Can rubber agroforests conserve biodiversity in Jambi (Sumatra)?

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***Abstract*— Rubber agroforests (RAF) consist of rubber planted and managed by farmers with limited agricultural inputs, that allow natural forest regeneration to take place from seed banks and active seed dispersal. Thus, RAF stands have uneven-age structure and high biodiversity. The natural forest area of Indonesia has rapidly decreased in recent decades, due to legal and illegal logging, fires and conversion to other land use types; on the other hand the RAF area remained approximately constant. The RAF habitat has therefore become more important for biodiversity conservation. Some species found in RAF are categorized as 'critically endangered' and 'endangered' species (based on IUCN/SSC, the World Conservation Union – Species Survival Commission). Species richness and species accumulation curves for the seedling and sapling stages were similar between natural secondary forest and RAF, however in the tree stratum, i.e. trees > 10 cm dbh, selective thinning by farmers leads to reduction of species diversity. Ex-situ conservation in RAF is challenging and will need to be based on a participatory approach to increase awareness of opportunities and threats, and has to provide appropriate incentives to maintain the endangered species and enrich the RAF with trees that have direct use values for farmers and the local community that traditionally had access to RAF under customary law.**

***Index Term* — Indonesia, species richness, vegetation structure**

I. INTRODUCTION

Species richness of trees and many taxonomic groups in the plant and animal kingdom, is high in humid tropical forests. Natural forests in Sumatra, Indonesia, are rapidly lost and degrading. Annual deforestation rate in Central Sumatra as a percentage of 1990 forest cover was reported to be 3.2 – 5.9 % [1]. The conversion rate in Bungo district in Jambi province alone during 1993 to 2002 was about 25% [2]. Loss of forest biodiversity depends largely on the type of land cover to which the natural forest was converted [3].

In Bungo district of Jambi province, forest cover was gradually decreasing while RAFs cover remained constant [2]. Vegetation structure and species composition of RAF has been reported [4], [5], [6], [7] and diversity of 'ferns' (Pteridophytes) [8]. Unfortunately, however, complex rubber agroforests did not get attention from decision makers in forest conservation, who generally were not aware of the existence of the systems or of the local knowledge and management practices that allow ecological forest functions to persist.

Complex RAF is characterized by a substantial share or rubber trees in the total tree biomass and a large diversity of native forest trees and understory plants [8] [9]. RAFs were developed under up land rice and crop fallow systems with various management intensities [4][10]. These RAF systems may well represent domesticated forests [5] that maintain forest ecological processes of regeneration and economically benefit on the weekly basis derived by tapping off rubber [11].

To date, many people in Sumatra highly depend on natural production systems despite the small area of natural forest that is left. In 2006, about 1.2 million ha in Jambi was characterized as 'estate crops' land use types and about 50% had rubber-based farming system. The rubber based farming systems were managed by 227,122 households [12]. Farmers generated an income of up to USD 1,429 per ha per year from these systems [13].

Can RAF conserve biodiversity in Jambi, Sumatra? This question is important, because current conservation priorities emphasize on protecting species and ecosystems. On the other hand, biodiversity for local people is related with basic human needs, such as food, cloth, health and shelter [14]. The first step to determine conservation value is to conduct botanical and structural surveys. Plant diversity measures can be used to compare RAFs conservation value to that of forests. Therefore we assessed the conservation value of RAF in Jambi through botanical and structural survey of plant species in Bungo and Tebo districts of Jambi province.

II. MATERIALS AND METHODS

A. *Study Area*

The study was conducted in Bungo and Tebo districts of Jambi province (Figure 1). Soils of the lowland peneplain are very acid, have low fertility status, leached soils (Ultisols) deposited under marine conditions in the past, with higher clay contents close to the river. The piedmont hills were built mainly by granite and andesitic lava. The soils range from shallow to very deep, very acid, moderate to fine texture, well to moderately-excessive drained and generally higher fertility. Soil types are Entisols, and Inceptisol [10].

The climate in Bungo district is classified as an A type [15]. The mean annual rainfall and number of rainy days in Muara Bungo were 2,602 mm per annum and 126 days per annum, while in Rantau Pandan these were 2,888 mm per annum and 130 days per annum, respectively.

Selection criteria for these approximately 25 km^2 windows were the opportunity to capture diversity through the presence of a range of land use types. Sampling within the windows was done in an equidistant grid of points, with additional points to obtain a minimum number of replicates of all major land use strata. To implement this scheme, land cover in Bungo and Tebo districts was interpreted from satellite images of Landsat ETM taken in 2002.

