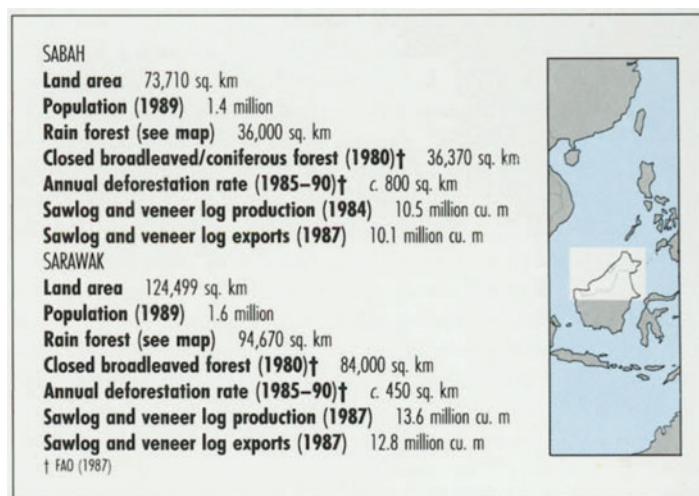


24 Sabah and Sarawak (Eastern Malaysia)



In Sabah and Sarawak rain forests cover 46 per cent and 70 per cent of the land respectively (1985 data; FAO, 1987). Predicted cover for 1990 based on these data were 39 per cent and 64 per cent respectively. In both states the control of forests is a state matter, although coming under an overall federal policy. About 45 per cent and 37 per cent of Sabah and Sarawak's land area are included in the Permanent Forest Estate (PFE). Outside the PFE, much of Sarawak's land consists of stateland forest, while much of Sabah's land has already been converted to other land use, mainly agriculture.

A major factor responsible for deforestation in Sarawak is shifting agriculture, often following provision of access to the land by the logging companies. By 1978, about 23 per cent of the state's land area had been used for shifting agriculture at some time, and the amount was growing by 0.5 to 1 per cent per year. However, all but 2.5 per cent of the PFE remains unaffected.

Much concern has been expressed that Sarawak's logging levels are unsustainable and damaging to the interests of rural people. In 1989/90 an ITTO mission visited Sarawak to investigate. The results were released as this atlas was going to press, and do recommend a reduction in logging levels.

In Sabah, shifting agriculture only affects about 15 per cent of the land area. A further 12 per cent is due to be converted to settled agriculture. There is little doubt that the main cause of forest degradation and deforestation here is logging. Furthermore, in 1983 an estimated 20 per cent of Sabah's forested land was burnt; 85 per cent of this was logged forest.

Mangrove forest receives little protection, and logging has been widespread, primarily for woodchip exports to Japan and Taiwan.

Both states have systems of totally protected areas. National parks cover 0.65 per cent and 1.9 per cent of Sarawak and Sabah respectively, and other protected areas cover a further 1.4 per cent and 7 per cent respectively. Several new areas have been proposed for protection and, if gazetted, will result in protection of 8.1 per cent and 8.9 per cent of Sarawak and Sabah respectively. These will cover most of East Malaysia's ecological and biological diversity, but increasing pressure on land and particularly timber resources means that few, if any, areas are totally secure. Proper management for both forest conservation and production will require a substantial increase in trained manpower.

INTRODUCTION

Sarawak and Sabah are the two states that comprise Eastern Malaysia. They lie on the north and north-western parts of the island of Borneo and between them occupy one-third of its area.

The climate is typically wet equatorial. Rainfall is heavy, especially during the north-east monsoon season between November and February, and to a lesser extent between May and June. Rain falls in most, if not all, months, with a minimum annual total of 1730 mm in the driest parts of central Sabah, while 5000 mm plus falls in the montane areas such as Mount Mulu, Sarawak. The annual average is about 2500 mm. Humidity as expected, is always high.

Borneo is the biggest exposed part of the Sunda Shelf, and consists mostly of young, uplifted sedimentary rocks. Sabah and Sarawak consist of alluvial and often swampy coastal plains with hilly rolling country inland intersected by large rivers and mountain ranges in the interior. In Sabah, the central mountain ranges rise abruptly from the west coast to the granodiorite peak of Mount Kinabalu (4094 m), the highest summit in Southeast Asia. The Trus Madi (2649 m) and

Crocker ranges extend south and south-west respectively. In central Sabah, Mount Lutong (1657 m) is a striking sandstone arc, while in eastern Sabah few areas rise above 500 m. Sabah also has some extinct volcanic peaks (Tawau Hills, 1303 m) and ultrabasic mountains (Silam, Tawau). The largest river, the Kinabatangan, drains eastwards, is navigable for long distances and waters an extensive plain.

Sarawak has mountains along two-thirds of its inland frontier. Mount Mulu in the north reaches 2371 m and has spectacular karst formations nearby, which include the largest underground cave in the world. The Kelabit Highlands reach 2438 m on Mount Murud. From the mountains of the border flow the great rivers Trusan, Limbang, Baram, Rajang and Lupar, which create coastal swamps covering 14 per cent of the State's land area, mainly in the coastal plains. The Rajang is the largest river.

