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## Aloeswood Forest and the Maritime World

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### Abstract

Aloeswood is one of the most valuable minor forest products of the Southeast Asian tropical rain forests. Borneo is a center of *Aquilaria* spp. and many people are collecting aloeswood from upriver mountain ranges. The collected materials are sent downriver to the harbor cities and thence to Singapore, the largest commercial center of aloeswood, where merchants gather from Arabia, Bangladesh and China. Seventy percent of aloeswood is sent to Arab countries and the rest to the China area. Artificial plantations of *Aquilaria* spp. and various experimental trials to produce aloeswood are being made by local researchers and merchants.

### I Introduction

The rich, diversified tropical rain forest of Borneo is the nursery of valuable forest products. The most abundant major resource is, of course, timber; but before wide-scale logging operations started, many minor forest products were extracted from this area, for instance, resins, bezoars, rattans, and aloeswood. Although those resources are not as vigorous as timbers, they have remained in demand in the outside world since early historical times [Yamada 1979]. But there are scarcely any articles which detail their present production areas and distributions.

During thirteen years of area study on Borneo, I have conducted research on the island's aloeswood and surveyed its commercial routes. This article deals with the ecology of aloeswood as an important minor product from tropical Southeast Asian forests and its present major maritime routes to Arabia and China. I want to show how the tropical rain forest and maritime world are connected by this resource.

During the survey, I interviewed many villagers and dealers in aloeswood in Borneo. Their experience and knowledge was really interesting. I owe much of my data to them, although I do not name them here.

### II Study Area and Survey Method

The study area covers the whole of Borneo Island. From 1982 to 1986, I concentrated on

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Brunei Darussalam as a JICA (Japan International Cooperation Agency) expert. From 1988 to 1993, as part of a Joint Research with Malaysia, United States and Japan, I spent my time mainly in Sarawak; and from 1992 to 1994, I studied the Kalimantan and Sabah area as part of an integrated area study team from our Center headed by Prof. Kato.

The areas surveyed were forests and villages mainly along the major rivers. Many people connected with aloeswood were interviewed. Trips to search for aloeswood were also made several times in the mountain areas of the upper Kayan river and Brunei forest. Interviews were also conducted at Chinese merchants' houses in such major harbor cities as Takakan, Samarinda, Balikpapan, Tawau, Sandakan, Bandar Seri Begawan and Kuching. In Singapore, in particular, I met many Arab and Bangladeshi merchants in the Chinese merchants' shops.

This article summarizes these interviews and my own observations.

### III Results and Discussion

#### 1) *Collection of Aloeswood from the Forest*

Aloeswood (*Aquilaria* spp.) is found in the deep lowland mixed Dipterocarp forests of Borneo along the major rivers to the hilly side of the upper rivers. The sites are heterogeneous from riverside to ridge. There are several species according to the collectors, but the major species appears to be *Aquilaria malaccensis*. This species is widely distributed over the whole of Southeast Asia. In the Borneo forest, the whitish bark of this species is very distinct and easily recognized.

On a one-day trip with Penan people to search for aloeswood on the upper Kapuas river, we encountered ten trees ranging from small seedlings to midium-sized trees of 30 cm DBH. The most abundant site was on a steep slope between a ridge and the river basin. When we saw a tree, the villagers cut a small portion to see whether it contained aloeswood. If there were signs of darker resinous texture, they cut whole the tree; but if not, they left it. When they saw the sign in the trunk, they cut down the tree and sliced off the bark and sapwood. In the case of a big tree, they cut the trunk into lengths of ca. 50 cm and searched for darker portions of the trunk. They continued to cut into small pieces up to the branch zone and dug out the roots. After trimming all the sapwood, they brought the major pieces of aloeswood back to the camp near the small river and chipped off the unwanted material more finely so that only the fragrant part remained. This process is done after dinner until midnight.