Fig. 1 Study area in Bungo and Tebo districts, Jambi province

B. *Datasets*

Vascular plants in a sampling unit were classified into three strata, e.g. seedlings, saplings and trees. Two datasets on sapling stratum were available for comparison of species richness of vascular plant in forest and RAF, e.g. by Rasnovi [16] and Tata and van Noordwijk (unpublished data). The first dataset recorded saplings with a height more than 1 m and diameter at the breast height (dbh; 1.3 m from the ground) less than 3 cm, which were sampled along a 60 m line transect. Seventy seven transects were sampled in RAF and 31 transects were sampled in forest during 2002-2005. Total plot area covered in secondary forest and RAF were 0.9 ha and 2.4 ha, respectively.

The second dataset was derived from a smaller total plot area, e.g. 0.3 ha each of secondary forest and RAF. All strata of vegetation were recorded. The dbh of trees = 10 cm within circular plots of 200 m^2 was measured. Saplings and woody climbers, with dbh less than 10 cm and height of more than 2 m, were recorded from 50 m^2 subplots. Similar data were collected for seedlings (consisting of shrubs and woody plants less than 2 m high) within 25 m^2 subplots.

Herbarium specimens were collected from each individual tree, except very well known species, and deposited at the Herbarium of the World Agroforestry Centre (ICRAF-SEA). Herbarium specimens were identified at the Herbarium Bogoriense, Bogor, Indonesia. Each species was then classified into its conservation status, according to the IUCN Red List threatened species, e.g. critically endangered (CR), endangered (EN) and vulnerable (VU) [17].

C. *Data Analysis: Diversity Indices and Species Richness*

Species richness, number of individual flora, number of families, density and basal area were compared between forest and other land use type using analysis of variance (*F*-test), and continued with Dunnet test when it was significant using Statistica 6.0 (StatSoft Inc., USA). The relationship between species richness and sample size was compared between both land use types in curves of species accumulation, generated from randomly resampling the sample plot data in six reiterations, using R 2.1.1 software [18].

The data were analyzed using ecological standard methods. Abundance of ground cover species was calculated as percentage of a species relative to all species. For each LUT, species richness (the total number of species per land use type) and species diversity, was calculated as the Simpson's index [19].

III. RESULTS

A. *Floristic Composition and Vegetation Structure*

The structure of the seedling and sapling strata in forest and RAF was not significantly different. In forest, a mean of 15.4 species belonging to 11.3 families were recorded from the seedling stratum; while a mean of 15.7 species belonging to 11.9 families were recorded in RAF. We recorded 11.2 species in the sapling stratum belonging to 8.8 families in the forest, and 10.6 species belonging to 8.0 families in RAF. In contrast, the tree stratum in forest differed with the tree stratum in RAF. A mean of 9.6 tree species belonging to 8 families were recorded in forest plots; while in RAF, we

TABLE I
PLANT SPECIES COMPOSITION AND STRUCTURE OF RAF AND FOREST IN BUNGO AND TEBO DISTRICTS, JAMBI

Land Uses	Strata	Sampling Unit (ha)	Parameter		
			Total Stem	Total Species	Total Family
Forest	Seedling	0.32	712	283	196
	Sapling	0.32	152	122	50
	Sapling '05	0.90	1404	646	68
	Tree	0.32	55	50	40
RAF	Seedling	0.32	847	286	113
	Sapling	0.32	152	116	42
	Sapling '05	2.40	2148	689	72
	Tree	0.32	47	42	28

recorded 6.0 tree species belonging to 5.3 families. Total individual, total species and family number encountered in forest and RAF from two data sets are shown in Table I.

Distribution of tree species according to dbh in RAF was slightly similar to dbh distribution in forest. Individual number of trees dbh 10-19 in RAF was higher than it was in forest (Fig. 2).

