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Research Article

A preliminary ethnobotanical study on useful plants by local communities in Bodogol Lowland Forest, Sukabumi, West Java

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ABSTRACT. The ethnobotanical study on plants useful to local communities in the lowland forests of Bodogol, Sukabumi, West Java was conducted in order to investigate the interaction between local people and the surrounding conserved area and the importance of forest preservation for their daily lives. Data collection techniques included the "walk in the wood" interview and direct observation, especially at permanent plots. The result of this current study shows that people in the Bodogol Lowland Forest in Sukabumi, West Java recognise approximately 215 species that are used for various daily purposes ranging from food sources to conctruction material. Among these plants are two rare species in Indonesia, namely *Pinanga javana* and *Fibraurea tinctoria*.

Keywords: Bodogol, ethnobotany, Indonesia, useful plants, Sukabumi, West Java.

INTRODUCTION

At present, the existence of biological resources and ecosystems are regarded as insufficient demands by inhabitants. Some ecosystems have been altered due to intervention by human activities. The rate of damage or degradation caused by humans is frightening. Various efforts have been made to provide a better understanding of the importance of preserving nature. Population explosion and arrogance among humans have long been considered as the prime causes of damage (Wilson, 2007).

Indonesia is listed as a nation with megabiodiversity. Unfortunately, most Indonesians are not fully aware of their nation's assets. Indonesia is at present experiencing the immense erosion of its genetic resources and loss of outstanding biodiversity due to deforestation and increasingly shrinking wildlife habitats (MAB, 2009). Consequently, success in biodiversity conservation efforts in Indonesia is essential in order to reduce further loss of biodiversity in the country.

The ethnobotanical study on the diversity of useful plants found at the lowlands of Bodogol, Sukabumi, West Java was conducted in order to investigate interaction between the people and the surrounding conserved area. Bodogol is a buffer zone for the Mount Gede Pangrango National Park. Prior to the current study, Alhamd *et al.* (2008) had carried out an ecological study in four permanent plots in protected forest, pine (*Pinus merkusii*), rasamala (*Altingia excelsa*), and agathis (*Agathis borneensis*) dominated forests. The result of the study indicated that the number of trees found within a hectare at each observed plot were 140, 20, 133, and 46 species, respectively.

The importance of conducting an ethnobotanical study in this area is to explore

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the potential uses of lowland tropical plants that occur in Bodogol and that can be developed further into sources of income with the hope that sense of ownership is developed in the community. This could protect forests through less foraging or illegal activities in protected forests. This is essential for the development of participatory management of protected areas with surrounding communities at buffer zones.

The aim of this study is to gain information on the diversity of plants and their uses by local communities in the Bodogol Lowland Forest as the foundation for the improvenment of management of the Bodogol Nature Conservation and Education Centre (PPKAB). A series of programmes are carried out at the Bodogol lowland forest by the Mount Gede Pangrango National Park, with involvement of the local community.

MATERIALS AND METHODS

The study was conducted at the Bodogol lowland forest (Figure 1). The study was conducted through four visits from 2009 to 2010. Each visit lasted seven to 14 working days. Data collection was mainly carried out in four permanent plots using the "walk in the wood" method (van Hoang *et al.*, 2008?). Direct field observations on forest extraction activities by local communities were also conducted.

In this present study, informants are classified into two categories: Key and regular informants. Key informants include traditional elders, healers and community leaders; while regular informants are local residents within study sites. The distinction between key informants and regular informants is based on the snowballing usual technique, which means

