

# CASE STUDY ON NDF OF AGAR WOOD (*Aquilaria* spp. & *Gyrinops* spp.) IN INDONESIA



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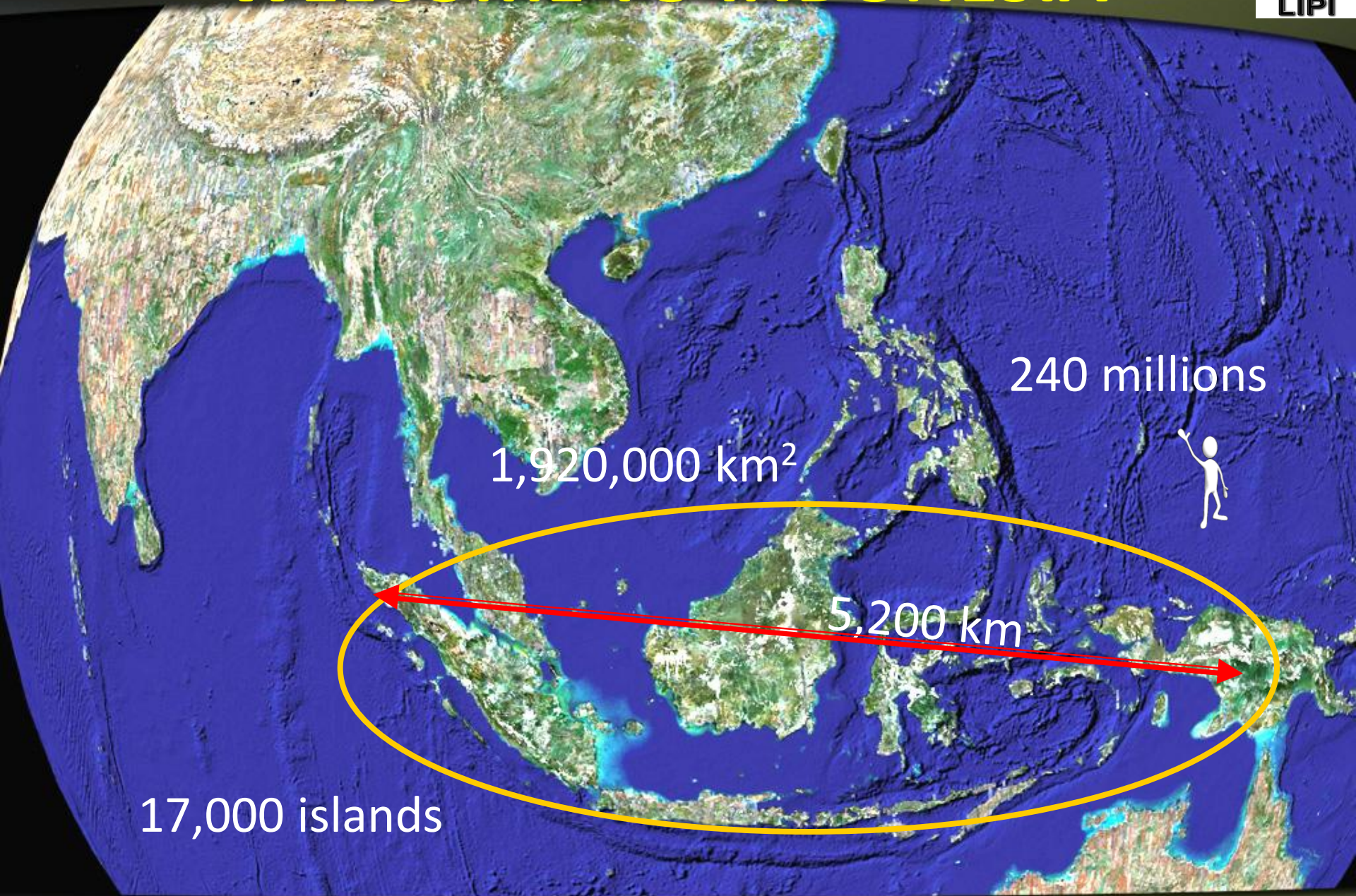
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# WELCOME TO INDONESIA



1,920,000 km<sup>2</sup>

240 millions



5,200 km

17,000 islands

## Forest area by forest category across the seven main islands in Indonesia

No.	Land forest coverage (status)	Size (thousands of ha)	%
1	Conservation forest areas	14,365	15.3
2	Protected forest areas	22,102	23.5
3	<b>Production forest divided into 3 categories</b>		
3.a	Limited Production Forest (HPT)	18,180	19.4
3.b	Production Forest (HP)	20,624	22.0
3.c	Production Forest subject to be converted (HPK)	10,693	11.4
	<b>Sub Total</b>	<b>49,497</b>	<b>52.7</b>
4	Other land use	7,967	8.4
	<b>Total</b>	<b>93,924</b>	<b>100</b>

Data sources: *Rehabilitation of Land Forest Cover in Indonesia year 2005, BAPLAN 2005)*

