

The Ethnobotanical Uses of Plant Species in the Kakenauwe and Lambusanga Forest Reserve Areas

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Introduction

Use of cultivated and wild plants by the people of the villages within and around the Kakenauwe and Lambusanga forest reserves is vast. A variety of plant species are used for food, medicine and timber, for boats and houses. Much of the knowledge of this usage lies with older people in the villages and has never before been documented. Operation Wallacea is a series of wildlife surveys and conservation expeditions, aiming to achieve National Park status for two forest reserves in Kakenauwe and Lambusanga. In order to accomplish this it is important to document the value and importance of the forest to the local people.

This report covers an initial survey carried out in order to produce a listing of the ethnobotanically important plant species in the area, wild and cultivated. Use, occurrence and, where applicable, preparation were recorded. This initial survey serves as a basis for assessment of what projects may be carried out in forthcoming years.

Research Methodology

Local people are the most important source of information for documenting the ethnobotanical uses of plants. The area of study was confined to the villages of Labundo bundo, Kakanauwe and Lawele. Useful plants grown in the gardens around the houses are often found in fenced areas called 'Toga'. So called 'forest gardens' are used for large-scale cultivation of plants used as food.

Local women of Labundo bundo were consulted for information of what plants they found the most important in their garden and also to establish the uses, if any, of the cultivated plants. They were asked what they grow to use themselves and what they grow to sell and what they grow specifically in their Togas and forest gardens.

Species composition and frequency was recorded for the 'Togas' of the three villages. Lawele is a village significantly larger than the other two, sprawling over a great area. Thus, it was divided into two areas: 'Lawele East' and 'Lawele West'. Local people were questioned to establish what they used the plants in the Toga for. This provides a good record of the plants used by the people and furthermore it was hypothesised plant species found in several gardens and also in different villages must really work.

The main market for the region, in Lawele, was visited in order to establish which plants are of local economic importance and to find out what plants from the gardens and which plants collected from directly from the forest are sold.

A medicine woman, Hamsiah, was interviewed to find out which plants were the most common in her remedies. A walk through the forest with the medicine woman gave us information which wild plants are collected for medicinal purposes. Common symptoms were presented to her and she was asked to describe composition and preparation of a remedy for it. A listing of medicinally important plants was constructed, including information on treatment and preparation.

Plant names were given in bahasa Indonesia or local Butonese. Floras of Malaysian, Singapore and Thai plants and listings of translated of Malay plant names were used to

identify the plants and to assign a scientific name to each species. Herbarium specimens were collected in cases when the species could not be identified and specimens sent to the Natural museum in Bogor for identification. The expertise of an Indonesian taxonomist from Bogor, Dr. Buardi, was used for plant identification in some cases. A translator, Nenny, interpreted the interviews and also contributed useful information on the uses of locally grown plants.

Much of the identification work is to be completed in Britain using herbariums and floras and is still an ongoing part of the project. The plants included in this report may or may not have been identified at this stage.

Results

The plants considered by the women of Labundo bundo as the most important in their gardens are presented in table 1. Species composition of the Toga gardens in Labundo bundo, Lawele and Kakenauwe is presented in appendix 1. Everything grown in the villages is sold to markets in villages close by (Labundo bundo does not have its own market).

