Can traditional forest management protect and conserve ironwood (ulin) stands? An option and approach in East Kalimantan

Wahyuni, T.

Appendix

Appendix 1

List of vernacular names of Borneo ironwood (*Eusideroxylon zwageri* Teijsm. and Binn)

Vernacular name and variability	**Ethnic or cultural identity; (region) and country**
Tagas *(litis, magangai, agintanga)*	Dayak Agabag, Sembakung river, Nunukan District, Northeast Kalimantan*
Telien or *teliyon* *(baning, sirap* or *jambu, jupe)*	Paser, Paser District (Muluy and Rantau Layung village), East Kalimantan*
Belian *(tando, lilin, tembaga, kapur)*	West Kalimantan
Terah	Berawan, Kelabit
Tabalien	Ngaju Dayak, Central Kalimantan
Belian	Sarawak, Sabah, Brunei
Bulian	Bangka island
Bulian *(gundjing* or *regis, rambai, ketimun, terkujung)*	Jambi, Sumatra
Bulian *(daging, kapur, sirap, tanduk)*	Senami forest, Jambi
Tambulian	Sabah, Philippines
Tulian, *tebelian* and *teluyatn*	Kalimantan
Onglen *(regis, arang, koenjit)*	Palembang, Sumatra
Sakian or *biliran*	Philippines
Im muk or *yam muk*	Cantonese, Hakka in Sabah

Bilian or *bois de fer de Borneo*	French
Bilian, Borneo ironwood, *tambulian, belian* and *ulin*	English
Legno ferro del Borneo	Italian
Borneojarntra	Swedish
Borneo's ijzerhout or *onglen, Palembang Iyzerhout* or *oelin*	Dutch
Borneo Eisenholz	German
Ulin	Modern Indonesian

Source: After Martawijaya et al 1989 and * this research

Appendix 2

Lists of tree species protected under the Decree No. 54/Kpts/Um/2/1972 (the species are allowed to be cut only after reaching the minimum size determined)

No.	Scientific name	Local name	Minimum cutting diameter (cm)
I	**Resin producing tree species**		
1.	*Palaquium gutta*	Balam merah, Sumban	50
2.	*Agathis labillardieri*	Damar, Kopal	50
3.	*Dyera* sp	Jelutung	60
4.	*Palaquium Ieiocarpum*	Hangkang	30
5.	*Dryobalanops camphora*	Kapur banis	60
6.	*Styrax* sp.	Kemenyan	30
7.	*Dipterocarpus* sp	Keruing (minyak)	50
8.	*Ganua motleyana*	Ketiau	30
9.	*Shorea* sp.	Mata kucing (damar)	60
II	**Fruit tree species**		
1.	Palaquium walsurlfolium	Balam suntai	40
2.	*P. burckii*	Jambu monyet	30
3.	*Durio zibethinus*	Durian	60
4.	*Aleurites moluccanus*	Kemiri	50
5.	*Arenga pinnata*	Enau	40
III	**Tree species with its useful bark and/or natural colour substance.**		
1.	*Excoecaria agallocha*	Mata buta	25
2.	*Myristica argentea*	Honggi, Saya	30
3.	*Cudrania* sp.	Kayu kuning	10
4.	*Cinnamomum burmannii*	Kayu manis	25
5.	*Caesalpinia sappan*	Kayu sepang	10
6.	*Cinnamomum cullilawan*	Kulit lawang	25
7.	*Cryptocarya massoy*	Massoi	25
IV	**Tree species with one or more specific values, such as bark, wood, or essential oil**		
1.	*Pterospermum* sp.	Bayur	30
2.	***Eusideroxylon zwageri***	Bulian, Ulin	60
3.	*Eucalyptus* sp.	Leda, eucalyptus	40
4.	*Azadirachta indica*	Imba	50
5.	*Intsia amboinensis*	Ipil	60

6.	*Diospyros* sp.	Kayu hitam	60
7.	*Timonius sericeus*	Ketimunan	40
8.	*Scorodocarpus borneensis*	Kulin, Kayu bawang	50
9.	*Cordia subcordata*	Pumasamada	40
10.	*Manilkara kauki*	Sawo kecik	45
11.	*Dalbergia latifolia*	Sono keling	50
12.	*Toona sinensis*	Suren	60
13.	*Duabanga moluccana*	Taker, benuang	60
14.	*Fagraea fragrans*	Tembasu	50
15.	*Santalum album*	Cendana	50
16.	*Protium javanicum*	Trenggulun	50

Through the Minister of Forestry Decree No. 261/Kpts-IV/1990, the following 12 species of the genus *Shorea* were added to the list. These species were known to produce 'tengkawang fruits' which can be used for various purposes including cosmetics. These are: *Shorea stenopten* and *S. stenoptera, S. gysber, S. pinanga, S. compressa, S. seminis, S. martiniana, S. mexistropteryx, S. beccariana, S. micrantha, S. palembanica, S. lepidota* and *S. singkawang.*