# Agar wood producing species in Indonesia



Species	Ecology (m asl) *	Distribution
<i>A. beccariana</i> van Tiegh.	Up to 825: primary forests	Sumatra, Borneo/Kalimantan, common
<i>A. cumingiana</i> (Decne) Ridl.	Medium altitude: in primary forest	South Borneo, Moluccas (Morotai & Halmahera),
<i>A. fillaria</i> (Oken) Merr.	Up to 130: open swamp forest	Celebes, Moluccas: Morotai, Seram & Ambon, West New Guinea: Sorong & Babo)
<i>A. hirta</i> Ridl.	Up to 300: in hill slope from lowland forest	Riau, South Sumatra, Bangka, Belitung & other neighboring small islands (Bintan, Batam).
<i>A. malaccensis</i> Lamk.	Up to 270: common in primary forest	Sumatra, Borneo/Kalimantan & its surrounding small islands
<i>A. microcarpa</i> Baill.	Up to 200 at primary forest	Sumatra, Bangka-Belitung, Borneo/Kalimantan & other neighboring small islands)
<i>G. decipiens</i> nov. sp.	At 100 m, primary forest	Central Celebes (Warotoli, Palarabi)
<i>G. ladermanii</i> Domke	0 – 200 m: virgin forest – slope area, dense	New Guinea ( Mt. Prince Laderman)
<i>G. moluccana</i> (Miq.) Baill.	± 100	Moluccas (Halamahera & Buru)
<i>G. podocarpus</i> (Gilg.) Domke	<u>Up to 750, in primary forest</u>	West Papua (Sorong, Monep)
<i>G. salicifolia</i> Ridl.	At 300 m, in fringing rain forest	Western New Guinea (Utakwa & Nabire)
<i>G. verstigii</i> (Gilg.) Domke	Up to 900	N.E. Celebes, Lesser Sunda Islands (Lombok, Sumbawa, Flores, Sumba) & West New Guinea)

Source of data: Ding Hou, 1972, Wiriadinata, 1995, Soerhartono & Newton, 2001, Oyen & Nguyen Xuan Dung 1999.

# Density estimation of adult tree (> 10 cm dbh) of *Aquilaria* spp. in Sumatra and Kalimantan based on the analysis of NFI sample plots

Location	No. of plots	Total area (ha)	Density per ha
<b>SUMATRA</b>			
Low land	15	135	0.47 ± 0.30
Up land	3	27	0.36 ± 0.17
<b>KALIMANTAN</b>			
Low land	24	216	0.83 ± 0.73
Up land	11	99	1.17 ± 1.09

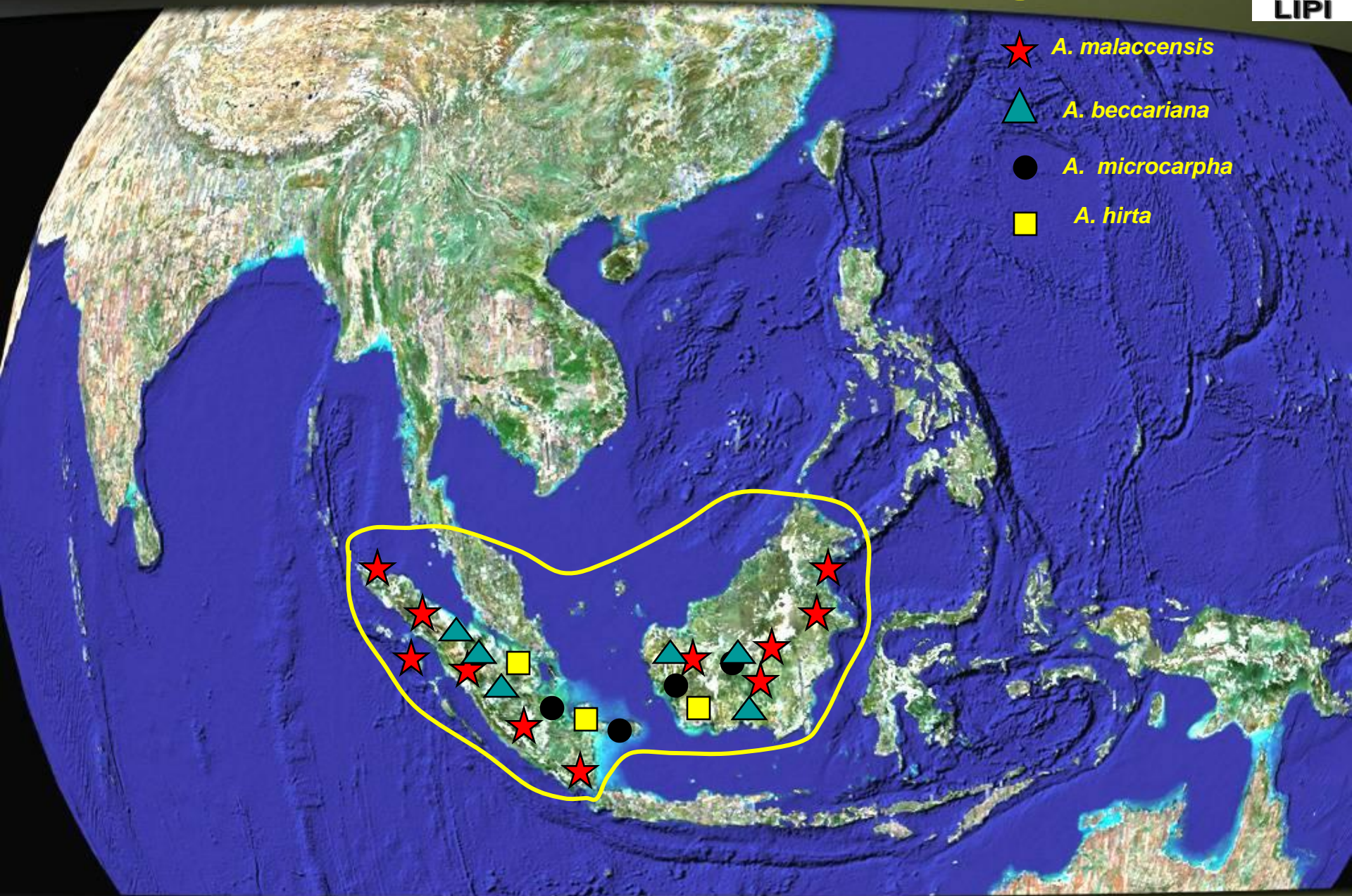
Source data: *Soehartono & Newton, 2000*.

