica</i> Vid.
	<i>Intsia bijuga</i> (Colebr.) O. Ktze.
	<i>Pterocarpus indicus</i> Willd. forma <i>echinatus</i> (Pers.) Rojo
	<i>Pterocarpus indicus</i> Willd. forma <i>indicus</i>
	<i>Pterocymbium tinctorium</i> (Blanco) Merr.
	<i>Pterospermum celebicum</i> Miq.
	<i>Toona calantas</i> Merr. & Rolfe
	Lower montane rainforest
<i>Lithocarpus castellarnauianus</i> (Vid.) A. Camus	
<i>Lithocarpus vidalii</i> (F. -Vill.) Rehd	
<i>Litsea fulva</i> (Blume) F.-Vill.	
<i>Litsea garciae</i> Vid.	
<i>Litsea ilocana</i> Merr.	
<i>Litsea odorifera</i> Val.	
<i>Litsea philippinensis</i> Merr.	
<i>Litsea urdanetensis</i> Elmer	
<i>Syzygium acrophilum</i> (C. Rob.) Merr.	
<i>Syzygium cumini</i> (L.) Skeels	
<i>Syzygium jambos</i> (L.) Alst.	
<i>Syzygium neei</i> (Merr.) Merr.	
<i>Syzygium obliquinervium</i> (Elmer) Merr.	
<i>Syzygium simile</i> (Merr.) Merr.	
<i>Syzygium subcaudatum</i> (Merr.) Merr.	

Forest formations are disturbed by natural catastrophic occurrences and anthropogenic inputs. Most of the species succeed after natural (*e.g.* chablis) or man-made activities causing gaps (*e.g.* clearings), and therefore interrupt the usual forest formation processes.

Introduction and invasion by exotics have negative impacts to the native flora and fauna, altering their natural habitats. *Swietenia macrophylla*, is an allelopathic exotic species affecting its neighboring plants (Phuntso, 2002). Allelopathy is a kind of chemical composition affecting vegetational patterns, natural forest regeneration and understory composition. Allelopathic chemicals (phenols, tannins, and, alkaloids in Mahogany leaf) found in different plant parts and in the soil, escape into the environment, influencing the growth and development of neighboring plants.

However, not all invasive species are exotics. Abundant invasive species of *Leucaena*, *Psidium*, *Lantana*, *Mimosa*, *Passiflora* and *Merremia* (Castillo, 2005); *Antigonon leptopus*, *Casuarinas spp.*, *Colocasia esculenta*, *Eucalyptus camaldulensis*, *Hibiscus tiliaceus*, *Lantana camara*, *Passiflora edulis*, *Psidium guajava*, *Ricinus communis*, and *Syzygium jambos* (Llamas, 2003) either exotic or indigenous if uncontrolled, has the potential to disturb the succession stages and canopy stratification resulting to ecological imbalance. Further, Castillo (2005) stressed out that invasive plants decrease species richness, compete with, and displace native species. These locally and broadly invasive plants are commonly dispersed by wind (anemochory) or by water (hydrochory).

Grassland ecosystems, inhabited by Cogon (*Imperata cylindrica*) and Talahib (*Saccharum spontaneum*) are found in patches all over the island, following no particular pattern. Pioneer species such as Anabiong (*Trema orientalis*), *Euphorbia spp.*, and some *Ficus spp.* took over the cogonal areas during the succession stages.

C. FLORISTIC COMPOSITION, SPECIES RICHNESS AND DIVERSITY

The Calayan Island, being situated in the northernmost part of the Philippine archipelago with unstable climatic conditions, is poorly studied, especially its diverse flora. Salvosa (1962) and Rojo (1999) listed and described species in their lexicon, habitually trees and shrubs. Oliveros (2004) characterized the island with *Dipterocarp* components. In this vegetation analysis, the area harbors a total of 81 families, 216 genera, and 285 species (Appendix 3) of spermatophytes, pteridophytes and lycophytes. The dominant family *Dipterocarpaceae*, which is not found in Batanes, (Alcala 1986; Davis *et. al.* 1995; Haribon Foundation 1999) and associates comprising of *Lauraceae*, *Sapotaceae*, *Meliaceae*, *Rubiaceae*, *Sapindaceae*, *Dilleniaceae*, *Myrtaceae*, and *Euphorbiaceae* to name a few inferred that Calayan flora is much related to that of Northern Sierra Madre mountains. Nonexistence of *Dipterocarp* species in Batanes may be explained by adaptation with the harsh environment of the area, such that stunted trees of other species take over instead. The species of *Podocarpus* and *Diospyros* found in the island however connects it to the Batanes flora, and provides a bit of evidence to trace their phyto geography and evolution.

The primitive gymnosperms are believed to be the ancestors of angiosperms. *Araucarias*, *Podocarps* and *Cycads* under the gymnosperm plant group could be the key species to trace the evolutionary pathways of the flora and its habitat (emergence of the island). Three species of

gymnosperms are present in the area including a gigantic *Agathis philippinensis* (232.5 cm DBH, 32.86 m total height) and *Podocarpus costalis* (80 cm DBH, 25 m total height). Out of 285 total species, 268 are angiosperms (36 monocots and 232 dicots), 12 pteridophytes and 2 lycophytes.

The plant resources found inside the established plots and along the transect walk consisted of 121 and 164 species respectively. The flora is composed of 73% trees, mostly from families *Dipterocarpaceae*, *Lauraceae*, *Meliaceae* and *Sapotaceae*, which dominate the upper canopy that acts as a shield between the undergrowth and the external environment and facilitates microclimate regulation. *Agathis philippinensis* and some *Shorea contorta* are the wolf (emergent) tree species receiving full sunlight on top and on both sides. The undergrowth layer includes species with < 10 cm DBH (pole, sapling and seedlings), shrubs (7%), herbs (7%) and ferns (7%). Lianas and herbaceous vines (7%) invade the canopy strata from forest floor creeping to the crown.

D. ENDEMISM AND UTILITY

Out of the total number of Philippine flora, 6, 371 are endemics (ARCBC). Isolated island of Calayan and nearby islets are assumed potential centers of biodiversity and could be considered as one of the “areas of high endemism.” This geographic unit satisfies the DENR- UNEP (1997) criteria to be earmarked as a center of plant diversity; species – rich site, has large number of Philippine endemics, with diverse range of ecosystem types and has significant number of species adapted to special conditions like limestone formation. It has at least 72 species endemic to the Philippines, 3 species endemic to the Batanes- Babuyan Islands, 129 indigenous species and 39 exotic species. Figure 1 shows the relative percentages of species distribution. *Podocarpus costalis*, *Drypetes falcata* and *Lumnasia babuyanica* are island-endemics, found nowhere else in the world.

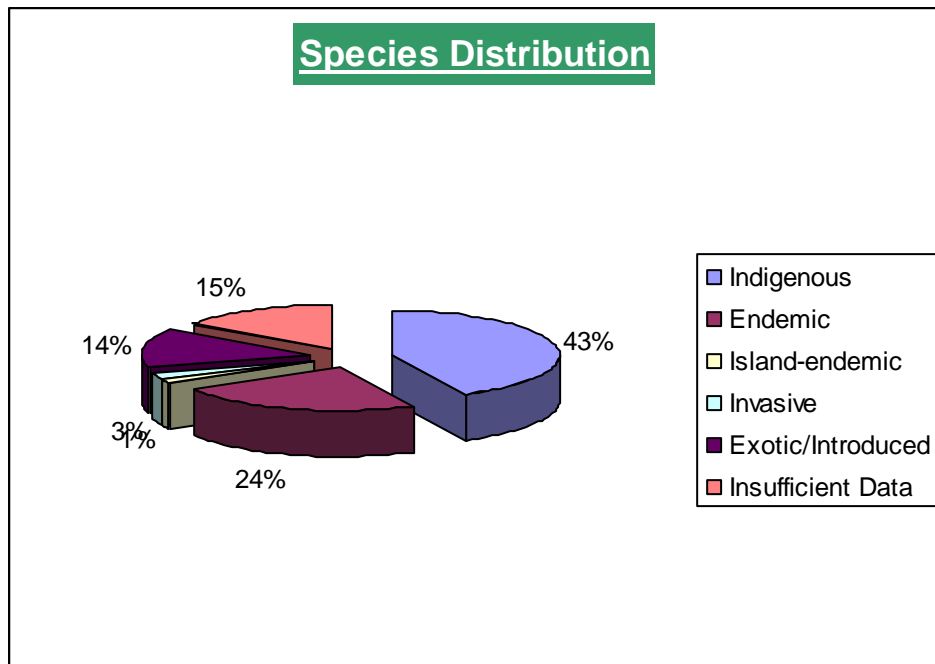


Figure 2. Relative percentages of floral species of Calayan Island.

These species has traditional and commercial values to benefit the local communities, research and educational institutions and industry. The local people use forest and natural resources based on their indigenous knowledge and cultural beliefs. They use a plant's reproductive and vegetative parts for food, forage for their animals, and medicine. However, the knowledge on the species' primary and secondary uses (Appendix 4) and application is lacking. Consequently, the species is not put in its best use. Moreover, there are plant species considered as weeds by local knowledge which modern science has found importance for. This being the case, there is less effort to conserve those floral resources.

Invasive and potentially invasive species, albeit their detrimental ecological effects, has several uses essential to man. Some of these plants are sources of vegetable oils, fats, edible fruits and nuts. Some have medicinal and aesthetic values.

In Table 3, the major use of each plant was tallied to explicitly recognize their value as island- endemic, endemic, indigenous, exotic and even invasive species. The large numbers of species are used as timber (34), edible fruits and nuts (27), ornamental (24) medicinal (20). Indigenous plants are commonly utilized as timber (25), ornamental (17), and medicine (15); endemics as timber (8), medicine, ornamental (3) and fiber (3); exotics and introduced as furniture (10) and sources of edible fruits and nuts (2); and island – endemics as ornamental.

Table 3. Utilities and biogeographic status of plant species in the island

Utility	Island endemic	Endemic	Indigenous	Exotic/ Introduced	Total
Timber	-	8	25	1	34
Plant – producing exudates	-	-	1	-	1
Medicinal	-	5	15	-	20
Vegetables	-	-	1	1	4
Ornamental	2	3	12	2	24
Edible fruits and nuts	-	1	16	10	27
Furniture	-	-	2	1	3
Tannin and dye- producing plants	-	-	3	1	4
Handicraft	-	1	2	-	3
Essential oils	-	1	1	-	2
Spices and condiments	-	-	3	1	4
Fiber plants	-	3	2	1	6
Vegetable oils and fats	-	-	1	2	3
Source of carbohydrates	-	-	1	2	3
Aromatic woods	-	1	1	-	2
Shade and cover plants	-	-	1	-	1
Forage	-	1	1	0	2
Packing and thatching	-	-	1	-	1

Stimulant	-	-	1	1	2
Fuel plants	-	-	1	0	1
Beverage	-	-	-	1	1
Total	2	24	96	24	146

Note: This is an incomplete listing of primary uses of species found in the island because of unavailable data.

E. CONSERVATION STATUS

Listed in Table 4 are the species found in the island that are listed under any of the threat categories of the International Union for the Conservation of Nature and Natural Resources (IUCN). As shown by the vegetation analysis results, the dominant species, *Shorea contorta* also faces the highest level of risk, and therefore needs immediate protection and conservation measures.

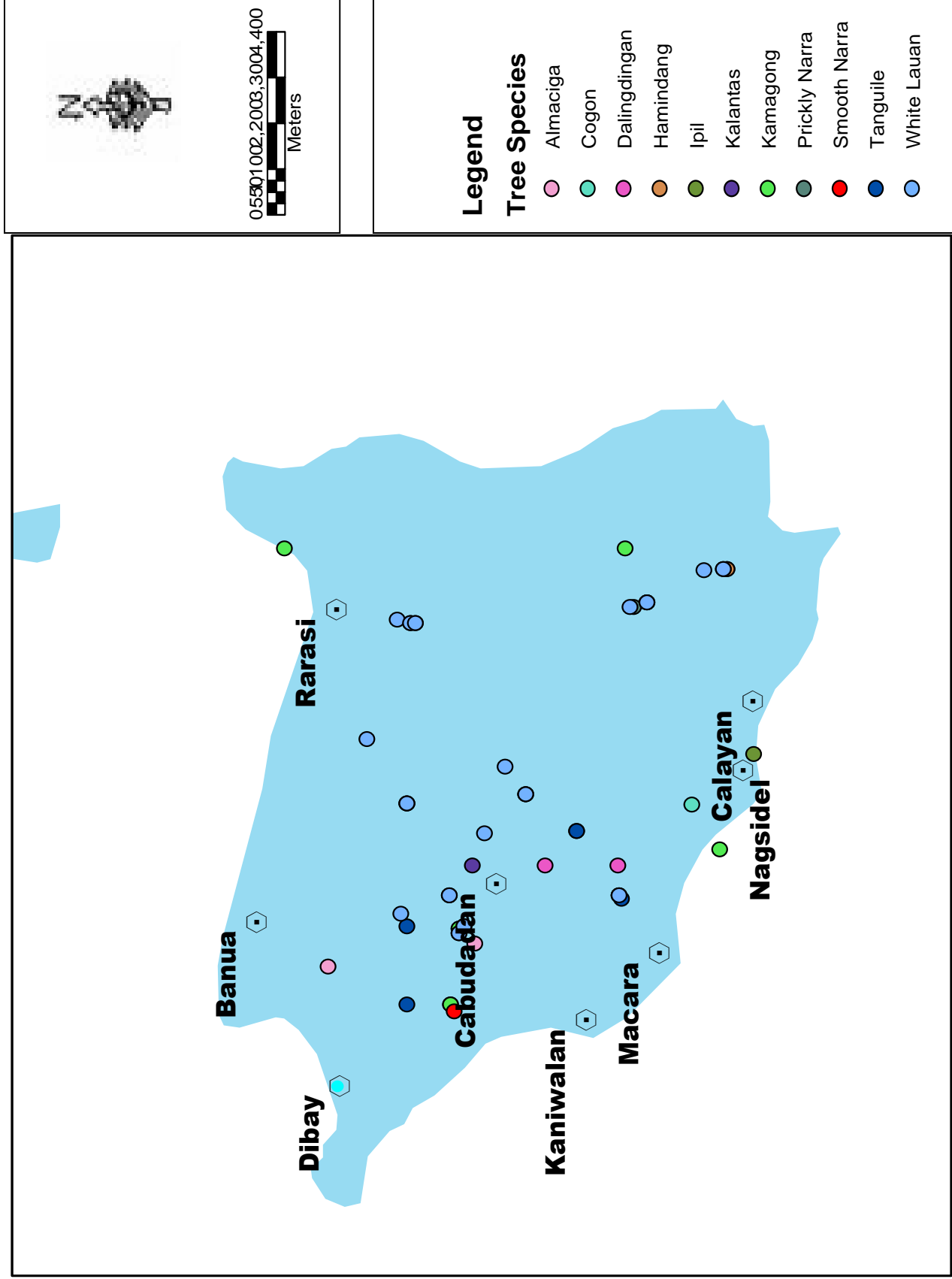
Table 4. Plant species listed in the 2004 IUCN Red List

Common Name	Scientific Name	Conservation Status
Almaciga	<i>Agathis philippinensis</i> Warb.	Vulnerable
Bayanti	<i>Aglaia rimosa</i> (Blanco) Merr.	Lower Risk
Pitogo	<i>Cycas riuminiana</i> Porte ex Regel	Data Deficient
Katmon	<i>Dillenia philippinensis</i> Rolfe	Vulnerable
Kamagong	<i>Diospyros blancoi</i> A. DC.	Endangered
Kamagong`	<i>Diospyros philippinensis</i>	Vulnerable
Dalingdingan	<i>Hopea foxworthyi</i> Elm.	Vulnerable
Ipil	<i>Intsia bijuga</i> (Colebr.) O. Ktze.	Vulnerable
Hamindang	<i>Macaranga bicolor</i> Muell. Arg.	Vulnerable
Igem dagat	<i>Podocarpus costalis</i> C. Presl	Endangered
Prickly narra	<i>Pterocarpus indicus</i> Willd. forma <i>echinatus</i> (Pers.) Rojo	Vulnerable
Smooth narra	<i>Pterocarpus indicus</i> Willd. forma <i>indicus</i>	Vulnerable
White lauan	<i>Shorea contorta</i> (Vid.) Merr. & Rolfe	Critically Endangered
Tanguile	<i>Shorea polysperma</i> (Blanco) Merr.	Critically Endangered
Kalantas	<i>Toona calantas</i> Merr. & Rolfe	Data Deficient

Note: *Diospyros philippinensis* and *Diospyros blancoi* refer to only one species according to Rojo 1999 but we included both in the list because of different IUCN categories.

Fourteen species in the island are under the IUCN Threat categories, and representatives of each of these species were plotted in the map (Figure 2). *Aglaia rimosa*, *Cycas riuminiana*, *Dillenia philippinensis* and *Podocarpus costalis* were excluded in the mapping due to environmental factors affecting the GPS receiver. Basing on the distribution of these species, almost the entire island needs urgent conservation and protection measures.

Figure 2. Location of some threatened flora of Calayan Island



F. THREATS

Forestlands and watersheds occupy 54.36% of the total land area of the island. Local communities derive products from remaining forests for subsistence. Deforestation in the northwestern and central portion is extremely upsetting, creating vast tracts of kaingin, poorly drained, trampled, and eroded soils. Hectares of forests were slashed and burned (swidden agriculture) to plant rice, corn and other agricultural crops. In a profile, a pattern of *forest - ricefield - kaingin* patches is an extensive practice by kaingineros who clear-cut a part of the forest, planted the area for rice and corn, and utilizes remaining stand as shelterbelts and windbreaks to protect their crops (Figure 7). Despite the implementations of the Log Ban, Selective Logging and Chain Saw Act, timber harvesting operations are still being undertaken for local consumption. Abandoned sawn logs in some sites and trails are inappropriately utilized, as in the case of Narra and Dipterocarp being used for fuel wood. Narra is a premium species and Dipterocarps belong to the Philippine Mahogany Group (Appendix 4) which is a source of highly valued timber. Improper utilization of both timber and non-timber forest products (NTFPs) chiefly due to lack of knowledge, skills and resources hasten habitat and biodiversity loss. Destructive tapping of Manila Copal (resin) from almaciga trees and debarking of white lauan and tanguile retard growth and lessen the species' survivability.

A lot of mature *Toona calantas* have been felled for boat -making (“lampitaw”). Only scarce saplings and seedlings are seen and only a single kalantas tree had been inventoried in the established plot. This scenario endangers the *Shorea contorta* which they use as substitute for boat- making.

