

**HEART OF THE MATTER: AGARWOOD USE AND TRADE
AND CITES IMPLEMENTATION FOR *AQUILARIA MALACCENSIS***

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HARVEST, TRADE AND CITES IMPLEMENTATION WITHIN KEY AQUILARIA RANGE STATES

INDONESIA

Status and distribution

Six *Aquilaria* species are known to occur in Indonesia: *A. beccariana*, *A. cumingiana*, *A. filaria*, *A. hirta*, *A. malaccensis*, and *A. microcarpa* (Soehartono, 1997). All of these species produce agarwood, and all but *A. filaria* are categorized as threatened according to the IUCN Red List Categories (Oldfield *et al.*, 1998). Indonesia is also home to other species that produce aromatic resinous substances, e.g. several *Gonystylus* species (Oldfield *et al.*, 1998). The range of *A. malaccensis* is restricted to Sumatra and Kalimantan (Ding Hou, 1960, cited in Wiriadinata, 1995). The species is considered virtually extinct in West Kalimantan by Soehartono and Mardiasuti (1997). Other *Aquilaria* species are found in Irian Jaya, Kalimantan, Maluku, Sulawesi, Sumatra and West Nusa Tenggara (NTB), being patchily distributed throughout natural forests (Afifi, 1995; Levang and de Foresta, 1994; Soehartono and Mardiasuti, 1997; Wiriadinata, 1995). In Kalimantan, it was reported that four species of *Aquilaria* are found scattered on ridges and slopes of well-drained land (Keller and Sidiyasa, 1994). In 1997, collectors reported that agarwood-producing trees (*Aquilaria* spp.) could be found in several Kalimantan reserves and national parks: Bukit Baka National Park; Gunung Palung National Park; Bintuang Karimun Reserve; Mandor Reserve; and Gunung Niut. Traders confirmed that *Aquilaria* spp. occur in these areas, with the exception of Mandor Reserve, where they are thought extinct. Excessive exploitation has increased the difficulty in finding *Aquilaria* in Gunung Palung and Gunung Niut (Soehartono and Mardiasuti, 1997).

The National Forestry Inventory (NFI) Database shows that *Aquilaria* species have adapted to various habitats in certain regions of West Kalimantan. Although widely distributed, the densities of *Aquilaria* are very low. The NFI Database gives approximate populations of *Aquilaria* species as 1.87/ha in Sumatra, 3.37/ha in Kalimantan and 4.33/ha in Irian Jaya (Soehartono and Mardiasuti, 1997). Considerable difficulties have been noted in finding *Aquilaria* trees of 30 cm dbh and greater in regions of Kalimantan (Sidiyasa *et al.*, 1986). According to the CITES Scientific Authority (Indonesian Institute of Science - LIPI), surveys of *Aquilaria* have not been undertaken in all regions (Oetomo, 1995), so that population data are unavailable for *Aquilaria* spp., including for *A. malaccensis*. *Aquilaria* spp. are threatened in Indonesia owing in part to the indiscriminate felling of infected and uninfected trees, which is driven by continuing demand and large profits. A number of secondary threats generally applicable to most forest species are also applicable to *A. malaccensis*, e.g. habitat degradation and loss resulting from forest fires, forest conversion to plantations (including forest plantations), logging and land mining concessions, and the creation of settlement areas for transmigratory peoples (Soehartono and Mardiasuti, 1997).

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Harvesting

The search for agarwood, locally known as *gaharu*, has widened from unprotected forests to reserve areas and also across the Papua New Guinea-Irian Jaya border, as indicated in part by collectors' and traders' knowledge of the location of *Aquilaria* trees in particular reserves (see **Status and distribution**). When agarwood-producing trees were discovered in Kayan Mentarang Nature Reserve, East Kalimantan in 1991, collectors (some in helicopters) flocked to the Reserve,