Table 1

Main plants grown in gardens of Labundo bundo

Indonesian name	Scientific name
Coklat	<i>Theobroma cacao</i>
Jagung	<i>Zea maize</i>
Jambu air	<i>Syzygium aqueum</i>
Jambu mete	<i>Anacardium occidentale</i>
Jeruk	<i>Citrus sp.</i>
Kacan hijau	<i>Vigna radiatus</i>
Kacang panjang	<i>Vigna unguiculata</i>
Keladi	<i>Colocasia esculenta</i>
Kelapa	<i>Cocos nucifera</i>
Kopi	<i>Coffea robusta</i>
Labuh	<i>Curcubita moschata</i>
Lombok	<i>Capsicum frutescens</i>
Mangga	<i>Mangifera indica</i>
Nangka	<i>Artocarpus heterophylla</i>
Nenas	<i>Ananas comosus</i>
Pepaya	<i>Carica papaya</i>
Pisang	<i>Musa X paradisiaca</i>
Rambutan	<i>Nephelium lappaceum</i>
Salak	<i>Salacca edulis</i>
Semangka	<i>Citrulus vulgaris</i>
Tebu	<i>Saccharum officinarum</i>
Terong	<i>Solanum melogena</i>
Tomat	<i>Lycopersicon esculentum</i>
Ubi jalar	<i>Ipomea batatas</i>
Ubi kayu	<i>Manihot utilissima</i>

Primarily fruit and vegetables were sold at the market. These were harvested from village gardens or forest gardens. No medicinal plants were sold, except those that have multiple uses as food and medicine. Tembakau (*Nicotiana tabacum*) and Kopi (*Coffea robusta*) sold at the market had not been grown locally.

Areas are cleared in the forest for forest gardens through agreement between the villagers and the head of the village. The people tending each garden have not paid for the land and do not pay any tax. Primarily (*Cocos nucifera*), Coklat (*Theobroma cacao*) and Jambu mete (*Anacardium occidentale*) are grown in the forest gardens in the studied area. The forest gardens are often surrounded by hedges of Gamal (Leguminosae), which provide shelter and fertilise the soil by fixing nitrogen. The main plants cultivated in forest gardens are presented in table 2.

Two rice crops in one year is alternated with a year of one rice crop during the wet season and kacang hijau (nitrogenfixing) for the other season. Seeds of rice and kacang hijau kept and replanted the following year. Rice fields are burned after harvest and Pepaya, Ubi jalar and Ubi kayu grow in the newly exposed soil without being planted.

Table 2

Cultivated plants of forest gardens

Indonesian name	Scientific name
Bayam	<i>Amaranthus spinosus</i>
Coklat	<i>Theobroma cacao</i>
Gamal	<i>Leguminosae</i>
Gandung	<i>Poaceae</i>
Jagung	<i>Zea maize</i>
Jambu mete	<i>Anacardium occidentale</i>
Kacang hijau	<i>Vigna radiatus</i>
Kacang panjang	<i>Vigna unguiculata</i>
Kelapa	<i>Cocos nucifera</i>
Kopi	<i>Coffea robusta</i>
Nasi Padi	
Pepaya	<i>Carica papaya</i>
Pisang	<i>Musa X paradisiaca</i>
Talas	<i>Colocasia esculenta</i>
Tebu	<i>Saccharum officinarum</i>
Ubi jalar	<i>Ipomea batatas</i>
Ubi kayu	<i>Manihot utilissima</i>

Plants collected from the forest for food, timber and medicine are presented in appendix 2. Timber wood is categorised as first or second class depending on how strong it is. First class timber includes few species, such as Wola (*Vitex cofassus*), and is very expensive. Most people use second class timber to build their houses, since many are semipermanent abodes.

A listing of plants with medicinal uses, cultivated or wild, is presented in appendix 3.

Discussion

This report includes the main parts of the study of ethnobotanical uses of plant species in the Kakenauwe and Lambusanga forest reserve areas. Initial surveys were carried out, mainly to provide a base data set upon which further projects will be based.

Identification of trees in the jungle is no easy task, for several reasons. Firstly, the canopy is very high up and it is often difficult to identify which tree crown belongs to which trunk, when standing on the ground. Secondly, again due to the height of the canopy, it is difficult to obtain leaves which can be used for identification. The fallen leaves are often dead or decaying and may have lost important characteristics for identification. Thirdly, the limited time spent in the forest may not coincide with the flowering and fruiting season of the tree

species, thus limiting material available for identification. Some plant material was sent to Bogor for identification, but this work has yet to be completed. This explains why many of the species in appendix 2 are presented with a local name only.