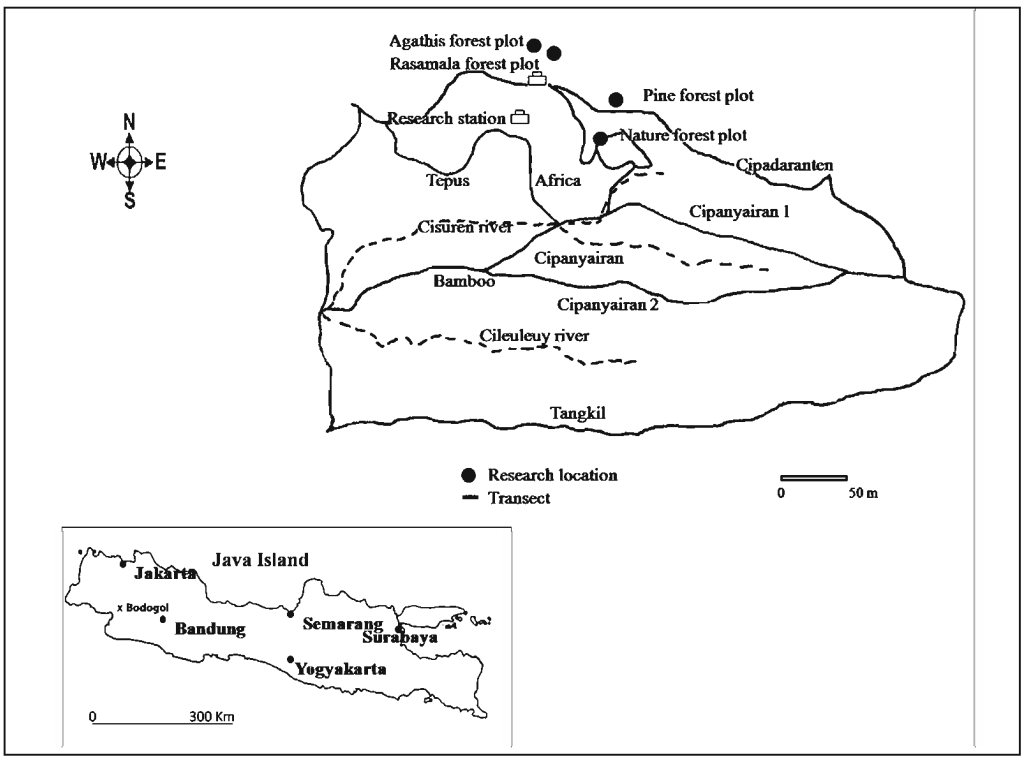

Figure 1. A map of Bodogol Nature Conservation and Education Centre, showing four permanent plots.

information known by an informant is based on information or instructions given by previous informants. In most cases, key informants have greater and deeper knowledge and understanding of local history and customs.

Data from each useful plant species was recorded including local names, habitat, and uses. Useful plant species, which could not be identified in the field were prepared as herbarium specimens to be identified later at the Herbarium Bogoriense (BO). Data is tabulated for further analysis.

The majority of people are Sundanese and they live in seven villages selected in this current study as study sites: Bodogol, Cibilik, Ciletuh, Cipeucang, Ciwaluh, Gintung, and Lengkong Hilir. Most of them are farmers who plant various types of crops.

RESULTS AND DISCUSSION

Diversity of useful plants in Bodogol lowland forest

Traditional knowledge among local communities on usage values of plants is influenced by the level of culture, environment, cultural transformation, technological inventions, and interaction between communities. The group of people that have higher level of education are able to manage, and optimally and sustainably use plant resources. On the contrary, for groups that possess lower level of education, environmental management is based on short-term interests, just to meet the needs of daily life.

The result of this present study recorded 215 plant species of which 186 species are found within the four permanent plots while 29 species are found outside the plots (Table 1). Approximately 200 species of plants are used by people at the study sites (Figure 2). These plants include 47 species that are used as food sources, 68 species for construction material, 93 species for traditional medicine and cosmetics, and 79 species for other purposes.

Some species of useful plants found in the permanent plots are also found in the Mount Halimun National Park (Rahayu & Harada, 2004), Mount Gede Pangrango National Park (Balai TNGGP, 2006) and Mount Salak (Mirmanto *et al.*, 2008). In this present study, the similarity is reasonable and acceptable as the areas are located in proximity of the same landscapes and ecosystems. Although traditional knowledge of plant usage in the social groups is predominantly of Sundanese origin, local variations exist depending on environmental conditions and locations.