demonstrating the strength of the demand. The practice of using helicopters to search for agarwood is known to have continued until at least 1997 (Hartadi, 1997). Sumatran harvesters are known to have trespassed in Kerinci Seblat, Gunung Leuser and Bukit Barisan Selatan Nature Reserves (Hidayat, 1996). Hartadi (1997) notes the shift in collecting habits of indigenous people (such as the Dayak Tribe of East Kalimantan), from subsistence to commercial harvesting. This is owing in part to competition from large numbers of collectors brought in by agarwood traders and middlemen. Soehartono and Mardiasuti (1997) provide an account of the process of agarwood harvesting, collection and the structure of the agarwood trade in West Kalimantan. This includes tree selection, the practical process of felling, a description of the different collector types (both local and nonlocal) and their relationship with traders. Searching for and/or harvest of agarwood may be either a temporary or permanent occupation. Collectors dependent on agarwood for their income are often 'tied' to a middleman through a credit system. Middlemen typically have links with 50-100 collectors and may be independent (they can sell to any trader in any region), or they may be dependent upon a single trader, who is often a family relative.

Agarwood is used locally for medicinal purposes, but based on information compiled during this study, it appears that the majority of agarwood harvested is exported. The main export destination according to CITES annual report data is Singapore, followed by Taiwan.

Markets and prices

Agarwood grade classifications vary slightly with locality and also from one middleman or collector to another. The government has never issued a standard grading classification that was acceptable to trading companies and collectors alike (Oetomo, 1995; Soehartono and Mardiasuti, 1997). In 1997, in the Apau Kayan area of East Kalimantan, 'super grade A' agarwood was quoted as selling for IDR1 250 000/kg (USD450/kg) (Hartadi, 1997). In NTB, the best grade of agarwood was quoted at approximately IDR1 500 000/kg (USD540/kg) in 1997 (Anon., 1997b). In 1999, in Jayapura, 'super grade' agarwood was for sale for approximately IDR3 500 000/kg (USD385/kg), but at the time of the first monetary crisis in November 1997, the same grade sold for approximately IDR7 500 000/kg (Priyadi, 1999).

In West Kalimantan, the one trading company in operation quoted prices paid to middlemen (who typically link collectors with traders) and those which they themselves charged (Soehartono and Mardiasuti, 1997). The prices were originally obtained in Indonesian rupiahs, but were converted in 1995/6 at USD1:IDR2361. A range of Indonesian agarwood prices obtained from the former chief of the former agarwood trade association *Asosiasi Pengusaha Damar, Gubal Gaharu dan Kemedangan Indonesia* (APDGKI - the Indonesian Traders Association of Resin-Gaharu and Garrowood).

Reported international trade

Indonesia's CITES annual reports show the total export of approximately 923 t of chips to seven countries during the period 1995 to 1997: approximately 324 t in 1995, 294 t in 1996 and 305 t in 1997. Most exports were destined for Singapore (781 t) followed by Taiwan (116 t). The remaining destinations were in the Middle East. Corresponding CITES import data for this three-year period were provided only by Singapore (214 t) and Japan (0.5 t).

Singapore also reported the re-export of approximately one tonne of chips to Indonesia in 1996 and imported a total of approximately four tonnes of Indonesian *Aquilaria malaccensis* via Malaysia and Taiwan in 1995 and 1996. During the period 1995 to 1997, Singapore reported the total re-export of approximately 581 t of Indonesian agarwood to various countries, the largest reported importer being Taiwan (229 t). Of this total, approximately 105 t were reported as pre-

Convention stocks. According to CITES annual report data, Taiwan was the largest end-consumer of *Aquilaria malaccensis* exported from Indonesia: 345 t of Indonesian *A. malaccensis* was reported exported or re-exported to Taiwan. This is less than a third of Taiwan's total *Aquilaria* imports from Indonesia according to Taiwan's Customs statistics, which totalled approximately 1122 t. As noted under the section on **International trade**, this could reflect trade in agarwood of species in addition to *A. malaccensis*.