It should be noted that the information in appendix 3 is based entirely upon information from Hamsiah, Nenny and other local people. No attempt has been made to verify and to find out the consistency of the data. Some plant species have been recorded as treating several, apparently different symptoms. This has arisen in cases when the uses of plants grown in several different places have been differentially described. The listing is simply a documentation of what plant species have medicinal uses and what symptoms they treat, according to the word of mouth of local people.

Future projects include a more accurate recording of the collection of fruits and nuts from the forest (seasonality, species and quantities), a recording of extraction from the forest of timber for boat building, houses and firewood and a more detailed comparison of the plant species used for food and medicine in four villages around the Kakenauwe and Lambusanga reserve areas. Furthermore rattan species distribution and the effects and economic value of its extraction from the forests will be studied.

APPENIX 1

Species Composition of TOGA Gardens

Local name	Scientific name	Lawele East	Kakenauwe	Labundo bundo	Lawele West
Bayam	<i>Amaranthus spinosus</i>	0	2	1	0
Beluntas	<i>Pluchea indica</i>	0	0	1	4
Bunga getah		1	1	2	2
Camba camba	<i>Phyllanthus nirun</i>	0	1	0	0
Celery'		0	0	1	2
Cengkeh	<i>Eugenia caryophyllata</i> ¹	1	0	0	0
Cocor bebek	<i>Kalanchoe pinnata</i>	3	1	2	0
Coklat	<i>Theobroma cacao</i>	4	1	11	0
Dariangu		0	0	0	3
Daun mangkok	<i>Nothopanax scutellarium</i> ²	2	5	5	0
Daun sawi	<i>Brassica peruridus</i>	1	1	0	0
Enau	<i>Arenga pinata</i>	1	0	0	0
Jahe	<i>Zingiber officinale</i>	7	3	3	3
Jambu air	<i>Syzygium aqueum</i>	1	4	1	1
Jambu biji/batu	<i>Psidium guajava</i>	3	12	10	8
Jambu mete	<i>Anacardium occidentale</i>	1	2	12	0
Jambu putih		0	0	0	1
Jarak	<i>Jatropha curcas</i>	2	0	4	1
Jaran gan	<i>Acorus calmus</i>	0	0	1	0
Jeruk besar	<i>Citrus grandis</i>	4	7	4	2
Jeruk nipis	<i>Citrus aurantifolia</i>	0	4	1	1
Jeruk purut	<i>Citrus hystrix</i>	0	0	4	0
Kacang panjang	<i>Vigna unguiculata</i>	0	3	0	0
Kankang	<i>Ipomea aquatica</i>	0	2	1	0
Kapas	<i>Gossypium barbadense</i>	1	1	0	2
Kayu jawa		0	0	1	0
Kecipir	<i>Psophocarpus tetragonobolus</i>	0	0	0	0
Kedondong	<i>Spondias cytherea</i>	4	4	8	1
Kelapa	<i>Cocos nucifera</i>	1	6	10	11
Kelor	<i>Moringa oleifera</i>	4	7	13	1
Kemangi	<i>Ocimum basilicum</i>	7	0	0	6
Kencur	<i>Kaempferia galanga</i>	1	2	1	0
Ketapang	<i>Terminalia catappa</i>	1	1	0	0
Kopi	<i>Coffea robusta</i>	0	0	2	0
Kumis kucing	<i>Orthosiphon grandiflorus</i> ³	10	0	0	9
Kunyit	<i>Curcuma domestica</i>	9	0	3	3
Labuh merah	<i>Curcubita moschata</i>	0	1	1	0
Labuh putih	<i>Lagynaria siceravia</i>	0	0	1	0
Laos merah	<i>Zingiber pupurecum</i> ?	2	0	0	0
Laos/Lengkuas	<i>Alpinia galanga</i>	10	9	9	9
Lempuyang		0	0	1	0
Libo	<i>Ficus</i> sp.	1	2	0	1
Lombok	<i>Capsicum frutescens</i>	3	2	9	2
Mangga	<i>Mangifera indica</i>	2	6	11	7
Manggopa	<i>Syzygium aqueum</i> var.	2	1	1	0
Martawali	<i>Tinospora crispa</i>	0	0	1	0
Melati	<i>Jasminum sambac</i>	1	0	0	0
Merita	<i>Piper nigrum</i>	1	0	1	0
Myana	<i>Coleus atropurpureus</i> ⁴	4	1	1	6
Nangka	<i>Artocarpus heterophylla</i>	1	2	6	0
Neke	Dracaenaceae	1	0	0	0
Nenas	<i>Ananas comosus</i>	3	4	14	0
Pandan		1	0	1	4
Pangi		0	0	1	0
Pecar		1	1	0	3
Pepaya	<i>Carica papaya</i>	8	12	9	4
Pepaya bunga	<i>Carica papaya</i> var.	0	4	2	1
Pinang	<i>Areca catechu</i>	6	1	0	0
Pisang	<i>Musa X paradisiaca</i>	4	9	11	9
Rambutan	<i>Nephelium lappaceum</i>	3	0	3	3
Ruku		1	0	0	0