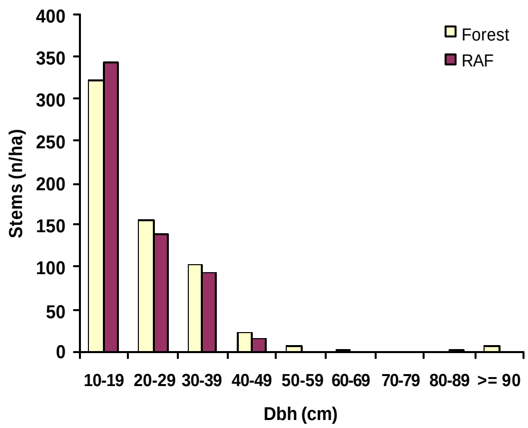


Fig. 2 Diameter (Dbh) distribution of tree species in forest and RAF, Jambi

B. Species Richness and Diversity Indices

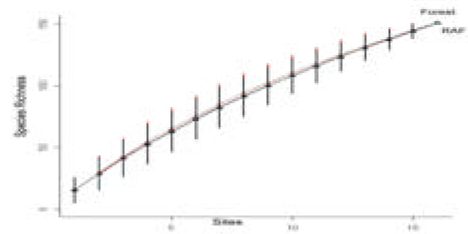
Species accumulation curves are shown in Fig. 3. The re-sampled species richness curves between forest and RAF for seedlings and saplings, but in the tree stratum species richness in forest was significantly higher than that in RAF when 8 or more plots when considered.

Diversity indices confirmed this pattern. The Simpson index for seedlings, saplings and tree diversity in forest was 0.98, 0.99 and 0.98, respectively; while the Simpson index of each stratum in RAF was 0.97, 0.98 and 0.72, respectively. With a larger sampled area in the first dataset, the Simpson index in RAF and forest was slightly lower, at 0.90 and 0.94, respectively.

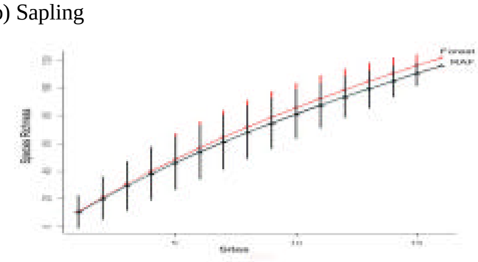
C. Rarity of Flora

According to SSC/IUCN red list, many species of Dipterocarpaceae found in forests are 'critically endangered' and 'endangered'. We encountered seventeen species categorized as IUCN Red List species in forests, and six species of IUCN Red list appeared in RAF (Table Appendix). In forests, six species belonging to Dipterocarpaceae family were listed at CR status; six species of Dipterocarpaceae were listed as EN and five species were listed as VU. In RAF, three species of *Parashorea* were observed with CR status; one species of *Anisoptera* with EN status and two species of Thymeleaceae (*Aquilaria malaccensis* and *Gonystylus macrophyllus*) with VU status. All of these species are valuable timber trees, with the latter two the source of 'eaglewood' or 'agarwood'. Twenty species of LR status, were encountered in forests and 18 species of LR status were found in RAF.

a) Seedling



b) Sapling



c) Tree

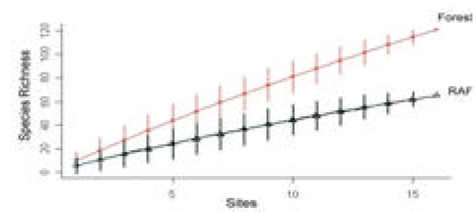


Fig. 3. Relationship between number of observed plant species and number of plots included in the analysis for three strata in forest and RAF; vertical lines show standard deviation of results obtained by re-sampling the data

IV. DISCUSSION

Despite differences in sample size in the two datasets, they support similar conclusions regarding the diversity of the lowland tropical forests and RAFs. The tree diversity in these systems is such that many species are only encountered once even after considerable sampling efforts. Statistical analysis techniques allow this diversity to be explored [20].

Species richness of seedlings and saplings was similar for forest and RAF. In contrast, species richness of the tree stratum was higher in forest than in RAF. Farmer management practices, slashing young trees close to rubber, especially if they don't have direct use value, are the likely cause of this difference. Other studies also reported management practices as affecting species richness, botanical composition and diversity of RAF [7], [21]. The more intense (and frequent) the management practice, the lower tree species richness in RAF.

RAF management by farmers consists mostly of weeding and selective thinning. Tree species which are not economically beneficial may be thinned. Selective thinning was, based on interviews with farmers, done to minimize competition for soil nutrients and light, in order to raise productivity of latex. In contrast to interventions in the tree stratum, farmers allow natural regeneration in RAF, by maintaining diversity in seedling and sapling strata.