Harvest and trade controls

The use of agarwood is regulated via *Decree No. 8 of 1999* concerning the *Uses of Wild Flora and Animals*. *Aquilaria malaccensis* is not included in the government's list of protected fauna and flora (*Decree No. 7 of 1999*). However, some local governments (such as Paniai District in Irian Jaya) have taken further steps to conserve their *Aquilaria* stocks by prohibiting searching and felling of *Aquilaria* spp. (Anon., 1995b). Agarwood is considered a forest product and therefore control of harvest and domestic transport is the responsibility of the Ministry of Forestry and Regional Forestry Offices. Permits are required to harvest *gaharu* and other products from State forests in Kalimantan, as set out in *Forestry Regulation No. 28 of 1985*. An exception is made for local communities dependent on forest resources for their livelihoods (Soehartono and Mardiasuti, 1997). Where trees belong to local villagers, middlemen seek the approval to fell them from the villagers and hire a collector to return to fell and collect the agarwood at a later stage.

Local forest authorities at each *kabupaten* (district) are entrusted to administer permits for all activities within their own forest authority. Large collecting groups of 20-30 people are said usually to obtain harvesting permits from the local forest authority to harvest from natural forests. Registered traders are thought almost certainly to obtain permits to avoid unnecessary difficulties when shipping consignments to other islands. However, smaller groups of two to four collectors are said to obtain harvesting permits rarely, owing to the small likelihood of being caught by forest authorities. Obtaining a permit is said to be a lengthy process (taking up to one day) and is considered inconvenient by the collector unless they reside close to the local authority office from which the permit must be obtained (Oetomo, 1995; Soehartono and Mardiasuti, 1997).

Before agarwood consignments are shipped to other regions within Indonesia, traders are required to pay a forest resource tax known as the Iuran Hasil Hutan (IHH), which varies according to the weight and grade of the consignment (Oetomo, 1995). The fees are IDR20 000/kg (USD2/kg) for both *Damar gaharu* (resin) and *Gubal gaharu* (inner part of agarwood), and IDR15 000/kg (USD2/kg) for *Kemedangan gaharu* (*Decree of Minister of Forestry No.606/Kpts-IV/1996*). Traders are also required to obtain a wood transport permit known as a *Surat Angkutan Kayu Olahan* (SAKO) from the local forest authority in order to transport agarwood to another region. Under the auspices of the Ministry of Forestry, the Department of Protection and Nature Conservation (PKA, formerly known as the Directorate General of Forest Protection and Nature Conservation, PHPA) is Indonesia's CITES Management Authority. Agarwood exporters must be licensed and registered with PKA in order to apply for CITES export permits. To obtain a trading licence, companies must already have acquired several documents including a Business Permit and a Certificate of Inspection and to have been recommended for licensing by the Regional Forestry Office.

In 1995, all registered agarwood traders and other related businesses in Indonesia united to form a single association, the *Himpunan Pengusaha dan Budidaya Gaharu Indonesia* (HPBGI - the Indonesian Association for Gaharu Industry and Cultivation).

The HPBGI was formed by the merger of 150 members of the Association of Gaharu Indonesia (APGINDO) in Jakarta and 50 members of APDGKI in Riau (Anon., 1995c). In the early 1990s, three companies were registered in West Kalimantan, but by 1997 only one company was operating (Soehartono and Mardiasuti, 1997). This company has links to 14 middlemen throughout the region. Thirty registered companies were in operation in Irian Jaya during the period 1994 to 1995 (Anon., 1995d), but this had fallen by half in 1997 (Anon., 1997a). In NTB, there is reportedly only one company in operation (Anon., 1997b).

According to Soehartono (1997) and information received from PKA, PKA, in consultation with LIPI, began establishing annual harvest quotas for *Aquilaria malaccensis* following the species's listing in CITES Appendix II. The harvest quota is distributed among Regional Forest Offices located in regions having the potential to produce *gaharu*, who in turn distribute the quota among registered *gaharu*traders.

According to the annual list of harvest quotas produced by PKA, the harvest quota is allocated not only to regions in Kalimantan and Sumatra but also to regions on islands where *A. malaccensis* does not occur, but where other *Aquilaria* species do, e.g. Irian Jaya. PKA began issuing total annual export quotas for *Aquilaria malaccensis* in 1996: 300 t in 1996, 270 t in 1997, 150 t in 1998 and 270 t in 1999. Export quotas for 1998 and 1999 were disseminated to the Parties via CITES *Notification No. 1998/36* and *No. 1999/47*. Quota levels are determined by PKA in consultation with LIPI. Data provided by each Regional Forestry Office (*Kanwil*) are reported to be taken into account (Priyadi, 1999). As mentioned above, population data for *A. malaccensis* and other *Aquilaria* species are lacking (Oetomo, 1995). Research for this report finds no evidence to suggest that export quotas are based on population data, but rather that they are based on subjective information.