# Estimate of the total population of adult trees (> 10 cm dbh) of *Aquilaria* spp. in Sumatra and Kalimantan based on density estimation from NFI sample plots

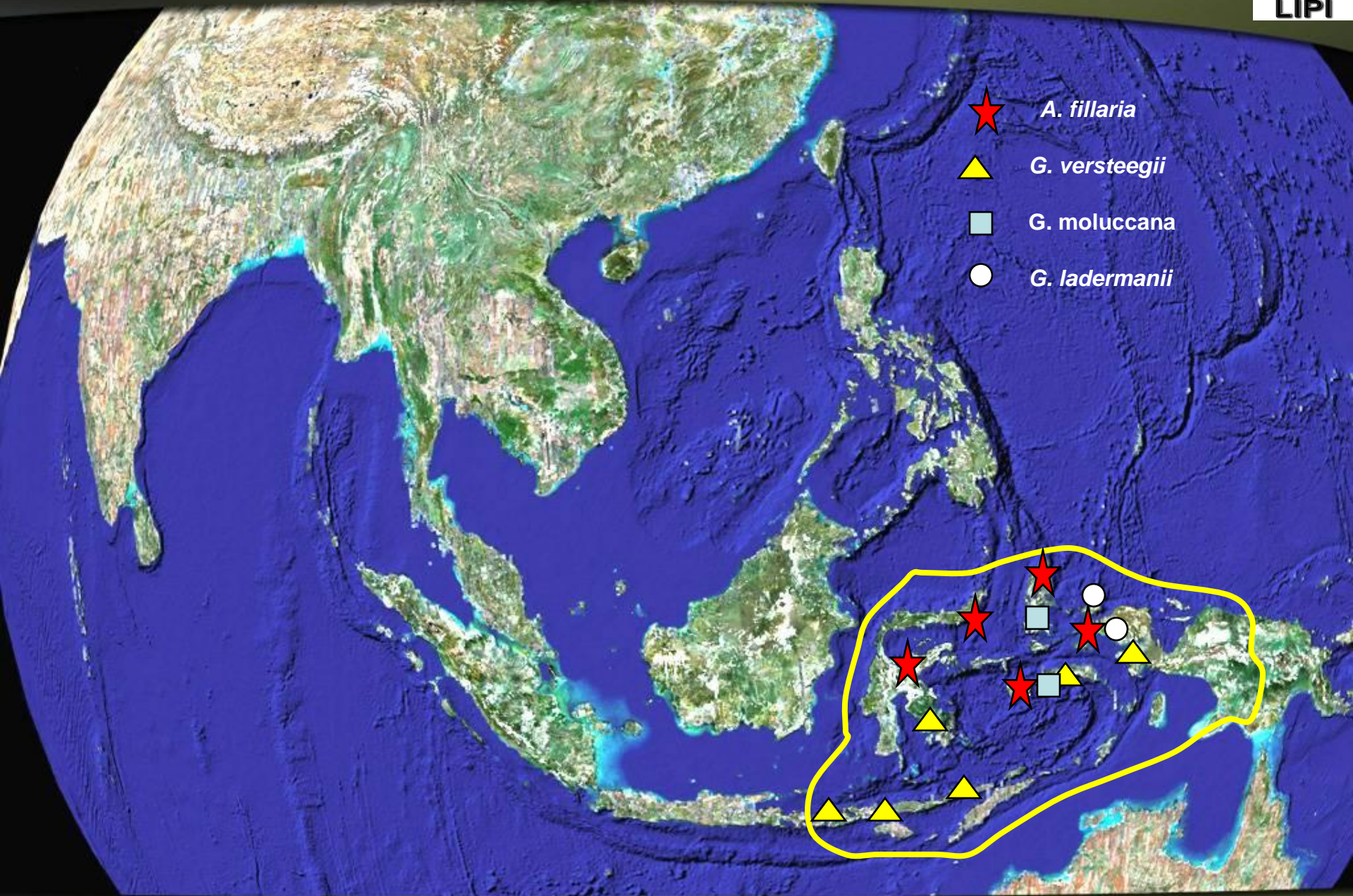
Location	Forest area (x1000 ha)	Population size (a) (x 1000)	Population size (b) (x 1000)
<b>SUMATRA</b>			
Low land	13,934	6,548.9 $\pm$ 4,180.2	418.0 $\pm$ 418.0
Up land	3,348	1,205.3 $\pm$ 569.1	133.9 $\pm$ 133.9
<b>KALIMANTAN</b>			
Low land	31,199	25,995.2 $\pm$ 22,775.6	1,559.9 $\pm$ 1,559.9
Up land	1,790	2,094.3 $\pm$ 1,951.1	483.3 $\pm$ 129.6