Appendix 1 continued

Salak	<i>Salacca edulis</i>	1	2	1	0
Sambroto	<i>Andrographis paniculata</i>	5	1	1	2
Sambunyawa		3	0	0	7
Semangka	<i>Citrus vulgaris</i>	0	1	0	0
Sereh	<i>Andropogon nardus</i> ⁵	10	8	8	11
Sirih	<i>Piper betel</i>	1	1	0	0
Sirsak	<i>Annona muricata</i>	1	2	5	1
Sukun	<i>Artocarpus actilis</i> ⁶	0	1	1	0
Sykas	<i>Cycas rumphii</i>	1	1	0	0
Talas/Keladi	<i>Colocasia esculenta</i>	0	3	3	1
Tebu	<i>Saccharum officinarum</i>	3	6	1	8
Temu lawak	<i>Curcuma xanthirhiza</i>	3	4	3	0
Terong	<i>Solanum melogena</i>	3	4	2	3
Tomat	<i>Lycopersicon esculentum</i>	0	3	3	1
Ubi jalar	<i>Ipomea batatas</i>	0	4	3	1
Ubi kayu	<i>Manihot utilissima</i>	1	5	3	3
Waru	<i>Hibiscus tiliaceus</i>	0	1	0	3

¹or synonym *Eugenia aromatica*

²or synonym *Polyscias scutellaria*

³or *Orthosiphon aristata*

⁴or synonym *Plectranthus scutellarioides*

⁵or *Cymbopogon citratus*

⁶or *Artocarpus communis*

APPENDIX 2

FOREST Plants with Ethnobotanical Uses from
the Kakenauwe and Lambusanga Reserve Areas

Indonesian name	Scientific name	Life form	Use	Preparation
Bankali merah		tree	2nd class timber	houses
Bau	<i>Pterospermum acerifolium</i>	tree	2nd class timber	houses
Behi		tree	1st class timber	boats
Belimbing hutan	<i>Averrhoa bilimbi</i>	tree	food	fruit eaten
Benoa	<i>Hernandia catappa</i>	tree	food	fruit eaten
Bigi	<i>Dillenia</i> sp.	tree	food and timber (2nd class)	fruit eaten
Bolongita	<i>Tetrameles nudiflora</i>	tree	2nd class timber	canoes
Bonalu batu		epiphyte	appendicitis	3 stems 15cm long boiled in 5 glasses of water until 1/5 vol. Drink twice daily.
Bunalu	<i>Drynaria</i> sp.	fern	appendicitis	Make drink by boiling stem in water.
Cua		small shrub (?)	fishing	Dry root, grind and sprinkle in water. Fish die and float to surface.
Daun melingo	<i>Gnetum gnemon</i>	tree	vegetable	boil young leaves
Durian	<i>Durio zibethinus</i>	tree	food	fruit eaten
Enau	<i>Arenga pinata</i>	palm	palm sugar	Extract sap using bamboo cylinders. Cook until crystallised
Ka embu embu	<i>Dysoxylum sessile</i>	tree	fever and vomitting	4 leaves and 2 glasses of water boiled until volume reduced by half. Drink
Kambao	<i>Polyscias populnea</i> ?	tree	tuberculosis and timber (2nd class)	7 young leaves and 2 glasses of water boiled until vol. reduced by half. Drink twice daily until better. Boil young flower in water, drink to reduce blood in phlegm. Timber used for canoes and flooring in houses
Kaseh/Matoa	<i>Pometia pinnata</i>	tree	timber and medicine	Timber for housing. Grind bark of tree and rub powder on skin for antileach treatment
Kayu jingi jingi		tree	burns	Grill leaf in fire, pound and apply powder to burns.
Kayu kuning		liana	tiredness and stomach ache	30cm of climbing stem boiled in 3 glasses of water until vol of 1 glass. Drink three times daily.