Annual export and harvest quotas (kg) for *Aquilaria malaccensis* from 1996 to 1999

Year	Total export quota (kg)	Total harvest quota (kg)	Provincial distribution of <i>Aquilaria malaccensis</i> quotas harvest
1996	300 000	300 000	Jambi 40 000; Central Sulawesi 18 750; Southeast Sulawesi 18 750; North Sulawesi 18 750; Sulsel 18 750; South Sumatra 40 000; North Sumatra 70 000; West Sumatra 50 000; West Nusa Tenggara (NTB) 25 000
1997	270 000	300 000	Irian Jaya 70 000; Kalimantan 70 000; Maluku 30 000; NTB 40 000; Sulawesi 40 000; Sumatra 50 000
1998	150 000	150 000	Kalimantan 75 000; Sumatra 75 000
1999	270 000	300 000	Aceh 30 000; East Kalimantan 30 000; South Kalimantan 30 000; Lampung 30 000; Maluku 30 000; East Nusa Tenggara 30 000; Riau 30 000; South Sulawesi 30 000; North Sulawesi 30 000; West Sumatra 30 000

Source: Anon., 1996-1999 and CITES *Notification No. 1999/47*

According to Indonesia's CITES-reported exports, 1995 exports were approximately six tonnes under the export quota for that year, but in 1997, total exports exceeded the export quota by

almost 36 t. Ministry of Forestry staff inspect both imports and exports. Although they check, for example, permit validity and that the permit volume tallies with the actual trade volume, they have acknowledged that few officers can actually differentiate between *A. malaccensis* and other *Aquilaria* species (P. Subijanto, PKA, pers. comm. to TRAFFIC Southeast Asia, 21 April 1999). Noting that government authorities were not yet able to identify agarwood products in trade (normally chips and powder) to species level, Soehartono (1997) comments that, in practice, CITES regulations and procedures are applied to the export of any agarwood products, regardless of the species involved. Therefore, it is likely that CITES export permits are likely to be issued for other *Aquilaria* species in addition to *A. malaccensis*. Research conducted during this study indicates that exports from Irian Jaya (most likely to involve *A. filaria*) are exempted from CITES requirements (P. Subijanto, PKA, pers. comm. to TRAFFIC Southeast Asia, 21 April 1999).

Illegal trade

There are concerns regarding uncontrolled and indiscriminate felling of *Aquilaria* trees and demand and harvesting are believed to have increased in response to high export prices (WWF, 1994, cited in Soehartono, 1997) and recent economic uncertainties in Indonesia. Government resources to control exploitation and trade are insufficient given the large forest areas (Soehartono, 1997). According to Soehartono and Mardiasuti (1997), agarwood is described as rare in Kalimantan, where prices paid to collectors have declined owing to a drop in quality. Extraction from protected areas (parks and reserves) has been reported in Kalimantan (Hartadi, 1997; Soehartono and Mardiasuti, 1997) and Sumatra (Hidayat, 1996). The profitability of the *gaharu* trade has led to the creation of the so-called 'gaharumafia'. Three of a gang of 10 so-called mafia members are reported to have been gaoled after having been arrested in a nature reserve in Bandar Lampung (Sumatra) in 1995 (Anon., 1995e). Uncontrolled exploitation is also reported in other provinces, indicating significant illegal trade. For example, seven tonnes of *gaharu* originating in Irian Jaya were reported in the national press to have been seized in Jakarta in 1997, but this was only a fraction of the hundreds of tonnes reportedly smuggled out through Irian Jaya since the previous year, according to the Governor (Anon., 1997c). In Irian Jaya there have also been reported instances of military personnel stealing agarwood from local people (Anon., 1998b). Traders from India alleged that Indonesian agarwood was illegally imported into India by air. Forest resource tax (IHH) documents may be manipulated to show a wood product other than agarwood, with a lower IHH tariff. At least 11-15 t of agarwood have been seized during attempts to export it illegally in this manner (Anon., 1996a; 1996b; 1996c).