Based on wood density of the species, the distribution of pioneer and late successional trees in RAFs was similar to that in forests (data not shown). Late successional species have high wood density and grow slowly, while pioneer species tends to have low wood density and fast growing. Botanic composition and structural characteristics in RAF may indirectly conserve other taxa, such as birds [6], [22]; bats, mammals and primates [23]. The complexity of structural characteristic in RAF supports the living of wildlife and may also as a refuge for wildlife [22].

Tree species with the highest threat listing were mainly found in forests, and only 4 genera were found in RAF. All of them were not cultivated. The red list species of *Parashorea*, (known locally as tebalun), *Anisoptera* (mersawa), and *Gonystylus* (ramin) are usually used as construction timber. Farmers recognise those species as valuable. *Aquilaria* trees, local name of gaharu, produce valuable wood for medicine and cultural purpose Farmers allow regeneration and maintain valuable trees in RAF, which produce good timber, latex or resin, food and fruits [24]. Several species appear in the IUCN list as lower risk status found in RAFs in the three stages, which reflect farmers maintain diversity in RAF, as long as species locally recognized to provide valuable products and used for livelihood and cultural purpose [14].

The conservation role of RAF may be limited, due to management practices [7] and plant species preference of farmers [14]. However, RAFs may act as last reservoir of lowland forest species, when farmers allow natural generation in RAF from seed banks and natural disperse and cultivation. Nowadays, farmers in Bungo and Tebo districts interested to cultivate timber species in their rubber garden [24], [25], [27], since raised awareness of farmers about scarcity of timber trees from the natural forests. However, this interest is limited so far by lack of knowledge on cultivation and plant propagation techniques [24].

Ex-situ conservation of plants in RAF is challenging and can be tackled with pro-poor strategy [14], [26], [27]. Three points can be applied. First, rubber farmers need to be aware about the rarity status of species they may have on their property, by an education campaign and publications. Second, species focused management conservation, to ensure maintenance of particular interested species. Third, collaboration from other stake holders, by giving support to farmers, such as funds, incentives, guidance, and capacity building. Application of this conservation strategy may not as simple as its theory, therefore the strategy should be applied through partnership, where all stake holders share balance rights and responsibilities, risks and decision making.

V. CONCLUSIONS

1) Tree diversity and species richness in RAF were lower than in natural forests, but seedling and sapling diversity were similar.
2) RAFs provide a limited role as conservation area allowing reproduction of rare tree species, where only six species appear in the IUCN red list species found in RAF.
3) Conservation of rare species in RAF needs farmers' collaboration, which may be elaborate in a pro-poor conservation strategy.

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REFERENCES

[1] F. Archard, H. D. Eva, H. J. Stibig, P. Mayaux, J. Gallego, T. Richards, and J. P. Malingreau, "Determination of deforestation rates of the world's humid tropical forests," *Science*, vol. 297, pp. 999-1002 , 2002.

[2] A. Ekadinata and G. Vincent, "Land cover change detection in Bungo District Jambi using object based classification", *SAU Working Document*, no. 14. Bogor, Indonesia: World Agroforestry Centre (ICRAF-SEA), 2005.

[3] A. N. Gillison and N. Liswanti, "Assessing biodiversity at landscape level in Northern Thailand and Sumatra (Indonesia): the importance of environmental context," *Agric. Ecosys. Environ*, vol. 104, pp. 75-86, 2004.

[4] A. Gouyon, H de Foresta, P. Levang. "Does 'Jungle Rubber' deserve its name? An analysis of rubber agroforestry system in Southeast Asia," *Agroforest Syst* vol. 22, pp. 181-20, 1993.

[5] G. Michon. *Domesticating Forests : How Farmers Manage Forest Resources*. Bogor, Indonesia: IRD, CIFOR and ICRAF, 2005.

[6] H. Beukema, F. Danielsen, G. Vincent, S. Hardiwinoto, J. van Andel, "Plant and bird diversity in rubber agroforests in the lowlands of Sumatra, Indonesia," *Agroforest Syst*, vol. 70, pp. 217-242, 2007.

[7] S. Rasnovi, G. Vincent, C. Kusmana, and S. Tjitrosemito, "Keragaman jenis anakan tumbuhan berkayu pada wanatani karet: pengaruh mur dan intensitas manajemen," in *Belajar dari Bungo: Mengelola sumber daya alam di era desentralisasi*, 2008, paper 3-6, pp.239-256.

