PANITIA PELAKSANA
Seminar Nasional
Silvikultur Tropika III Tahun 2015
Departemen Silvikultur, Fakultas Kehutanan IPB

List of participans who have accepted for ORAL presentation in the 1st International Seminar of Tropical Silviculture. All accepted full paper of participants who have completed registration for the seminar by the deadline of 8 August 2015 will be published in Proceedings. Further information please kindly visit: www.semisilvik.event.ipb.ac.id

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1	Abubakar M. Lahjie, Rochadi Kristiningum dan Karmilasari	Simulation Production of Forest Logged Over Area With The Restoration Silvicultural Systems Indonesian (RSSI) as Model of Sustainable Forest Management in Area TPTJ PT Sarmiento Parakantja Timber, Central Kalimantan Province
2	Achmad Sururi, and Sobri Effendy	Predicting The Cooling Effect of Green Space Areas With Trees Using an Empirical Model in Bogor Agricultural University
3	Ahmad Yamani, Prof. Abubakar M. Lahjie, Prof. B.D.A.S Simarangkir, Rochadi Kristiningrum	Analysis Bioeconomy, Growth And Recovery Stands Felling Forests Based on Local Wisdom in Penajam Paser Utara Regency East Kalimantan Province
4	Ananto Triyogo and Hironori Yasuda	The Effects of Plant Resistance of Galling Insects, *Dryocosmus kuriphillus*, on Arthropod Composition on Chestnut Tree, Castanea Crenata
5	Bima Krida Pamungkas, Nieke Karnaningroem, Didik Bambang Supriyadi, Mas Agus Mardiyanto	Portable Wastewater Treatment Plant Design With Aerobic Biofilter Unit For Bakery Industry in Surabaya
6	Budiaman	Effectivity and Product Diversification of The Biological Pollinator of *Apis mellifera* L. in Toraja Coffee Plantation Monoculture
7	Cecep Kusmana, Edje Djamhuri, and Satriavi Putri Astrinata	The Alternative Culturing Technique Performance of Bintaro (*Cerbera manghas* Linn) as Potential Mangrove Tree Species For Biofuel
8	Dharmawati F. Djam'an, Kurniawati Purwaka Putri, Evayusvita Rustam, and dan Agus Astho Pramono	Potential of Fruit Production Tembesu (*Fagraea fragrans* Roxb.) off Ogan Ilir (OI) and Ogan Komering Ilir (OKI) The South Sumatera
9	Dr Ir Basuki Wasis, MS , Prof Dr Ir Sri Wilarso Budi R, MS, Berry Oktavianto, S.hut	Soil Quality Analysis oPine Stands in Holcim , Educational Forest Post Silica Mining Area
10	Duryat and Melya Riniarti	Measurement of Natural Regeneration Rate of Mangrove Forest After Thinning at University of Lampung Mangrove Educational Forest
11	Dwi Astiani, Lisa M Curran, Mujiman, Ruspita Salim, Nelly Lisnawati, Dessy Ratnasari, Deddy D Firwanta, Yadi Purwanto	Variation of Forest Structure and Biomass Allocation Among Degradation Level of West Kalimantan Peatland Forest
12	Eka Perdanawati Yunus, Supriyanto, Iskandar Z. Siregar	Genotypic and Phenotypic Analyses of Mutated *Acacia mangium* Willd.
13	Ellok Dwi Sulichantini	The Effect of Propagation Methods, Tissue Culture, Mini Cutting And Seed to The Growth Of *Eucalyptus pellita* F. Muell in Nursery
14	Farida Herry Susanty	Biodiversity Important Factors Assessment on Lowland Tropical Forest By Ecological Quantitative Parameters
15	Hesti Lestari Tata	Distribution and Growth of *Dyera polyphylla* (Miq) Steenis in Jambi
16	Ida Rosita	Physical and Chemical Soil Properties in Some Agroforestry Patterns
17	Ika Heriansyah	Evaluation of Reduced Impact Logging Technique at Different Logging Intensity: an Assessment on Sustainable Yield and Carbon Sequestration
18	Jenny Rumondang, Yadi Setiadi, Iwan Hilwan	Effectivity Trial of Paspalum Conjugatum, Setaria Splendida and Vetiveria Zizanoides on Aluminum Poisened Soil.
19	Jeprianto Manurung, Iskandar Z. Siregar, Cecep Kusmana	Genetic Variation and Leaf Characteristic of Mangrove *Avicennia marina* (Forsk.) in Isolated Island-Pulau Sangiang, Indonesia
20	Luluk Setyaningsih and Sri Wilarso Budi	Adaptation of Jabon (*Anthocephalus cadamba* Roxb) Seedlings To Lead (Pb) Under Nutrient Culture Condition1)
21	Petrus A. Dimara, Muliyana Arifudin, Amilda Auri	Harvesting Technique and Identification of Agarwood by Agarwood Seekers of Local Communities in Papua (Study Case: Community of Agarwood Seekers in Manokwari, Sarmi, Teluk Wondama and Sorong Selatan)