The Indonesian monetary crisis has greatly elevated agarwood prices and hence increased the level of illegal harvesting. Irian Jaya in particular has witnessed an upsurge in the search for agarwood (thought to be *A. filaria*) and harvesting by locals. Papua New Guineans are also said to have crossed the national border into Irian Jaya to sell their agarwood to middlemen and traders (Priyadi, 1999). In Papua New Guinea, the CITES Management and Scientific Authority for Plants has received reports from field officers since approximately 1997 that *Aquilaria* harvested in Papua New Guinea, primarily in Vanimore, is being illegally brought into Irian Jaya for export. The lack of staff makes the Papua New Guinea-Irian Jaya border difficult to police, but further investigation by officials in Papua New Guinea into this activity is anticipated (O. Giddens, Papua New Guinea CITES Management and Scientific Authority for Plants, pers. comm. to TRAFFIC Oceania, June 1999).

Cultivation

Successful efforts to cultivate *Aquilarias* species have been initiated in several provinces and some traders have established plantations, e.g. in Riau (Sumatra), Lombok and Bogor (Java) (Wiriadinata, 1995). Research is underway on the inoculation of *Aquilaria* trees with agarwood-producing fungi. Research is also ongoing regarding the ecology of agarwood-producing species, including the *in-situ* study of their natural regeneration (Soehartono and Mardiasuti, 1997).

LAO PDR

TRP reports that *Aquilaria* is found in southern Lao PDR, particularly in the Dong Ha Sao, Xe Pian and Dong Ampham regions. Although Lao PDR is not a range State for *A. malaccensis*, *A. baillonii* and *A. crassna* occur here (Heuveling van Beek, TRP, *in litt.* to TRAFFIC International, 2 May 2000; Heuveling van Beek and Phillips, 1999; Le Cong, 1996; Oldfield *et al.*, 1998). Collectors in Lao PDR are considered inexperienced agarwood harvesters and discard all but the dark resinous sections. There appear to be no formal agarwood traders in Vientiane, the capital of Lao PDR. Interviews with the Institute of Medicinal Plants indicate that agarwood is known to Lao PDR herbalists but is rarely used. There is no oil distillation undertaken in this country as far as is known (Heuveling van Beek and Phillips, 1999).

According to Heuveling van Beek and Phillips (1999), Lao PDR is reported by traders to serve as a source of agarwood for many Vietnamese traders, who transport agarwood eastwards, and for Thai traders, who transport agarwood westwards. At least one Thai trader was killed in an agarwood dispute in Vientiane Province four years ago and there have been varying reports of Thai contractors harvesting large volumes of agarwood under the guise of clearing trees in areas to be flooded by dams. There is little control of the harvesting of agarwood and these activities have been undertaken without Lao PDR authorities being aware of agarwood's value and rarity. There were no reports of trade northwards towards Kunming Province of China.

One company based in Mumbai (India) approached the government for rights to clear all the trees around artificial lake sites. Lao PDR agarwood stocks are reported by Indian traders to be smuggled into India by air. Two poachers have been shot in the Dong Ha Sao region for smuggling agarwood. In 1995, a company obtained permission from the government to buy four to five tonnes of agarwood seized by Customs (Heuveling van Beek and Phillips, 1999). Lao PDR is not a Party to CITES and trade with this country is not detailed in the CITES annual reports of other Parties.

Cultivation

TRP has experimented with agarwood formation in a small plantation belonging to the Agricultural Service. A number of agarwood seedlings were recently planted at the National University of Lao PDR.

A UNDP/Australian-funded rural development project found that villagers involved in harvesting agarwood were attempting cultivation, albeit unsystematically (Pereira, 1995). The project spanned four years, with more than 1000 trees planted at various locations, producing a stock of trees of unknown resin potential over 4.5 m high and with girths of 20-30 cm. Discussions are underway between the project's managers and TRP with respect to undertaking a more comprehensive agarwood project.