Source : Soehartono & Newton, 2000

# Distribution of malaccensis group

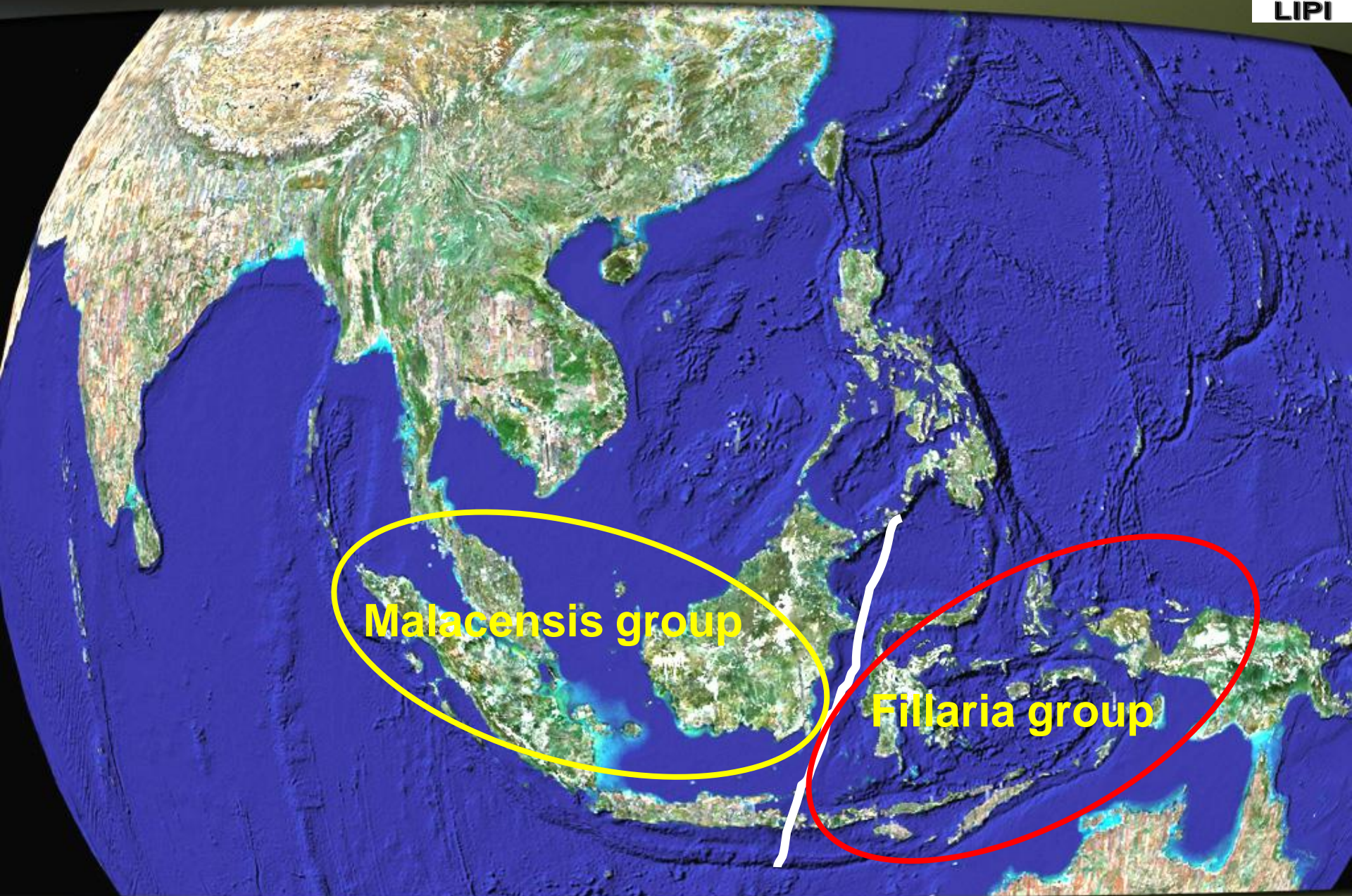


# Ditribution of fillaria group





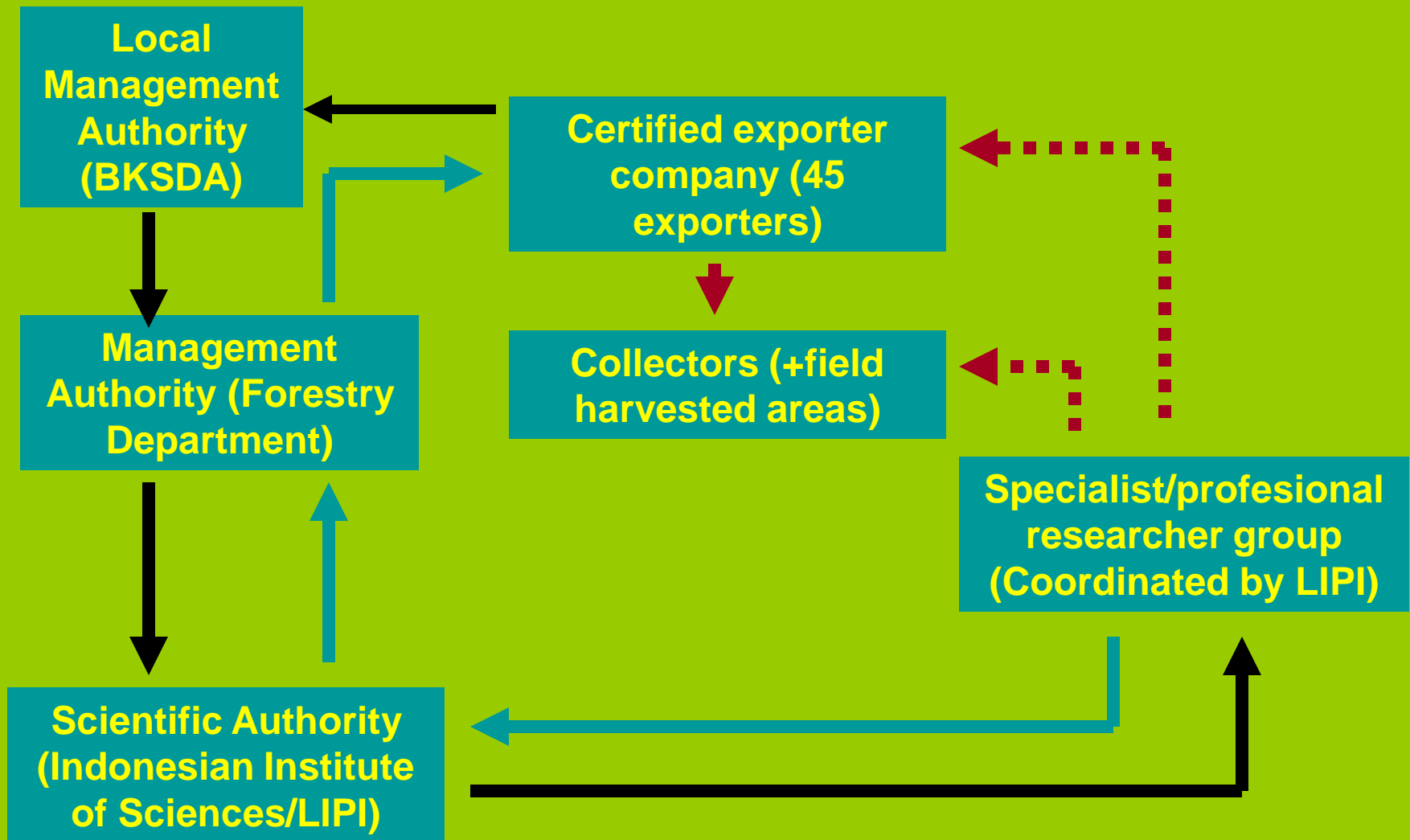
# Agar wood quota setting area in Indonesia



Malacensis group

Filaria group

# PROCEDURE FOR DETERMINING QUOTA OF AGAR WOOD BASED ON NON DETRIMENT