The result of interviews with local people (Table 2) reveals that most of the species have more than one category of use. An example is a tree locally known as "ki damar" (*Agathis celebica*). This *Agathis* tree is used as a vegetable (leaves), construction material, fuel wood, lacquer and drugs. "Bengang" (*Neesia altissima*) is used as an ingredient in traditional medicine, in building material, fuel wood and in handicraft. "Pacing" (*Costus speciosus*) is used as source for traditional medicine and rituals. "Cangcaratan" (*Neonauclea calycina*) and "ki arang" (*Lasianthus* sp.) are used as sources for building materials, fuel wood and handicraft. The leaves of "jirak" (*Symplocos fasciculata*) are consumed as a vegetable and other parts are used in traditional medicine, building material and bird feed.

Other uses of plant species in Bodogol Lowland Forest are for toys (i.e. fruit of *Donax cannaeformis*, seeds of *Lantana camara* and fruit of *Castanopsis argentea*), magic and rituals (flower of *Michelia montana* and *Staurogyne elongata*, leaves of *Etlingera elatior*), natural dye (fruit of *Melastoma malabathricum*), fish poison (roots of *Derris elliptica*), animal feed (fruit and young leaf of *Ficus ampelas, F. grossulariodes, F. padana, Symplocos fasciculata, Omalanthus giganteus* etc.), potential for ornamental plants (*Magnolia candollii, Saurauia nudiflora, Lygodium circinatum, Cyrtandra picta, Pinanga* species, etc.), bio-insectide (leaves and bark of *Beilschmedia gemmiflora*) and handicraft (rattan species and *Dicranopteris linearis*).

The use of various plants as vegetables is immensely important in Sundanese, Javanese and Balinese cuisines. These types of fresh

Table 1. Useful plants outside permanent plots in Bodogol lowland forest.

No.	Scientific Name	Local Name	Uses				
			Food	Medicine	Construction	Fuel wood	Others
1.	*Abelmoschus esculentus*	Kaworo		√			
2.	*Amomum compactum*	Kapol		√			√
3.	*Flemingia strobilifera*	Hahapaan		√			
4.	*Boesenbergia pandurata*	Temu kunci		√			
5.	*Cananga odorata*	Kenanga					√
6.	*Canna edulis*	Ganyong	√				
7.	*Carica papaya*	Gedang gandul		√			√
8.	*Ceiba pentandra*	Randu			√	√	
9.	*Cymbopogon citratus*	Seureh	√	√			
10.	*Drypetes longifolia*	Ki sa'at		√			
11.	*Durio zibethinus*	Kadu leuweung	√	√	√	√	
12.	*Graptophyllum pictum*	Handeuleum		√			
13.	*Hibiscus rosa-sinensis*	Wera		√			
14.	*Kaemfperia galanga*	Cikur		√			
15.	*Kalanchoe pinnata*	Buntiris		√			
16.	*Musa acuminata*	Cau kole					√
17.	*Orthosiphon aristatus*	Kumis kucing		√			
18.	*Oxalis* sp.	Babawangan		√			
19.	*Paraserianthes falcataria*	Jeunjing			√	√	√
20.	*Maranta arundinacea*	Patat	√	√			
21.	*Physalis minima*	Cecenet		√			
22.	*Piper betle*	Seureuh		√			
23.	*Archidendron jiringa*	Jengkol	√	√			
24.	*Plectranthus scutellarioides*	Jawer kotok		√			
25.	*Pluchea indica*	Beluntas		√			
26.	*Spondias* sp.	Kedondong cina	√				
27.	*Swietenia mahagoni*	Mahoni		√	√	√	
28.	*Zingiber officinale*	Jahe	√	√			
29.	*Zingiber aromaticum*	Lempuyang		√			