Appendix 3

List of fancy wood group based on information from Indonesian Forestry Department

No.	Trade name	Local name	Scientific name
1.	Bongin	Pauh kijang, Sepah, Kayu Batu	Irvingia malayana Oliv
2.	Bungur	Wungu, Tekuyung, Benger, Ketangi	Lagerstroemia speciosa Pers
3.	Cempaka	Minjaran, Wasian, Manglid, Sitekwok	Michelia spp, Elmerrillia spp
4.	Cendana	Kayu kuning, Lemo Daru	Santalum album L.
5.	Dahu	Dao, Sengkuang, Basuong, Koili	Dracontomelon spp
6.	Johar	Juar, Trengguli, Sebusuk, Bobondelan	Cassia spp
7.	Kuku	Kayu laut, Papus, Nani laut	Pericopsis mooniana Thw
8.	Kupang	Kayu ruan, Saga	Ormosia spp
9.	Lasi	Adina, Kilaki	Adinauclea fagifolia Ridsd
10.	Mahoni	Mahoni	Swietenia spp
11.	Melur	Sampinur tali, Jamuju, Ki Merah, Cematan, Alau, Kayu embun, Kayu Cina, Sandu, Sampinur bunga	Dacrydium junghuhnii Miq; Podocarpus spp; Dacrydium spp
12.	Membacang	Limus piit, Ambacang, Wani mempelam, Asam mangga	Mangifera spp
13.	Mindi	Bawang kungut	Melia spp
14.	Nyirih	Nyireh, Niri	Xylocarpus granatum Koning
15.	Pasang	Mempening, Baturua, Kasunu, Triti	Quercus spp
16.	Perepat Darat	Marapat, Teruntum batu	Combretocarpus rotundatus Dans
17.	Raja Bunga	Segawe, Klenderi, Saga	Adenanthera spp
18.	Rengas	Ingas, Suloh, Rangas, Rengas burung	Gluta spp; Melanorrhoea spp
19.	Ramin	Gaharu buaya, Medang keladi, Keladi, Miang	Gonystylus bancanus Kurz
20.	Sawo Kecik	Subo, Ki sawo	Manilkara spp
21.	Salimuli	Kendal, Kalimasada, Purnamasada	Cordia spp
22.	Sindur	Sepetir, Sasumdur, Mobingo	Sindora spp
23.	Sonokembang	Angsana, Linggua, Nala, Candana	Pterocarpus indicus Willd
24.	Sonokeling	Linggota, Sono sungu, Sonobrits	Dalbergia latifolia Roxb
25.	Sungkai	Jati seberang, Jati londo	Peronema canescens Jack

No.	Trade name	Local name	Scientific name
26.	Tanjung	Sawo manuk, Karikis	Mimusops elengi L.
27.	Tapos	Kelampai, Setan, Kedui, Wayang	Elateriospermum tapos BI
28.	Tinjau Belukar	Lontar kuning	Pteleocarpus lampongus Bakh
29.	Torem	Sawai, Torem	Manikara kanosensis H.L.et.B.M.
30.	Trembesi	Ki hujan	Samanea saman Merr
31.	Ulin	Kayu besi, Bulian, Kokon	Eusideroxylon zwageri T.et.b
32.	Weru	Beru, Ki Hiyang, Bengkal	Albizia procera Benth

Source: Appendix of ministerial decree of the Ministry of Forestry Nr.163/Kpts-II/2003 (26 May 2003)