FINDING



# SOURCES OF AGAR WOOD POTENCY DATA FOR QUOTA SETTING

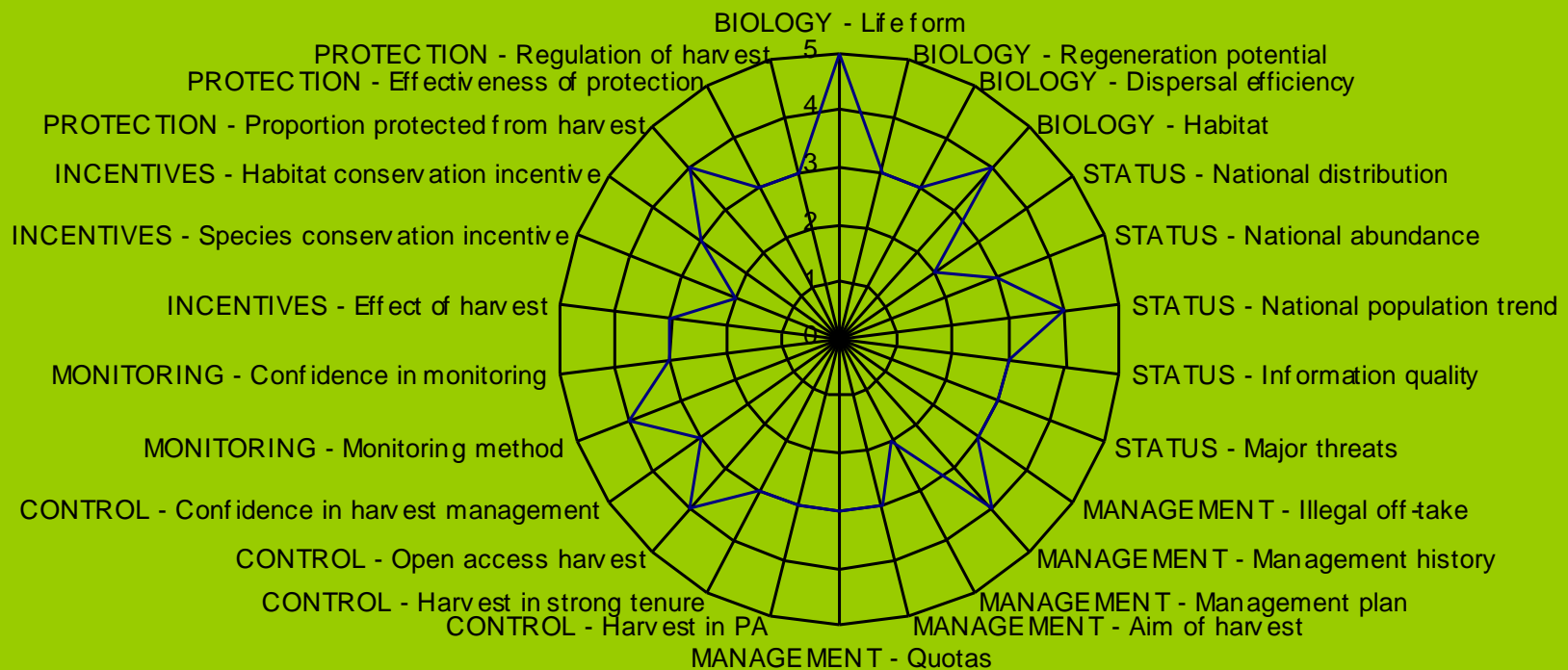
- Field sampling by working group of agar wood in main producing areas
- Actual production data of Agar wood from exporters, forestry district offices, association, local traders, farmers
- Report data on target and realization of annual export