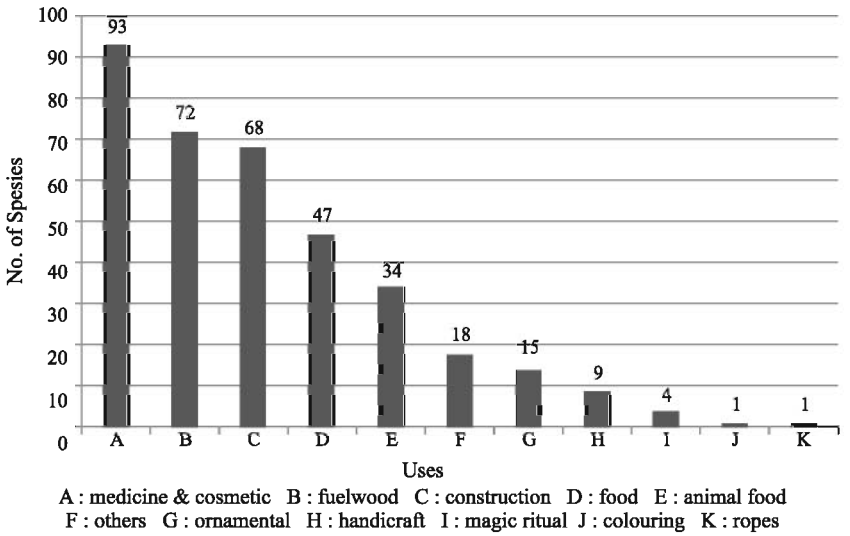

Figure 2. Diversity of useful plants found in lowland forest of Bodogol, Mount Gede Pangrango National Park.

Table 2. List of useful plants found in lowland forests of Bodogol that possess more than one category of use.

No	Scientific Name	Local Name	Uses				
			Food	Medicine	Construction	Fuel wood	Others
1.	*Agathis celebica*	Ki damar	√		√	√	√
2.	*Altingia excelsa*	Rasamala		√	√	√	√
3.	*Amomum coccineum*	Tepus	√				√
4.	*Amomum compactum*	Kapol		√			√
5.	*Antidesma bunius*	Buni	√			√	√
6.	*Ardisia crispa*	Ki ajag			√	√	
7.	*Arenga pinnata*	Kawung		√		√	√
8.	*Artocarpus elastica*	Teureup	√		√	√	√
9.	*Artocarpus sp.*	Nangka leuweung	√		√	√	
10.	*Barringtonia racemosa*	Putat		√	√	√	
11.	*Begonia* sp.	Hariang		√			√
12.	*Beilschmiedia gemmiflora*	Huru tengi			√		√
13.	*Beilschmiedia madang*	Songgom		√			√
14.	*Blumea balsamifera*	Sembung		√			
15.	*Blumeodendron tokbrai*	Tokbrai			√	√	√
16.	*Bridelia glauca*	Kanyere		√	√	√	√
17.	*Calliandra calothyrsus*	Kaliandra				√	√
18.	*Cananga odorata*	Kenanga					√
19.	*Canna edulis*	Ganyong	√				
20.	*Carica papaya*	Gedang gandul		√			√
21.	*Caryota mitis*	Sarai		√			
22.	*Castanopsis argentea*	Saninten			√	√	√
23.	*Castanopsis javanica*	Ki hiur			√	√	
24.	*Castanopsis tungurut*	Pasang kalimorot			√	√	
25.	*Ceiba pentandra*	Randu			√	√	
26.	*Clauxylon polot*	Talingkup	√			√	√
27.	*Clerodendrum* sp.	Ki tarasi			√	√	
28.	*Costus speciosus*	Pacing		√			√
29.	*Curculigo cardifolia*	Marasi	√	√			√
30.	*Curculigo latifolia*	Congkok	√				√
31.	*Cymbopogon citratus*	Seureh	√	√			
32.	*Cyrtandra picta*	Rendeu badak		√			√
33.	*Daemonorops sp.*	Hoe seti	√	√			√
34.	*Dinochloa scandens*	Cangkore		√			√
35.	*Dipterocarpus hasseltii*	Pahlahlar			√	√	
36.	*Donax cannaeformis*	Bangban/ a'awian		√			√
37.	*Durio zibethinus*	Kadu leuweung	√	√	√	√	
38.	*Dysoxyllum densiflorum*	Ki haji			√	√	
39.	*Elaeocarpus angustifolius*	Janitri			√	√	
40.	*Erechtites valerianifolia*	Sintrong	√	√			√
41.	*Eryngium foetidum*	Walang	√	√			
42.	*Melicope latifolia*	Ki sampang			√	√	√
43.	*Eupotarium pallescens*	Ki rinyuh		√		√	√
44.	*Fibraurea chloroleuca*	Ki koneng		√		√	
45.	*Ficus deltoidea*	Tabat barito		√			
46.	*Ficus glabella*	Bunut	√	√			
47.	*Ficus grossularioides*	Hamerang minyak				√	√
48.	*Ficus ribes*	Walen		√			√
49.	*Ficus vasculosa*	Beunying	√	√		√	√
50.	*Flacourtia* sp.	Kupa leuweung	√		√	√	