Appendix 4

Table 1. Species importance value of trees in 2 ha plot at Muluy sites

No.	Species	N	B.A	RF	RDens	RDom	SIV
1	Actinodaphne glabra Blume	2	0.671	1.6	0.2	0.2	2.0
2.	Adenanthera sp	1	0.432	2.1	0.3	0.7	3.1
3.	Aglaia sp	4	0.221	8.7	1.4	1.6	11.7
4.	Aglaia tomentosa Teijsm. and Binn	2	0.262	3.5	0.5	0.3	4.3
5.	Alseodaphne sp	25	1.259	37.4	7.9	6.6	51.9
6.	Alstonia angustiloba	1	0.671	1.6	0.2	0.3	2.1
7.	Anthocephalus chinensis	1	0.432	1.6	0.2	1.6	3.4
8	Aporosa grandistipulata Merr	2	0.221	2.1	0.3	0.2	2.6
9.	Archidendron pauciflorum	1	0.262	2.1	0.3	0.1	2.5
10.	Artocarpus anisophyllus Miq	11	1.084	18.4	3.2	3.8	25.4
11.	Artocarpus elasticus Blume	3	0.490	6.4	1.1	1.0	8.5
12.	Artocarpus odoratissimus Miq	5	0.861	10.6	1.6	0.9	13.2
13.	Baccaurea sp	1	0.562	2.1	0.3	0.4	2.8
14.	Bruinsmia stiracoides Boerl.& Koord.	3	0.458	5.6	0.8	0.9	7.2
15.	Calophyllum sp	2	0.389	1.9	0.3	0.1	2.3
16.	Canarium sp	1	0.132	1.9	0.3	0.1	2.3
17.	Carrallia braehiata Merr	1	0.262	1.9	0.3	0.1	2.3
18.	Cratoxylum formosum (Jack) Dyer	2	0.084	2.1	0.3	0.3	2.7
19.	Cyathocalyx sp	2	0.490	1.6	0.2	0.1	1.9
20.	Dacryodes indum L	1	0.487	2.1	0.3	0.2	2.6
21.	Dacryodes rostrata (Blume) H.J.Lam	8	0.962	14.3	2.1	1.8	18.1
22.	Dialium indum L.	4	0.084	6.1	0.9	0.6	7.6
23.	Dillenia reticulata King	3	0.490	6.3	0.9	1.5	8.7
24.	Diospyros borneensis Hiern	3	0.191	5.2	0.8	0.5	6.5
25.	Dipterocarpus sp	3	0.517	5.4	0.7	0.5	6.7
26.	Disoxylum sp	2	0.254	2.1	0.3	0.1	2.5
27.	Drypetes polyneura Airy Show	3	0.060	5.9	0.8	0.3	7.1
28.	Durio caucius	2	0.042	1.6	0.2	0.2	2.0
29.	Durio dulcis Becc	1	0.494	1.6	0.2	0.1	1.9
30.	Durio zibethinus Murray	3	0.289	5.6	0.8	0.5	6.9
31.	Eusideroxylon zwageri T. et. B	33	3.652	46.6	14.1	22.2	82.8

No.	Species	N	B.A	RF	RDens	RDom	SIV
32.	Ficusvaarpus grandiflorus Blanco	1	0.418	1.6	0.2	0.1	1.9
33.	Garcinia sp	2	0.075	1.6	0.2	0.1	1.9
34.	Gardenia sp	1	0.114	1.6	0.2	0.2	2.0
35.	Gironniera nervosa Planch	12	1.877	27.3	4.6	1.9	33.8
36.	Gironniera sp	2	0.209	3.8	0.5	0.4	4.7
37.	Gonocaryum sp	10	1.236	14.1	2.9	6.1	23.1
38.	Homania javensis	1	0.254	2.8	0.5	0.2	3.5
39.	Ixonanthes reticulata Jack	3	0.060	6.1	0.9	1.9	8.9
40.	Kibara coriacea (Blume) Tulasme	2	0.042	1.6	0.2	0.1	1.9
41.	Knema latericia Elmer	3	0.494	4.3	1.0	0.6	5.9
42.	Koompassia excelsa Taub	2	0.289	4.0	0.6	1.3	5.9
43.	Lepisanthes sp	1	0.671	1.6	0.2	0.2	1.9
44.	Lithocarpus cf.gracilis (Korth.) Soepadmo	6	0.732	12.4	1.9	1.2	15.5
45.	Lithocarpus sp	13	1.221	20.2	3.4	2.3	25.9
46.	Litsea sp	2	0.262	3.1	0.5	0.2	3.7
47.	Macaranga gigantea	2	0.042	3.6	0.5	0.3	4.5
48.	Macaranga hypoleuca	1	0.494	1.9	0.3	0.2	2.4
49.	Magnolia lasia Noot.	3	0.289	7.5	1.3	0.5	9.3
50.	Microcos sp	1	0.671	1.6	0.2	0.2	2.0
51.	Mischocarpus pentapetalus (Roxb.) Radlk	10	1.232	11.0	2.5	2.2	15.7
52.	Nephelium lappaceum L.	2	0.060	2.8	0.5	0.2	3.5
53.	Nephelium sp	1	0.042	2.1	0.3	0.1	2.5
54.	Ochanostachys amentaceae Mast	29	1.236	46.4	9.1	7.8	63.3
55.	Payena acuminata Pierre	6	0.228	11.8	1.8	1.3	14.9
56.	Polyalthia rumphii (Blume) Merr	12	1.235	13.7	2.9	1.4	18.1
57.	Polyalthia sp	2	0.270	4.0	0.6	0.3	4.9
58.	Prainea sp	1	0.054	1.9	0.3	0.1	2.3
59.	Prunus sp	2	0.170	1.6	0.2	0.1	1.9
60.	Pternandra rostrata (Cogn.)M.P. Nayar	1	0.127	2.1	0.3	0.3	2.7
61.	Santiria tomentosa Blume	2	0.352	4.2	0.6	0.3	5.1
62.	Scorodocarpus bornensis	1	0.289	1.6	0.2	0.1	1.9
63.	Shorea leprosula Miq	28	1.867	41.4	7.9	10.9	60.2
64.	Shorea parvifolia Dyer	1	0.261	1.9	0.3	0.1	2.3
65.	Sterculia sp	1	0.562	1.6	0.2	0.2	2.0