[8] H.J. Beukema and M. van Noordwijk, "Terrestrial pteridophytes as indicators of a forest-like environment in rubber production systems in the lowlands of Jambi, Sumatra," *Agric Ecosys Environ*, vol. 104, pp. 63-73, 2004.

[9] Y. Laumonier. *The Vegetation and Physiography of Sumatra*. Dordrecht, the Netherlands: Kluwer, 1997.

[10] M. van Noordwijk, D. Murdiyarso, K. Hairiah, U.R. Wasrin, A. Rachman, and T. P. Tomich, "Forest soils under alternatives to slash-and-burn agriculture in Sumatra, Indonesia", In *Soils of Tropical Forest Ecosystems: Characteristics, Ecology and management*, 1998, Springer-Verlag, Berlin. pp 175-185.

[11] T.P. Tomich, H. de Foresta, R. Dennis, Q.M. Ketterings, D. Murdiyarso, D., C.A. Palm, F. Stolle, S. Suyanto, and M. Van Noordwijk, "Carbon offsets for conservation and development in Indonesia?", *Am J. of Alternat Agric*, vol. 17, pp. 125-137, 2002.

[12] BPS Bungo. *Bungo dalam Angka 2006 (Bungo in Figures 2006)*, Kerjasama Bappeda dan Kantor Statistik Tingkat I Muara Bungo, 2006.

[13] M. J. A. Rosyid, G. Wibawa, and A. Gunawan (2002) Rubber based farming systems development for increasing smallholders's income in Indonesia. The International Rubber Research and Development Board homepage. [Online] Available: http://www.irrdb.com/irrdb/seminars/SmallHoldersIncome.htm

[14] D. Kaimowitz and D. Sheil, "Conserving what and for whom? Why conservation should meet basic human needs in the Tropics", *Biotropica*, vol. 39, pp. 567-574, 2007.

[15] F. H. Schmidt and J.H.A. Ferguson, *Rainfall types on wet and dry period ratios for Indonesia with Western New Guinee.* Verhandelingen, Kementrian Perhubungan Djawatan Meteorologi, 1951, no. 42.

[16] S. Rasnovi, "Ekologi Regenerasi Tumbuhan Berkayu pada Sistem Agroforest Kare," Doctoral thesis, Sekolah Pasca Sarjana, Institut Pertanian Bogor. Bogor, 2006.

[17] (2002) The IUCN website. [Online]. Available: http:// www.iucnredlist.org.

[18] R. Kindt and R. Coe, *Tree diversity analysis: A manual and software for common statistical methods for ecological and biodiversity studies*, Nairobi, Kenya: World Agroforestry Centre (ICRAF), 2005.

[19] J.A. Ludwig and J. F. Reynolds, *Statistical ecology: a primer on methods and computing*, Canada: John Wiley & Sons, Inc., 1988.

[20] R. Kindt, P. van Damme, and A.J. Simons, "Patterns of species richness at varying scales in Western Kenya: planning for agroecosystem diversification", *Biodiv Conserv*, doi:10.1007/s10531-005-0311-9, 2006.

[21] R. Werner, "The impact of management practices on species richness within productive rubber agroforests of Indonesia. In: *Proc. of International Workshop on Management of secondary and logged-over forest in Indonesia*, 1999, pp: 33-44.

[22] D.M. Griffith, "Agroforestry: a Refuge for tropical biodiversity," *Conserv Biol*, vol. 14, pp. 325-326, 2000.

[23] L. Joshi, C. Panjiwibowo, Riyadharma, D. Chaniago, Jasnari, H.Susmanto, A. Ekadinata and M. Bennet. (2007) "Traditional rubber agroforests in Jambi Indonesia – where conservation and human livelihood converge", Poster the World Agroforestry Centre. [Online] Available: http://www.worldagroforestry.org/Library/index.asp?Category=Poster$rectype=&searchText=&page=2

[24] H. Tata, M. van Noordwijk, S. Rasnovi, and L. Joshi, "Pengayaan jenis di wanatani karet" in *Belajar dari Bungo: Mengelola sumber daya alam di era desentralisasi*, 2008, paper 3-5, pp. 222-238.

[25] R. Akiefnawati, G. Wibawa, L. Joshi, and M. van Noordwijk, "Meningkatkan produktivitas karet melalui system wanatani", in *Belajar dari Bungo: Mengelola sumber daya alam di era desentralisasi*, 2008, paper 3-4, p.206-221.