51.	*Garcinia Morella*	Manggis/Manggu	√	√	√	√	
52.	*Gmelina* sp.	Kinkilaban		√	√	√	
53.	*Gordonia excelsa*	Wuni	√			√	
54.	*Hedycium coronarium*	Gandasuli		√			√
55.	*Helicia robusta*	Ki sariawan	√	√			
56.	*Hemigraphis alternata*	Remek daging	√	√			
57.	*Hornstedtia mollis*	Pinding totot	√				√
58.	*Impatiens* sp.	Pacar tere		√			√
59.	*Indigofera suffricosa*	Tarum		√			√
60.	*Knema cinerea*	Ki mokla			√	√	
61.	*Knema intermedia*	Dudurenan		√	√		
62.	*Lantana camara*	Cente		√		√	√
63.	*Lasianthus purpureus*	Kopi leuweung		√	√		
64.	*Lasianthus sp.*	Ki areng		√	√	√	
65.	*Lithocarpus rotundatus*	Tangogog			√	√	
66.	*Lithocarpus korthalsii*	Pasang bodas			√	√	
67.	*Lithocarpus teysmanii*	Pasang kayang			√	√	
68.	*Macaranga semiglobosa*	Mangong			√	√	
69.	*Macaranga* sp.	Kaliki		√			
70.	*Maesopsis eminii*	Ki afrika/manii			√	√	√
71.	*Magnolia candolli*	Cempaka gondok			√	√	√
72.	*Magnolia Montana*	Cempaka			√		√
73.	*Mangifera indica*	Limus	√		√	√	
74.	*Manglietia glauca*	Manglid			√	√	√
75.	*Medinilla rubicund*	Manjel			√	√	√
76.	*Melastoma malabathricum*	Harendong kebo	√			√	√
77.	*Mikania cordata*	Capituheur		√			√
78.	*Myrsine hasseltii*	Bareubeuy			√	√	
79.	*Neesia altissima*	Bengang		√	√	√	√
80.	*Neonauclea calycina*	Cangcaratan			√	√	√
81.	*Omalanthus giganteus*	Kareumbi				√	√
82.	*Oxalis corniculata*	Calincing	√	√			√
83.	*Oxalis* sp.	Babawangan		√			
84.	*Paraserianthes falcataria*	Jeunjing			√	√	√
85.	*Peronema canescens*	Ki songka			√	√	
86.	*Phrynium pubinerve*	Lipung					√
87.	*Maranta arundinacea*	Patat	√	√			
88.	*Pilea trinervia*	Pohpohan	√	√			
89.	*Pinus merkusii*	Pinus			√	√	√
90.	*Piper aduncum*	Sengseurehan		√		√	
91.	*Archidendron jiringa*	Jengkol	√	√			
92.	*Podocarpus neriifolius*	Ki putrid			√		
93.	*Pometia pinnata*	Leungsir/matoa			√	√	
94.	*Pygmeum latifolium*	Kawoyang			√	√	√
95.	*Sandoricum koetjape*	Kecapi	√		√	√	
96.	*Saurauia nudiflora*	Ki leho besar		√		√	√
97.	*Schefflera aromatica*	Panggang puyuh/ Jangkurang	√				√
98.	*Schefflera* sp.	Panggang badak	√	√			
99.	*Schima wallichii*	Puspa			√	√	
100.	*Selaginella plana*	Pakis rane	√	√			
101.	*Staurogyne elongata*	Rendeu		√			√
102.	*Sterculia oblongata*	Hantap	√	√	√	√	
103.	*Suregada* sp.	Huru beunyeur			√		
104.	*Swietenia mahagoni*	Mahoni		√	√	√	
105.	*Symplocos fasciculate*	Jirak	√	√	√		√