KAINGIN



Figure 4. Fresh slash-and-burn area

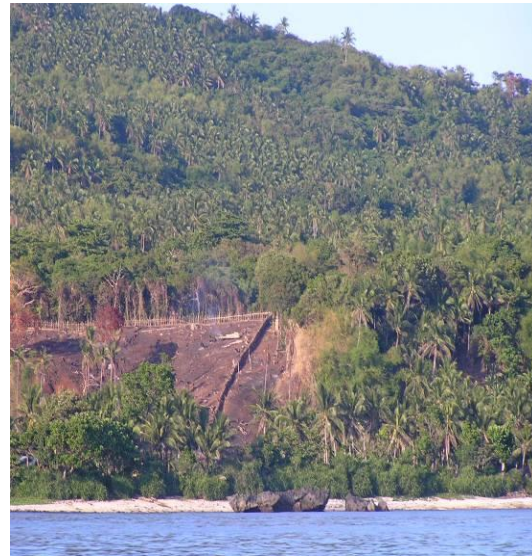


Figure 5. A kaingin area with a 45°-slope

ILLEGAL LOGGING



Figure 6. Abandoned lumber near trail.



Figure 7. A 30- m tall, *Shorea polysperma* with ~90 cm DBH, partially severed

UNCONTROLLED LAND CONVERSION



Figure 8. A typical forest (*bakir*)-ricefield (*talon*)-kaingin pattern.



Figure 9. Hectares of cultivated lands planted to coconuts and peanuts.

IMPROPER UTILIZATION OF FOREST PRODUCTS



Figure 10. *Shorea contorta* bark used for walls.



Figure 11. Trunk with gall (left); decayed bark (right) of *Agathis philippinensis* due to improper tapping of resin.

IV. CONCLUSIONS

The botanical expedition to Calayan Island recorded a total of at least 285 species, 215 genera under 81 families; of which 72 species are endemic to the Philippines, 3 are endemic to the Babuyan Islands, 129 indigenous, 39 exotics and 42 are unidentified. Fourteen (14) are found to be threatened species included in the conservation priority areas.

Analysis of data indicated an average stand density of 425 trees per hectare and a total of 82.97 m² per hectare for overstorey, while for understorey, there were 408 trees per hectare and 6.99 m² per hectare. The relatively low density value can be attributed to the threats/activities also mentioned in this study but when compared to the density values from Caliraya (400+), which is classified as a degraded area, and the 1,000+ density value for Mt. Malindang which is good, then we can say that the density values of Calayan is still relatively good.

In terms of diversity and dominance, there were a total of 121 species were identified inside the sampling plots. Diversity index for overstorey showed a value of 1.69 and 1.86 for understorey. The area is said to be relatively diverse, as it falls within the usual range of Shannon's index, which is between 1.5 and 3.5. Index of dominance for overstorey is 0.029 while for understorey it is 0.019. The values indicate that dominance in the area are shared by many species and not centered on few/ single species.

The most important species are *Shorea contorta*, *Aphanamixis polystachya*, *Spondias cytherea*, *Knema glomerata*, *Shorea polysperma* and *Agathis philippinensis*. The future dominant species would not only include *Knema glomerata* and *Aphanamixis polystachya* but also *Palaquim tenuipetiolatum*, *Arthophyllum abernianum*, *Strombosia philippinensis*, and *Cyathocalyx acuminatus*.

Based on our strict working definition of virgin forest, the island is a secondary forest; however, there are patches which are still suitable for wildlife habitat with natural existing vegetation and floral composition. These outstanding forests are in jeopardy by kaingin, illegal logging, uncontrolled land conversion and improper extraction of forest products.

As per forest classification, the DAO 05-2005 forest categories is quite subjective to the observer's view of ground and canopy cover, thus would not be a very reliable measure. Basing forest classification (primary or secondary) on tree architecture of a few sample trees is not reliable either, as the branching of trees are affected by many factors other than gaps and man-made openings. The classification of ES Fernando would be the most reliable since there are indicator species per forest classification.

V. RECOMMENDATIONS

The vegetation analysis and floral resources inventory provides baseline data for varying future purposes. Because of complexity and high diversity, this floral databank is incomplete and to avoid botanical information bankruptcy, more taxonomic efforts should be undertaken. The plant world is oftentimes neglected by scientific communities, well, in fact, it needs extensive exploration for numerous endemic plants are unidentified, and some are becoming extinct before having discovered. Vegetation analysis of nearby islands and islets and studies on the Batanes Island should be done to complete or at least augment data to comprehensively analyze their affinities. Investigations on the biogeographic affinities of Calayan plants to the Luzon and Batanes flora can be a follow-up study. Further research on physical, anatomical and chemical properties of plants should be conducted for efficient extraction of every species for conservation.

Agathis philippinensis and *Shorea contorta* are in the brink of local extinction thus need urgent conservation strategies. The LGU should draft an ordinance to prohibit resource-destructive activities in the island. Trainings and seminars on proper resin tapping techniques are recommended for sustainable use of these valuable resources. Boundary delineation (area limitation and allocation for best use) should be done to control deforestation and land degradation. Implementation of forestry laws (the Chain Saw Act and Log Ban) should be strictly regulated. This calls for the drafting of a comprehensive environmental management plan for the island, which would delineate different zone types, determining protection areas and areas which can be utilized by the local communities.

Information and Education Campaign (IEC) is an integral part of conservation. Lecture series in the community on forest importance, protection, rehabilitation and utilization is recommended. The locals, especially the farmers should be taught the concepts of sustainable forest management and agroforestry.

Given all those evidences and arguments, it is highly recommended that the Babuyan Group of Islands (Calayan) should be established as a protected area under R. A. No. 7586 to preserve essential ecological processes, enhance biodiversity, promote sustainability of resources found therein, and protect against devastating human exploitation and destruction of wildlife habitats.

PHOTOGALLERY



Pterocymbium tinctorium (Blanco) Merr.



Donax cannaeformis (G. Forst.) K. Schum.



Mallotus ricinoides (Pers.) Muell.-Arg.



Casuarina equisetifolia Forst.



Alstonia scholaris (L.) R. Br.



Leea guineensis G. Don



Chromolaena odorata (L.) R.M. King & H. Rob.



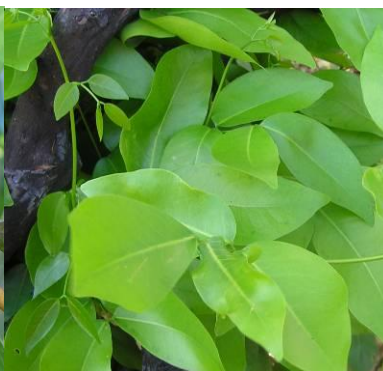
Artocarpus altilis (Park.) Fosb.



Psidium guajava L.



Ficus septica Burm. f.



Intsia bijuga (Colebr.) O. Ktze.



Drypetes falcata Pax & K. Hoffm.



Pterospermum celebicum Miq.



Aglaia rimosa (Blanco) Merr.



Podocarpus costalis C. Presl



Homalanthus rotundifolius Merr.



Mussaenda philippica A. Rich



Manihot glaziovii Muell.-Arg



Palaquium tenuipetiolatum Merr.



Melastoma malabathricum L. ssp. *malabathricum*



Shorea polysperma (Blanco) Merr.



Shorea contorta Vid.



Diospyros blancoi A. DC.



Barringtonia asiatica (L.) Kurz



Calophyllum inophyllum L.



Terminalia catappa L.



Cananga odorata (Lamk.) Hook.f. & Thoms.



Ceiba pentandra (L.) Gaertn.



Dillenia philippinensis Rolfe



Anacardium occidentale L.

|

APPENDIX 1. List of species with corresponding local names

LOCAL NAME	COMMON NAME	LOCAL NAME	COMMON NAME	LOCAL NAME	COMMON NAME	LOCAL NAME	COMMON NAME
5-star	ceara rubber	buned	gatasan	mabolo	kamagong	samak	binunga
agalumbay	adasai	dalipawen	dita	magalayaw	kangko	sayapo	sayapo
agandong	anabiong	danupra	kalantas	magalayaw purau	lupisan-liitan	sida-i	viapple
agrau	alagau	dapaian	dapiau	makarat	babuyan lunas	takulau	lanutan linis
alakaak-puti	alakaak-puti	dumadara	dumadara	malaikmo	urarog	talapnungan	talapnungan
alangingi	alangingi	dumadara A	damarau	malalansones	miau	talapnungan bakir	palonopoi
alem	alim	dumadara A	ngabngab	malalapnit	malabuho	tampui	tampui
alimunos	tanguile	dumadara B	tambalau	marabasa	bangulo	tibeg	malatibig
anagep	kubing-kauit	dungon	ngabngab	marakamiring	lomarau	tulang- tulang	pagingang tabak
anas	white lauan	dungon red	prickly narra	marakape	manggoi	uratan	urarog
andarayan	andarayan	dungon yellow	smooth narra	marapiña	kamot	wild mango	tirukan itim
aningat	almaciga	gad-dil	halakan	marasamak	hamindang	bamban	bamban
apatot	bangkoro	guyong- guyong	guyong- guyong	milan-milan	bani		
aplas	aplas	indang	katagpung tilos	namot	aropit	<i>*Local names were given by the guides.</i>	
apu	palosapis	kalupit	kalumpit	pakak	rimas		
argau	alagau-dagat	kamiring	malaligas	palatangan	dokloi		
arui	kangko	karming sambal	batinai	palomaria	palomaria		
balanggawisan	kansilai	kasiw	oro-kalingag	pamalalyen	katmon kambal		
balete	baleteng tilos	kayumanis laparan	kayumanis laparan	pangamiringen	lomarau		

balingagta	balingagta	lagontok	balanting bilog	pangaplasin	isis-ibon
banaba	panglomboien	lakyas	urarog	panglombien nalabaga/purau	malaruhat buntotatan
barakbak	pangugok	lanuti	pasuit	pau	kaluis
barsik	karmai- bugkau	laplapsot	lamog	pipyasen	kamiing
basog	maniknik	lapnit	taluto	rahayen	homalinan/homaliuan
batindaw	ulo	lasuban	lasuban	raya-raya	hauili
bayok	bayok bayokan	latabak	tangisang bayawak	sagat	sasalit/dangula
botbotchog	malabuhay	lingo-lingo	lingo-lingo	sagyat	malachico
bukyot	kalauis	lupa	lipa	salaysay	talisai
bulala	bulala	lupa puraw	Lipang kalabaw	salbang	dapdap

APPENDIX 2. List of plant species with their elevations (based on sampling)

FAMILY/ SCIENTIFIC NAME	ELEVATION	FAMILY/ SCIENTIFIC NAME	ELEVATION
Anacardiaceae		Lecythidaceae	
<i>Dracontomelon dao</i> (Blanco) Men	M	<i>Barringtonia spicata</i> Blume	L
<i>Oncocarpus tranchyphylla</i> (Perk.)	L - M	Leeaceae/ Vitaceae	
<i>Semecarpus glauciphyllus</i> Elmer	M	<i>Cayratia trifolia</i> (L.) Quis.	M
<i>Spondias cytherea</i> Rolfe.	M - H	<i>Leea guineensis</i> G. Don	M
<i>Swintonia acuta</i> Engl.	L	Marantaceae	
<i>Swintonia foxworthyl</i> (Elmer)	M - H	<i>Donax cannaeformis</i> (G. Forst.) K	M-H
Annonaceae		<i>Phrynium philippinensis</i> Ridl.	M
<i>Cyathocalyx acuminatus</i> C.B. Ro	M	Meliaceae	
<i>Orophea glabra</i> Merr.	M	<i>Aphanamixis polystachya</i> (Wall.)	L- M- H
<i>Orophea glabra</i> Merr.	H	<i>Hibiscus tiliaceus</i> L.	L
<i>Phaeanthus pubescens</i> Merr.	M	<i>Toona calantas</i> Merr. & Rolfe	M-H
<i>Polyalthia elongata</i> Merr.	M	<i>Aglaiia altenifoliola</i> Merr.	M - H
<i>Polyalthia ramiflora</i> Merr.	M	Moraceae	
<i>Uvaria</i> sp.	M	<i>Artocarpus altilis</i> (Park.) Fosb.	L - M - H
Apocynaceae		<i>Artocarpus vrieseana</i> Miq. <i>Var. refractus</i> (Becc.) Jarr.	L - M - H
<i>Alstonia scholaris</i> (L.) R. Br. var.	M	<i>Ficus ampelas</i> Burm. F.	L-M
<i>Kibatalia blancoi</i> (Rolfe.) Merr.	M	<i>Ficus congesta</i> Roxb. <i>Var congesta</i>	M
<i>Rauvolfia verticillata</i> (Lour.) Baill		<i>Ficus cumingii</i> Maq.	M
Araceae		<i>Ficus irisana</i> Elmer	M
<i>Homalomena philippinensis</i> Engl.	M	<i>Ficus pellucido-punctata</i> Griff.	L - M
Araliaceae		<i>Ficus septica</i> Burm. f.	L - M
<i>Arthrophyllum abernianum</i> Merr.	M - H	<i>Ficus variegata</i> Blume	L - M - H
<i>Polyscias nodosa</i> (Blume) Seem.	M	Myristicaceae	
Aracucariaceae		<i>Knema glomerata</i> (Blanco) Merr.	L - M - H
<i>Agathis philippinensis</i> Warb.	H	<i>Myristica ceylanica</i> A. DC. <i>Var. ca</i>	L-M-H
Arecaceae		Myrsinaceae	

<i>Calamus merrillii</i> Becc.	M	<i>Discocalyx xiphophylla</i> Quis. & M	H
<i>Caryota rumphiana</i> Mart. <i>Var. oxy</i>	M	Myrtaceae	
<i>Pinanga batanensis</i> Becc.	M	<i>Cleistocalyx operculatus</i> (Roxb) Merr. & Peery	M
<i>Vernonia acrophylla</i> Merr.	H	<i>Syzygium simile</i> (Merr.) Merr.	L - M - H
Burseraceae		<i>Syzygium acrophilum</i> (C.B. Rob.) Merr.	L - M
<i>Dacryodes costata</i> (Benn.) H.J. La	M	<i>Syzygium jambos</i> (L.) Alst.	H
Celastraceae		<i>Syzygium neei</i> (Merr.) Merr.	M
<i>Salacia korthalsiana</i> Mig.	L - M	<i>Syzygium obliquinervium</i> (Elmer)	M
Chlorathaceae		<i>Syzygium subcaudatum</i> (Merr.) M	H
<i>Sarcandra glabra</i>	H	Ncytaginaceae	
Clusiaceae		<i>Pisonia umbellifera</i> (J.R. & G. Fo	L - M
<i>Cratoxylum blancoi</i> Merr.	M	Olacaceae	
<i>Crataylum blancoi</i> Blume <i>var. ap</i>	M - H	<i>Strombosia philippinensis</i> (Baill.)	L - M - H
<i>Calophyllum inophyllum</i> L.	L	Oleaceae	
<i>Garcinia venolusa</i> (Blanco) Chois	M - H	<i>Linociera clementis</i> Quis. & Merr.	
Combretaceae		Phyllanthaceae	
<i>Terminalia catappa</i> L.	L	<i>Excoecaria obtusa</i> Merr.	L
<i>Terminalia microcarpa</i> Decne.	L-M	Podocarpaceae	
Convallariaceae		<i>Podocarpus costalis</i> C. Presl	L
<i>Draceana angustifolia</i> Roxb.		Polygalaceae	
Dilleniaceae		<i>Xanthophyllum vitellinum</i> (Blume)	L - M - H
<i>Dillenia diantha</i> Hoogl.	L - M	Pteridaceae	
Dipterocarpaceae		<i>Pteris philippinensis</i>	M-H
<i>Anisoptera thurifera</i> (Blanco) Blu	M-H	Putranjivaceae	
<i>Shorea contorta</i> (Vid.) Merr. & Ro	M - H	<i>Drypetes convulata</i> Airy Shaw	H
<i>Shorea polysperma</i> (Blanco) Merr	M-H	<i>Drypetes monosperma</i> (Mer.) Pa	H
Ebenaceae		Rubiaceae	
<i>Diospyros discolor</i> Willd.	L - M - H	<i>Canthium monstrosum</i> (A. Rich.)	M
<i>Diospyros elmeri</i> Merr.	M	<i>Canthium subcapitatum</i> (Merr.) M	M
<i>Diospyros ulo</i> Merr.	M	<i>Guetardella hexasperma</i> (Roxb.)	M

Elaeocarpaceae		<i>Ixora ebracteolata</i> Merr.	H
<i>Elaeocarpus curanii</i> Merr.	H	<i>Mitragyna rotundifolia</i> (Roxb.) O. Ktze	M
Euphorbiaceae		<i>Morinda citrifolia</i> L.	L
<i>Alchornea rugosa</i> (Lour.) Muell.-A	M	<i>Psychotria chasalioides</i> Merr.	L
<i>Breynia acuminata</i> Muell.-Argi		<i>Psychotria elliptilimba</i> Merr.	M - H
<i>Glochidion urophyloides</i> Elmer	M - L	<i>Randia wallichii</i> Hook. f. em. K. V.	H
<i>Homalonthus rotundifolius</i> Merr.	H	Rutaceae	
<i>Macaranga bicolor</i> Muell. Arg.	M - H	<i>Clausena grandifolia</i> Merr.	M
<i>Macaranga tanarius</i> (L.) Muell.-Ar	M-H	<i>Evodia monophyllia</i> Merr.	M
<i>Melanolepis multiglandosa</i> var. <i>m</i>	L -M	<i>Lunasia babuyanica</i> Merr.	L-M-H
<i>Manibot glaziovii</i> Muell.-Arg	L-M	Sapindaceae	
Fabaceae		<i>Acer laurinum</i> Haask. Apud Hoev	H
<i>Pongamia pinnata</i> (L.) Merr.	L	<i>Dimocarpus fumatus</i> (Blume) Lee	H
<i>Instia bijuga</i> (Colebr.) O. Kuntze	L	<i>Trigonachras falcatocuspudata</i> Ra	H
<i>Erythrina orientalis</i> (L.) Merr.	L	Sapotaceae	
<i>Leuceana leucocephala</i> (Lam) de	L	<i>Ganua obovatifolia</i> (Merr.) Assem	M
<i>Pongamia pinnata</i> (L.) Merr.	L	<i>Palaquim glabrum</i> Merr.	M
<i>Pterocarpus indicus</i> Willd. forma	H	<i>Palaquim tenuipetiolatum</i> Merr.	L - M - H
<i>Pterocarpus indicus</i> Willd. forma	L - M - H	<i>Ponteria luzoniensis</i> (Merr.) Baeb	L- M
<i>Lithocarpus castellarnaniannus</i> (Vidal)	M-H	Staphyleaceae	
<i>Lithocarpus vidalii</i> (F.-Vill.) Rehd	M - H	<i>Turpinia ovalifolia</i> Elmer	M
Flacourtiaceae/Malvaceae		<i>Turpinia sphaerocarpa</i> Hassk.	L
<i>Homalium multiflorum</i> Merr.	M -H	Sterculiaceae/ Malvaceae	
Gleicheniaceae		<i>Heritiera sylvatica</i> Vidal	L
<i>Dicropteris linearis</i> (Burm.) Under		<i>Pterocymbium tinctorium</i> (Blanco)	M - H
Icacinaceae		<i>Pterospermum niverum</i> Vidal	L
<i>Gomphandra cumingiana</i> (Miers)	M	<i>Sterculia oblongata</i> R. Br.	M
<i>Gomphandra luzoniensis</i> (Merr.)	L - H	Theaceae	
<i>Gonocaryum cognatum</i> Elm.		<i>Adinandra luzonica</i> Merr.	M
Juglandaceae		<i>Adinandra macgregorii</i> Merr.	M

<i>Engelbardia serrata</i> Blume	H	Thymelaeaceae	
Lauraceae		<i>Wikstroemia lanceolata</i> Merr.	L-M
<i>Actinodaphne</i> sp.	H	Tiliaceae/ Malvaceae	
<i>Beilschmiedia nigrifolia</i> Elm.	H	<i>Trichospermum eriopodum</i> (Turcz.)	M
<i>Cinnamomum oroi</i> Quis.	H	Ulmaceae/ Cannabaceae	
<i>Cryptocarya glauca</i> Merr.	L - M - H	<i>Celtis latifolia</i> (Blume) Planch.	L
<i>Debaasia cairocan</i> (Vidal) C. K. A	H	<i>Celtis philippinensis</i>	L-M
<i>Litsea fulva</i> (Blume) Fernandez-V	H	<i>Trema orientalis</i> (L.) Blume	L - M
<i>Litsea garciae</i> Vidal	H	Urticaceae	
<i>Litsea ilocana</i> Merr.	H	<i>Dendrocnide luzonensis</i> (Wedd.)	L
<i>Litsea odorifera</i> Val.	H	<i>Dendrocnide meyeniana</i> (Walp.)	M
<i>Litsea philippinensis</i> Merr.	M	Verbenaceae/ Lamiaceae	
<i>Litsea urdanetensis</i> Elmer	M	<i>Premna integrifolia</i> L.	L
<i>Neolitsea megacarpa</i> Merr.	M	<i>Premna odorata</i> Blanco	M
		<i>Teijsmanniodendron abernianum</i>	M - H
		<i>Vitex turczaninowii</i> Merr.	L-M

- L- low elevation
- M- medium/ intermediate elevation
- H- high elevation

APPENDIX 3. Checklist of species of Calayan Island

The families of lycophytes, fern and their allies are arranged alphabetically; gymnosperms follow the classification of Walter S. Judd, et. al ((Plant Systematics: A Phylogenetic Approach, 2002) and angiosperms follow the recent classification in the APG II 2003 (An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG II, The Linnean Society of London, Botanical Journal of the Linnean Society, 141: 399 - 436).