No.	Species	N	B.A	RF	RDens	RDom	SIV
66.	Sterculia stipulata Korth.	2	0.458	1.9	0.3	0.8	3.0
67.	Swintonia sp	1	0.389	1.9	0.3	0.2	2.3
68.	Symplocos fasciculata Zoll	1	0.132	1.6	0.2	0.1	1.9
69.	Syzygium sp	10	1.142	18.1	2.6	1.7	22.4
70.	Trigoniastrum hypoleucum Miq	2	0.418	21.0	0.8	0.3	22.1
71.	Triomma malaccensis Hook.f.	2	0.075	1.9	0.5	1.3	3.8
72.	UN1	1	0.114	2.1	0.3	0.4	2.8
73.	UN2	2	0.877	4.3	0.8	0.7	5.8
74.	UN3	3	0.209	7.6	1.4	0.9	9.9
75.	UN4	1	0.236	2.8	0.5	0.2	3.5
76.	UN5	1	0.254	2.1	0.3	0.2	2.6
77.	UN6	1	0.060	1.6	0.2	0.1	1.9
78.	UN7	2	0.042	3.5	0.5	0.4	4.4
79.	Xanthophyllum affine Korth.Ex Miq	3	0.494	5.7	0.9	0.3	6.9
80.	Xylopia elliptica Maingay ex Hook.f.	1	0.289	2.1	0.3	0.8	3.2
	Total	**336**	41.975				

UN: unidentified

Table 2. Family composition and family importance value of trees in 2 ha plot at Muluy sites

No.	Family	N	B.A	R diversity	R density	R dom	FIV
1.	Anacardiaceae	1	0.080	3,0	1,0	0,6	4,7
2.	Annonaceae	15	1.130	12,4	17,6	11,4	41,4
3.	Apocynaceae	1	1.730	2,2	0,9	1,1	4,2
4.	Bombacaceae	5	0.680	16,6	5,0	3,4	25,0
5.	Burseraceae	13	1.140	16,2	13,7	14,0	43,9
6.	Dilleniaceae	3	0.234	2,4	3,7	5,8	11,9
7.	Dipterocarpaceae	32	1.867	21,5	35,3	45,9	102,8
8.	Ebenaceae	2	0.671	4,7	3,0	1,9	9,6
9.	Euphorbiaceae	9	0.432	20,6	11,0	6,4	38,0
10.	Fagaceae	19	1.221	15,7	21,1	14,0	50,7
11.	Guttiferae	2	0.262	5,3	1,9	0,9	8,1
12.	Hypericaceae	1	0.084	2,4	1,2	1,2	4,9
13.	Icacinaceae	10	0.790	13,2	11,5	24,3	49,1
14.	Lauraceae	71	3.652	30,9	90,0	116,7	237,7
15.	Leguminosae	8	1.130	13,2	9,1	9,4	31,7
16.	Linaceae	3	0.730	5,5	3,5	7,5	16,5
17.	Magnoliaceae	3	0.680	8,6	5,3	2,0	15,9
18.	Melastomataceae	1	0.440	2,4	1,2	1,1	4,7
19.	Meliaceae	8	1.490	20,9	9,5	8,2	38,7
20.	Monimiaceae	1	0.620	2,2	0,9	0,3	3,4
21.	Moraceae	21	1.110	23,4	26,3	24,6	74,3
22.	Myristicaceae	7	0.130	7,8	3,9	2,3	14,0
23.	Myrtaceae	6	1.730	10,1	10,2	6,9	27,2
24.	Olacaceae	30	1.680	15,5	37,0	31,6	84,0
25.	Polygalaceae	3	0.440	4,7	3,3	1,4	9,4
26.	Rhizophoraceae	1	0.171	3,0	1,0	0,6	4,6
27.	Rosaceae	1	0.432	2,2	0,9	0,5	3,6
28.	Rubiaceae	2	0.221	4,4	1,8	7,1	13,4
29.	Sapindaceae	14	0.562	20,6	15,5	13,1	49,2
30.	Sapotaceae	6	0.284	13,2	7,2	5,1	25,5
31.	Sterculiaceae	2	0.190	5,3	1,9	4,3	11,5
32.	Styracaceae	3	0.261	7,7	3,2	3,5	14,3
33.	Symplocaceae	1	0.562	2,2	0,9	0,6	3,7
34.	Tiliaceae	1	0.458	2,2	0,9	0,7	3,8
35.	Trigoniaceae	2	0.389	7,8	3,0	1,3	12,1
36.	Ulmaceae	11	0.832	16,3	20,4	9,0	45,8
37.	UN	11	0.789	33,7	15,9	11,3	60,9
	T o t a l	**336**	**41.975**				