Appendix 2 continued

Kayu manis/kulit lawang	<i>Cinnamomum iners</i>	tree	spice	bark used
Kedondong	<i>Spondias cytherea</i>	tree	food	fruit eaten
Kuman tawu		mangrove	antiwrinkle	Crush mangrove fruit and make cream together with rice and Kunyit.
Langsat	<i>Lansium domesticum</i>	tree	food	fruit eaten
Libo 'hutan' ¹	<i>Ficus sp.</i>	tree	chicken pox	Cut young stem in half longitudinally. Spoon out pith and squeeze out juice. Drink.
Lolipo/Ketapang hutan	<i>Terminlia copelandii</i>	tree	2nd class timber	Semipermanent housing.
Manggopa	<i>Syzygium aqueum</i> ¹	tree	food	Fruit eaten
Martawali	<i>Tinospora crispa</i>	vine	malaria treatment	Use stem, cook with water. Drink.
Mengkudu	<i>Morinda citrifolia</i>	tree	swellings and skin infections (boils)	Rub leaf between hands and apply to swelling or apply leaf hot to boil on skin.
Mente	<i>Anarcadium occidentale</i>	climber	rope/string /handicraft	stem used
Nangka	<i>Artocarpus heterophylla</i>	tree	food	Fruit eaten as youn in a stew or fresh when mature.
Pandan		pandana palm	mat making	
Rotan	(several species)	Rattan palm	furniture, balls, baskets	
Rumba	Zingiberaceae	giant herb	postnatal treatment	Crush rhizome and wear around stomach, tightens skin and causes muscle contractions.
Sirsak	<i>Annona musicatu</i>	tree	food	fruit eaten
Sukun	<i>Artocarpus altilis</i>	tree	food	
Taimanu		tree	2nd class timber	Semipermanent housing
Urufi putih	<i>Alangium salvifolium</i>	tree	2nd class timber	Semipermanent housing
Uruvi		tree	2nd class timber	Semipermanent housing and stilts for raising houses out of water
Wola	<i>Vitex cofassus</i>	tree	1st class timber	Houses and furniture.

¹wild variety of 'Jambu air'

APPENDIX 3

MEDICINAL Plants in the Villages In and Around
the Kakenauwe and Lambusanga Reserve Areas