NO	NAME	TITLE
22	Priyono Suryanto, Bambang Suwignyo, Sukirno Dwi Asmoro Prianto, Eka Tarwaca Susila Putra, Taufan Alam	Characteristics, Model and Rooting Dynamic Relationship with Soybean Yield in *Tumpangsari* of *Kayu Putih* (*Melaleuca leucadendron* Linn)
23	Rosa Suryantini, Reine Suci Wulandari and Sarma Siahaan	Genetics Variability of *Garcinia* Spp. (Sikup And Tengguli) in Penakalan, West Kalimantan
24	Safinah S.Hakim, Purwanto B. Santosa, Dewi Alimah	Seed Germination and Survival of Seedball Technology for Aeroseeding in Degraded Peat Swamp Forest
25	Suci Ratna Puri, Nurheni Wijayanto dan Arum Sekar Wulandari	Growth and Production of Soybean (*Glycine* Max (L) Merrill) in Agroforestry Systems Sentang (*Azadirachta excelsa* Jack)
26	Sukaesih Pradjadinata and Hesti Lestari Tata	Native Species for Degraded Peat Swamp Forest Rehabilitation
27	Syaiful Eddy, Iskhaq Iskandar, Mohammad Rasyid Ridho, Andy Mulyana	Community-Based Mangrove Forests Conservation for Sustainable Fisheries
28	Wahyudi	Growth and Yield of Meranti Planted Under Akasia Plants in Kapuas, Central Kalimantan
29	Yeni W N Ratnaningrum and Sapto Indriko	Impact of Fertility Variation on Reproductive Fitness and Genetic Diversity of Sandalwood (*Santalum album* Linn., Santalaceae) Planted in Provenance Trial in Yogyakarta, Indonesia
30	Yudi Firmanul Arifin, Siti Hamidah, Yulian Firmana Arifin	The Analysis of Ecological Aspects of Gelam (*Melaleuca cajuputi*) , to Support Silviculture and Conservation of Species on Peatlands
31	Zainal Muttaqin, Sri Wilarso Budi R, Basuki Wasis, Iskandar Z Siregar, Corryanti	Identification of Teak Mistletoe Species and Basic Information of Utilization as Medicinal Plant

UNIVERSITAS PAPUA
FAKULTAS KEHUTANAN
MANOKWARI
Jl. G. Salju Amban Manokwari-Papua Barat 98314
Tel./Fax : 211065, 211364 Laman : http//www fahutan.unipa.ac.id

SURAT TUGAS

No. 185 /UN42.1.4/PP/2015

Dekan Fakultas Kehutanan member tugas kepada staf Dosen Fakultas Kehutanan yang nama-namanya disebutkan di bawah ini:

1. Petrus A. Dimara, S.Hut, M.Sc (NIP. 197904022005011002)
2. Muliana Arifudin, S.Hut, MWood. Sc (NIP. 198201092006042002)
3. Amilda Auri, S.Hut, M.Sc (NIP. 19831031200801200801 2004)
4. Wolfram Y. Mofu, S.Hut, M.Si (NIP. 197803212003121002)
5. Herman A. Manusawai, S.Hut, M.Si

Untuk melaksanakan tugas oral presentase pada kegiatan Seminar Internasional Silvikultur 1 dengan judul "HARVESTING TECHNIQUE AND IDENTIFICATION OF AGARWOOD QUALITY BY LOCAL COMMUNITIES OF AGARWOOD SEEKERS IN PAPUA (Study case: community of agarwood seekers in Manokwari, Sarmi, Teluk Wondama dan Sorong Selatan)" Pada tanggal 21 Agustus 2015 di Bogor.

Demikian surat tugas ini dibuat untuk dilaksanakan dengan penuh tanggung jawab.

Manokwari, 14 Agustus 2015
Dekan

Ir. Endra Gunawan, MP
NIP. 19660416 1993031003

Temnusan:
1. Dekan (Sebagai laporan)
2. Ketua Jurusan Kehutanan
3. Ketua Program Studi Kehutanan
4. Ketua Program Studi Diploma Tiga BDH
5. Yang bersangkutan
6. Arsip

1st International Seminar of Silviculture

THE FIRST INTERNATIONAL SEMINAR OF TROPICAL SILVICULTURE

"Role of Innovation in Tropical Silviculture on Sustainable Forestry Development:
Close To Nature Silviculture"

Bogor, Agustus 21st 2015
IPB International Convention Center, Bogor, Indonesia

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SCHEDULE
THE FIRST INTERNATIONAL SEMINAR OF TROPICAL SILVICULTURE

"Role of Innovation in Tropical Silviculture on Sustainable Forestry Development: Close To Nature Silviculture"

IPB International Convention Center, Bogor
Friday, Agustus 21st2015

No.	Time	Agenda	PIC/Presenter
1	08.30 – 08.55	Registration	Committee
2	08.55 – 09.00	Opening	MC: Suli
3	09.00 – 09.15	Greetings	
		1.Chairman of Committee Reports	Dr. Lailan Syaufina
		2. Welcome remarks Director of SEAMEO-BIOTROP	Dr Ir Irdika Mansur M For Sc
		3. Welcome remarks by Dean of Faculty of Forestry IPB	Dr. Rinekso Soekmadi
		4. Welcome Addres and Opening by Rector of IPB	Prof. Dr. Herry Suhardiyanto
4	**09.15 – 11.15**	**Morning Session**	Chairman: Prof. Dr. Iskandar Z. Siregar Reporter: Adisti Permatasari Putri Hartoyo, S.Hut, Msi
	09.15 – 09.30	Invited speaker: Genetics in Silviculture: Principles, Current Practices and Future Research Direction	Dr. Koichi Kamiya
	09.30 – 09.45	Canopy arthropod communities along a land-use gradient in Central Sumatra	Dr. Jochen Drescer
	09.45 – 10.00	Transboundary haze pollution issue: challenges in tropical silviculture	Prof. Dr. Ahmad Ainuddin Nuruddin

No.	Time	Agenda	PIC/Presenter
		science innovation	
	10.00-10.15	FLAGT-VPA and TLAS Implementation in Indonesia	MFP Kementerian Lingkungan Hidup dan Kehutanan
	10.15 – 10.30	Best practices in forest plantation management in Indonesia	PT RAPP
	10.30 – 11.15	Discussion	Committee
5	11.15 – 13.15	Lunch Break and Poster session	Committee
6	**13.15 – 16.50**	**Afternoon Session (Parallel Oral Presentation)**	Committee
7	**16.50 – 16.55**	**Announcement Of The Best Poster of International Seminar**	MC: Suli
8	**16.55 – 17.00**	**Closing**	