Appendix 5

Table 1. Species importance value of trees in plots at Rantau Layung sites

No.	Species	N	BA	R Dom	RF	RD	SIV
1.	Aglaia sp	14	1.732	6.48	30.56	5.45	42.49
2.	Alseodaphne sp	4	.671	1.85	11.11	2.11	15.08
3.	Antidesma neurocarpa Miq	6	.432	2.78	13.89	1.36	18.03
4.	Antidesma sp	3	.221	1.39	8.33	0.69	10.42
5.	Artocarpus sp	2	.262	0.93	2.78	0.82	4.53
6.	Croton argyratus Blume	2	.084	0.93	5.56	0.26	6.74
7.	Dillenia grandifolia	1	.490	0.46	2.78	1.54	4.78
8.	Diospyros sp.	1	.261	0.46	2.78	0.82	4.06
9.	Diospyros sumatrana Miq	7	.562	3.24	16.67	1.77	21.68
10.	Dryobalanops lanceolata Kurz	7	.458	3.24	11.11	1.44	15.79
11.	Ellipanthus tomentosus Kurz	6	.389	2.78	13.89	1.22	17.89
12.	Elmerrillia tsiampacca (L) Dandy	1	.132	0.46	2.78	0.42	3.66
13.	Endertia spectabilis Steenis & de wid	25	4.830	11.57	36.11	15.20	62.88
14.	Eusideroxylon zwageri T. et. B	18	3.198	8.33	41.67	10.06	60.06
15.	Ficus sp	1	.418	0.46	2.78	1.32	4.56
16.	Garcinia parvifolia (Miq.) Miq	1	.075	0.46	2.78	0.24	3.48
17.	Gironniera nervosa Planch	10	1.114	4.63	19.44	3.51	27.58
18.	Hopea dryobalanoides Miq	5	.877	2.31	13.89	2.76	18.96
19.	Knema lutiola W.J.J.O. de Wilde	2	.209	0.93	5.56	0.66	7.14
20.	Knema palens W.J.J.O. de Wilde	2	.236	0.93	5.56	0.74	7.22
21.	Koompassia malaccensis	2	1.254	0.93	5.56	3.95	10.43
22.	Lithocarpus sp	1	.060	0.46	2.78	0.19	3.43
23.	Macaranga pruinosa	1	.042	0.46	2.78	0.13	3.37
24.	Ochanostachys amentacea Mast	20	1.494	9.26	44.44	4.70	58.40
25.	Polyalthia lateriflora Blume	17	1.289	7.87	33.33	4.06	45.26
26.	Polyalthia sp	1	.035	0.46	2.78	0.11	3.35
27.	Pterospermum javanicum Jungh.	1	.270	0.46	2.78	0.85	4.09
28.	Saurauia sp	1	.054	0.46	2.78	0.17	3.41
29.	Shorea parvistipulata Heim	1	.070	0.46	2.78	0.22	3.46
30.	Shorea spp.	29	6.527	13.43	30.56	20.54	64.52
31.	Sterculia stipulata Korth	1	.352	0.46	2.78	1.11	4.35
32.	Unidentified	1	.154	0.46	2.78	0.48	3.72
33.	Unidentified	22	3.528	10.19	38.89	11.10	60.17
	T o t a l	**216**	**31.779**				

Table 2. Family composition and family importance value of trees in 2 ha plot at Rantau Layung sites