§ - Island – endemic (found only in the Babuyan Islands)

* - exotic

LYCOPHYTES

Lycopodiales

Lycopodiaceae

Lamon babae

Lycopodiella cernua (L.) Pic. Serm.

Selaginellaceae

Kamariang gubat

Selaginella plana Hieron

PTERIDOPHYTES

Aspleniaceae

Pakpak lawin

Asplenium musaeifolium Mett.

Pakpak lawin lalake

Asplenium nidus L.

Blechnaceae

Pakong alakdan

Blechnum orientale L.

Cyatheaceae

Pakong buwaya

Cyathea contaminans (Wall. et. Hook.) Copel.

Gleicheniaceae

Kilob

Dicranopteris linearis (Burm. f.) Underw.

Ophioglossaceae

Tukod langit

Helminthostachys zeylanica (L.) Hook

Polypodiaceae

Kabkab

Drynaria quercifolia (L.) J. Sm.

Pakong bato

Microsorium longissimum Fee

Pteridaceae

Pakong gubat

Pityrogramma calomelanos (L.) Link

Pako

Pteris mutilata Linn.

Schizaeaceae

Nito

Lygodium flexuosum (L.) Sw.

Nitong puti

Lygodium circinnatum (Burm.) Sw.

GYMNOSPERMS

Cycadales

Cycadaceae

Pitogo

Cycas riuminiana Porte ex Regel

Coniferales

Podocarpaceae

§ Igem dagat

Podocarpus costalis C. Presl

Araucariaceae

Almaciga

Agathis philippinensis Warb.

ANGIOSPERMS

BASAL FAMILIES

Chloranthaceae

Gipas

Sarcandra glabra (Thun.) Nakai

MAGNOLIIDS

Laurales

Lauraceae

Alau Malian

Tirukan itim

Oro-kalingag

Baliktaran

Malakadios

Margapali

Limbahan

Bangulo

Malabakan

Batikuling surutan

Bakan

Dilak – manuk

Balakauin

* Avocado

Actinodaphne sp.

Beilschmiedia nigrifolia Elm.

Cinnamomum oroi Quis.

Cryptocarya glauca Merr.

Debaasia cairocan (Vid.) C.K. Allen

Debaasia incrassata (Jack) Kosterm.

Litsea fulva (Blume) F.-Vill.

Litsea garciae Vid.

Litsea ilocana Merr.

Litsea odorifera Val.

Litsea philippinensis Merr.

Litsea urdanetensis Elmer

Neolitsea megacarpa Merr.

Persea gratissima Gaertn.

Magnoliales

Annonaceae

*Guyabano

*Atis

Ilang- ilang

Damarau

Lanutan linis

Annona muricata L.

Annona squamosa L.

Cananga odorata (Lamk.) Hook.f.& Thoms.

Cyathocalyx globosus Merr.

Orophea glabra Merr.

Langlangis
Lanutan haba
Lasuban
*Indian Lanutan
Allagat

Myristicaceae

Anuping
Tambalau
Ngab – ngab

Phaeanthus pubescens Merr.
Polyalthia elongata Merr.
Polyalthia ramiflora Merr.
Polyalthia longifolia Benth.& Hook.f.
Uvaria sp.

Knema glomerata (Blanco) Merr.
Myristica ceylanica A. DC. var. *cagayanensis* (Merr.) Sincl.

Piperales

Piperaceae

Ikmo

Piper betle L.

MONOCOTS

Alismatales

Araceae

*Biga
Lusegut
Gabi
Alopayi
Dugtong
Bolong kahinai
Amlong
*Kamay kastila
Yautia

Alocasia macrorrhizos (L.) G. Don
Amydrium medium (Zoll. & Mor.) Nicolson
Colocasia esculentum (L.) Schott
Homalomena philippinensis Engl. ex Engl. & Krause
Photos hermaphroditus (Blanco) Merr.
Photodium lobbianum Schott
Rhaphidophora merrilli Engl.
Syngonium podophyllum Schott.
Xanthosoma violaceum Schott

Asparagales

Asparagaceae

Fortune plant

Malasambal

Laxmanniaceae

Baston de San Jose

Hypoxidaceae

Abang-abang

Dracaena fragrans Ker- Gawl.

Dracaena angustifolia Roxb.

Cordyline terminalis (L.) Kunth. var. *ferrea*

Curculigo capitulata (Lour.) O. Kuntze

Pandanales

Pandanaceae

Pandan banguhan

Pandan dagat

Pandanus amaryllifolius Roxb.

Pandanus tectorius Soland.

COMMELINIDS

Arecales

Arecaceae

Palasan

Tandulang parang

Takipan tilos

*Niog

Anahau

Dapiau

Calamus merrillii Becc.

Calamus usitatus Blanco

Caryota rumbiana Mart. var. *oxydonta* Becc.

Cocos nucifera L.

Livistonia rotundifolia (Lam.) Mart. var. *luzonensis* Becc.

Pinanga batanensis Becc.

Poales

Bromeliaceae

*Pinya

Poaceae

Kauayan kiling

Bikal

Ananas comosus (L.) Merr.

Bambusa vulgaris Schrad. ex. Wendland

Dinochloa acutiflora (Munro) S. Dransf.

Bikal babui
Cogon
Palay
Talahib
Mais

Dinocloa luconiae (Munro) Merr.
Imperata cylindrica (L.) Beauv.
Oryza sp.
Saccharum spontaneum L.
Zea mays Linn.

Zingiberales

Costaceae

Tubang-usa

Costus speciosus (Koenig) Smith

Marantaceae

Pagingang tabak

Bamban

Hagithit

Discocalyx xiphophylla Quis. & Merr.

Donax cannaeformis (G. Forst.) K. Schum.

Phrynium philippinense Ridl.

Musaceae

Saging matsing

Musa acuminata Colla

Zingiberaceae

Tagbak

Alpinia elegans (Presl.) K. Schum.

Pal-la

Alpinia galanga (L.) Sw. var. *pyramidata* (Blume) K. Schum.

CORE EUDICOTS

Ranunculales

Dilleniaceae

Katmon kambal

Katmon

Dillenia diantha Hoogl.

Dillenia philippinensis Rolfe

Caryophyllales

Nyctaginaceae

Anuling

Pisonia umbellifera (Forst.) Seem.

Polygalaceae

Kamot

Xanthophyllum vitellinum (Blume) Dietr.

Santalales

Olacaceae

Tamayuan

Strombosia philippinensis (Baill.) Rolfe

ROSIDS

Saxifragales

Vitaceae

Alangingi

Mali-mali

Ayo

Cayratia trifolia (L.) Domin.

Leea guineensis G. Don

Tetrastigma harmandii Planch.

Crossosomatales

Staphyleaceae

Anongo

Laloi

Turpinia ovalifolia Elmer

Turpinia sphaerocarpa Hassk.

Myrtales

Combretaceae

Kalumpit

Talisai

Lythraceae

Melendres

Banaba

Melastomataceae

Malatungaw

Terminalia microcarpa Decne. subsp. *microcarpa*

Terminalia catappa L.

Lagerstroemia indica L.

Lagerstroemia speciosa (L.) Pers.

Melastoma malabathricum L. ssp. *malabathricum*

Myrtaceae

Malaruhat

*River red gum

*Guava

Baltik

Duhat

Tampui

Pangugok

Barabak

Panglomboien

Malaruhat bundok

Cleistocalyx operculatus (Roxb.) Merr. & Perry

Eucalyptus camaldulensis Dehnh.

Psidium guajava L.

Syzygium acrophilum (C.B. Rob.) Merr.

Syzygium cumini (L.) Skeels

Syzygium jambos (L.) Alst.

Syzygium neei (Merr.) Merr.

Syzygium obliquinervium (Elmer) Merr.

Syzygium simile (Merr.) Merr.

Syzygium subcaudatum (Merr.) Merr.

EUROSIDS I

Celastrales

Celastraceae

Aropit

Salacia korthalsiana Miq.

Fabales

Fabaceae

*Mani

*Fringon

Caballero

*Golden shower

Dapdap

Kakauate

Ipil

*Ipil-ipil

Makahiya

Arachis hypogaea L.

Bauhinia monandra Kurz

Caesalpinia pulcherrima (L.) Swartz

Cassia fistula L.

Erythrina variegata L.

Gliricidia sepium (Jacq.) Kunth ex Walp.

Intsia bijuga (Colebr.) O. Ktze.

Leuceana leucocephala (Lam.) de Wit

Mimosa pudica L.

Bani
Prickly narra
Smooth narra
*Sampalok
Polygonaceae
*Kadena de amor

Pongamia pinnata (L.) Merr.
Pterocarpus indicus Willd. forma *echinatus* (Pers.) Rojo
Pterocarpus indicus Willd. forma *indicus*
Tamarindus indica L.

Antigodon leptotus Hook & Arn.

Fagales

Casuarinaceae
Agoho
Fagaceae
Palonapoi
Vidal oak
Lithocarpus
Juglandaceae
Lupisan-liitan

Casuarina equisetifolia Forst.

Lithocarpus castellarnauianus (Vid.) A. Camus
Lithocarpus vidalii (F. -Vill.) Rehd
Lithocarpus sp.

Engelhardia serrata Blume

Malpighiales

Clusiaceae
Bitagog
Kansilai
Guyong-guyong
Gatasan
Euphorbiaceae
Bogus
Aguioi
Kamai-bugkau
Panantolen

Calophyllum inophyllum L.
Cratoxylum blancoi Blume var. *apiculatum* Merr.
Cratoxylum blancoi Merr.
Garcinia venulosa (Blanco) Choisy

Acalypha amentacea Roxb.
Alchornea rugosa (Lour.) Muell.-Arg.
Breynia acuminata Muell.-Arg.
Fabrenheitia pendula (Hassk.) Airy Shaw

Halakan
Balanting bilog
Hamindang
Binunga
Hinlaumo
Anaplan
Banato
*Cassava
*Ceara rubber
Alim
Apanang
*Castor oil plant

Passifloraceae

*Pasionaria

Phyllanthaceae

Bignai
Bignai pugo
Batano

Putranjivaceae

Lukot
§ Balingagta
Utong- babui

Oxalidales

Elaeocarpaceae

Bangles

Oxalidaceae

Kamias

Glochidion urophyloides Elmer
Homalonthus rotundifolius Merr.
Macaranga bicolor Muell.- Arg.
Macaranga tanarius (L.) Muell- Arg.
Mallotus ricinoides (Pers.) Muell.- Arg.
Mallotus paniculatus (Lam.) Muell. -Arg.
Mallotus philippinensis (Lam.) Muell- Arg.
Manihot esculenta Crantz
Manihot glaziovii Muell.-Arg
Melanolepis multiglandosa (Reinw. ex Blume) Reichb.f. & Zoll.
Neotronia cumingii (Muell.Arg.) Pax & K. Hoffm.
Ricinus communis L.

Passiflora edulis Sims

Antidesma bunius (L.) Spreng.
Antidesma pentandrum (Blanco) Merr.
Excoecaria obtusa Merr.

Drypetes convulata Airy Shaw
Drypetes falcata Pax & K. Hoffm.
Drypetes monosperma (Merr.) Pax & K. Hoffm.

Elaeocarpus curanii Merr.

Averhoa bilimbi L.

*Balimbing

Averboea carambola L.

Rosales

Cannabaceae

Urarog

Malaikmo

Anabiong

Moraceae

*Rimas

*Nangka

Kubing-kauit

Upling gubat

Malatibig

Isis-ibon

Butli

Aplas

Hagimit

Tibig

Baleteng tilos

Niog-niogan

Hauili

Tangisang bayawak

Rosaceae

Sapinit

Urticaceae

Lipa

Lipang kalabaw

*Alabong

Celtis latifolia (Blume) Planch.

Celtis philippinensis Blanco

Trema orientalis (L.) Blume

Artocarpus altilis (Park.) Fosb.

Artocarpus heterophyllus Lam.

Artocarpus vrieseanus Miq. var. *refractus* (Becc.) Jarr.

Ficus ampelas Burm. f.

Ficus congesta Roxb.

Ficus cumingii Miq. var. *cumingii*

Ficus gul Laut. & K. Schum.

Ficus irisana Elm.

Ficus minabassae (Tejism & de Vr.) Miq.

Ficus nota (Blanco) Merr.

Ficus pellucido-punctata Griff.

Ficus pseudopalma Blanco

Ficus septica Burm. f.

Ficus variegata Blume

Rubus sp.

Dendrocnide luzonensis (Wedd.) Chew var. *luzonensis*

Dendrocnide meyeniana (Walp.) Chew

Pilea microphylla (L.) Liebm.

Hanopol

Poikilospermum suaveolens (Blume) Merr.

EUROSIDS

Brassicales

Caricaceae

*Papaya

Carica papaya L.

Moringaceae

Malungai

Moringa oleifera Lamk.

Malvales

Bixaceae

*Achuete

Bixa orellana L.

Dipterocarpaceae

Palosapis

Anisoptera thurifera (Blanco) Blume

Dalingdingan

Hopea foxworthyi Elm.

White lauan

Shorea contorta Vid.

Tanguile

Shorea polysperma (Blanco) Merr.

Malvaceae

*American kapok

Ceiba pentandra (L.) Gaertn.

Dungon

Heritiera sylvatica Vid.

Gumamela

Hibiscus rosa-sinensis L.

malabago

Hibiscus tiliaceus L.

Tamuyan

Homalium multiflorum Merr.

Taluto

Pterocymbium tinctorium (Blanco) Merr.

Bayok bayokan

Pterospermum celebicum Miq.

Malabuho

Sterculia oblongata R. Br.

Banilad

Sterculia comosa Wall.

*Cacao

Theobroma cacao L.

Sayapo
Kulot-kulotan

Thymelaeaceae

Salagong sibat

Trichospermum eriopodum (Turcz.) Merr.

Triumfetta bartramia L.

Wikstroemia lanceolata Merr.

Sapindales

Anacardiaceae

*Kasoy

Dao

Mangga

Malaligas

Masukal

Kamiring

Viapple

Kalauis

Lomarau

Burseraceae

Kalaua

Meliaceae

Bayanti

Kangko

Miau

Bagalunga

Santol

*Big leaf mahogany

Kalantas

Malabuhan

Rutaceae

Anacardium occidentale L.

Dracontomelon dao (Blanco) Merr.

Mangifera indica L.

Semecarpus trachyphyllus Perk.

Semecarpus glauciphyllus Elmer

Semecarpus philippinensis Engl.

Spondias cytherea Sonn.

Swintonia acuta Engl.

Swintonia foxworthyi Elmer

Dacryodes costata (Benn.) H.J. Lam

Aglaia rimosa (Blanco) Merr.

Aphanamixis polystachya (Wall.) R.N. Parker

Dysoxylum alliaceum Blume

Melia azadirachta L.

Sandoricum koetjape (Burm.f.) Merr.

Swietenia macrophylla King

Toona calantas Merr. & Rolfe

Aglaia lawii (Wight) Sald. ex. Ram.

Lukban
Kayumanis laparan
Kamal bugtongin
§ Babuyan lunas
Matang-araw

Sapindaceae

Philippine maple
Bulala
Salab

Citrus maxima (Burm.) Merr.
Clausena grandifolia Merr.
Evodia monophylla Merr.
Lunasia babuyanica Merr.
Melicope triphylla (Lam.) Merr.

Acer laurinum Haask.
Dimocarpus fumatus (Blume) Leenh. ssp. *philippinensis* Leenh.
Trigonachras cuspidata Radlk.

ASTERIDS

Ericales

Ebenaceae

Kamagong
Balingagta
Ebony
Ulo

Diospyros blancoi A. DC.
Diospyros elmerii Merr.
Diospyros ferrea (Willd.) Bakh.
Diospyros ulo Merr.

Lecythidaceae

Botong
Nuling
Lamog

Barringtonia asiatica (L.) Kurz
Barringtonia acutangula (L.) Gaertn. ssp. *spicata* (Blume) Payson
Planchonia spectabilis Merr.

Myrsinaceae

Ardisia

Ardisia sp.

Sapotaceae

Baraibai
*Caimito
Pianga
Alakaak-puti
Maniknik

Cerbera manghas L.
Chrysophyllum cainito L.
Ganua obovatifolia (Merr.) Assem
Palaquim glabrum Merr.
Palaquim tenuipetiolatum Merr.

Duklitan
Banokbok
Tiesa
Theaceae
Kamiing
Batinai

Planchonella duclitan (Blanco) Baehni
Pouteria luzoniensis (Merr.) Baehni var. *luzoniensis*
Pouteria rivicoa (Gaertn.f.) Ducke

Adinandra luzonica Merr.
Adinandra macgregorii Merr.