FIRST INTERNATIONAL SEMINAR OF SILVICULTURE

"Role of Innovation in Tropical Silviculture on Sustainable Forestry Management: Close to Nature Silviculture"

AFTERNOON SESSION - Topic: (1) Non Wood Forest Product

Date : Friday, August 21st 2015
Time : 13.30 – 16.00 WIB
Room : Meeting room A, IPB International Convention Center (IICC) Bogor
Chairperson : Dr. Ir. Noor Farikhah Haneda, MS
Reporter : Tri Yanto, S.Hut

No	Time	Name	Judul
1	13.30-13.40	Zainal Muttaqin, Sri Wilarso Budi R, Basuki Wasis, Iskandar Z Siregar, Corryanti	Identification of Teak Mistletoe Species and Basic Information of Utilization as Medicinal Plant
2	13.40-13.50	Petrus A. Dimara, Muliyana Arifudin, Amilda Auri	Harvesting Technique and Identification of Agarwood by Agarwood Seekers of Local Communities in Papua (Case study: Community of Agarwood Seekers in Manokwari, Sarmi, Teluk Wondama and Sorong Selatan)
3	13.50-14.00	Budiaman	Effectivity and Product Diversification of The Biological Pollinator of *Apis Mellifera* L. in Toraja Coffee Plantation

No	Time	Name	Judul
			Monoculture
4	14.00-14.10	Elis N Herliyana, Fitri Andriani , Hanifah N Lioe	Cultivation of four Oyster Mushroom Isolates on Sengon and Jabon Substrate and the Analysis of its Mushroom Chemical Composition
5	14.10-14.20	Dharmawati F. Dtime'an, Kurniawati Purwaka Putri, Evayusvita Rustam, and dan Agus Astho Pramono	Potential of Fruit Production Tembesu (*Fagraea fragrans* Roxb.) Off Ogan Ilir (OI) and Ogan Komering Ilir (OKI) The South Sumatera
6	14.20-14.35	Discussion	Discussion
7	14.35-14.50	Coffee break	Coffee break
8	14.50-15.00	Priyono Suryanto, Bambang Suwignyo, Sukirno Dwi Asmoro Prianto, Eka Tarwaca Susila Putra, Taufan Alam	Characteristics, Model and Rooting Dynamic Relationship With Soybean Yield in *Tumpangsari* of *Kayu Putih* (*Melaleuca leucadendron* LINN)
9	15.00-15.10	Hesti Lestari Tata	Distribution and Growth of *Dyera polyphylla* (Miq) Steenis in Timebi
10	15.10-15.20	Elis N Herliyana, Risma	The Potential of Logs and Twigs Jabon (Anthocephalus

No	Time	Name	Judul
		Anggraeni, Hanifah N Lioe	Cadamba) for The Cultivation of Ear Mushroom, Oyster Mushroom, and Lentinus and Chemical Composition
11	15.20-15.30	Syaiful Eddy, Iskhaq Iskandar, Mohammad Rasyid Ridho, Andy Mulyana	Community-Based Mangrove Forests Conservation for Sustainable Fisheries
12	15.30-15.40	Claudia ZB Sudin, Endes N Dachlan, Elis N Herliyana	Diversity of Lichens at Cibodas Botanical Garden, Bogor Botanical Garden and Ecopark-LIPI as Bioindicators of Air
13	15.40-16.00	Discussion	Discussion

HARVESTING TECHNIQUE AND IDENTIFICATION OF AGARWOOD QUALITY BY LOCAL COMMUNITIES OF AGARWOOD SEEKERS IN PAPUA
(Study case: community of agarwood seekers in Manokwari, Sarmi, Teluk Wondama dan Sorong Selatan)