No.	FAMILY	N	BA	R dominance	R diversity	R density	FIV
1.	Actinidiaceae	1	0.050	0.46	2.78	0.16	3.40
2.	Annonaceae	19	1.480	8.80	38.89	4.66	52.34
3.	Connaraceae	6	0.390	2.78	13.89	1.23	17.89
4.	Dilleniaceae	1	0.490	0.46	2.78	1.54	4.78
5.	Dipterocarpaceae	42	7.930	19.44	58.33	24.95	102.73
6.	Ebenaceae	8	0.820	3.70	19.44	2.58	25.73
7.	Euphorbiaceae	12	0.780	5.56	30.56	2.45	38.57
8.	Fagaceae	1	0.060	0.46	2.78	0.19	3.43
9.	Guttiferae	1	0.070	0.46	2.78	0.22	3.46
10.	Lauraceae	22	3.870	10.19	52.78	12.18	75.14
11.	Leguminosae	27	6.080	12.50	41.67	19.13	73.30
12.	Magnoliaceae	1	0.130	0.46	2.78	0.41	3.65
13.	Meliaceae	14	1.730	6.48	30.56	5.44	42.48
14.	Moraceae	3	0.680	1.39	5.56	2.14	9.08
15.	Myristicaceae	4	0.440	1.85	11.11	1.38	14.35
16.	Olacaceae	20	1.490	9.26	44.44	4.69	58.39
17.	Sterculiaceae	2	0.620	0.93	5.56	1.95	8.43
18.	Ulmaceae	10	1.110	4.63	19.44	3.49	27.57
19.	Unidentified	22	3.528	10.19	38.89	11.11	60.18
	T o t a l	216	31.779				

Where:

N	:	Number of trees
BA	:	Basal Area
RDom	:	Relative dominance
RF	:	Relative frequency
RDens	:	Relative density
RDiv	:	Relative diversity
SIV	:	Species importance value
FIV	:	Family importance value

Appendix 6

Table 1. Tree species found inside the *simpunkg*, which produce food, medicine, firewood, wood and non-timber forest products at Muluy plots

No.	Local name	Scientific name	Products			
			Fruit	Vegetable	Medicine	Others
1.	Telien baning	*Eusideroxylon zwageri*			v	
2.	Akos	*Friesodielsa argentia*			v	V
3.	Aragendang	*Ficusvaarpus grandiflorus*	v			
4.	Bajur	*Pterospermum sp*			v	Boat, bullock cart
5.	Biang	*Artocarpus tamaran*	v			
6.	Belimbing sipot	*Microcos sp*	v			
7.	Bensiang	*Ziziphus angustifolia*	v		v	
8.	Benturung	*Artocarpus odoratissimus*	v		v	
9.	Benuang	*Lepisanthes sp*			v	
10.	Biasong	*Canarium sp*	v			
11.	Derari	*Ficus obscura*	v			
12.	Dora wani	Unidentified species	v			
13.	Dungket	*Nephelium sp*	v			
14.	Duyan	*Durio zibethinus*	v			
15.	Gasing	*Ficus sp*	v			
16.	Jan	*Dialium cf.indum L.*	v			
17.	Jering	*Archidendron pauciflorum*	v			
18.	Jupe	Unidentified species	v		v	
19.	Kendis	*Garcinia parvifolia*	v		v	
20.	Kelupo	Unidentified species	v			
21.	Kepuan	*Artocarpus anisophyllus*	v			
22.	Keputu	*Artocarpus anisophyllus*	v			
23.	Keramu	*Dacryodes rostrata*	v			
24.	Karopitit	*Trigoniastrum hypoleucum*	v			
25.	Kayu Petulu	*Memcylon amplexicaule*			v	V
26.	Lami	*Bridelia glauca*	v			
27.	Layung	*Durio dulcis*	v			

No.	Local name	Scientific name	Products			
			Fruit	Vegetable	Medicine	Others
28.	Lendamun	*Aglaia sp*	v			
29.	Lesat	*Lansium domesticum*	v		v	
30.	Liombot	*Disoxylum sp*	v			
31.	Luing	*Triomma malaccensis*	v			
32.	Mangkolato	Unidentified species	v			
33.	Marompetak	*Dillenia excelsa*			v	V
34.	Meliwe puti	*Polyalthia sp*				V
35.	Marontien	Unidentified species	v			
36.	Natu	*Payena acuminate*	v			V
37.	Nsori	*Artocarpus anisophyllus*	v			
38.	Nsango	*Artocarpus anisophyllus*	V			
39.	Onsom	*Swintonia sp*	v			
40.	Paken	*Durio kutejensis*	v			
41.	Pekalung	*Artocarpus elasticus*	v			Resin, traditional shirt
42.	Penani	*Goniothalamus sp*			v	
43.	Puak empulu	*Baccaurea tetrandra*	v			
44.	Puak pliwon	*Neoscortechinia sp*	v			
45.	Rumbun	*Glochidion sp*	v			Firewood
46.	Selo gunti	*Diospyros sp*	v			
47.	Semayap	*Nephelium lappacerum*	v			
48.	Sembilek	*Lepisanthes amoena*	v			
49.	Sentolu	*Luvunga sp*			v	
50.	Simo	*Canarium sp*				Resin
51.	Siopot	*Aquilaria beccariana*				Resin
52	Tutu dada	*Gonithalamus* sp.			v	V
53.	Siwo	*Nephelium sp*	v			
54.	Tempuro	*Dillenia cf. grandifolia*	v			
55.	Took	*Anthocephalus chinensis*	v			
56.	Toyop	*Artocarpus elasticus*	v			Traditional shirt
57.	Tuola	Unidentified species	v			
58.	Tulang ban	*Timonius lasianthoides*			v	
59.	Umar	*Prainea sp*	v			
60.	Wayan	*Homania javensis*	v			