EUASTERIDS I

Ericales

Boraginaceae
Tsaang gubat
Icacinaceae
Mangoi
Mabunot
Angkak

Ehretia microphylla Lam.

Gomphandra cumingiana (Miers) F.- Vill.
Gomphandra luzoniensis (Merr.) Merr.
Gonocaryum cognatum Elm.

Gentiales

Apocynaceae
Dita
Pandakaki
Pasnit
Tangitang
Andarayan
Rubiaceae
Tadiang anuang
Apaipai
*Kape
Dimupa

Alstonia scholaris (L.) R. Br.
Tabernaemontana pandacaqui Poir.
Kibatalia blancoi (Rolfe) Merr.
Neissosperma glomerata (Blume) Fasb.& Sachet
Rauwolfia verticillata (Lour.) Baillon

Canthium monstrosum (A. Rich.) Merr.
Canthium subcapitalum (Merr.) Merr.
Coffea arabica L.
Guetardella hexasperma (Roxb.) Jansen

*Santan
Pilis
Asas
Mambog
Bangkoro
Kahoy dalaga
Kadpaayan
Katagpung tilos
Bosili

Ixora chinensis Lam.
Ixora ebracteolata Merr.
Ixora macrophylla Bartl. ex DC.
Mitragyna rotundifolia (Roxb.) O. Ktze.
Morinda citrifolia L.
Mussaenda philippica A. Rich
Psychotria chasalioides Merr.
Psychotria elliptilimba Merr.
Randia wallichii Hook.f.ex K.& V.

Lamiales

Acanthaceae

Red adontorema

Lamiaceae

*Gmelina

Alagau-dagat

Alagau

Dangula

Lagundi

Lingo-lingo

Oleaceae

Kayantol

Verbenaceae

*Pigeon berry

*Coronitas

Odontonema strictum (Nees.) O. Kuntze

Gmelina arborea Roxb.

Premna integrifolia L.

Premna odorata Blanco

Teijsmanniodendron abernianum (Merr.) Bakh.

Vitex negundo L.

Viticipremna philippinensis (Turcz.) H.J. Lam.

Linociera clementis Quis. & Merr.

Duranta repens L.

Lantana camara L.

Solanales

Convolvulaceae

*Sweet potato

Bulakan

Solanaceae

Siling labuyo

*Tabako

Bagan-bagan

Ipomoea batatas (L.) Lamk.

Merremia peltata (L.) Merr.

Capsicum frutescens L.

Nicotiana tabacum L.

Solanum biflorum Lour.

EUASTERIDS II

Apiales

Araliaceae

Dokloi

Malapapaya

Galamay-amoy

Arthophyllum abernianum Merr.

Polyscias nodosa (Blume) Seem.

Schefflera elliptica (Blume) Harms

Asterales

Asteraceae

*Gonoi

Adasai

Chromolaena odorata (L.) R.M. King & H. Rob.

Vernonia acrophila Merr.

APPENDIX 4. Various uses of the plant species of Calayan and utility classification by DAO 19

Common Name	Scientific Name	Utility/ Use	DAO- 19
Bogus	<i>Acalypha amentacea</i> Roxb.	Timber	LUS
Philippine maple	<i>Acer laurinum</i> Haask.		LUS
Alaui malian	<i>Actinodaphne</i> sp.		
Kamiing	<i>Adinandra luzonica</i> Merr.		LUS
Batinai	<i>Adinandra macgregorii</i> Merr.		LUS
	<i>Adinandra</i> sp.		
Almaciga	<i>Agathis philippinensis</i> Warb.	Timber, plants producing exudates	PS
Malabuhan	<i>Aglaia alternifoliola</i> Merr.		LUS
Bayanti	<i>Aglaia rimosa</i> (Blanco) Merr.		LUS
Aguioi	<i>Alchornia rugosa</i> (Lour.) Muell.-Arg.	Medicinal	LUS
Biga	<i>Alocasia macrorrhizos</i> (L.) G. Don	Vegetables, ornamental	
Tagbak	<i>Alpinia elegans</i> (Presl.) K. Schum.	Edible fruits and nuts, made to lotion	
Pal-La	<i>Alpinia galanga</i> (L.) Sw. var. <i>pyramidata</i> (Blume) K. Schum.	Spices and condiments	
Dita	<i>Alstonia scholaris</i> (L.) R. Br.	Medicinal, ornamental	PMS
Lusegut	<i>Amydrium medium</i> (Zoll. & Mor.) Nicolson		
Kasoy	<i>Anacardium occidentale</i> L.	Edible fruits and nuts, ornamental, beverage	LUS
Pinya	<i>Ananas comosus</i> (L.) Merr.		
Palosapis	<i>Anisoptera thurifera</i> (Blanco) Blume	Timber	PG
Guyabano	<i>Annona muricata</i> L.	Edible fruits and nuts, ornamental	LUS
Atis	<i>Annona squamosa</i> L.	Edible fruits and nuts, ornamental	LUS
Bignai	<i>Antidesma bunius</i> (L.) Spreng.	Edible fruits and nuts, medicinal, ornamental	LUS
Bignai pugo	<i>Antidesma pentandrum</i> (Blanco) Merr.		

Kadena de amor	<i>Antigonon leptopus</i> Hook & Arn.	Ornamental	
Kangko	<i>Aphanamixis polystachya</i> (Wall.) R.N. Parker	Timber	LUS
Mani	<i>Arachis hypogaea</i> L.		
	<i>Ardisia</i> sp.		
Dokloi	<i>Arthrophyllum abernianum</i> Merr.		LUS
Rimas	<i>Artocarpus altilis</i> (Park.) Fosb.	Edible fruits and nuts	LUS
Nangka	<i>Artocarpus heterophyllus</i> Lam.	Edible fruits and nuts, ornamental	LUS
Kubing-kauit	<i>Artocarpus vrieseanus</i> Miq. var. <i>refractus</i> (Becc.) Jarr.	Edible fruits and nuts	LUS
Pakpak lawin	<i>Asplenium musaeifolium</i> Mett.	Ornamental	
Pakpak lawin lalake	<i>Asplenium nidus</i> L.	Ornamental	
Kamias	<i>Averhoa bilimbi</i> L.	Edible fruits and nuts, medicinal	LUS
Balimbing	<i>Averhoa carambola</i> L.	Edible fruits and nuts, medicinal	LUS
Kauayan kiling	<i>Bambusa vulgaris</i> Schrad.	Constuction and furniture, medicinal, ornamental	
Nuling	<i>Barringtonia acutangula</i> (L.) Gaertn. ssp. <i>spicata</i> (Blume) Payens		LUS
Botong	<i>Barringtonia asiatica</i> (L.) Kurz	Medicinal	LUS
Fringon	<i>Bauhinia monandra</i> Kurz	Ornamental	LUS
Tirukan itim	<i>Beilschmiedia nigrifolia</i> Elm.		LUS
Achuete	<i>Bixa orellana</i> L.	Tannin and dye-producing plants	LUS
Pakong alakdan	<i>Blechnum orientale</i> L.	Edible fruits and nuts	
Kamai-bugkau	<i>Breynia acuminata</i> Muell.-Arg.		LUS
Caballero	<i>Caesalpinia pulcherrima</i> (L.) Swartz	Ornamental	LUS
Palasan	<i>Calamus merrillii</i> Becc.	Handicraft and furniture	
Tandulang parang	<i>Calamus usitatus</i> Blanco	Handicraft and furniture	

Gabi	<i>Calocasia esculentum</i> (L.) Schott		
Bitao	<i>Calophyllum inophyllum</i> L.	Timber	FCH
Ilang- ilang	<i>Cananga odorata</i> (Lamk.) Hook.f.& Thoms.	Essential oil plants, medicinal, ornamental	
Tadiang anuang	<i>Canthium monstrosum</i> (A. Rich.) Merr.		LUS
Apai	<i>Canthium subcapitalum</i> (Merr.) Merr.		LUS
Siling labuyo	<i>Capsicum frutescens</i> L.	Spices and condiments, ornamental	
Papaya	<i>Carica papaya</i> L.	Edible fruits and nuts, soap making, ornamental	
Takipan tilos	<i>Caryota rumphiana</i> Mart. var. <i>oxydonta</i> Becc.	Timber, ornamental	
Golden shower	<i>Cassia fistula</i> L.	Medicinal, ornamental, agricultural implement, tannin and dye-producing plants	
Agoho	<i>Casuarina equisetifolia</i> Forst.		FCH
Alangingi	<i>Cayratia trifolia</i> (L.) Quis.	Medicinal	
American kapok	<i>Ceiba pentandra</i> (L.) Gaertn.	Fiber plants, ornamental	LUS
Urarog	<i>Celtis latifolia</i> (Blume) Planch.		LUS
Malaikmo	<i>Celtis philippinensis</i> Blanco	Timber	LUS
Baraibai	<i>Cerbera manghas</i> L.	Vegetable oils and fats, medicinal, fuel plants, agricultural implement, ornamental	LUS
Gonoi	<i>Chromolaena odorata</i> (L.) R.M. King & H. Rob.		LUS
Caimito	<i>Chrysophyllum cainito</i> L.	Edible fruits and nuts, medicinal	LUS
Oro-kalingag	<i>Cinnamomum oroi</i> Quis.		LUS
Lukban	<i>Citrus maxima</i> (Burm.) Merr.	Edible fruits and nuts	LUS
Kayumanis laparan	<i>Clausena grandifolia</i> Merr.		LUS
Malaruhut	<i>Cleistocalyx operculatus</i> (Roxb.) Merr. & Perry	Medicinal	FCH
Niog	<i>Cocos nucifera</i> L.	Vegetable oils and fats, timber, food, medicinal	

Kape	<i>Coffea arabica</i> L.	Beverage, ornamental	LUS
Baston de San Jose	<i>Cordyline terminalis</i> (L.) Kunth. var. <i>ferrea</i>	Ornamental	
Tubang-usa	<i>Costus speciosus</i> (Koenig) Smith	Medicinal	
Kansilai	<i>Cratoxylum blancoi</i> Blume var. <i>apiculatum</i> Merr.		LUS
Guyong-guyong	<i>Cratoxylum blancoi</i> Merr.	Fiber plants	LUS
Baliktaran	<i>Cryptocarya glauca</i> Merr.		LUS
Abang-abang	<i>Curculigo capitulata</i> (Lour.) O. Kuntze	Ornamental	
Pakong buwaya	<i>Cyathea contaminans</i> (Hook) Copel	Ornamental, root and tuber plants, agricultural implement	
Damarau	<i>Cyathocalyx acuminatus</i> C.B. Rob.		LUS
Pitogo	<i>Cycas riuminiana</i> Porte ex Regel		
Kalaua	<i>Dacryodes costata</i> (Benn.) H.J. Lam		LUS
Malakadios	<i>Debaasia cairocan</i> (Vid.) C.K. Allen		LUS
Margapali	<i>Debaasia incrassata</i> (Jack) Kosterm.		LUS
Lipa	<i>Dendrocnide luzonensis</i> (Wedd.) Chew var. <i>luzonensis</i>		LUS
Lipang kalabaw	<i>Dendrocnide meyeniana</i> (Walp.) Chew	Essential oil plants	LUS
Kilob	<i>Dicranopteris linearis</i> (Burm.) Underw.		
Katmon kambal	<i>Dillenia diantha</i> Hoogl.		LUS
Katmon	<i>Dillenia philippinensis</i> Rolfe	Timber, ornamental	LUS
Bulala	<i>Dimocarpus fumatus</i> (Blume) Leenh. ssp. <i>philippinensis</i> Leenh.		
Bikal	<i>Dinochloa acutiflora</i> (Munro) S. Dransf.		
Bikal babui	<i>Dinochloa luconiae</i> (Munro) Merr.	Construction and furniture	
Kamagong	<i>Diospyros blancoi</i> A. DC.	Edible fruits and nuts, medicinal, furniture,	PS

		ornamental	
Balingagta	<i>Diospyros elmeri</i> Merr.		LUS
Ebony	<i>Diospyros ferrea</i> (Willd.) Bakh.	Timber	PS
Ulo	<i>Diospyros ulo</i> Merr.		LUS
Pagingang tabak	<i>Discocalyx xiphophylla</i> Quis. & Merr.		
Bamban	<i>Donax cannaeformis</i> (G. Forst.) K. Schum.	Handicraft	
Fortune plant	<i>Dracaena fragrans</i> Ker- Gawl.	Oranamental	
Malasambal	<i>Draceana angustifolia</i> Roxb.	Ornamental	
Dao	<i>Dracontomelon dao</i> (Blanco) Merr.	Edible fruits and nuts, furniture, medicinal, ornamental	PS
Kabkab	<i>Drynaria quercifolia</i> (L.) J. Sm.	Ornamental	
Lukot	<i>Drypetes convulata</i> Airy Shaw		LUS
Balingagta	<i>Drypetes falcata</i> Pax & K. Hoffm.	Ornamental	LUS
Utong- babui	<i>Drypetes monosperma</i> (Merr.) Pax & K. Hoffm.	Ornamental	LUS
Pigeon berry	<i>Duranta repens</i> L.		
Miau	<i>Dysoxylum alliaceum</i> Blume	Aromatic woods	FCH
Tsaang gubat	<i>Ehretia microphylla</i> Lam.		
Bangles	<i>Elaeocarpus curanii</i> Merr.		LUS
Lupisan-liitan	<i>Engelhardia serrata</i> Blume	Timber	LUS
Dapdap	<i>Erythrina variegata</i> L.	Medicinal, ornamental	LUS
River red gum	<i>Eucalyptus camaldulensis</i> Dehnh.	Timber, ornamental	LUS
Kamal bugtongin	<i>Evodia monophylla</i> Merr.		LUS
Batano	<i>Excoecaria obtusa</i> Merr.		LUS
Panantolen	<i>Fabrenbeitia pendula</i> (Hassk.) Airy Shaw		LUS
Upling gubat	<i>Ficus ampelas</i> Burm. f.	Medicinal	LUS

Malatibig	<i>Ficus congesta</i> Roxb.		LUS
Isis-ibon	<i>Ficus cumingii</i> Miq. var. <i>cumingii</i>		LUS
Butli	<i>Ficus gul</i> Laut. & K. Schum.		LUS
Aplas	<i>Ficus irisana</i> Elm.		LUS
Hagimit	<i>Ficus minabassae</i> (Tejism & de Vr.) Miq.	Fiber plants	LUS
Tibig	<i>Ficus nota</i> (Blanco) Merr.	Edible fruits and nuts, water generation	LUS
Baleteng tilos	<i>Ficus pellucido-punctata</i> Griff.		LUS
Niog-niogan	<i>Ficus pseudopalma</i> Blanco	Ornamental	LUS
Hauili	<i>Ficus septica</i> Burm. f.	Medicinal, ornamental	LUS
Tangisang bayawak	<i>Ficus variegata</i> Blume	Construction, shade and cover plants, plants producing exudates	LUS
Pianga	<i>Gannua obovatifolia</i> (Merr.) Assem		LUS
Gatasan	<i>Garcinia venolusa</i> (Blanco) Choisy		LUS
Kakauate	<i>Gliricidia sepium</i> (Jacq.) Kunth ex Walp.	Ornamental, forage	LUS
Halakan	<i>Glochidion urophyllodes</i> Elmer		LUS
Gmelina	<i>Gmelina arborea</i> Roxb.	Ornamental	PMS
Mangoi	<i>Gomphandra cumingiana</i> (Miers) F.- Vill.	Construction, furniture, fiber plants	LUS
Mabunot	<i>Gomphandra luzoniensis</i> (Merr.) Merr.		LUS
Angkak	<i>Gonocaryum cognatum</i> Elm.		LUS
Dimupa	<i>Guettardella hexasperma</i> (Roxb.) Jansen		LUS
Anuping	<i>Gymnacranchera farquhariana</i> (Hook. F. & Thomson) var. <i>paniculata</i> (A.D.C.) R.T. Schouten		LUS
Tukod langit	<i>Helminthostachys zeylanica</i> (L.) Hook	Edible leaves	
Dungon	<i>Heritiera sylvatica</i> Vid.	Timber	LUS
Gumamela	<i>Hibiscus rosa-sinensis</i> L.	Ornamental, medicinal	LUS

malabago	<i>Hibiscus tiliaceus</i> L.	Fiber plants, ornamental	LUS
Tamuyan	<i>Homalium multiflorum</i> Merr.		LUS
Alopayi	<i>Homalomena philippinensis</i> Engl. ex Engl. & Krause		
Balanting bilog	<i>Homalonthus rotundifolius</i> Merr.		LUS
Dalingdingan	<i>Hopea foxworthyi</i> Elm.		MG
Cogon	<i>Imperata cylindrica</i> (L.) Beauv.	Packing and thaching, source of fiber	
Ipil	<i>Intsia bijuga</i> (Colebr.) O. Ktze.	Timber, medicinal, shade and cover plants, edible seed	PS
Sweet potato	<i>Ipomoea batatas</i> (L.) Lamk.	Root and tuber plants, edible leaves	
Santan	<i>Ixora chinensis</i> Lam.	Medicinal, ornamental	
Pilis	<i>Ixora ebracteolata</i> Merr.		
Asas	<i>Ixora macrophylla</i> Bartl. ex DC.		
Pasnit	<i>Kibatalia blancoi</i> (Rolfe) Merr.	Medicinal	LUS
Tambalau	<i>Knema glomerata</i> (Blanco) Merr.	Timber	LUS
Melendres	<i>Lagerstroemia indica</i> L.	Ornamental	LUS
Banaba	<i>Lagerstroemia speciosa</i> (L.) Pers.	Timber, medicinal, ornamental, plants producing exudates	FCH
Coronitas	<i>Lantana camara</i> L.	Medicinal, ornamental	LUS
	<i>Lasianthus</i> sp.		
Mali-mali	<i>Leea guineensis</i> G. Don	Medicinal, ornamental	LUS
Ipil-ipil	<i>Leuceana leucocephala</i> (Lam.) de Wit	Shade and cover plants, ornamental	LUS
Kayantol	<i>Linociera clementis</i> Quis. & Merr.		LUS
Palonapoi	<i>Litocarpus castellanianus</i> (Vid.) A. Camus		
Vidal oak	<i>Litocarpus vidalii</i> (F. -Vill.) Rehd		LUS
Limbahan	<i>Litsea fulva</i> (Blume) F.-Vill.	Timber	LUS
Bangulo	<i>Litsea garciae</i> Vid.	Edible fruits and nuts	LUS