A group of aloeswood collectors normally consists of two to four people. They carry 15-20 kg of rice plus kitchenware and tent, knife, axe and the minimum of necessary utensils. Meat and fish are also very important. Since the collection is very heavy work, they need good protein and one day's rest every week. In two to three weeks, they accumulate several tens of kilograms of aloeswood. After consuming all their rice, they return to the village.

In the village, Chinese merchants who buy aloeswood from collectors are always waiting. The aloeswood materials are classified into five to seven classes according to the quality. The finest one is called "super" and cost 1,000,000 Rp/kg in 1994 in east Kalimantan, which is equivalent to US\$ 500/kg. This highest quality is scarcely obtained in this area, where most of the wood is second to third grade. The "super" grade is very black and purely resinous. The color becomes lighter with decreasing quality. The price of the lower class is around 100,000 Rp/kg. In the village, the Chinese merchants check the quality and divide the wood into categories, weigh it and negotiate a price with the collectors. The merchant always offers a lower price and the collectors demand a higher one. After several offers and counteroffers, the price is finalized and the cash is paid to the collectors. The collectors divide this income equally among themselves: The youngest beginner gets the same amount as the older boss.

The villagers often go into the forest to search for aloeswood. The costs of transportation and rice purchase are sometimes provided by a Chinese merchant so that he can get a more stable supply of material from the villagers. Villagers get into the forest four to six times a year. In particular, they often go just before Christmas, because they need money. Merchants have networks among the villagers, with each merchant controlling ten to forty groups of four persons each on average. But majority of villagers are freelance and can sell their collection to any merchant. Sometimes they may themselves take their collection downriver to sell.

According to one merchant, there are thousand of collectors in the upper Mahakam and Kayan rivers. Some of the products come from the Malaysian side, where the price of aloeswood is not so good. Many of the laborers in the logging camps look for aloeswood as a sidejob.

## 2) *Transportation of Aloeswood from Village to Harbor City*

The collected materials are sent downriver to a harbor city. Apo Kayan is one of the centers of collection, but river transportation is blocked by rapids. So the materials are sent by air directly to Samarinda or Tarakan. In the Pujungan area, on the other hand, the aloeswood is transported in large boats owned by a merchant who stays in the lower village and deals with transportation business and sundry. He owns several shops on the lower reach of the river and sends sundry goods upriver in his boats. Transportation is not restricted things. People from the upper villages frequently use his boats. Collectors and merchants of aloeswood are also important users of these boats. Along the Kayan river, there are many camps where collectors stay for several weeks. The boats stop at these locations and unload people and necessities and pick up aloeswood. Some collectors have a fixed merchant to whom they sell aloeswood, while others are free from such connections. These collectors originate from many places all over Indonesia, from Java to Flores. The collected materials are packed in large bags holding more than 50 kg of aloeswood.

In the middle of the lower reach is a village called Long Peso, where all passengers and materials are unloaded and change to a regular taxi boat. Some of the collectors have houses here and some merchants collect aloeswood from several collectors in this village.

Regular taxi boats carry most of the materials down the river to Tanjung Selor, the capital of the area. There are several medium-sized merchants in this city, including Arabs. Arab merchants have been here for more than 50 years handling aloeswood, birds' nests, and other forest products. Arab merchants from Jakarta or Singapore also sometimes come here to buy materials directly, but most of the materials are sent to Jakarta by ship.

On the opposite side of Tg. Selor is Tarakan, one of the largest centers of commerce in northeastern Borneo. There are several big aloeswood merchants in this city. One of them was formerly the manager of a logging camp and has now become one of the largest dealers in the city. In his large house, materials are collected, divided into several classes and sent to Jakarta. Sometimes Japanese merchants come to him, although Indonesian merchants cannot usually provide the well-sorted materials demanded by the highly sophisticated Japanese incense culture. Collectors from the upper villages frequently visit his house, and he buys even low-quality material from them. Having made good connections during his time in the logging operation, he has a large network throughout east Kalimantan through which he accumulates materials to send to Jakarta.