Petrus A. Dimara[1*], Muliyana Arifudin[1], Amilda Auri[1], Wolfram Y. Mofu[1], Herman A. Manusawai[1]

[1]Forestry Faculty, University of Papua, Manokwari, 98314, Papua Barat, Indonesia
*Corresponding address: petrusdimara@gmail.com

Abstract

The intensity of collecting sapwood and kemedangan agarwood in Papuan natural forest has been increased in several regions includes Jayapura, Wamena, Sarmi, Keerom, Sorong, Teluk Wondama dan Manokwari. This research aims to elucidate the local knowledge of agarwood seeker comunities in Papua in corresponding to harvesting technique and criteria for determining Agarwood quality. Determination of sample by sampling method was carried out towards agarwood employers existing in research area according to the data of Natural Resources Conservation Center, with sampling intensity 50% of the total of agarwood seeker communities who have knowledge and experiences about harvesting technique of agarwood in natural forests. Results showed that harvesting techniques used are chopping, cutting down and unplugging. Agarwood quality that has been traded by the communities are Super Class, Class AB, Class Teri, Class Tanggung, kemedangan Class A, kemedangan Class B, kemedangan Class C, and buaya Agarwood.

Keyword: Harvesting Techniques, agarwood seeker communities, Quality Agarwood

1. INTRODUCTION

Agarwood, a non wood forest product (NTFP) which is greatly exported from Indonesia to Cina, Saudi Arabia, Jepang dan Amerika Serikat, is derived from natural forests of Kalimantan, Sumatera, Sulawesi, Papua, Ambon, NTB, NTT dan Jawa [8]. The utilization of sapwood and kemedangan as raw materials for the production of perfumes, incense and medicines is increasing so that the intensity of harvesting and trade is increasing as well. At the congress Cites 13th in Bangkok-Thailand on October 2004 determined that several species of agarwood tree are categorized in Appendix II or as almost endangered plant species. The apendix regulates and restricts the export of agarwood obtained from natural forests at the selected quota number, specifically for the species of *Aquilaria malaccensis, A. filaria* dan *Gyrinops* spp. [1]

The use of Agarwood tree traditionally in several regions in Papua have been done over the ages, but only certain parts of the tree; for example, the bark is used for making cawat, rope and traditional hat; agarwood leaf is used food wrapping as it has good smell and boost appetite. This fact indicates that the potency of plant-producing agarwood has been known by the community and is categorized as endemic species in Papua. The species f agarwood that have been generally known by the community in Papua such as: *Aquilaria filaria, A.hirta* Ridl., *Phaleria perrotetiana* Jack dan *Gyrinops* sp., serta *Wikstroemia polyantha* dan *W. tenuriamis* as reported by Herbarium Manokwariense Unit – Unipa Manokwari. Especially in Papua, the exploitation of agarwood took place around 1980s, after getting information from agarwood seekers/traders outside Papua region about the presence of essensial oils in stem, branch, twig and root of plant-producing agarwood which has highly economic value.

High world demand of agarwood and its high selling price have attracted the interest of either local communities and visitors to extract agarwood massively in several regions [1]. In Papua, the intensity of collecting sapwood and kemedangan from natural forest is getting higher in Jayapura, Wamena, Sarmi, Keerom, Sorong, Teluk Wondama dan Kabupaten Manokwari. Harvesting agarwood in the natural forests involves community groups from several regions, either the seeker, the buyer or the seller of agarwood. Agarwood seekers in Papua generally harvest the mature agarwood trees with speculation as they find it difficult to observe the symptoms gaharu trees that have been well infected. Because of that problem, the agarwood seekers simply cut down every single gaharu tree that they find in the field. Furthermore, as a result of the difference process of infection by pathogen fungi which take places naturally in several parts of pant-producing agarwood in natural forests, the indicator of determining producing tree for the communities in different regions are also different based on their local knowledge. The local knowledge related to the indicator of determining agarwood tree which has formed gubal shows the result of interaction between the community and the tree, which is necessary to be identified. This knowledge will become basic information for sustainably harvesting technique. The aims of this research are to What kind of technique used by the local community to harvest ready-to-harvest tree producing agarwood and how to identify the qualiy of the agarwood that ill be traded based on the comunity's knowledge.