Malabakan	<i>Litsea ilocana</i> Merr.		LUS
Batikuling surutan	<i>Litsea odorifera</i> Val.	Timber, medicinal	LUS
Bakan	<i>Litsea philippinensis</i> Merr.		LUS
Dilak - manuk	<i>Litsea urdanetensis</i> Elmer		LUS
Anahau	<i>Livistonia rotundifolia</i> (Lam.) Mart.var <i>rotundifolia</i>	Timber, packing and thatching, ornamental	LUS
Babuyan lunas	<i>Lunasia babuyanica</i> Merr.		LUS
Nitong puti	<i>Lygodium circinnatum</i> (Burm.) Sw.	Ornamental, handicraft, medicinal	
Nito	<i>Lygodium flexuosum</i> (L.) Sw.	Ornamental	
Hamindang	<i>Macaranga bicolor</i> Muell.- Arg.	Construction, ornamental	LUS
Binunga	<i>Macaranga tanarius</i> (L.) Muell- Arg.	Tannin and dye-producing plants, medicinal	LUS
Anaplan	<i>Mallotus paniculatus</i> (Lam.) Muell. -Arg.	Timber	LUS
Banato	<i>Mallotus philippinensis</i> (Lam.) Muell- Arg.	Construction, pulp and paper	LUS
Hinlaumo	<i>Mallotus ricinoides</i> (Pers.) Muell.- Arg.		LUS
Mangga	<i>Mangifera indica</i> L.	Edible fruits and nuts, ornamental	
Cassava	<i>Manihot esculenta</i> Crantz	Root and tuber plants, medicinal, ornamental	
Ceara rubber	<i>Manihot glaziovii</i> Muell.-Arg	Plant producing exudates, ornamental	
Alim	<i>Melanolepis multiglandosa</i> (Reinw. ex Blume) Reichb.f. & Zoll.	Medicinal	LUS
Malatungaw	<i>Melastoma malabathricum</i> L. ssp. <i>malabathricum</i>	Medicinal	
Bagalunga	<i>Melia dubia</i> Cav.	Medicinal, ornamental, furniture, construction, agricultural implement	LUS
Matang-araw	<i>Melicope triphylla</i> (Lam.) Merr.	Medicinal	LUS
Bulakan	<i>Merremia peltata</i> (L.) Merr.	Medicinal	
Pakong bato	<i>Microsorium longissimum</i> J.Sm. ex Fee		

Makahiya	<i>Mimosa pudica</i> L.	Medicinal, ornamental	
Mambog	<i>Mitragyna rotundifolia</i> (Roxb.) O. Ktze.	Timber	LUS
Bangkoro	<i>Morinda citrifolia</i> L.	Tannin and dye-producing plants, ornamental	LUS
Malungai	<i>Moringa oleifera</i> Lamk.	Spices and condiments, medicinal, ornamental	
Saging matsing	<i>Musa acuminata</i> Colla	Plants producing exudates	
Kahoy dalaga	<i>Mussaenda philippica</i> A. Rich	Medicinal, ornamental	LUS
Ngab - ngab	<i>Myristica ceylanica</i> A. DC. var. <i>cagayanensis</i> (Merr.) Sincl.		LUS
Tangitang	<i>Neissosperma glomerata</i> (Blume) Fasb.& Sacht		LUS
Balakauin	<i>Neolitsea megacarpa</i> Merr.		LUS
Apanang	<i>Neotronia cumingii</i> (Muell.Arg.) Pax & K. Hoffm.	Construction	LUS
Tabako	<i>Nicotiana tabacum</i> L.	Stimulants, ornamental	
Red adontorema	<i>Odontonema strictum</i> (Nees.) O. Kuntze		
Lanutan linis	<i>Orophea glabra</i> Merr.		LUS
Palay	<i>Oryza sp.</i>		
Alakaak-puti	<i>Palaquim glabrum</i> Merr.		LUS
Maniknik	<i>Palaquim tenuipetiolatum</i> Merr.		
Pandan banguhan	<i>Pandanus amaryllifolius</i> Roxb.	Spices and condiments, medicinal, ornamental	
Pandan dagat	<i>Pandanus tectorius</i> Soland.	Handicraft	
Pasionaria	<i>Passiflora edulis</i> Sims	Oranmental, edible fruits and nuts	
Avocado	<i>Persea gratissima</i> Gaertn.	Edible fruits and nuts	LUS
Langlangis	<i>Phaeanthus pubescens</i> Merr.		LUS
Bolong kahinai	<i>Photodium lobbianum</i> Schott		

Dugtong	<i>Photos hermaphroditus</i> (Blanco) Merr.		
Hagithit	<i>Phrynium philippinensis</i> Ridl.		
Alabong	<i>Pilea microphylla</i> (L.) Liebm.	Medicinal, ornamental	
Dapiau	<i>Pinanga batanensis</i> Becc.	Ornamental	
Ikmo	<i>Piper betle</i> L.	Stimulant, ornamental	
Anuling	<i>Pisonia umbellifera</i> (Forst.) Seem.	Forage and medicinal	LUS
Duklitan	<i>Planchonella duclitan</i> (Blanco) Baehni	Furniture	FCH
Lamog	<i>Planchonia spectabilis</i> Merr.		LUS
Igem dagat	<i>Podocarpus costalis</i> C. Presl	Ornamental	IS
Hanopol	<i>Poikilospermum suaveolens</i> (Blume) Merr.		LUS
Lanutan haba	<i>Polyalthia elongata</i> Merr.		LUS
Lasuban	<i>Polyalthia ramiflora</i> Merr.		LUS
Indian Lanutan	<i>Polyalthia longifolia</i> Benth.& Hook.f.	Ornamental	LUS
Malapapaya	<i>Polyscias nodosa</i> (Blume) Seem.	Timber, medicinal, pulpwood and matchwood, ornamental	PMS
Bani	<i>Pongamia pinnata</i> (L.) Merr.	Medicinal	LUS
Banokbok	<i>Pouteria luzoniensis</i> (Merr.) Baehni var. <i>luzoniensis</i>		LUS
Tiesa	<i>Pouteria rivicoa</i> (Gaertn.f.) Ducke	Edible fruits and nuts	LUS
Alagau-dagat	<i>Premna integrifolia</i> L.	Timber	LUS
Alagau	<i>Premna odorata</i> Blanco	Timber	LUS
Guava	<i>Psidium guajava</i> L.	Edible fruits and nuts, medicinal, ornamental	LUS
Kadpaayan	<i>Psychotria chasalioides</i> Merr.		LUS
Katagpung tilos	<i>Psychotria elliptilimba</i> Merr.		LUS

	<i>Pteris philippinensis</i>		
Prickly narra	<i>Pterocarpus indicus</i> Willd. forma <i>echinatus</i> (Pers.) Rojo	Timber, plants producing exudates, vegetables, medicinal, tannin and dye producing plant, ornamental	PS
Smooth narra	<i>Pterocarpus indicus</i> Willd. forma <i>indicus</i>		PS
Taluto	<i>Pterocymbium tinctorium</i> (Blanco) Merr.	Timber, pulpwood and matchwood	PMS
Bayok bayokan	<i>Pterospermum celebicum</i> Miq.	Timber	LUS
Bosili	<i>Randia wallichii</i> Hook.f.ex K.& V.		LUS
Andarayan	<i>Rauwolfia verticillata</i> (Lour.) Baillon	Medicinal	LUS
Amlong	<i>Rhaphidophora merrilli</i> Engl.	Forage	
Castor oil plant	<i>Ricinus communis</i> L.	Vegetable oils and fats	
Sapinit	<i>Rubus</i> sp.		
Talahib	<i>Saccharum spontaneum</i> L.	Fiber plants, ornamental	
Aropit	<i>Salacia korthalsiana</i> Miq.	Edible fruits and nuts, medicinal	
Santol	<i>Sandoricum koetjape</i> (Burm.f.) Merr.	Edible fruits and nuts	FCH
Gipas	<i>Sarcandra glabra</i> (Thun.) Nakai	Medicinal	
Galamay-amo	<i>Schefflera elliptica</i> (Blume) Harms	Medicinal, ornamental	
Kamariang gubat	<i>Selaginella plana</i> Hieron	Ornamental	
Masukal	<i>Semecarpus glauciphyllus</i> Elmer		LUS
Kamiring	<i>Semecarpus philippinensis</i> Engl.	Medicinal	LUS
Malaligas	<i>Semecarpus trachyphyllus</i> Perk.		LUS
White lauan	<i>Shorea contorta</i> Vid.	Timber	PRM
Tanguile	<i>Shorea polysperma</i> (Blanco) Merr.	Timber	PRM
Bagan-bagan	<i>Solanum biflorum</i> Lour.		
Viapple	<i>Spondias cytherea</i> Sonn.	Edible fruits and nuts, ornamental	LUS
Banilad	<i>Sterculia comosa</i> Wall.		LUS

Malabuho	<i>Sterculia oblongata</i> R. Br.	Edible fruits and nuts	LUS
Tamayuan	<i>Strombosia philippinensis</i> (Baill.) Rolfe	Timber	FCH
Big leaf mahogany	<i>Swietenia macrophylla</i> King	Furniture, ornamental	FCH
Kalauis	<i>Swintonia acuta</i> Engl.		LUS
Lomarau	<i>Swintonia foxworthyi</i> <u>Elmer</u>		LUS
Kamay kastila	<i>Syngonium podophyllum</i> Schott.		LUS
Palomaria/Baltik	<i>Syzygium acrophilum</i> (C.B.Rob.) Merr.		LUS
Duhat	<i>Syzygium cumini</i> (L.) Skeels	Edible fruits and nuts, medicinal, ornamental	LUS
Tampui	<i>Syzygium jambos</i> (L.) Alst.	Edible fruits and nuts, medicinal	LUS
Pangugok	<i>Syzygium neei</i> (Merr.) Merr.		LUS
Barabak	<i>Syzygium obliquinervium</i> (Elmer) Merr.		LUS
Panglomboien	<i>Syzygium simile</i> (Merr.) Merr.		FCH
Malaruhat bundok	<i>Syzygium subcaudatum</i> (Merr.) Merr.		LUS
Pandakaki	<i>Tabernaemontana pandacaqui</i> Poir.	Medicinal, ornamental	LUS
Sampalok	<i>Tamarindus indica</i> L.	Edible fruits and nuts	LUS
Dangula	<i>Teijsmanniodendron abernianum</i> (Merr.) Bakh.	Timber, furniture	FCH
Talisai	<i>Terminalia catappa</i> L.	Tannin and dye producing plants	FCH
Kalumpit	<i>Terminalia microcarpa</i> Decne. subsp. <i>microcarpa</i>	Edible fruits and nuts	FCH
Sakat	<i>Terminalia nitens</i> Presl	Timber	FCH
Ayo	<i>Tetrastigma harmandii</i> Planch.		
Cacao	<i>Theobroma cacao</i> L.	Vegetable oils and fats	LUS
Kalantas	<i>Toona calantas</i> Merr. & Rolfe	Aromatic woods	PS
Anabiong	<i>Trema orientalis</i> (L.) Blume	Fuel woods	PMS
Sayapo	<i>Trichospermum eriopodum</i> (Turcz.) Merr.		LUS

Salab	<i>Trigonachras cuspidata</i> Radlk.		LUS
Kulot-kulotan	<i>Triumfetta rhomboidea</i> Jacq.	Fiber plants	
Anongo	<i>Turpinia ovalifolia</i> Elmer	Furniture, [pulpwood and matchwood	
Laloi	<i>Turpinia sphaerocarpa</i> Hassk.		
Allagat	<i>Uvaria sp.</i>		
Adasai	<i>Vernonia acrophila</i> Merr.		LUS
Lagundi	<i>Vitex negundo</i> L.	Medicine	LUS
Lingo-lingo	<i>Viticipremna philippinensis</i> (Turcz.) H.J. Lam.		PMS
Salagong sibat	<i>Wikstroemia lanceolata</i> Merr.	Fiber plants	LUS
Kamot	<i>Xanthophyllum vitellinum</i> (Blume) Dietr.	Timber	
Yautia	<i>Xanthosoma violaceum</i> Schott	Root and tuber plants	
Mais	<i>Zea mays</i> Linn.	Cereals, vegetable oils and fats, fuel plants, medicinal	
Lamon babae	<i>Lycopodiella cernua</i> (L.) Pic. Serm.		
Pakong gubat	<i>Pityrogramma calomelanos</i> (L.) Link		
<p>DAO-19 (DENR Administrative Order No 19, Series of 1995) covers the rates of forest charges pursuant to Republic Act No. 7161 and based on the FOB market price of forest products. Species were grouped such as: PS - Premium Species; PMS - Pulpwood and Matchwood Species; PG - Palosapis Group; MG - Manggachapui Group; LUS - Lesser Used Species; FCH - Furniture/ Construction Hardwood; IS - Igem Species; and PRM - Philippine Red Mahogany.</p>			

APPENDIX ONE: List of species with corresponding local names

LOCAL NAME	COMMON NAME	LOCAL NAME	COMMON NAME	LOCAL NAME	COMMON NAME	LOCAL NAME	COMMON NAME
5-star	ceara rubber	buned	gatasan	mabolo	kamagong	samak	binunga
agalumbay	adasai	dalipawen	dita	magalayaw	kangko	sayapo	sayapo
agandong	anabiong	danupra	kalantas	magalayaw purau	lupisan-liitan	sida-i	viapple
agrau	alagau	dapaian	dapiiau	makarat	babuyan lunas	takulau	lanutan linis
alakaak-puti	alakaak-puti	dumadara	dumadara	malaikmo	urarog	talapnungan	talapnungan
alangingi	alangingi	dumadara A	damarau	malalansones	miau	talapnungan bakir	palonopoi
alem	alim	dumadara A	ngabngab	malalapnit	malabuho	tampui	tampui
alimunos	tanguile	dumadara B	tambalau	marabasa	bangulo	tibeg	malatibig
anagep	kubing-kauit	dungon	ngabngab	marakamiring	lomarau	tulang- tulang	pagingang tabak
anas	white lauan	dungon red	prickly narra	marakape	manggoi	uratan	urarog
andarayan	andarayan	dungon yellow	smooth narra	marapiña	kamot	wild mango	tirukan itim
aningat	almaciga	gad-dil	halakan	marasamak	hamindang	bamban	bamban
apatot	bangkoro	guyong- guyong	guyong- guyong	milan-milan	bani		
aplas	aplas	indang	katagpung tilos	namot	aropit		
apu	palosapis	kalupit	kalumpit	pakak	rimas		
argau	alagau-dagat	kamiring	malaligas	palatangan	dokloi		
arui	kangko	karming sambal	batinai	palomaria	palomaria		
balanggawisan	kansilai	kasiw	oro-kalingag	pamalalyen	katmon kambal		
balete	baleteng tilos	kayumanis laparan	kayumanis laparan	pangamiringen	lomarau		
balingagta	balingagta	lagontok	balanting bilog	pangaplasin	isis-ibon		
banaba	panglomboien	lakyas	urarog	panglombien	malaruhat buntotatan		

**Local names were given
by the guides.*

barakbak	pangugok	lanuti	pasuit	nalabaga/purau	kaluis
barsik	karmai- bugkau	laplapsot	lamog	pau	kamiing
basog	maniknik	lapnit	taluto	pipyasen	homalanan/homaliuan
batindaw	ulo	lasuban	lasuban	rahayen	hauili
bayok	bayok	latabak	tangisang	raya-raya	sasalit/dangula
botbotchog	bayokan	lingo-lingo	bayawak	sagat	malachico
bukyot	malabuhay	lingo-lingo	lingo-lingo	sagyat	talisai
bulala	kalauis	lupa	lipa	salaysay	dapdap
	bulala	lupa puraw	Lipang kalabaw	salbang	

APPENDIX TWO: List of plant species recording and sampling elevations.

Family & Scientific Name	Elevation	Family & Scientific Name	Elevation
Anacardiaceae		Lecythidaceae	
<i>Dracontomelon dao</i> (Blanco) Men	M	<i>Barringtonia spicata</i> Blume	L
<i>Oncocarpus tranchyphylla</i> (Perk.)	L - M	Leeaceae/ Vitaceae	
<i>Semecarpus glauciphyllus</i> Elmer	M	<i>Cayratia trifolia</i> (L.) Quis.	M
<i>Spondias cytherea</i> Rolfe.	M - H	<i>Leea guineensis</i> G. Don	M
<i>Swintonia acuta</i> Engl.	L	Marantaceae	
<i>Swintonia foxworthyl</i> (Elmer)	M - H	<i>Donax cannaeformis</i> (G. Forst.) K	M-H
Annonaceae		<i>Phrynium philippinensis</i> Ridl.	M
<i>Cyathocalyx acuminatus</i> C.B. Ro	M	Meliaceae	
<i>Orophea glabra</i> Merr.	M	<i>Aphanamixis polystachya</i> (Wall.)	L- M- H
<i>Orophea glabra</i> Merr.	H	<i>Hibiscus tiliaceus</i> L.	L
<i>Phaeanthus pubescens</i> Merr.	M	<i>Toona calantas</i> Merr. & Rolfe	M-H
<i>Polyalthia elongata</i> Merr.	M	<i>Aglaia altenifoliola</i> Merr.	M - H
<i>Polyalthia ramiflora</i> Merr.	M	Moraceae	
<i>Uvaria sp.</i>	M	<i>Artocarpus altilis</i> (Park.) Fosb.	L - M - H
Apocynaceae		<i>Artocarpus vrieseana</i> Miq. <i>Var. refractus</i> (Becc.) Jarr.	L - M - H
<i>Alstonia scholaris</i> (L.) R. Br. var.	M	<i>Ficus ampelas</i> Burm. F.	L-M
<i>Kibatalia blancoi</i> (Rolfe.) Merr.	M	<i>Ficus congesta</i> Roxb. <i>Var. conges</i>	M
<i>Rauwolfia verticillata</i> (Lour.) Baill		<i>Ficus cumingii</i> Maq.	M
Araceae		<i>Ficus irisana</i> Elmer	M
<i>Homalomena philippinensis</i> Engl.	M	<i>Ficus pellucido-punctata</i> Griff.	L - M
Araliaceae		<i>Ficus septica</i> Burm. f.	L - M
<i>Arthrophyllum abernianum</i> Merr.	M - H	<i>Ficus variegata</i> Blume	L - M - H
<i>Polyscias nodosa</i> (Blume) Seem.	M	Myristicaceae	
Aracuriaceae		<i>Knema glomerata</i> (Blanco) Merr.	L - M - H
<i>Agathis philippinensis</i> Warb.	H	<i>Myristica ceylanica</i> A. DC. <i>Var. ca</i>	L-M-H
Arecaceae		Myrsinaceae	
<i>Calamus merrillii</i> Becc.	M	<i>Discocalyx xiphophylla</i> Quis. & M	H
<i>Caryota rumphiana</i> Mart. <i>Var. oxy</i>	M	Myrtaceae	
<i>Pinanga batanensis</i> Becc.	M	<i>Cleistocalyx operculatus</i> (Roxb) Merr. & Peery	M
<i>Vernonia acrophylla</i> Merr.	H	<i>Syzygium simile</i> (Merr.) Merr.	L - M - H
Burseraceae		<i>Syzygium acrophilum</i> (C.B. Rob.) Merr.	L - M
<i>Dacryodes costata</i> (Benn.) H.J. La	M	<i>Syzygium jambos</i> (L.) Alst.	H
Celastraceae		<i>Syzygium neei</i> (Merr.) Merr.	M
<i>Salacia korthalsiana</i> Mig.	L - M	<i>Syzygium obliquinervium</i> (Elmer)	M
Chlorathaceae		<i>Syzygium subcaudatum</i> (Merr.) M	H
<i>Sarcandra glabra</i>	H	Ncytaginaceae	
Clusiaceae		<i>Pisonia umbellifera</i> (J.R. & G. Fo	L - M