[26] M.E. Kabir and E.L. Webb, " Can homegardens conserve biodiversity in Bangladesh?", *Biotropica*, vol. 39, pp. 567-574.

[27] M. van Noordwijk, D. Boutin, G. Wibawa and L. Joshi, "Rubber production and forest functions in small holder rubber agroforestry in Indonesia", in: Proc. International Rubber Conference and Products Exhibition, 2004, p. 131.

APPENDIX TABLE

TREE SPECIES AND IUCN/SSC STATUS IN FORESTS AND RAFS, IN BUNGO AND TEBO DISTRICTS, JAMBI PROVICE

Family	Species	IUCN status	Forest			RAF			Uses
			Seed-ling	Sapling*	tree	seed ling	Sap-ling*	tree	
			(.................. Important value index …………)						
Dipterocarpaceae	*Dipterocarpus gracilis*	CR		0.7					Timber
	Dipterocarpus grandiflorus	CR		0.1					Timber
	Hopea nigra	CR		1.7					Timber
	Parashorea aptera	CR		0.6			0.02		Timber
	Parashorea lucida	CR		0.2			0.1		Timber
	Parashorea malaononan	CR					0.9		Timber
	Shorea johorensis	CR		0.05					Timber
	Anisoptera costata	EN	3.4	1.3					Timber
	Anisoptera laevis	EN		0.6			0.02		Timber
	Shorea bracteolate	EN		0.04					Timber
	Shorea leprosula	EN		1.6	2.2				Timber
	Vatica lowii	EN		0.06					Timber
	Vatica stapfiana	EN		0.6					Timber
Araucariaceae	*Agathis dammara*	VU		0.09					Timber, resin
Fabaceae	*Dalbergia latifolia*	VU	0.5						Timber
Lauraceae	*Eusiderroxylon zwageri*	VU		0.5					Timber
Meliaceae	*Aglaia angustifolia*	VU		0.1					Fruits edible
Thymeleaceae	*Aquilaria malaccensis*	VU		0.04			1.1		Agar wood, medicine
	Gonystylus macrophyllus	VU					0.2		Timber
Alangiaceae	*Alangium javanicum*	LR			1.4				-
Apocynaceae	*Alstonia angustifolia*	LR			1.6			1.8	Latex, timber
	Alstonia scholaris	LR						3.1	Latex, timber
	Dyera costulata	LR				0.5		2.3	Latex
Burseraceae	*Canarium littorale*	LR	0.7	0.9		2.1	1.6		Timber, resin
	Canarium patentinervium	LR	2.7	5.5		0.5	1.9		Timber, edible seeds
	Dacryodes rostrata	LR						1.7	Timber, resin, edible seeds
	Santiria griffithii	LR	2.2	1.6	1.3	0.5	0.9	1.6	Timber
	Santiria laevigata	LR	1.0				1.6		Timber, edible fruits
	Santiria tomentosa	LR			2.3				Timber, edible fruits
Caesalpinaceae	*Koompassia malaccensis*	LR	1.6					3.9	Timber
Celastraceae	*Bhesa paniculata*	LR	0.5		1.3			1.7	Timber, edible fruits (aril)
Clusiacea	*Callophyllum soulatri*	LR	2.3	1.3			1.9		Timber, latex is used as poison, oil can be extracted from seeds
	Garcinia maingayi	LR						2.0	Edible fruits, pigment
Meliaceae	*Aglaia argentea*	LR	0.5			0.5			-
	Aglaia forbesii	LR		0.9					Edible fruits
	Aglaia tomentosa	LR						1.7	Timber, edible fruits
	Aglaia lawii	LR		0.9					Timber, leaves is used as medicine
	Aglaia palembanica	LR				0.5			-
	Dysoxylum alliaceum	LR	0.5						Timber
Myristicaceae	*Horsfieldia grandis*	LR				0.5			-
	Myristica cf. iners	LR			2.2				-
Rhizophoraceae	*Anisophyllea disticha*	LR	2.6			0.6			-
Rosaceae	*Parastemon cf. urophyllus*	LR		1.9					-
	Prunus arborea	LR	0.5						Timber
Sapindaceae	*Dimocarpus longan*	LR	1.2	0.9	2.4				Edible fruits, timber.
	Nephelium lappaceum	LR	0.5	0.9	1.8	1.0	0.9	1.7	Edible fruits. Cultivated

Note: * Compilation of two data sets. CR = critically endangered; EN = Endangered; VU = vulnerable; LR = Lower Risk