Table 2. Tree species found inside the *simpunkg*, which produce food, medicine, firewood, wood and non timber forest products at Rantau Layung plots

No.	Local name	Scientific name	Products			
			Fruit	Vegetable	Medicine	Others
1.	Telien baning	*Eusideroxylon zwageri*			v	
2.	Bajur	*Pterospermum javanicum Jungh*			v	Boat, bullock cart
3.	Biang	*Artocarpus tamaran*	v			
4.	Derari	*Ficus obscura*	v			
5.	Kondis biwang	*Garcinia parvifolia*	v		v	
6.	Keramu	*Artocarpus sp*	v			
7.	Karopitit	*Diospyros sumatrana Miq*	v			
8.	Lami	*Cleistanthus paxii Jabl*	v			
9.	Miwe	*Polyalthia sp*				V
10.	Marontien	Unidentified species	v			
11.	Puak pliwon	*Baccaurea bracteata Muell.Arg*	v			
12.	Tempuro	*Dillenia cf. Grandifolia*	v			
13.	Umar	*Prainea sp*	v			

Appendix 7. Log Production Based on Tree Species, Period 2001-2004

No	Species	Year										Total	%
		2001		2002		2003		2004		2005			
		TPTI	IPK	TPTI	IPK	TPTI	IPK	TPTI	IPK	TPTI	IPK		
1	Meranti	831,782.84	1,071,324.05	668,538.72	656,274.86	320,237.81	143,997.07	773,001.60	447,734.85	835,677.51	411,608.72	6,160,178.03	47.58
2	Kapur	94,820.46	225,917.31	74,009.90	120,158.57	32,173.15	25,133.85	92,390.48	177,825.75	118,722.83	130,690.54	1,091,842.84	8.43
3	Bangkirai	61,362.18	225,258.07	55,351.16	52,248.99	18,233.47	13,243.01	33,061.24	55,729.92	64,060.00	83,624.29	662,172.33	5.11
4	Nyatoh	15,698.38	22,575.12	19,006.41	13,245.87	8,450.01	9,752.40	18,801.17	21,708.70	19,860.14	25,984.05	176,083.25	1.36
6	Agathis	21,038.79	4,247.34	14,834.27	2,698.62	5,390.81	587.89	2,004.87	633.14	4,942.54	1,270.10	57,617.37	0.45
7	Kayu Rawa	-	-	-	-	-	-	-	-	-	-	-	-
8	Anggi	2,901.01	1,695.47	817.39	21.82	473.46	254.98	522.29	74.84	1,024.61	308.58	8,094.45	0.06
9	Mersawa	6,991.85	12,003.24	2,540.45	3,215.96	1,583.89	3,831.27	8,714.79	4,430.71	271.69	5,426.04	49,009.89	0.38
10	Ironwood	15.29	21,342.26	49.99	4,406.30	50.30	-	270.25	-	92.72	-	26,227.11	0.20
11	Kenjing	205,473.97	373,909.80	146,289.73	201,032.90	49,143.27	96,988.96	75,631.97	133,756.20	99,550.35	149,062.40	1,530,838.95	11.82
12	Other commercial	96,989.11	1,214,583.41	74,916.41	432,177.13	35,238.41	297,013.41	98,538.23	731,945.98	144,614.00	59,491.79	3,185,507.88	24.60
	Total	1,337,072.88	3,172,856.07	1,056,354.43	1,485,451.42	470,974.58	590,802.84	1,103,936.89	1,573,840.09	1,288,816.39	867,476.51	12,947,582.10	100.00

Source: Provincial Forest Service, 2006

Appendix 8. Datasheets used for community-based data collection

Data sheet 1. Settlement History **Key informants – Village head/traditional Leader*			
Respondent		Date	
Village		Enumerator	

Name		**Gender**	
Age		**Ethnic group**	

Question: Please tell us about the history of this village. If the village was moved from (an) earlier location(s), when and how was the village established? Where did the original residents migrate from? What was the reason to move and what was done with the old/abandoned settlement?