<i>Cratogeomys blancoi</i> Merr.	M	Oleaceae	
<i>Cratogeomys blancoi</i> Blume var. <i>ap</i>	M - H	<i>Strombosia philippinensis</i> (Baill.)	L - M - H
<i>Calophyllum inophyllum</i> L.	L	Oleaceae	
<i>Garcinia venolosa</i> (Blanco) Chois	M - H	<i>Linociera clementis</i> Quis. & Merr.	
Combretaceae		Phyllanthaceae	
<i>Terminalia catappa</i> L.	L	<i>Excoecaria obtusa</i> Merr.	L
<i>Terminalia microcarpa</i> Decne.	L-M	Podocarpaceae	
Convolvulariaceae		<i>Podocarpus costalis</i> C. Presl	L
<i>Dracaena angustifolia</i> Roxb.		Polygalaceae	
Dilleniaceae		<i>Xanthophyllum vitellinum</i> (Blume)	L - M - H
<i>Dillenia diantha</i> Hoogl.	L - M	Pteridaceae	
Dipterocarpaceae		<i>Pteris philippinensis</i>	M-H
<i>Anisoptera thurifera</i> (Blanco) Blu	M-H	Putranjivaceae	
<i>Shorea contorta</i> (Vid.) Merr. & Ro	M - H	<i>Drypetes convulata</i> Airy Shaw	H
<i>Shorea polysperma</i> (Blanco) Merr	M-H	<i>Drypetes monosperma</i> (Mer.) Pa	H
Ebenaceae		Rubiaceae	
<i>Diospyros discolor</i> Willd.	L - M - H	<i>Canthium monstrosum</i> (A. Rich.)	M
<i>Diospyros elmeri</i> Merr.	M	<i>Canthium subcapitatum</i> (Merr.) M	M
<i>Diospyros ulo</i> Merr.	M	<i>Guettardella hexasperma</i> (Roxb.)	M
Elaeocarpaceae		<i>Ixora ebracteolata</i> Merr.	H
<i>Elaeocarpus curanii</i> Merr.	H	<i>Mitragyna rotundifolia</i> (Roxb.) O. Ktze	M
Euphorbiaceae		<i>Morinda citrifolia</i> L.	L
<i>Alchornea rugosa</i> (Lour.) Muell.-A	M	<i>Psychotria chasalioides</i> Merr.	L
<i>Breynia acuminata</i> Muell.-Argi		<i>Psychotria elliptilimba</i> Merr.	M - H
<i>Glochidion urophyloides</i> Elmer	M - L	<i>Randia wallichii</i> Hook. f. em. K. V.	H
<i>Homalonthus rotundifolius</i> Merr.	H	Rutaceae	
<i>Macaranga bicolor</i> Muell. Arg.	M - H	<i>Clausena grandifolia</i> Merr.	M
<i>Macaranga tanarius</i> (L.) Muell.-Ar	M-H	<i>Evodia monophyllia</i> Merr.	M
<i>Melanolepis multiglandosa</i> var. <i>m</i>	L - M	<i>Lumnasia babyuanica</i> Merr.	L-M-H
<i>Manihot glaziovii</i> Muell.-Arg	L-M	Sapindaceae	
Fabaceae		<i>Acer laurinum</i> Haask. Apud Hoer	H
<i>Pongamia pinnata</i> (L.) Merr.	L	<i>Dimocarpus fumatus</i> (Blume) Lee	H
<i>Instia bijuga</i> (Colebr.) O. Kuntze	L	<i>Trigonachras falcatuspidata</i> Ra	H
<i>Erythrina orientalis</i> (L.) Merr.	L	Sapotaceae	
<i>Leuceana leucocephala</i> (Lam) de	L	<i>Ganua obovatifolia</i> (Merr.) Assem	M
<i>Pongamia pinnata</i> (L.) Merr.	L	<i>Palaquim glabrum</i> Merr.	M
<i>Pterocarpus indicus</i> Willd. forma	H	<i>Palaquim tenuipetiolatum</i> Merr.	L - M - H
<i>Pterocarpus indicus</i> Willd. forma	L - M - H	<i>Ponteria luzoniensis</i> (Merr.) Baeb	L - M
<i>Lithocarpus castellarmanianus</i> (Vidal)	M-H	Staphyleaceae	
<i>Lithocarpus vidalii</i> (F.-Vill.) Rehd	M - H	<i>Turpinia ovalifolia</i> Elmer	M
Flacourtiaceae/Malvaceae		<i>Turpinia sphaerocarpa</i> Hassk.	L

<i>Homalium multiflorum</i> Merr.	M -H	Sterculiaceae/ Malvaceae	
Gleicheniaceae		<i>Heritiera sylvatica</i> Vidal	L
<i>Dicropteris linearis</i> (Burm.) Under		<i>Pterocymbium tinctorium</i> (Blanco)	M - H
 Icacinaceae		<i>Pterospermum niverum</i> Vidal	L
<i>Gomphandra cumingiana</i> (Miers)	M	<i>Sterculia oblongata</i> R. Br.	M
<i>Gomphandra luzoniensis</i> (Merr.)	L - H	Theaceae	
<i>Gonocaryum cognatum</i> Elm.		<i>Adinandra luzonica</i> Merr.	M
Juglandaceae		<i>Adinandra macgregorii</i> Merr.	M
<i>Engelbardia serrata</i> Blume	H	Thymelaeaceae	
Lauraceae		<i>Wikstroemia lanceolata</i> Merr.	L-M
<i>Actinodaphne</i> sp.	H	Tiliaceae/ Malvaceae	
<i>Beilschmiedia nigrifolia</i> Elm.	H	<i>Trichospermum eriopodum</i> (Turcz.)	M
<i>Cinnamomum oroi</i> Quis.	H	Ulmaceae/ Cannabaceae	
<i>Cryptocarya glauca</i> Merr.	L - M - H	<i>Celtis latifolia</i> (Blume) Planch.	L
<i>Debaasia cairocan</i> (Vidal) C. K. A	H	<i>Celtis philippinensis</i>	L-M
<i>Litsea fulva</i> (Blume) Fernandez-V	H	<i>Trema orientalis</i> (L.) Blume	L - M
<i>Litsea garciae</i> Vidal	H	Urticaceae	
<i>Litsea ilocana</i> Merr.	H	<i>Dendrocnide luzonensis</i> (Wedd.)	L
<i>Litsea odorifera</i> Val.	H	<i>Dendrocnide meyeniana</i> (Walp.)	M
<i>Litsea philippinensis</i> Merr.	M	Verbenaceae/ Lamiaceae	
<i>Litsea urdanetensis</i> Elmer	M	<i>Premna integrifolia</i> L.	L
<i>Neolitsea megacarpa</i> Merr.	M	<i>Premna odorata</i> Blanco	M
		<i>Teijsmanniodendron abernianum</i>	M - H
		<i>Vitex turczaninowii</i> Merr.	L-M

- L- low elevation
- M- medium/ intermediate elevation
- H- high elevation

APPENDIX THREE: Checklist of species of Calayan Island

The families of lycophytes, fern and their allies are arranged alphabetically; gymnosperms follow the classification of Walter S. Judd, et. al ((Plant Systematics: A Phylogenetic Approach, 2002) and angiosperms follow the recent classification in the APG II 2003 (An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG II, The Linnean Society of London, Botanical Journal of the Linnean Society, 141: 399 – 436).

LYCOPHYTES

Lycopodiales

Lycopodiaceae

Lamon babae *Lycopodiella cernua* (L.) Pic. Serm.

Selaginellaceae

Kamariang gubat *Selaginella plana* Hieron

PTERIDOPHYTES

Aspleniaceae

Pakpak lawin *Asplenium musaeifolium* Mett.

Pakpak lawin lalake *Asplenium nidus* L.

Blechnaceae

Pakong alakdan *Blechnum orientale* L.

Cyatheaceae

Pakong buwaya *Cyathea contaminans* (Wall. Et. Hook.) Copel.

Gleicheniaceae

Kilob *Dicranopteris linearis* (Burm. F.) Underw.

Ophioglossaceae

Tukod langit *Helmintostachys zeylanica* (L.) Hook

Polypodiaceae

Kabkab *Drynaria quercifolia* (L.) J. Sm.

Pakong bato *Microsorium longissimum* Fee

Pteridaceae

Pakong gubat *Pityrogramma calomelanos* (L.) Link

Pako *Pteris utilate* Linn.

Schizaeaceae

Nito *Lygodium flexuosum* (L.) Sw.

Nitong puti *Lygodium circinnatum* (Burm.) Sw.

GYMNOSPERMS

Cycadales

Cycadaceae

Pitogo *Cycas riuminiana* Porte ex Regel

Coniferales

Podocarpaceae

§ Igem dagat

Podocarpus costalis C. Presl

Araucariaceae

Almaciga

Agathis philippinensis Warb.

ANGIOSPERMS

BASAL FAMILIES

Chloranthaceae

Gipas

Sarcandra glabra (Thun.) Nakai

MAGNOLIIDS

Laurales

Lauraceae

Alaui Malian

Actinodaphne sp.

Tirukan itim

Beilschmiedia nigrifolia Elm.

Oro-kalingag

Cinnamomum oroi Quis.

Baliktaran

Cryptocarya glauca Merr.

Malakadios

Dehaasia cairocan (Vid.) C.K. Allen

Margapali

Dehaasia incrassata (Jack) Kosterm.

Limbahan

Litsea fulva (Blume) F.-Vill.

Bangulo

Litsea garciae Vid.

Malabakan

Litsea ilocana Merr.

Batikuling surutan

Litsea odorifera Val.

Bakan

Litsea philippinensis Merr.

Dilak – manuk

Litsea urdanetensis Elmer

Balakauin

Neolitsea megacarpa Merr.

* Avocado

Persea gratissima Gaertn.

Magnoliales

Annonaceae

*Guyabano

Annona muricata L.

*Atis

Annona squamosa L.

Ilang- ilang

Cananga odorata (Lamk.) Hook.f.& Thoms.

Damarau

Cyathocalyx globosus Merr.

Lanutan linis

Orophea glabra Merr.

Langlangis

Phaeanthus pubescens Merr.

Lanutan haba

Polyalthia elongata Merr.

Lasuban

Polyalthia ramiflora Merr.

*Indian Lanutan

Polyalthia longifolia Benth.& Hook.f.

Allagat

Uvaria sp.

Myristicaceae

Anuping

Tambalau
Ngab – ngab

Knema glomerata (Blanco) Merr.
Myristica ceylanica A. DC. var. *cagayanensis* (Merr.) Sincl.

Piperales

Piperaceae

Ikmo

Piper betle L.

MONOCOTS

Alismatales

Araceae

*Biga
Lusegut
Gabi
Alopayi
Dugtong
Bolong kahinai
Amlong
*Kamay kastila
Yautia

Alocasia macrorrhizos (L.) G. Don
Amydrium medium (Zoll. & Mor.) Nicolson
Colocasia esculentum (L.) Schott
Homalomena philippinensis Engl. ex Engl. & Krause
Photos hermaphroditus (Blanco) Merr.
Photodium lobbianum Schott
Rhaphidophora merrilli Engl.
Syngonium podophyllum Schott.
Xanthosoma violaceum Schott

Asparagales

Asparagaceae

Fortune plant
Malasambal

Dracaena fragrans Ker- Gawl.
Dracaena angustifolia Roxb.

Laxmanniaceae

Baston de San Jose

Cordyline terminalis (L.) Kunth. var. *ferrea*

Hypoxidaceae

Abang-abang

Curculigo capitulata (Lour.) O. Kuntze

Pandanales

Pandanaceae

Pandan banguhan
Pandan dagat

Pandanus amaryllifolius Roxb.
Pandanus tectorius Soland.

COMMELINIDS

Arecales

Arecaceae

Palasan
Tandulang parang
Takipan tilos
*Niog
Anahau
Dapiau

Calamus merrillii Becc.
Calamus usitatus Blanco
Caryota rumbiana Mart. var. *oxydonta* Becc.
Cocos nucifera L.
Livistonia rotundifolia (Lam.) Mart. var. *luzonensis* Becc.
Pinanga batanensis Becc.

Poales

Bromeliaceae

*Pinya

Ananas comosus (L.) Merr.

Poaceae

Kauayan kiling

Bambusa vulgaris Schrad. ex. Wendland

Bikal

Dinochloa acutiflora (Munro) S. Dransf.

Bikal babui

Dinochloa luconiae (Munro) Merr.

Cogon

Imperata cylindrica (L.) Beauv.

Palay

Oryza sp.

Talahib

Saccharum spontaneum L.

Mais

Zea mays Linn.

Zingiberales

Costaceae

Tubang-usa

Costus speciosus (Koenig) Smith

Marantaceae

Pagingang tabak

Discocalyx xiphophylla Quis. & Merr.

Bamban

Donax cannaeformis (G. Forst.) K. Schum.

Hagithit

Phrynium philippinense Ridl.

Musaceae

Saging matsing

Musa acuminata Colla

Zingiberaceae

Tagbak

Alpinia elegans (Presl.) K. Schum.

Pal-la

Alpinia galanga (L.) Sw. var. *pyramidata* (Blume) K. Schum.

CORE EUDICOTS

Ranunculales

Dilleniaceae

Katmon kambal

Dillenia diantha Hoogl.

Katmon

Dillenia philippinensis Rolfe

Caryophyllales

Nyctaginaceae

Anuling

Pisonia umbellifera (Forst.) Seem.

Polygalaceae

Kamot

Xanthophyllum vitellinum (Blume) Dietr.

Santalales

Olacaceae

Tamayuan

Strombosia philippinensis (Baill.) Rolfe

ROSIDS

Saxifragales

Vitaceae

Alangingi
Mali-mali
Ayo

Cayratia trifolia (L.) Domin.
Leea guineensis G. Don
Tetrastigma harmandii Planch.

Crossosomatales

Staphyleaceae

Anongo
Laloi

Turpinia ovalifolia Elmer
Turpinia sphaerocarpa Hassk.

Myrtales

Combretaceae

Kalumpit
Talisai

Terminalia microcarpa Decne. subsp. *microcarpa*
Terminalia catappa L.

Lythraceae

Melendres
Banaba

Lagerstroemia indica L.
Lagerstroemia speciosa (L.) Pers.

Melastomataceae

Malatungaw

Melastoma malabathricum L. ssp. *malabathricum*

Myrtaceae

Malaruhat
*River red gum
*Guava
Baltik
Duhat
Tampui
Pangugok
Barabak
Panglomboien
Malaruhat bundok

Cleistocalyx operculatus (Roxb.) Merr. & Perry
Eucalyptus camaldulensis Dehnh.
Psidium guajava L.
Syzygium acrophilum (C.B. Rob.) Merr.
Syzygium cumini (L.) Skeels
Syzygium jambos (L.) Alst.
Syzygium neei (Merr.) Merr.
Syzygium obliquinervium (Elmer) Merr.
Syzygium simile (Merr.) Merr.
Syzygium subcandatum (Merr.) Merr.

EUROSIDS I

Celastrales

Celastraceae

Aropit

Salacia korthalsiana Miq.

Fabales

Fabaceae

*Mani
*Fringon
Caballero
*Golden shower

Arachis hypogaea L.
Bauhinia monandra Kurz
Caesalpinia pulcherrima (L.) Swartz
Cassia fistula L.

Dapdap
Kakauate
Ipil
*Ipil-ipil
Makahiya
Bani
Prickly narra
Smooth narra
*Sampalok

Polygonaceae

*Kadena de amor

Erythrina variegata L.
Gliricidia sepium (Jacq.) Kunth ex Walp.
Intsia bijuga (Colebr.) O. Ktze.
Leuceana leucocephala (Lam.) de Wit
Mimosa pudica L.
Pongamia pinnata (L.) Merr.
Pterocarpus indicus Willd. forma *echinatus* (Pers.) Rojo
Pterocarpus indicus Willd. forma *indicus*
Tamarindus indica L.

Antigodon leptotus Hook & Arn.

Fagales

Casuarinaceae

Agoho

Casuarina equisetifolia Forst.

Fagaceae

Palonapoi

Lithocarpus castellarnanianus (Vid.) A. Camus

Vidal oak

Lithocarpus vidalii (F. -Vill.) Rehd

Lithocarpus

Lithocarpus sp.

Juglandaceae

Lupisan-liitan

Engelhardia serrata Blume

Malpighiales

Clusiaceae

Bitagog

Calophyllum inophyllum L.

Kansilai

Cratoxylum blancoi Blume var. *apiculatum* Merr.

Guyong-guyong

Cratoxylum blancoi Merr.

Gatasan

Garcinia venulosa (Blanco) Choisy

Euphorbiaceae

Bogus

Acalypha amentacea Roxb.

Aguioi

Alchornea rugosa (Lour.) Muell.-Arg.

Kamai-bugkau

Breynia acuminata Muell.-Arg.

Panantolen

Fahrenbeitia pendula (Hassk.) Airy Shaw

Halakan

Glochidion urophyloides Elmer

Balanting bilog

Homalonthus rotundifolius Merr.

Hamindang

Macaranga bicolor Muell.- Arg.

Binunga

Macaranga tanarius (L.) Muell- Arg.

Hinlaumo

Mallotus ricinoides (Pers.) Muell.- Arg.

Anaplan

Mallotus paniculatus (Lam.) Muell. -Arg.

Banato

Mallotus philippinensis (Lam.) Muell- Arg.

*Cassava

Manibot esculenta Crantz

*Ceara rubber

Manibot glaziovii Muell.-Arg

Alim

Melanolepis multiglandosa (Reinw. ex Blume) Reichb.f. & Zoll.

Apanang
*Castor oil plant

Passifloraceae

*Pasionaria

Phyllanthaceae

Bignai
Bignai pugo
Batano

Putranjivaceae

Lukot
§ Balingagta
Utong- babui

Neotrovia cumingii (Muell.Arg.) Pax & K. Hoffm.
Ricinus communis L.

Passiflora edulis Sims

Antidesma bunius (L.) Spreng.
Antidesma pentandrum (Blanco) Merr.
Excoecaria obtusa Merr.

Drypetes convulata Airy Shaw
Drypetes falcata Pax & K. Hoffm.
Drypetes monosperma (Merr.) Pax & K. Hoffm.

Oxalidales

Elaeocarpaceae

Bangles

Oxalidaceae

Kamias
*Balimbing

Elaeocarpus curanii Merr.

Averhoa bilimbi L.
Averhoa carambola L.