**Mother tree of *A. malaccensis***

# NDF diagram of *A. malaccensis*

*Aquilaria malaccensis*



Source: Indonesia CITES document

# NATIONAL QUOTA OF *A. malacensis*



Year	Quota	Realization
1996	300000	29953
1997	300000	287002
1998	150000	148238
1999	300000	81079
2000	225000	81377
<b>2001 (App.II)</b>	<b>75000</b>	<b>74826</b>
2002	75000	49546
2003	50000	50000
2004	50000	50000
2005	50000	50000
2006	50000	50000
2007	35000	35000
2008	30000	---

Source of data: S.A., 2008.

# NATIONAL QUOTA OF *A. filaria*



Year	Quota	Realization
1998	70000	No data
1999	250000	232570
2000	200000	163773
2001 (App II)	125000	144946
2002	125000	104699
2003	125000	125000
2004	125000	125000
2005	125000	125000
2006	125000	125000
2007	65000	65000
2008	60000	---

Source of data: S.A., 2008.

# TRADITIONAL MANAGEMENT OF AGARWOOD (*A. malaccensis*) IN EAST KALIMANTAN



Seedling of *A. malaccensis*  
under the mother tree



Traditional inoculation  
method



Mother tree grown in traditional garden



Nursery by local people



Agar wood products from traditional  
inoculation

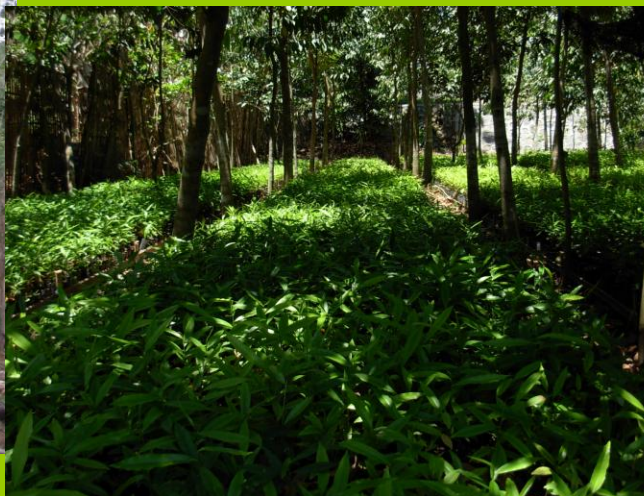
# UTILIZATION AND MANAGEMENT OF AGARWOOD (*A.malaccensis*) IN SUMATRA