In the Chinese area (Kota) in Jakarta, there are several merchants who buy the materials from all over Indonesia. One merchant has branch offices in almost all the big harbor cities including Pakan Baru, Pontianak, Bandjarmasin, Samarinda, Tarakan, Ujung Pandang, Ambon and Jaya Pura. And the owners of the shop frequently visit those places. The main work of the Jakarta office is to check the materials, and re-classify them and send them to Singapore.

### 3) *Singapore: The Largest Commercial Center*

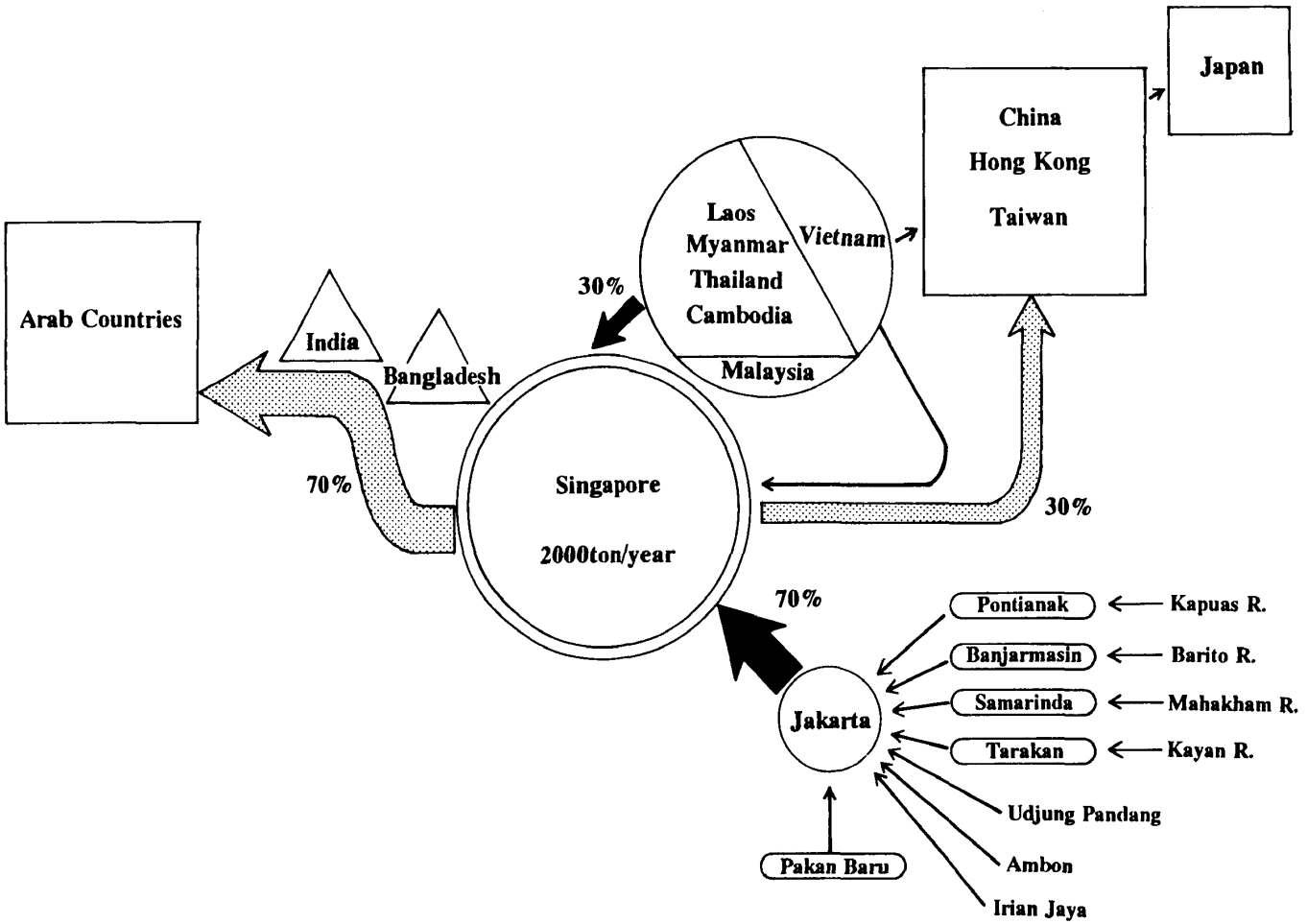
Near the old airport of Singapore are dozens of aloeswood merchants' shops which have large storerooms. The aloeswood sent from Jakarta is stored here, re-classified again, and sold to merchants from outside. Seventy percent of the aloeswood in Singapore comes from Indonesia and 30 percent from other Southeast Asian countries.