Rosales

Cannabaceae

Urarog
Malaikmo
Anabiong

Moraceae

*Rimas
*Nangka
Kubing-kauit
Upling gubat
Malatibig
Isis-ibon
Butli
Aplas
Hagimit
Tibig
Baleteng tilos
Niog-niogan
Hauili
Tangisang bayawak

Celtis latifolia (Blume) Planch.
Celtis philippinensis Blanco
Trema orientalis (L.) Blume

Artocarpus altilis (Park.) Fosb.
Artocarpus heterophyllus Lam.
Artocarpus vrieseanus Miq. var. *refractus* (Becc.) Jarr.
Ficus ampelas Burm. f.
Ficus congesta Roxb.
Ficus cumingii Miq. var. *cumingii*
Ficus gul Laut. & K. Schum.
Ficus irisana Elm.
Ficus minabassae (Tejism & de Vr.) Miq.
Ficus nota (Blanco) Merr.
Ficus pellucido-punctata Griff.
Ficus pseudopalma Blanco
Ficus septica Burm. f.
Ficus variegata Blume

Rosaceae

Sapinit

Urticaceae

Rubus sp.

Lipa
Lipang kalabaw
*Alabong
Hanopol

Dendrocnide luzonensis (Wedd.) Chew var. *luzonensis*
Dendrocnide meyeniana (Walp.) Chew
Pilea microphylla (L.) Liebm.
Poikilospermum suaveolens (Blume) Merr.

EUROSIDS

Brassicales

Caricaceae

*Papaya

Carica papaya L.

Moringaceae

Malungai

Moringa oleifera Lamk.

Malvales

Bixaceae

*Achuete

Bixa orellana L.

Dipterocarpaceae

Palosapis

Anisoptera thurifera (Blanco) Blume

Dalingdingan

Hopea foxworthyi Elm.

White lauan

Shorea contorta Vid.

Tanguile

Shorea polysperma (Blanco) Merr.

Malvaceae

*American kapok

Ceiba pentandra (L.) Gaertn.

Dungon

Heritiera sylvatica Vid.

Gumamela

Hibiscus rosa-sinensis L.

malabago

Hibiscus tiliaceus L.

Tamuyan

Homalium multiflorum Merr.

Taluto

Pterocymbium tinctorium (Blanco) Merr.

Bayok bayokan

Pterospermum celebicum Miq.

Malabuho

Sterculia oblongata R. Br.

Banilad

Sterculia comosa Wall.

*Cacao

Theobroma cacao L.

Sayapo

Trichospermum eriopodum (Turcz.) Merr.

Kulot-kulotan

Triumfetta bartramia L.

Thymelaeaceae

Salagong sibat

Wikstroemia lanceolata Merr.

Sapindales

Anacardiaceae

*Kasoy

Anacardium occidentale L.

Dao

Dracontomelon dao (Blanco) Merr.

Mangga

Mangifera indica L.

Malaligas

Semecarpus trachyphyllus Perk.

Masukal

Semecarpus glauciphyllus Elmer

Kamiring
Viapple
Kalauis
Lomarau

Semecarpus philippinensis Engl.
Spondias cytherea Sonn.
Swintonia acuta Engl.
Swintonia foxworthyi Elmer

Burseraceae

Kalaua

Dacryodes costata (Benn.) H.J. Lam

Meliaceae

Bayanti
Kangko
Miau
Bagalunga
Santol
*Big leaf mahogany
Kalantas
Malabuhan

Aglaiia rimosa (Blanco) Merr.
Aphanamixis polystachya (Wall.) R.N. Parker
Dysoxylum alliaceum Blume
Melia azadirachta L.
Sandoricum koetjape (Burm.f.) Merr.
Swietenia macrophylla King
Toona calantas Merr. & Rolfe
Aglaiia lawii (Wight) Sald. ex. Ram.

Rutaceae

Lukban
Kayumanis laparan
Kamal bugtongin
§ Babuyan lunas
Matang-araw

Citrus maxima (Burm.) Merr.
Clausena grandifolia Merr.
Evodia monophylla Merr.
Lunasia babuyanica Merr.
Melicope triphylla (Lam.) Merr.

Sapindaceae

Philippine maple
Bulala
Salab

Acer laurinum Haask.
Dimocarpus fumatus (Blume) Leenh. ssp. *philippinensis* Leenh.
Trigonachras cuspidata Radlk.

ASTERIDS

Ericales

Ebenaceae

Kamagong
Balingagta
Ebony
Ulo

Diospyros blancoi A. DC.
Diospyros elmerii Merr.
Diospyros ferrea (Willd.) Bakh.
Diospyros ulo Merr.

Lecythidaceae

Botong

Barringtonia asiatica (L.) Kurz
Barringtonia acutangula (L.) Gaertn. ssp. *spicata* (Blume)

Nuling
Lamog

Payens
Planchonia spectabilis Merr.

Myrsinaceae

Ardisia

Ardisia sp.

Sapotaceae

Baraibai
*Caimito

Cerbera manghas L.
Chrysophyllum cainito L.

Pianga
Alakaak-puti
Maniknik
Duklitan
Banokbok
Tiesa

Theaceae

Kamiing
Batinai

Ganua obovatifolia (Merr.) Assem
Palaquim glabrum Merr.
Palaquim tenuipetiolatum Merr.
Planchonella duclitan (Blanco) Baehni
Pouteria luzoniensis (Merr.) Baehni var. *luzoniensis*
Pouteria rivicoa (Gaertn.f.) Ducke

Adinandra luzonica Merr.
Adinandra macgregorii Merr.

EUASTERIDS I

Ericales

Boraginaceae

Tsaang gubat

Ebretia microphylla Lam.

Icacinaceae

Mangoi
Mabunot
Angkak

Gomphandra cumingiana (Miers) F.- Vill.
Gomphandra luzoniensis (Merr.) Merr.
Gonocaryum cognatum Elm.

Gentiales

Apocynaceae

Dita
Pandakaki
Pasnit
Tangitang
Andarayan

Alstonia scholaris (L.) R. Br.
Tabernaemontana pandacaku Poir.
Kibatalia blancoi (Rolfe) Merr.
Neissosperma glomerata (Blume) Fasb.& Sacht
Rauwolfia verticillata (Lour.) Baillon

Rubiaceae

Tadiang anuang
Apaipai
*Kape
Dimupa
*Santan
Pilis
Asas
Mambog
Bangkoro
Kahoy dalaga
Kadpaayan
Katagpung tilos
Bosili

Canthium monstrosum (A. Rich.) Merr.
Canthium subcapitalum (Merr.) Merr.
Coffea arabica L.
Guetardella hexasperma (Roxb.) Jansen
Ixora chinensis Lam.
Ixora ebracteolata Merr.
Ixora macrophylla Bartl. ex DC.
Mitragyna rotundifolia (Roxb.) O. Ktze.
Morinda citrifolia L.
Mussaenda philippica A. Rich
Psychotria chasalioides Merr.
Psychotria elliptilimba Merr.
Randia wallichii Hook.f.ex K.& V.

Lamiales

Acanthaceae

Red adontorema

Odontonema strictum (Nees.) O. Kuntze

Lamiaceae

*Gmelina

Gmelina arborea Roxb.

Alagau-dagat

Premna integrifolia L.

Alagau

Premna odorata Blanco

Dangula

Teijsmanniodendron abernianum (Merr.) Bakh.

Lagundi

Vitex negundo L.

Lingo-lingo

Viticipremna philippinensis (Turcz.) H.J. Lam.

Oleaceae

Kayantol

Linociera clementis Quis. & Merr.

Verbenaceae

*Pigeon berry

Duranta repens L.

*Coronitas

Lantana camara L.

Solanales

Convolvulaceae

*Sweet potato

Ipomoea batatas (L.) Lamk.

Bulakan

Merremia peltata (L.) Merr.

Solanaceae

Siling labuyo

Capsicum frutescens L.

*Tabako

Nicotiana tabacum L.

Bagan-bagan

Solanum biflorum Lour.

EUASTERIDS II

Apiales

Araliaceae

Dokloi

Arthophyllum abernianum Merr.

Malapapaya

Polyscias nodosa (Blume) Seem.

Galamay-amor

Schefflera elliptica (Blume) Harms

Asterales

Asteraceae

*Gonoi

Chromolaena odorata (L.) R.M. King & H. Rob.

Adasai

Vernonia acrophila Merr.

§ - Island – endemic (found only in the Babuyan Islands)

* - exotic

APPENDIX FOUR: Uses and DAO utility classifications of plant species recorded on Calayan

DAO-19 (DENR Administrative Order No 19, Series of 1995) covers the rates of forest charges pursuant to Republic Act No. 7161 and based on the FOB market price of forest products. Species were grouped such as: PS - Premium Species; PMS - Pulpwood and Matchwood Species; PG - Palosapis Group; MG - Manggachapui Group; LUS - Lesser Used Species; FCH - Furniture/ Construction Hardwood; IS - Igem Species; and PRM - Philippine Red Mahogany.

Common Name	Scientific Name	Utility/ Use	DAO- 19
Bogus	<i>Acalypha amentacea</i> Roxb.	Timber	LUS
Philippine maple	<i>Acer laurinum</i> Haask.		LUS
Alaui malian	<i>Actinodaphne</i> sp.		
Kamiing	<i>Adinandra luzonica</i> Merr.		LUS
Batinai	<i>Adinandra macgregorii</i> Merr.		LUS
	<i>Adinandra</i> sp.		
Almaciga	<i>Agathis philippinensis</i> Warb.	Timber, plants producing exudates	PS
Malabuhan	<i>Aglaia alternifoliola</i> Merr.		LUS
Bayanti	<i>Aglaia rimosa</i> (Blanco) Merr.		LUS
Aguioi	<i>Alchornea rugosa</i> (Lour.) Muell.-Arg.	Medicinal	LUS
Biga	<i>Alocasia macrorrhizos</i> (L.) G. Don	Vegetables, ornamental	
Tagbak	<i>Alpinia elegans</i> (Presl.) K. Schum.	Edible fruits and nuts, made to lotion	
Pal-La	<i>Alpinia galanga</i> (L.) Sw. var. <i>pyramidata</i> (Blume) K. Schum.	Spices and condiments	
Dita	<i>Alstonia scholaris</i> (L.) R. Br.	Medicinal, ornamental	PMS
Lusegut	<i>Amydrium medium</i> (Zoll. & Mor.) Nicolson		
Kasoy	<i>Anacardium occidentale</i> L.	Edible fruits and nuts, ornamental, beverage	LUS
Pinya	<i>Ananas comosus</i> (L.) Merr.		
Palosapis	<i>Anisoptera thurifera</i> (Blanco) Blume	Timber	PG
Guyabano	<i>Annona muricata</i> L.	Edible fruits and nuts, ornamental	LUS

Atis	<i>Annona squamosa</i> L.	Edible fruits and nuts, ornamental	LUS
Bignai	<i>Antidesma bunius</i> (L.) Spreng.	Edible fruits and nuts, medicinal, ornamental	LUS
Bignai pugo	<i>Antidesma pentandrum</i> (Blanco) Merr.		
Kadena de amor	<i>Antigonon leptopus</i> Hook & Arn.	Ornamental	
Kangko	<i>Aphanamixis polystachya</i> (Wall.) R.N. Parker	Timber	LUS
Mani	<i>Arachis hypogaea</i> L.		
	<i>Ardisia</i> sp.		
Dokloi	<i>Arthophyllum abernianum</i> Merr.		LUS
Rimas	<i>Artocarpus altilis</i> (Park.) Fosb.	Edible fruits and nuts	LUS
Nangka	<i>Artocarpus heterophyllus</i> Lam.	Edible fruits and nuts, ornamental	LUS
Kubing-kauit	<i>Artocarpus vrieseanus</i> Miq. var. <i>refractus</i> (Becc.) Jarr.	Edible fruits and nuts	LUS
Pakpak lawin	<i>Asplenium musaefolium</i> Mett.	Ornamental	
Pakpak lawin lalake	<i>Asplenium nidus</i> L.	Ornamental	
Kamias	<i>Averhoa bilimbi</i> L.	Edible fruits and nuts, medicinal	LUS
Balimbing	<i>Averhoa carambola</i> L.	Edible fruits and nuts, medicinal	LUS
Kauayan kiling	<i>Bambusa vulgaris</i> Schrad.	Constuction and furniture, medicinal, ornamental	
Nuling	<i>Barringtonia acutangula</i> (L.) Gaertn. ssp. <i>spicata</i> (Blume) Payens		LUS
Botong	<i>Barringtonia asiatica</i> (L.) Kurz	Medicinal	LUS
Fringon	<i>Bauhinia monandra</i> Kurz	Ornamental	LUS
Tirukan itim	<i>Beilschmiedia nigrifolia</i> Elm.		LUS
Achuete	<i>Bixa orellana</i> L.	Tannin and dye-producing plants	LUS
Pakong alakdan	<i>Blechnum orientale</i> L.	Edible fruits and nuts	
Kamai-bugkau	<i>Breynia acuminata</i> Muell.-Arg.		LUS
Caballero	<i>Caesalpinia pulcherrima</i> (L.) Swartz	Ornamental	LUS
Palasan	<i>Calamus merrillii</i> Becc.	Handicraft and furniture	
Tandulang	<i>Calamus usitatus</i> Blanco	Handicraft and furniture	

parang			
Gabi	<i>Calocasia esculentum</i> (L.) Schott		
Bitaoog	<i>Calophyllum inophyllum</i> L.	Timber	FCH
Ilang- ilang	<i>Cananga odorata</i> (Lamk.) Hook.f.& Thoms.	Essential oil plants, medicinal, ornamental	
Tadiang anuang	<i>Canthium monstrosum</i> (A. Rich.) Merr.		LUS
Apaiapai	<i>Canthium subcapitalum</i> (Merr.) Merr.		LUS
Siling labuyo	<i>Capsicum frutescens</i> L.	Spices and condiments, ornamental	
Papaya	<i>Carica papaya</i> L.	Edible fruits and nuts, soap making, ornamental	
Takipan tilos	<i>Caryota rumphiana</i> Mart. var. <i>oxydonta</i> Becc.	Timber, ornamental	
Golden shower	<i>Cassia fistula</i> L.	Medicinal, ornamental, agricultural implement, tannin and dye-producing plants	
Agoho	<i>Casuarina equisetifolia</i> Forst.		FCH
Alangingi	<i>Cayratia trifolia</i> (L.) Quis.	Medicinal	
American kapok	<i>Ceiba pentandra</i> (L.) Gaertn.	Fiber plants, ornamental	LUS
Urarog	<i>Celtis latifolia</i> (Blume) Planch.		LUS
Malaikmo	<i>Celtis philippinensis</i> Blanco	Timber	LUS
Baraibai	<i>Cerbera manghas</i> L.	Vegetable oils and fats, medicinal, fuel plants, agricultural implement, ornamental	LUS
Gonoi	<i>Chromolaena odorata</i> (L.) R.M. King & H. Rob.		LUS
Caimito	<i>Chrysophyllum cainito</i> L.	Edible fruits and nuts, medicinal	LUS
Oro-kalingag	<i>Cinnamomum oroi</i> Quis.		LUS
Lukban	<i>Citrus maxima</i> (Burm.) Merr.	Edible fruits and nuts	LUS
Kayumanis laparan	<i>Clausena grandifolia</i> Merr.		LUS
Malaruhat	<i>Cleistocalyx operculatus</i> (Roxb.) Merr. & Perry	Medicinal	FCH
Niog	<i>Cocos nucifera</i> L.	Vegetable oils and fats, timber, food, medicinal	
Kape	<i>Coffea arabica</i> L.	Beverage, ornamental	LUS

Baston de San Jose	<i>Cordyline terminalis</i> (L.) Kunth. var. <i>ferrea</i>	Ornamental	
Tubang-usa	<i>Costus speciosus</i> (Koenig) Smith	Medicinal	
Kansilai	<i>Cratoxylum blancoi</i> Blume var. <i>apiculatum</i> Merr.		LUS
Guyong-guyong	<i>Cratoxylum blancoi</i> Merr.	Fiber plants	LUS
Baliktaran	<i>Cryptocarya glauca</i> Merr.		LUS
Abang-abang	<i>Curculigo capitulata</i> (Lour.) O. Kuntze	Ornamental	
Pakong buwaya	<i>Cyathea contaminans</i> (Hook) Copel	Ornamental, root and tuber plants, agricultural implement	
Damarau	<i>Cyathocalyx acuminatus</i> C.B. Rob.		LUS
Pitogo	<i>Cycas riuminiana</i> Porte ex Regel		
Kalaua	<i>Dacryodes costata</i> (Benn.) H.J. Lam		LUS
Malakadios	<i>Debaasia cairocana</i> (Vid.) C.K. Allen		LUS
Margapali	<i>Debaasia incrassata</i> (Jack) Kosterm.		LUS
Lipa	<i>Dendrocnide luzonensis</i> (Wedd.) Chew var. <i>luzonensis</i>		LUS
Lipang kalabaw	<i>Dendrocnide meyeniana</i> (Walp.) Chew	Essential oil plants	LUS
Kilob	<i>Dicranopteris linearis</i> (Burm.) Underw.		
Katmon kambal	<i>Dillenia diantha</i> Hoogl.		LUS
Katmon	<i>Dillenia philippinensis</i> Rolfe	Timber, ornamental	LUS
Bulala	<i>Dimocarpus fumatus</i> (Blume) Leenh. ssp. <i>philippinensis</i> Leenh.		
Bikal	<i>Dinochloa acutiflora</i> (Munro) S. Dransf.		
Bikal babui	<i>Dinochloa luconiae</i> (Munro) Merr.	Construction and furniture	
Kamagong	<i>Diospyros blancoi</i> A. DC.	Edible fruits and nuts, medicinal, furniture, ornamental	PS
Balingagta	<i>Diospyros elmeri</i> Merr.		LUS
Ebony	<i>Diospyros ferrea</i> (Willd.) Bakh.	Timber	PS

Ulo	<i>Diospyros ulo</i> Merr.		LUS
Pagingang tabak	<i>Discocalyx xiphophylla</i> Quis. & Merr.		
Bamban	<i>Donax cannaeformis</i> (G. Forst.) K. Schum.	Handicraft	
Fortune plant	<i>Dracaena fragrans</i> Ker- Gawl.	Oranamental	
Malasambal	<i>Draceana angustifolia</i> Roxb.	Ornamental	
Dao	<i>Dracontomelon dao</i> (Blanco) Merr.	Edible fruits and nuts, furniture, medicinal, ornamental	PS
Kabkab	<i>Drynaria quercifolia</i> (L.) J. Sm.	Ornamental	
Lukot	<i>Drypetes convulata</i> Airy Shaw		LUS
Balingagta	<i>Drypetes falcata</i> Pax & K. Hoffm.	Ornamental	LUS
Utong- babui	<i>Drypetes monosperma</i> (Merr.) Pax & K. Hoffm.	Ornamental	LUS
Pigeon berry	<i>Duranta repens</i> L.		
Miau	<i>Dysoxylum alliaceum</i> Blume	Aromatic woods	FCH
Tsaang gubat	<i>Ebretia microphylla</i> Lam.		
Bangles	<i>Elaeocarpus curanii</i> Merr.		LUS
Lupisan-liitan	<i>Engelhardia serrata</i> Blume	Timber	LUS
Dapdap	<i>Erythrina variegata</i> L.	Medicinal, ornamental	LUS
River red gum	<i>Eucalyptus camaldulensis</i> Dehnh.	Timber, ornamental	LUS
Kamal bugtongin	<i>Evodia monophylla</i> Merr.		LUS
Batano	<i>Excoecaria obtusa</i> Merr.		LUS
Panantolen	<i>Fabrenheitia pendula</i> (Hassk.) Airy Shaw		LUS
Upling gubat	<i>Ficus ampelas</i> Burm. f.	Medicinal	LUS
Malatibig	<i>Ficus congesta</i> Roxb.		LUS
Isis-ibon	<i>Ficus cumingii</i> Miq. var. <i>cumingii</i>		LUS
Butli	<i>Ficus gul</i> Laut. & K. Schum.		LUS
Aplas	<i>Ficus irisana</i> Elm.		LUS
Hagimit	<i>Ficus minabassae</i> (Tejism & de Vr.) Miq.	Fiber plants	LUS