106. *Syzygium antisepticum*	Ki tambaga			√	√	
107. *Syzygium lineatum*	Gelam/ki sireum			√	√	
108. *Syzygium* cf. *polyanthum*	Salam anjing	√			√	
109. *Tectaria* sp.	Pakis tiang			√		√
110. *Toona sureni*	Suren			√	√	√
111. *Urophyllum arboreum*	Ki cengkeh			√	√	
112. *Urophyllum* sp.	Cecengkehan		√			√
113. *Villebrunea rubescens*	Nangsi	√			√	√
114. *Xerospermum noronhianum*	Ki parai	√			√	
115. *Zingiber officinale*	Jahe	√	√			

salad are called "lalab" or "lalaban" in Sundanese and Javanese. In Sundanese culture particularly, there are three ways of presenting "lalaban": "lalab asak" "lalab atah" and "seupan" (Hanan, 1995). In this current study, eight species were recorded to be used by local people as "lalab atah" (Table 3). Among these plants, the leaves of *Helicia robusta*, *Schefflera aromatica*, *Schefflera* sp. and *Symplocos fasciculata* do not have commercial value and are never sold at the local market.

Demand for wood is directly linked with traditional houses of local communities around Bodogol. Also, wood is important as source material for meubels, farming equipment, fuel, and others. Communities are familiar with good quality wood needed for building material (for example, houses) such as *Maesopsis eminii* and *Paraserianthes falcataria* ("jeunjing"). These two species are planted around plantation areas or yards. *Maesopsis eminii* or "kayu Afrika" is an introduced species and was first brought to the area around 1975, while *P. falcataria* was introduced earlier. Apart from these two species, there are four other species known to local people: "picung" (*Pangium edule*), "muncang" (*Aleurites moluccana*), "rengas" (*Gluta renghas*), and "cempaka" (*Michelia montana*). These are not used much as building materials. "Picung" produces very unpleasant odour that it can cause occupants of a house to become unconscious. "Muncang" produces wood that is easily weathered. Exudates from "rengas" can cause skin irritation, so the use of its wood is avoided. However, use of wood from "cempaka" for building material (particularly for pillars) is highly recommended.

Table 3. Plant species used by local people in Bodogol in "lalab atah".