2. METHODS

a. Place and Time

This research was conducted in Papua and Papua Barat Provinces, including regencies of Manokwari, Sarmi, Teluk Wondama, Wamena dan Sorong Selatan. The research was carried out from Juli-December 2013.

b. Subject, Object dan Tools

The subject of this research was local community of agarwood seekers who have experiences in harvesting agarwood from natural forest and agarwood collector/employer. The object was tree species producing agarwood which is harvested from natural forest and then traded. Equiments used in this research were loupe, hanged-weight, pita meter, Altimeter, digital camera, dan note.

c. Research Methods

Sampling technique

The determination of sample was conducted by sampling to agarwood employers spread over the research area which is suitable to the data of Natural Resources Conservation Center (BKSDA). Purposive sampling with 50% sampling intensity of the total of agarwood seekers of community who have knowledge and experience about harvesting technique of agarwood from natural forest.

Observed variables and their measurements

1. Indicator of determining ready-to-harvest agarwood tree
2. Harvesting technique of agarwood
3. Identification of agarwood quality

Data Analysis

Identification of determining producing tree, harvesting technique, and determining agarwood quality were analyzed descriptively according to the findings in the field and showed by tables and figures.

3. RESULT AND DISCUSSION

a. Agarwood Based on knowledge of agarwood seeker of local community

The utilization of agarwood by Papuan communities prior to 1980s is still limited dan traditional mainly the use of parts of a tree, such as the making of ropes, loincloth belt and head strip. The community uses local languange to identify agarwood to differ this species to the other species. For *Arfak* comunity (*Meyakh* Tribe), agarwood is called "*Mokoroug*", *Maybrat* community (*Mare* Tribe) call it "*Aku*", while *Wamena* community (*Lani* Tribe) call it "*Eamburu*".

Up to date, the utilization of agarwood for economic purpose have involved various community groups of agarwood seekers. The groups consist of *Wamena, Biak and Serui* Communities as well as the owners of community lands. The communities of agarwood seekers in Papua are those who have knowledge in using agarwood and have capability to rove greatly natural forest. They interact directly with tree-producing agarwood. In other words, they roam natural forest to find the tree, collect the agarwood and sell it to seller or collector.

b. The Species of tree-producing agarwood (agarwood tree) and the criterion of ready-to-harvest agarwood tree

Agarwood trees in natural forest are spread either in valley or mountain areas with various population range. Generally tree-producing agarwood are woody plant [7]. However, there are also agarwood which are derived from lianas and shrubs. Several tree species producing agarwood which are used by local communities is shown in Table 1.

Tabel 1.Tree species producing agarwood

No	Regions of natural forest	Species of tree-producing agarwood
1	Manokwari	1. *Aquilaria filaria (Oken) Merr* 2. *Gyrinops* sp. 3. *Enkleia* sp. 4. *Wikstroemia polyantha* Merr 5. *Wikstroemia tenuiramis* Miq
2	Sarmi	1. *Gyrinops* sp. 2. *Wikstroemia polyantha* 3. *Aquilaria filaria*
3	Teluk Wondama	1. *Aquilaria filaria* 2. *Gyrinops* sp.
4	Wamena	1. *Gyrinops* sp.
5	Sorong Selatan	1. *Gyrinops* sp. 2. *Aquilaria filaria (Oken) Merr* 3. *Wikstroemia polyantha* Merr

Source : Dimara, 2007; Samderubun, 2008; Semunya, 2013 dan Sambom, 2013.