Tibig	<i>Ficus nota</i> (Blanco) Merr.	Edible fruits and nuts, water generation	LUS
Baleteng tilos	<i>Ficus pellucido-punctata</i> Griff.		LUS
Niog-niog	<i>Ficus pseudopalma</i> Blanco	Ornamental	LUS
Hauili	<i>Ficus septica</i> Burm. f.	Medicinal, ornamental	LUS
Tangisang bayawak	<i>Ficus variegata</i> Blume	Construction, shade and cover plants, plants producing exudates	LUS
Pianga	<i>Ganua obovatifolia</i> (Merr.) Assem		LUS
Gatasan	<i>Garcinia venolusa</i> (Blanco) Choisy		LUS
Kakauate	<i>Gliricidia sepium</i> (Jacq.) Kunth ex Walp.	Ornamental, forage	LUS
Halakan	<i>Glochidion urophyllodes</i> Elmer		LUS
Gmelina	<i>Gmelina arborea</i> Roxb.	Ornamental	PMS
Mangoi	<i>Gomphandra cumingiana</i> (Miers) F.- Vill.	Construction, furniture, fiber plants	LUS
Mabunot	<i>Gomphandra luzoniensis</i> (Merr.) Merr.		LUS
Angkak	<i>Gonocaryum cognatum</i> Elm.		LUS
Dimupa	<i>Guettardella hexasperma</i> (Roxb.) Jansen		LUS
Anuping	<i>Gymnacranchera farquhariana</i> (Hook. F. & Thomson) var. <i>paniculata</i> (A.D.C.) R.T. Schouten		LUS
Tukod langit	<i>Helmintostachys zeylanica</i> (L.) Hook	Edible leaves	
Dungon	<i>Heritiera sylvatica</i> Vid.	Timber	LUS
Gumamela	<i>Hibiscus rosa-sinensis</i> L.	Ornamental, medicinal	LUS
malabago	<i>Hibiscus tiliaceus</i> L.	Fiber plants, ornamental	LUS
Tamuyan	<i>Homalium multiflorum</i> Merr.		LUS
Alopayi	<i>Homalomena philippinensis</i> Engl. ex Engl. & Krause		
Balanting bilog	<i>Homalonthus rotundifolius</i> Merr.		LUS
Dalingdingan	<i>Hopea foxworthyi</i> Elm.		MG
Cogon	<i>Imperata cylindrica</i> (L.) Beauv.	Packing and thaching, source of fiber	
Ipil	<i>Intsia bijuga</i> (Colebr.) O. Ktze.	Timber, medicinal, shade and cover plants, edible seed	PS

Sweet potato	<i>Ipomoea batatas</i> (L.) Lamk.	Root and tuber plants, edible leaves	
Santan	<i>Ixora chinensis</i> Lam.	Medicinal, ornamental	
Pilis	<i>Ixora ebracteolata</i> Merr.		
Asas	<i>Ixora macrophylla</i> Bartl. ex DC.		
Pasnit	<i>Kibatalia blancoi</i> (Rolfe) Merr.	Medicinal	LUS
Tambalau	<i>Knema glomerata</i> (Blanco) Merr.	Timber	LUS
Melendres	<i>Lagerstroemia indica</i> L.	Ornamental	LUS
Banaba	<i>Lagerstroemia speciosa</i> (L.) Pers.	Timber, medicinal, ornamental, plants producing exudates	FCH
Coronitas	<i>Lantana camara</i> L.	Medicinal, ornamental	LUS
	<i>Lasianthus</i> sp.		
Mali-mali	<i>Leea guineensis</i> G. Don	Medicinal, ornamental	LUS
Ipil-ipil	<i>Leuceana leucocephala</i> (Lam.) de Wit	Shade and cover plants, ornamental	LUS
Kyantol	<i>Linociera clementis</i> Quis. & Merr.		LUS
Palonapoi	<i>Lithocarpus castellarmanianus</i> (Vid.) A. Camus		
Vidal oak	<i>Lithocarpus vidalii</i> (F. -Vill.) Rehd		LUS
Limbahan	<i>Litsea fulva</i> (Blume) F.-Vill.	Timber	LUS
Bangulo	<i>Litsea garciae</i> Vid.	Edible fruits and nuts	LUS
Malabakan	<i>Litsea ilocana</i> Merr.		LUS
Batikuling surutan	<i>Litsea odorifera</i> Val.	Timber, medicinal	LUS
Bakan	<i>Litsea philippinensis</i> Merr.		LUS
Dilak - manuk	<i>Litsea urdanetensis</i> Elmer		LUS
Anahau	<i>Livistonia rotundifolia</i> (Lam.) Mart.var <i>rotundifolia</i>	Timber, packing and thatching, ornamental	LUS
Babuyan lunas	<i>Lunasia babuyanica</i> Merr.		LUS
Nitong puti	<i>Lygodium circinnatum</i> (Burm.) Sw.	Ornamental, handicraft, medicinal	
Nito	<i>Lygodium flexuosum</i> (L.) Sw.	Ornamental	

Hamindang	<i>Macaranga bicolor</i> Muell.- Arg.	Construction, ornamental	LUS
Binunga	<i>Macaranga tanarius</i> (L.) Muell- Arg.	Tannin and dye-producing plants, medicinal	LUS
Anaplan	<i>Mallotus paniculatus</i> (Lam.) Muell. -Arg.	Timber	LUS
Banato	<i>Mallotus philippinensis</i> (Lam.) Muell- Arg.	Construction, pulp and paper	LUS
Hinlaumo	<i>Mallotus ricinoides</i> (Pers.) Muell.- Arg.		LUS
Mangga	<i>Mangifera indica</i> L.	Edible fruits and nuts, ornamental	
Cassava	<i>Manihot esculenta</i> Crantz	Root and tuber plants, medicinal, ornamental	
Ceara rubber	<i>Manihot glaziovii</i> Muell.-Arg	Plant producing exudates, ornamental	
Alim	<i>Melanolepis multiglandosa</i> (Reinw. ex Blume) Reichb.f. & Zoll.	Medicinal	LUS
Malatungaw	<i>Melastoma malabathricum</i> L. ssp. <i>malabathricum</i>	Medicinal	
Bagalunga	<i>Melia dubia</i> Cav.	Medicinal, ornamental, furniture, construction, agricultural implement	LUS
Matang-araw	<i>Melicope triphylla</i> (Lam.) Merr.	Medicinal	LUS
Bulkan	<i>Merremia peltata</i> (L.) Merr.	Medicinal	
Pakong bato	<i>Microsorium longissimum</i> J.Sm. ex Fee		
Makahiya	<i>Mimosa pudica</i> L.	Medicinal, ornamental	
Mambog	<i>Mitragyna rotundifolia</i> (Roxb.) O. Ktze.	Timber	LUS
Bangkoro	<i>Morinda citrifolia</i> L.	Tannin and dye-producing plants, ornamental	LUS
Malungai	<i>Moringa oleifera</i> Lamk.	Spices and condiments, medicinal, ornamental	
Saging matsing	<i>Musa acuminata</i> Colla	Plants producing exudates	
Kahoy dalaga	<i>Mussaenda philippica</i> A. Rich	Medicinal, ornamental	LUS
Ngab - ngab	<i>Myristica ceylanica</i> A. DC. var. <i>cagayanensis</i> (Merr.) Sincl.		LUS
Tangitang	<i>Neissosperma glomerata</i> (Blume) Fasb.& Sacht		LUS
Balakauin	<i>Neolitsea megacarpa</i> Merr.		LUS
Apanang	<i>Neotrowia cumingii</i> (Muell.Arg.) Pax & K. Hoffm.	Construction	LUS
Tabako	<i>Nicotiana tabacum</i> L.	Stimulants, ornamental	

Red adontorema	<i>Odontonema strictum</i> (Nees.) O. Kuntze		
Lanutan linis	<i>Orophea glabra</i> Merr.		LUS
Palay	<i>Oryza sp.</i>		
Alakaak-puti	<i>Palaquim glabrum</i> Merr.		LUS
Maniknik	<i>Palaquim tenuipetiolatum</i> Merr.		
Pandan banguhan	<i>Pandanus amaryllifolius</i> Roxb.	Spices and condiments, medicinal, ornamental	
Pandan dagat	<i>Pandanus tectorius</i> Soland.	Handicraft	
Pasionaria	<i>Passiflora edulis</i> Sims	Oranmental, edible fruits and nuts	
Avocado	<i>Persea gratissima</i> Gaertn.	Edible fruits and nuts	LUS
Langlangis	<i>Phaeanthus pubescens</i> Merr.		LUS
Bolong kahinai	<i>Photoidium lobbianum</i> Schott		
Dugtong	<i>Photos hermaphroditus</i> (Blanco) Merr.		
Hagithit	<i>Phrynium philippinensis</i> Ridl.		
Alabong	<i>Pilea microphylla</i> (L.) Liebm.	Medicinal, ornamental	
Dapiau	<i>Pinanga batanensis</i> Becc.	Ornamental	
Ikmo	<i>Piper betle</i> L.	Stimulant, ornamental	
Anuling	<i>Pisonia umbellifera</i> (Forst.) Seem.	Forage and medicinal	LUS
Duklitan	<i>Planchonella duclitan</i> (Blanco) Baehni	Furniture	FCH
Lamog	<i>Planchonia spectabilis</i> Merr.		LUS
Igem dagat	<i>Podocarpus costalis</i> C. Presl	Ornamental	IS
Hanopol	<i>Poikilospermum suaveolens</i> (Blume) Merr.		LUS
Lanutan haba	<i>Polyalthia elongata</i> Merr.		LUS
Lasuban	<i>Polyalthia ramiflora</i> Merr.		LUS
Indian Lanutan	<i>Polyalthia longifolia</i> Benth.& Hook.f.	Ornamental	LUS
Malapapaya	<i>Polyscias nodosa</i> (Blume) Seem.	Timber, medicinal, pulpwood and matchwood, ornamental	PMS
Bani	<i>Pongamia pinnata</i> (L.) Merr.	Medicinal	LUS

Banokbok	<i>Pouteria luzoniensis</i> (Merr.) Baehni var. <i>luzoniensis</i>		LUS
Tiesa	<i>Pouteria rivicoa</i> (Gaertn.f.) Ducke	Edible fruits and nuts	LUS
Alagau-dagat	<i>Premna integrifolia</i> L.	Timber	LUS
Alagau	<i>Premna odorata</i> Blanco	Timber	LUS
Guava	<i>Psidium guajava</i> L.	Edible fruits and nuts, medicinal, ornamental	LUS
Kadpaayan	<i>Psychotria chasalioides</i> Merr.		LUS
Katagpung tilos	<i>Psychotria elliptilimba</i> Merr.		LUS
	<i>Pteris philippinensis</i>		
Prickly narra	<i>Pterocarpus indicus</i> Willd. forma <i>echinatus</i> (Pers.) Rojo	Timber, plants producing exudates, vegetables, medicinal, tannin and dye producing plant, ornamental	PS
Smooth narra	<i>Pterocarpus indicus</i> Willd. forma <i>indicus</i>		PS
Taluto	<i>Pterocymbium tinctorium</i> (Blanco) Merr.	Timber, pulpwood and matchwood	PMS
Bayok bayokan	<i>Pterospermum celebicum</i> Miq.	Timber	LUS
Bosili	<i>Randia wallichii</i> Hook.f.ex K.& V.		LUS
Andarayan	<i>Rauwolfia verticillata</i> (Lour.) Baillon	Medicinal	LUS
Amlong	<i>Rhaphidophora merrilli</i> Engl.	Forage	
Castor oil plant	<i>Ricinus communis</i> L.	Vegetable oils and fats	
Sapinit	<i>Rubus</i> sp.		
Talahib	<i>Saccharum spontaneum</i> L.	Fiber plants, ornamental	
Aropit	<i>Salacia korthalsiana</i> Miq.	Edible fruits and nuts, medicinal	
Santol	<i>Sandoricum koetjape</i> (Burm.f.) Merr.	Edible fruits and nuts	FCH
Gipas	<i>Sarcandra glabra</i> (Thun.) Nakai	Medicinal	
Galamay-amor	<i>Schefflera elliptica</i> (Blume) Harms	Medicinal, ornamental	
Kamariang gubat	<i>Selaginella plana</i> Hieron	Ornamental	
Masukal	<i>Semecarpus glauciphyllus</i> Elmer		LUS
Kamiring	<i>Semecarpus philippinensis</i> Engl.	Medicinal	LUS

Malaligas	<i>Semecarpus trachyphyllus</i> Perk.		LUS
White lauan	<i>Shorea contorta</i> Vid.	Timber	PRM
Tanguile	<i>Shorea polysperma</i> (Blanco) Merr.	Timber	PRM
Bagan-bagan	<i>Solanum biflorum</i> Lour.		
Viapple	<i>Spondias cytherea</i> Sonn.	Edible fruits and nuts, ornamental	LUS
Banilad	<i>Sterculia comosa</i> Wall.		LUS
Malabuho	<i>Sterculia oblongata</i> R. Br.	Edible fruits and nuts	LUS
Tamayuan	<i>Strombosia philippinensis</i> (Baill.) Rolfe	Timber	FCH
Big leaf mahogany	<i>Swietenia macrophylla</i> King	Furniture, ornamental	FCH
Kalauis	<i>Swintonia acuta</i> Engl.		LUS
Lomarau	<i>Swintonia foxworthyi</i> <u>Elmer</u>		LUS
Kamay kastila	<i>Syngonium podophyllum</i> Schott.		LUS
Palomaria/Baltik	<i>Syzygium acrophilum</i> (C.B.Rob.) Merr.		LUS
Duhat	<i>Syzygium cumini</i> (L.) Skeels	Edible fruits and nuts, medicinal, ornamental	LUS
Tampui	<i>Syzygium jambos</i> (L.) Alst.	Edible fruits and nuts, medicinal	LUS
Pangugok	<i>Syzygium neei</i> (Merr.) Merr.		LUS
Barabak	<i>Syzygium obliquinervium</i> (Elmer) Merr.		LUS
Panglomboien	<i>Syzygium simile</i> (Merr.) Merr.		FCH
Malaruhat bundok	<i>Syzygium subcaudatum</i> (Merr.) Merr.		LUS
Pandakaki	<i>Tabernaemontana pandacaqui</i> Poir.	Medicinal, ornamental	LUS
Sampalok	<i>Tamarindus indica</i> L.	Edible fruits and nuts	LUS
Dangula	<i>Teijsmanniodendron abernianum</i> (Merr.) Bakh.	Timber, furniture	FCH
Talisai	<i>Terminalia catappa</i> L.	Tannin and dye producing plants	FCH
Kalumpit	<i>Terminalia microcarpa</i> Decne. subsp. <i>microcarpa</i>	Edible fruits and nuts	FCH
Sakat	<i>Terminalia nitens</i> Presl	Timber	FCH
Ayo	<i>Tetrastigma harmandii</i> Planch.		

Cacao	<i>Theobroma cacao</i> L.	Vegetable oils and fats	LUS
Kalantas	<i>Toona calantas</i> Merr. & Rolfe	Aromatic woods	PS
Anabiong	<i>Trema orientalis</i> (L.) Blume	Fuel woods	PMS
Sayapo	<i>Trichospermum eriopodum</i> (Turcz.) Merr.		LUS
Salab	<i>Trigonachras cuspidata</i> Radlk.		LUS
Kulot-kulotan	<i>Triumfetta rhomboidea</i> Jacq.	Fiber plants	
Anongo	<i>Turpinia ovalifolia</i> Elmer	Furniture, [pulpwood and matchwood	
Laloi	<i>Turpinia sphaerocarpa</i> Hassk.		
Allagat	<i>Uvaria</i> sp.		
Adasai	<i>Vernonia acrophila</i> Merr.		LUS
Lagundi	<i>Vitex negundo</i> L.	Medicine	LUS
Lingo-lingo	<i>Viticipremna philippinensis</i> (Turcz.) H.J. Lam.		PMS
Salagong sibat	<i>Wikstroemia lanceolata</i> Merr.	Fiber plants	LUS
Kamot	<i>Xanthophyllum vitellinum</i> (Blume) Dietr.	Timber	
Yautia	<i>Xanthosoma violaceum</i> Schott	Root and tuber plants	
Mais	<i>Zea mays</i> Linn.	Cereals, vegetable oils and fats, fuel plants, medicinal	
Lamon babae	<i>Lycopodiella cernua</i> (L.) Pic. Serm.		
Pakong gubat	<i>Pityrogramma calomelanos</i> (L.) Link		

PHOTOGALLERY



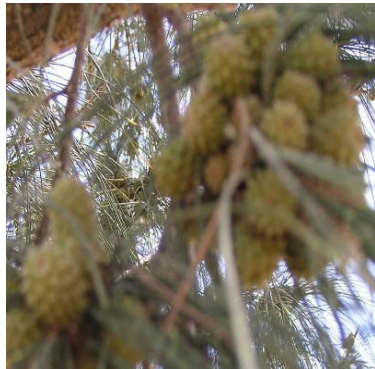
Pterocymbium tinctorium (Blanco) Merr.



Donax cannaeformis (G. Forst.) K. Schum.



Mallotus ricinoides (Pers.) Muell.- Arg.



Casuarina equisetifolia Forst.



Alstonia scholaris (L.) R. Br.



Leea guineensis G. Don



Chromolaena odorata (L.) R.M. King & H. Rob.



Artocarpus altilis (Park.) Fosb.



Psidium guajava L.



Ficus septica Burm. f.



Intsia bijuga (Colebr.) O. Ktze.



Drypetes falcata Pax & K. Hoffm.



Pterospermum celebicum Miq.



Aglaia rimosa (Blanco) Merr.



Podocarpus costalis C. Presl



Homalonthus rotundifolius Merr.



Mussaenda philippica A. Rich



Manihot glaziovii Muell.-Arg



Palaquim tenuipetiolatum Merr.



Melastoma malabathricum L.
ssp. malabathricum



Shorea polysperma (Blanco) Merr.



Shorea contorta Vid.



Diospyros blancoi A. DC.



Barringtonia asiatica (L.) Kurz



Calophyllum inophyllum L.



Terminalia catappa L.



Cananga odorata (Lamk.) Hook.
f. & Thoms.



Ceiba pentandra (L.) Gaertn.



Dillenia philippinensis Rolfe



Anacardium occidentale L.

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