Natural population of *A.malaccensis* in old traditional rubber plantation



Agarwood pilot project plantation

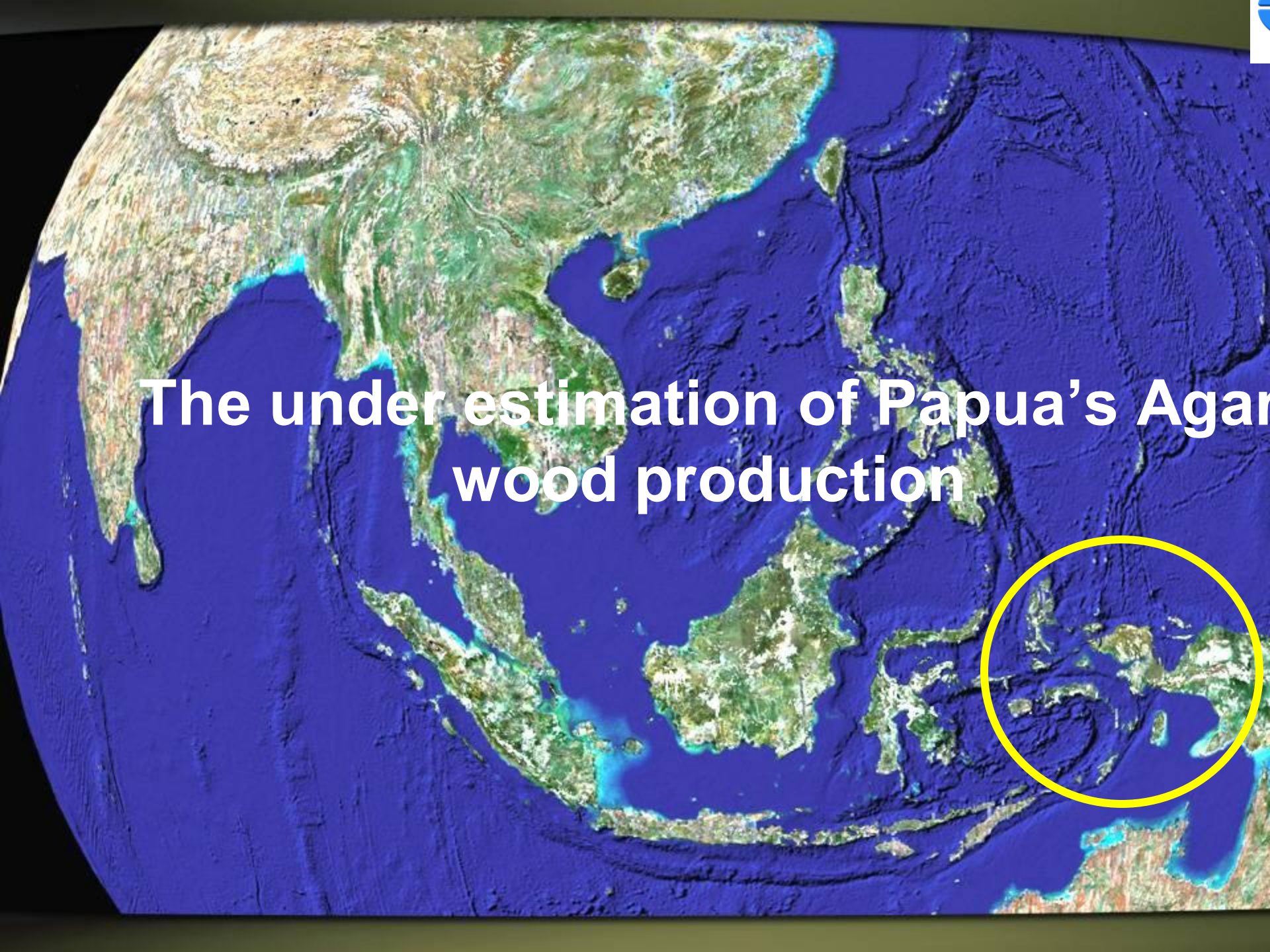


*A.malaccensis* nursery in Bengkulu, Sumatra



A big mother tree of *A.malaccensis* in the village of Tasik Betung - Sumatra, with > 80 cm in diameter



A satellite-style map of Southeast Asia and Oceania. The landmasses are shown in shades of green and brown, indicating vegetation and terrain. The surrounding oceans are a deep blue. A yellow circle highlights the island of Papua New Guinea in the southwestern Pacific. The text "The under estimation of Papua's Agarwood production" is overlaid in white, bold font across the center of the map.

**The under estimation of Papua's Agarwood production**

# Forest area by forest category of the Papua Indonesia

No.	Land forest coverage (status)	Size (thousands of ha)	%
1	Conservation forest areas	7,316.76	18.07
2	Protected forest areas	9,853.44	24.33
<b>3</b>	<b>Production forest divided into 3 categories</b>	<b>17170.02</b>	<b>42.40</b>
3.a	Limited Production Forest (HPT)	3,571.33	8.82
3.b	Production Forest (HP)	9,971.66	24.63
3.c	Production Forest subject to be converted (HPK)	8,528.90	21.06
	<b>Sub Total</b>	<b>22,071.89</b>	<b>54.51</b>
4	Other land use	1,245.79	3.08
	<b>Total</b>	<b>40,487.88</b>	<b>100</b>

Data source: *Forestry Department 2005*

# Asmat & Mappi Districts (One of the potential area of huge agar wood production)



# Development of extractive agar wood harvest in Papua Island (Indonesia)

- ***Circa 1994-1998 (much earlier according some qualitative data)***
  - Gaharu were harvested by cutting the trees
  - Only high quality of gaharu were collected (gubal), chips were left
  - Local people involvement very low, only by traders
- ***Circa 1999-2003***
  - Local people understand the high value of gaharu, starts to collect
  - Kamedangan is becoming more saleable
  - Re-visited & re-collected on the past harvested areas (chips & fallen woods) (circa 1994-1998) by local people
- ***Circa 2004-present***
  - **NO CUTTING** trees
  - Agar wood gather is by collection under the mud & soil from first era harvest period
  - Collection site areas are close to the village (1-2 days by boat)
  - Gubal & kamedangan have high production