Indonesian name	Scientific name	Use	Parts used	Preparation
Brojolintan		broken bones		
Bunga getah		plaster (and antiseptic) for cuts	white sap of stem	Rub sap into cut
Camba camba	<i>Phyllanthus nirun</i>	kidney stones and abortifacient	leaves and roots	For kidney stones boil leaves in water and mix with <i>Sonchus arvensis</i> . Root is used as an abortifacient.
Cocor bebek	<i>Kalanchoe pinnata</i>	headache and fever	leaves and sap	Leaves are pounded and applied to head for cooling effect. Apply sap as antiseptic to bites.
Daun mangkok	<i>Nothopanax scutellarium</i>	cooling and sunblock and dysentery	leaves	Sunblock is called 'Bedak Dingin'. Beras (white rice), Daun mangkok, Temu lawak, Kencur and Kunyit all grounded and made into small balls for storgae. When used, add water and mix in fresh leaf of Daun mangkok, apply to face.
Jahe	<i>Zingyber officinale</i>	spice and stomach disorders (see 'Kunyit')	rhizome	
Jambu biji/batu	<i>Psidium guajava</i>	diorrhea	young leaves	7 young leaves to glasses of water. Boil until reduced volume by half. Drink.
Jarak	<i>Jatropha curcas</i>	cold sores, herpes	sap from leaves/petioles	Rub sap on lips, has a drying-out effect
Kecapiring		kidney stones		
Kelapa	<i>Cocos nucifera</i>	swollen bites	coconut oil	massage oil onto swelling
Kencur	<i>Kaempferia galanga</i>	1. cooling powder 2. menstruation regulation	rhizome	see 'Daun mangkok'
Kumis kucing	<i>Orthosyphon aristata / grandiflorus</i>	kidney stones	Herb. Use stem and leaf.	3 stems with leaves in 3 glasses of water. Boil until volume reduced to 1/3. Drink 2X daily
Kunyit	<i>Curcuma longa</i>	Cough, wrinkles and cooling of skin (see 'Daun mangkok'), stomach and digestive tract and postnatal treatment for women.	rhizome	For stomach: pound 3 finger-lengths of Kunyit together with equal amounts of Jahe. Boil in 2 glasses of water until reduced to 1/2 volume. Drink. (Similar for treatment of cough, but without Jahe.) Postnatal treatment: Pound Kunyit and Jahe and add honey and raw egg yolk (preferable from village - organic). Drink for 4 days.
Lantana	<i>Lantana camara</i>	digestion and antiseptic	leaves and sap, respectively	
Laos/Lengkuas	<i>Alpinia galanga</i>	bites ('antihistamine') and dermatosis	rhizome	
Libo	<i>Ficus sp.</i>	1. glue 2. fever	1. juice from young fruit. 2. leaf	
Martawali	<i>Tinospora crispa</i>	1. broken bones. 2. malaria 3. evil spirits	stem of vine	1 and 2. Cut, pound 30cm stem. Add 3 glasses of water, reduce to 1/3 by boiling. Drink. 3. Bear bit of stem round neck after given birth to keep evil spirits away.

Appendix 3 continued

Myana	<i>Coleus atropurpureus</i>	Anaemia and asthma and the ecsema associated with asthma.	Herb. Use leaves.	Biol in water and drink with honey
Neke	<i>Dracaenaceae</i>	'Nits'/parasites in hair	leaf	Leaf used as a comb
Daun pacar		cosmetics	leaves	Grind and leave on nails overnight. Dies nails red/orange
Pinang	<i>Areca catechu</i>	stimulant, see 'Sirih'	nut	
Sambroto	<i>Andrographis paniculata</i>	malaria treatment	Herb. Whole plant used (clean).	5 plants to 2 glasses of water. Boil until volume of 1 glass. Let cool. Drink twice daily. Very bitter!
Sereh	<i>Andropogon nardus</i>	wounds	leaf blade	Apply to open wound.
Sirih	<i>Piper betel</i>	1. sore throats 2. stimulant 3. cosmetics	Vine. Leaves used.	1. Wrap sugar in leaf, chew and swallow. 2. Wrap betel nut, sugar, tobacco and lime in leaf and chew. 2. Pound leaves and add sugar and lime, apply to lips to make them red.
Sykas	<i>Cycas rumphii</i>	glue	juice of fruit, latex	
Temu lawak	<i>Curcuma xanthorisa</i>	sunblock	rhizome	see 'Daun mangkok'
Waru	<i>Hibiscus tiliaceus</i>	1. asthma 2. hair cosmetics	1. sap 2. small branch	Wrap small, split branch with leaking sap around bit of hair. Conditioning and 'curler' effect.