No	Scientific Name	Local name	Information
1	*Erechtites valerianifolia*	Sintrong	A, R
2	*Ficus glabella*	Bunut	A, R
3	*Helicia robusta*	Ki sariawan	A, R
4	*Pilea trinervia*	Pohpohan	A
5	*Schefflera aromatica*	Panggang puyuh / Jangkurang	R, Ag
6	*Schefflera* sp.	Panggang badak	R, Ag
7	*Selaginella plana*	Pakis rane	A, P, Ag
8	*Symplocos fasciculate*	Jirak	A, R, Ag

Note:

A = Found in natural forest
R = Found in "Rasamala" dominated forest
P = Found in Pine dominated forest
Ag = Found in *Agathis* dominated forest

Local communities also take wood found in their gardens or yards for fuel, such as dried coconut (*Cocos nucifera*) leaf stalks, dried old stems of cassava (*Manihot utilissima*), jackfruit (*Artocarpus heterophyllus*) and "jeunjing" (*Parasianthes falcataria*). According to locals, these types of wood are of good quality, and in the case of fire, these woods do not burn easily. However, they produce a lot of smoke. Through government subsidy programmes that provide 3 kg of liquefied petroleum gas for each family, use of firewood for cooking has been greatly reduced.

The result from data analysis shows that approximately 93 species are used for medicine and traditional cosmetics. The use of plants in traditional medicine is generally in the form of post partum care remedies, such as the use of materials derived from "kumis kucing" (*Orthosiphon aristatus*), "reundeu" (*Staurogyne elongata*), "sidagori" (*Sida rhombifolia*), "sembung" (*Blumea balsamifera*), "sintrong" (*Erechtites valerianifolia*), "capituheur" (*Mikania cordata*) and "ki urat" (*Plantago major*). These medicinal plants are found in conservation areas, and collecting the drug *simplicia* is allowed by foresters from the national park. However, harvesting *simplicia* from barks of "ki lame" (*Alstonia* sp.), "ki sintok" (*Cinnamomum* sp.), and the stem "ki koneng" (*Fibraurea tinctoria*) is still prohibited. *Fibraurea tinctoria* is listed as an endangered plant species in Indonesia (Mogea *et al.*, 2001).

"Kawung" or sugar palm (*Arenga pinnata*) is acclaimed by local people as a multi-purpose species. The ash from burned dried leaves and yellowish brown petiole is a traditional powder used to soften and remove black spots from the face. This is new information on the use of *A. pinnata*. Local people also use *A. pinnata* as a food source, medicine, firewood, as ropes, webbing and other purposes. This species is sparsely found in the areas. However, at the Mount Halimun National Park region, *A. pinnata* is found widespread and grows wild. It is also a plant with enormous economic value that supports income of local communities (Harada *et al*, 2005).

Rattan is often found in three permanent plots (natural forest, *Agathis* and "rasamala") (Table 4). According to the local people, price of rattan ranges from expensive to cheap. Rattan canes that are regarded expensive are those harvested from rattans locally known as "hoe omas" (this is the most expensive rattan), "hoe seti," "hoe bulubuk," "hoe seel," "hoe worms," and "hoe sampay." The cheapest canes are harvested from "bungbuay" rattan. Rattan was harvested from the forest surrounding

Table 4. Species of rattans found in the lowland forests of Bodogol.

No	Scientific Name	Local name	Information
1	*Calamus javensis*	Hoe cacing	A, R
2	*Calamus* sp.	Hoe omas	A, R
3	*Calamus* sp.	Hoe bulubuk	A, R
4	*Daemonorops rubra*	Hoe tretes	A, R
5	*Calamus* sp.	Hoe sampai	A, R
6	*Daemonorops melanochaetes*	Hoe seel	A, R
7	*Daemonorops oblonga.*	Hoe seti	A, R
8	*Plectocomia elongata*	Bungbuay	A, R, Ag

Note:

A = Found in natural forest P = Found in Pine dominated forest
R = Found in "Rasamala" dominated forest Ag = Found in *Agathis* dominated forest

villages and the canes were used as source materials for handicraft. This lasted until around 1975, after which forests were included into Perhutani (a government owned forestry company) areas. Currently, one material for handicraft is the bark of "paku andam" (*Dicranopteris linearis*), which is still harvested from the wild.