There are frequent visits by Arab, Bangladeshi and Chinese merchants. The best customers are Arab merchants, who buy the highest quality aloeswood. The Bangladeshi merchants usually buy low quality materials and sell them to the common Arab people.

Seventy percent of the aloeswood in Singapore is sent to Arab countries and 30 percent is sent to China, Hong Kong and Taiwan, mainly for making incense sticks and Chinese medicines. Some of the good materials from Vietnam are sent directly to Hong Kong and Japan. But Japanese merchants seem to have a different route through Hong Kong.

Fig. 1 summarizes the flow of aloeswood. It is very difficult to estimate the amount of aloeswood transported from each area. The total amount passing through Singapore was

estimated to be 2,000 ton/year, based on the interviews with merchants. This amount itself is not very reliable, but the percentages of outflow from Singapore to other countries may be more reliable.



**Fig.1** Summary of Maritime Commercial Routes of Aloeswood from Borneo and Southeast Asia to Arabia, China and Japan

4) *New Trends in the World of Aloeswood*

During my research on aloeswood in Southeast Asia, I encountered several new trends among researchers and merchants who are interested in aloeswood.

As resources are getting scarcer and quality is declining, the merchants want to make artificial plantations of *Aquilaria* species. They ask collectors to bring back seedlings from the forests. And those seedlings are planted in farms. There is already a plantation of 4 ha in Sumatra. Since aloeswood is an extract of certain chemicals caused by fungi or mechanical wounds, it is not known whether these plantation trees can produce aloeswood or not. But this kind of non-governmental plantation experiment by the merchants themselves is a good sign for the future of aloeswood.

The mechanism of the formation of aloeswood is still unknown, but experiments by wood anatomists have been started [Nobuchi and Somkid 1991]. Local forest research institutes are also interested in the plantations and experiments to produce aloeswood artificially.

As the tropical non-timber minor products are present in scattered localities in the forests, the search for resources needs time and patience. Young people in the upper villages are not very willing to continue this laborious work. But still many hundreds of people are now seeking these resources in Kalimantan, and in the very near future, Irian Jaya will become a center. With the shift of location, the former center of collection will remain untouched for many years, and as a result, aloeswood will become reestablished in the same area. This is the way resources should be managed in the tropical rain forest world. Actually, the regeneration of *Aquilaria* species in the forest is quite good and many trees remain in the forest.

There is also a movement to protect aloeswood collection by an international organization. But before a final decision is made, we need more detailed research on the matter. Aloeswood is one of the most important income sources for the villagers in the tropical rain forests of Southeast Asia. And because of their efforts, the high culture of incense in Arabia, China and Japan has flourished.

Aloeswood is typical of the natural resources of the Southeast Asian forests which have been carried to many countries through the maritime world and formed the basis of high culture in distant areas. But there are still many secrets surrounding this commerce. Bangladeshi merchants are said to have a history of more than 200 years of commerce in aloeswood between Southeast Asia and Arab countries. Further studies are needed to elucidate the present and historical situation of aloeswood in this region.

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