No.	Name of place	Location	Year of abandoning	Reason for abandoning	Present utilisation

Data sheet 2. Demography **Household survey- minimum 30 Hh/villages*			
Respondent		Date	
Village		Enumerator	

Household name		Ethnic		Age of informant	

Name	Family relationship	Age / Gender	Religion	Ethnic Group	Education	Occupation/Job	
						Primary	Secondary

Valuable goods/owned facilities				Remarks
Kind of goods	**Number (unit)**	**Year of buying**	**Price**	
1. House (own or rent)				
2. Television/parabola				
3. Tape/radio				
4. Chainsaw				
5. Bicycle/motorbike				
6. Canoe engine				
7. Canoe				
8. Sewing machine				
9. Electricity/generator				
10. VCD				
11. Gold				
12. Others				

Questionnaire 1. Village Description **Key Informant interview/Village Head*			
Respondent		Date	
Village		Enumerator	

No.	Questions	Answers
	I. Village description	
1.	Since when has this village existed and when was it formally acknowledged by government?	
2.	What is the area of the village? What does it border on?	a. Area ……
		b. Borders - North ……... - East …… - South …… - West ……
3.	What is the area of forest land, garden, *ladang* (swidden), swamp, settlement, and others?	a. Forest Area:…….
		b. Swidden Area:…….
		c. Garden:…….
		d. Settlement:……...
		e. Others:……
4.	What is the population of the village?	…….. people
		…….. households
5.	What ethnic groups are living in the village? List from the most to the least numerous.	
	II. Sources of income	
1.	Where does your income come from, besides from forest and *ladang*?	
2.	How big is your income? (Note: according to local unit/value, which will be converted later into Rp/month)	
3.	Are there any other household members, who work and earn money? If 'yes', who, what job, how much do they earn?	

Questionnaire 2. Cultural Background **Key Informant interview/Traditional Head*			
Respondent		Date	
Village		Enumerator	

	I. General description of traditional community	
1.	Describe briefly the history of the traditional community of this village?	
2.	Are the traditional rules and institutions still functioning significantly here?	No; reasons
		Yes; examples
3.	How long will the traditional rules be valid and what are the reasons?	
4.	To whom do the traditional rules apply and how are they maintained?	a. Insiders:
		b. Outsiders:
		c. Measures:
	II. Traditional rules and regulations	
1.	Are there any places traditionally protected from disturbance (e.g. sacred places or traditional land/forest)? If yes, please name them!	
2.	Why are those places protected?	
3.	Are there any traditional rules used for protecting the forest?	
4.	What traditional sanctions are imposed on people who damage the forests?	
5.	Are there any changes in the area of the forest being utilized?	a. Increase (What for?)
		b. Decrease (What for?)
		c. No change (What for?)
6.	Are there any changes in the traditional rules concerning forest land-uses?	a. No change (What for?)
		b. Becomes stricter (What for?)
		c. Becomes more flexible (What for?)
7.	Is it difficult to use/find new forest area?	a. More difficult (Why?)
		b. Easier (Why?)
		c. No change (Why?)

Questionnaire 3. Forest management related ironwood **HH Survey-minimum 30 Households/village*					
Respondent					
Village					
HH no./name		**Ethnic group**		**Age**	

No.	**Questions**	**Answers**
A. Dangers/threats of human activities to ironwood		
1.	Are there any places traditionally protected of ironwood from disturbance (e.g. sacred places or traditional land/forest)? If yes, please name them!	
2.	According to *Bapak/Ibu* which human activities can disturb the sustainability of ironwood resources and benefits to local communities? Why?	
3.	Could you please list them based on their degree of danger?	
4.	Beside dangers and threats are there also some advantages/benefits from those human activities? Please explain.	
B. Aspiration of local community		
1.	Is your (*Bapak/ibu*) life better than five/ten years ago? Why?	
2.	What future do you hope for your children/ young generation?	
3.	What do you expect/predict will happen in your village in the next few months/years?	
4.	In case the forest is degraded or disappears, what are you going to do?	
5.	Do you think that forest has made an important contribution to your family?	
6.	Do you think that forest will still be important for your grandchildren?	
7.	Do you think that the changes that have happanned in your lifetime have made life better for your people?	
8.	What would you like to change in the village?	
9.	Do you think commercial logging is a good way of using forests for future?	

Questionnaire 4. **Traditional knowledge on ironwood management and cultivation** ***Key Informants(3-5 persons)**			
Respondent		Date	
Village		Enumerator	

No.	Questions	Answers
1	If someone wants to know something about ironwood, who among the villagers is able to explain it? (note: at least five persons)	
2.	According to you (*Bapak/ibu*), what is the most suitable land for ironwood sites?	
3.	According to you, is the management of the land for ironwood easy or difficult, how do you overcome the problems?	
4.	According to you, is the germination of ironwood easy or difficult? If difficult, how do you overcome the problems?	a. Cracking
		b. Boiling
		c. Baking
		d. Others……
5.	Do you also take seedlings from the forest? If yes, how far is it? How many seedlings can you take in one time?	
6.	Do you plant these seedlings near the village?	
7.	Do you protect the seed trees?	

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