**MAIN PRODUCT OF CURRENT PRODUCTION IN PAPUA**

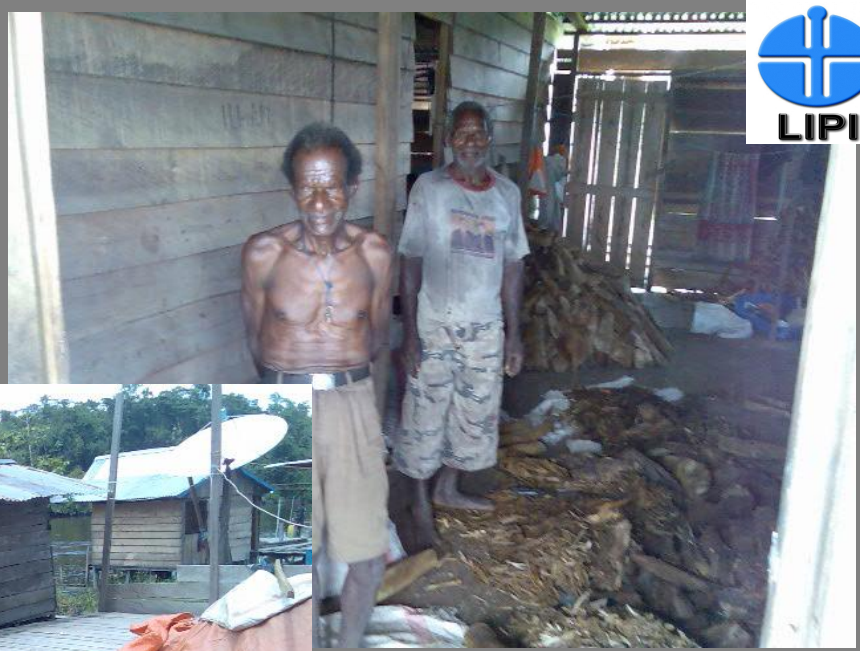


# LOCAL PRODUCTION CENSUS IN 2007 by BBKSDA PAPUA (1-4 weeks collection)



Region	Estimated weight stored by local people (ton)
Kabupaten Asmat	
Distrik Atsy	
Kampung Sagoni	±10
Kampung Bine	±10
Kampung Comoro	±15
Kampung Atsj	±5
Kampung Waganu	±15
Kampung Fos	±5
Kampung Bipim	50
Distrik Suator	
Kampung Jinak	±10
Kampung Waganu II	±15
Kabupaten Mappi	
Distrik Eci	
Kampung Asgon	±10
Kampung Amagon	±15
Kampung Kanami	±25
TOTAL STOCK IN 2 WEEKS	±140

*Field verification 2007 by Forestry District (BKSDA) Merauke*





Final packaging



Final destination for trading in Java



Traditional nursery supervised by Forestry District office



# OFFICIAL GAHARU PRODUCT FROM PAPUA

(recorded by BKSDA PAPUA)

Year	Gubal (kg)	Kemendangan (Kg)	National Quota - Kg (Local)
2006	105	112,500	65,000 (25,000)
2007	190	99,110	65,000 (25,000)
2008 (Sept)	220	119,825	65,000 (25,000)

*Note: Potential local trade some where 2 x of those values*

# MISSCONCEPTION ON GAHARU TRADE FROM INDONESIA



- Gaharu trade is utilizing the WHOLE TREE
  - Bole, branch, twigs, roots
  - 1 tree (dbh.108 cm, H: 22.5 m)= 1.2 ton dry weight (8.89 ton wet weight)
- Gaharu harvest from western part (Sumatra & Kalimantan) remains from cutting the trees of the *wild population* (include from old traditional rubber plantation)
  - **selected trees (forest, encroachment areas, rubber plantation, yard, etc)**
- Gaharu harvest from eastern part (Papua) by utilizing the past harvested areas(1993-2003)
  - **No trees cuted (Asmat, Agats, Asgon, Atsi, Senggo & Mappi)**
  - **Could be by cutting tree system in 1 region (not yet done due to isolation area-- Region Yahokimo, requested by the District Mayor)**
- Cultivation the species has been conducted since 1989 (Sumatra, Kalimantan, NTB) and 2007 in Papua
  - Regulation for the export traders (min 2 ha)
  - Part of national re-forestation program
  - Exceed 600,000 plants has been planted (2-16 years) and > 320,000 seedling

# SCIENTIFIC POINT OF VIEW

- We considered on re-evaluate the quota setting for gaharu especially in Papua:
  - Lack of accurate field data
  - Undervalued the real potency & production level
- Local production of INDONESIA gaharu **would not be** detriment, due to the new paradigm of utilization
  - Collected from past remaining harvested production areas
  - Harvested from controlled “wild population” areas
  - Cultivation activities throughout the potential areas
- Evaluate the scientific production level by next 3 years (starting 2009)

# Conclusion

- **INDONESIA still has high agar wood potency**
  - What is being extracted is only a fraction of what is available
- **With the supervision of MA, SA and Association the agar wood trees population is being controlled**
  - Cultivation
  - Selected harvest
  - Regulations on the harvest system
  - **Traditional harvest system will not damage ecosystem**
  - **Strict control combating illegal trade through travel document of origin**
  - Mutual commitment to control the harvest & trade systems (MA, SA & Association)
- **Current Indonesia era on wildlife related utilization is toward law enforcement**
  - Association initiate the collaborative actions with central government on establishment of sustainable harvest to local collectors, farmers, traders & local governments

**THANK YOU  
FOR YOUR ATTENTION**

02/02/2006