The population of "bingbin" (*Pinanga* species) is also scarce. Local people recognise four types of "bingbin" namely "bingbin hejo" (green "bingbin"), "bingbin koneng" (yellow "bingbin"), "bingbin beureum" (red "bingbin"), and "bingbin hideung" (black "bingbin"). "Bingbin" has a potential use as an ornamental plant especially the "bingbin koneng" and "bingbin beureum." "Bingbin hejo" (*Pinanga javana*) is included in the list of endangered plants of Indonesia (Mogea *et al.*, 2001). Gingers (Zingiberaceae) are often found in forest as understorey plants such as *Hedychium coronarium, Alpinia malaccensis, Zingiber, Costus speciosus* and *Hornstedtia* species. The last two taxa are commonly found in the permanent plots.

The result of this current study shows that diversity of useful plants in the lowland forests of Bedogol and the presence of food-producing plants are both high.

Local communities around the lowland forest of Bodogol

Indonesia is one of several countries in Asia that gives the authority to the people in managing their forests (Limberg *et al.*, 2009). Widada *et al.* (2006) reported that based on the result of a census carried out in 2003, the population of Indonesia was about 220 million (Census 2003), of which approximately 48.8 million live in the vicinity of forest areas, and around 10.2 million are poor.

The issue of local knowledge and development in forestry is increasingly considered; however, local public opinion is often largely neglected. Following the lapse of the land reform era in 1998, there is a tendency for communities around protected forests to acquire 100% access to natural resources in forests. This raises considerations regarding implementation of tropical forest conservation areas. Numerous opinions have been aired since, mostly pointing at local communities around the forest as a problem (Sheil *et al.*, 2009).

Maintaining biodiversity in areas that are used for other purposes also needs to be cautiously carried out with many important parties involved, such as local communities, logging companies and others (Stanley & Gaia 2002). Local community concerns are not solely on forest use. The forest landscape has echoes of culture, heritage and even recreational activities (Posey, 2000).

The lowland forest of Bodogol is located on the border between two districts in West Java Province: Bogor and Sukabumi. The forest includes the village of Benda, in the Cicurug Sub district (Kecamatan), Sukabumi. The forest is a buffer area for the Mount Gede Pangrango National Park. Nearly the entire forest is characterised by undulating topography with altitudes ranging between 600 to 800 m above sea level and 30 to 50% slopes. The forest is about 300 hectares, of which 56 hectares have been designated as the Nature Conservation Education Centre (PPKAB), established on December 12th, 1998.

There are several other villages around the forest namely Bodogol, Cibilik, Cipeucang, Ciletuh Ciwaluh, Gintung and Lengkong Hilir. They are able to name hundreds of useful animal and plant species. Despite the fact that non timber forest products such as fruits, rattan, pine sap and resin are abundant in surrounding forests, the number of items that have economic value is limited.

The result of this present study shows that the forest in Bodogol is relatively still well preserved. This is due to good cooperative management between local communities and the authority that protects forests. Local communities participate in forestry

programmes such as wildlife rehabilitation, field guiding and tree planting. The authority that protects forests also permits local communities to harvest pine sap and use the land within the pine forest for cultivation of medicinal plants such as "kumis kucing" (*Orthosiphon aristatus*) and "kapol" (*Amomum compactum*). Both have high economical value and help increase the daily income of local people. The forest authority provides information on the conservation and preservation of biodiversity for students within the vicinity of the forest every three months. This activity is considered important as conserving biodiversity and the environment is essential and need to be passed on to the next generation in order to sustain a good life.

CONCLUSION

Approximately 215 useful plant species are recognised in the lowland forest of Bodogol, Sukabumi, West Java, of which 186 species are found in four permanent plots. Among these species, two (*Pinanga javana* and *Fibraurea tinctoria*) are registered as rare plant species in Indonesia. Most of the useful plant species have value in more than one category. The result of this study also shows that the lowland forest of Bodogol has been properly maintained partly due to the role of traditional customs and active involvement of village officials and the forest authority in providing good direction for local communities in environmental conservation and managing sustainable biological resources for their daily life.

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