Criterion usually used by the community to identify ready-to-harvest agarwood tree are: the tree is dwarf, the tree looked brittle and there is changing in the color of leaves in the part of tree crown.

c. Harvesting Technique

Techniques commonly used by the community of agarwood seekers in Papua to harvest agarwood are by chopping, cutting down or pulling out the tree.

d. Classification of agarwood quality

The determination of agarwood quality is assesment to the size, color and shape of agarwood, fiber condition, wood density as well as aroma of the agarwood when burned. The ash of agarwood is assessed from the color and the aroma (SNI 01-5009.1-1999).

Sapwood and kemedangan are the part of agarwood that that have been traded so far in the community. The determination of agarwood quality that generally used by the community either employers or collectors is done visually towards the color, resin content, aroma, oil content as well as the size and the shape of agarwood flakes. The quality of agarwood (sapwood and kemedangan) from natural forests in Papua such as Manokwari, Sarmi, Teluk Wondama, Wamena and Sorong Selatn, is shown in the Table 2.

Table 2. Classification of agarwood quality from several regions in Papua

No	Regions of natural forest	**Classification of agarwood quality**									
		Sapwood			Kemedangan (KMG)						
		Super	Super AB	Sabah Super	TG.A	SabahI	TG.AB	TG. C	KMG I	KMG II	KMGIII
1	Manokwari	√	-	-	-	-	√	-	√	√	√
2	Sarmi	-	-	-	-	-	√	-	√	√	√
3	Teluk Wondama	-	-	-	-	-	-	-	√	√	√
4	Wamena	-	-	-	-	-	√	-	√	√	√
5	Sorong Selatan	√	√	-	-	-	√	√	√	√	√

Explanation: √ = included agarwood quality - = excluded agarwood quality

CONCLUSION

Harvesting techniques used by agarwood seekers in Papua are chopping, cutting down or pulling out the agarwood. Species of tree-producing agarwood that grow in Papuan forests are: *Aquilaria filaria (Oken) Merr, Gyrinops* sp., *Enkleia* sp., *Wikstroemia polyantha* Merr, *Wikstroemia tenuiramis* Miq. The quality of agarwood that are harvested and traded by the local community are Super Class, Class AB, Class Teri, Class Tanggung, kemedangan Class A, kemedangan Class B, kemedangan Class C, and Buaya Agarwood.

REFERENCES

[1] Departemen Kehutanan. 2005. *Profil Pengusahaan gaharu.* Pusat Bina Penyuluh Kehutanan. Jakarta

[2] Dimara P. A. Dan R. H.S. Siburian , 2007. *Jenis dan Spesifikasi Gaharu Perdagangan Asal Hutan Alam Kabupaten Manokwari.* Penelitian Dosen Muda. Kerjasama Dirjen Pendidikan Tinggi dan Universitas Negeri Papua

[3] Semunya S., 2013. Teknik Pemanenan Gaharu Oleh Masyarakat Mare Distrik Mare Selatan Kabupaten Maybrat. Skripsi Sarjana Kehutanan Universitas Negeri Papua Manokwari

[4] Samderubun M., 2008. Eksplorasi Jenis tumbuhan penghasil gaharu di Kampung Sewan di Distrik Sarmi Timur Kabupaten Sarmi. *Skripsi Sarjana Kehutanan* Universitas Negeri Papua Manokwari

[5] Sambom W., 2013. Teknik Pemanenan dan Identifikasi Kualitas Gaharu Pada Masyarakat Suku Lani di Kabupaten Manokwari, *Skripsi Sarjana Kehutanan* Universitas Negeri Papua Manokwari

[6] SNI 01-5009.1-1999. Gaharu. http://www.dephut.go.id (downloaded: 18 Maret 2008)

[7] Sumarna, 2002. Budidaya Gaharu, Seri Agribisnis, Penebar Swadaya, Jakarta

[8] Sumarna, 2005. Budidaya Gaharu. Penebar Swadaya. Jakarta