The human population of both states is low: Sabah has 1.4 million and Sarawak 1.6 million. It is also ethnically diverse, particularly in Sarawak, which has some 28 tribal groups. The Malays, Chinese

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and other non-native groups are largely urban and coastal, while indigenous groups such as Iban (30 per cent of Sarawak's population), Bidayuh, Kelabit, Lun Bawang, Kayan, Kenyah, Berawan and many other *orang ulu* groups are largely inland farmers (Hong, 1987). Many of these still have a culture and livelihood which is linked, at least loosely, to the forest. The Penan are a people from the interior of Borneo who traditionally live a nomadic life of hunting and gathering. While the majority are now settled, several hundred still live entirely on the products of the natural forest (see chapter 3).

Both states have locally elected governments which sit in the capital cities Kota Kinabalu (Sabah) and Kuching (Sarawak) and send separate representatives to the Federal Assembly in Kuala Lumpur. Land management issues are in the hands of the state authorities.

The Forests

Both Sarawak and Sabah were originally entirely clothed in tropical rain forest. Existing forest formations include the following:

1 Lowland evergreen rain forest rich in dipterocarps (known in Sarawak as mixed dipterocarp forest) is the natural vegetation throughout the interior in the, sometimes rugged, lowlands. Dominated by Dipterocarpaceae, these multi-storeyed forests are of great commercial value for their timber species, particularly *Dipterocarpus*, *Dryobalanops* and *Shorea*. Individual trees may reach 60 m in height and exceed 80 cm in diameter. On a one hectare plot near Mount Mulu, 225 species over 10 cm in diameter were found (Proctor *et al.*, 1983). It has been estimated that there are at least 3000 species of trees in this formation, 890 of which reach exploitable sizes (Thang, 1987).

2 Peat swamp forest was originally extensive in Sarawak and also occurred in south-west Sabah. Consisting of domed peat bogs, *Shorea albida* is an important species, and *Gonystylus bancanus* (ramin) is the single most valuable species. Other genera of trees often found in Sarawak and Sabah include *Calophyllum*, *Dryobalanops* and *Melanorrhoea*. In Sarawak, peat swamp forests were the first formations to be logged on a commercial scale and for many years were Sarawak's main source of timber. By 1972, they had all been licensed for timber extraction, and by the year 2000 are all due to have been logged (Chan *et al.*, 1985).

3 Heath forest (or *kerangas*) mainly occurs in small patches inland on sandstones. The forests are characteristically low in stature, even-canopied with pole-like trees and rich in ant-plants (*Myrmecodia*) and pitcher plants (*Nepenthes*). The tree flora typically contains species of *Dipterocarpus*, *Shorea albida*, *Melanorrhoea* and *Tristanopsis*, with *Agathis* and *Gymnostoma* dominant in some forests.

4 Forest occurs on limestone in karst regions in Sarawak at low elevations and up to high elevations on Mount Api and other outcrops around Mount Mulu (Anderson, 1965; Collins *et al.*, 1984). In Sabah there are important karst hills, all with caves, on the east coast. In both Sabah and Sarawak, some of the caves are inhabited by the swiftlets which produce edible birds' nests (Sabah Forest Department, 1984; Chan *et al.*, 1985).

5 A floristically distinctive forest formation occurs on the ultrabasic rocks which form a mountainous arc extending from Mount Kinabalu to the east coast. This forest has little commercial timber and is sometimes of low stature.

6 Lower and upper montane rain forests are mainly restricted to the eastern frontier of Sarawak with Indonesia and Sabah. In Sabah montane forests are widespread on Trus Madi, the Crocker Range and Mount Kinabalu, which is rich in endemic flora. The families Fagaceae, Flacourtiaceae, Guttiferae, Myrtaceae, and Sapotaceae provide the principal dominant species at lower altitudes, while in the upper montane forests the conifers *Dacrydium* and *Phyllocladus* are common.



Spectacular fields of limestone pinnacles bar the ascent to Gunung Api (Fire Mountain), whose forests have burnt from lightning strikes in living memory. The area is part of the Gunung Mulu National Park. N. M. Collins

Forest Resources and Management

According to FAO (1987) the forest estate in Sarawak stood at 84,000 sq. km of broadleaved forest in 1980 (67.5 per cent of land area), 81,910 sq. km in 1985 (65.2 per cent) and a predicted 79,630 sq. km in 1990 (64 per cent). Table 24.1 is an analysis of maps published in 1979 by the Sarawak Forest Department (see legend to Map 24.1). The total forest area shown on the map is 94,670 sq. km, or 76 per cent of land area, i.e. 14 per cent larger than FAO's estimate of the extent of the forest estate in 1990 (FAO, 1987). This should be borne in mind when studying the map.

In Sabah in 1953 natural forests covered 63,275 sq. km (Fox, 1978), or 86 per cent of the land area. Thirty years later the rain forest was reduced to 46,646 sq. km (63 per cent) (Sabah Forest Department, 1984). According to an FAO assessment in 1985 the rain forest cover was 33,130 sq. km (45 per cent) and the prediction was that this would fall to 29,110 sq. km (39 per cent) by 1990 (FAO, 1987). Table 24.1 gives an analysis of maps made available by the Sabah Forest Department (see legend to Map 24.1). This shows about 36,000 sq. km of rain forest in the Forest Reserves and protected areas, or 49 per cent of land area, i.e. 10 per cent bigger than FAO's estimate of the extent of the forest estate in 1990 (FAO, 1987).

Throughout Malaysia, land, including forest, is defined by the constitution as a state matter. Each state is responsible for the management of its forests, but it does so under a forest policy that is common. The 1977 Malaysia National Forest Policy emphasises that each state should keep 47 per cent of its land as forest reserves for sustained yield production of timber and other products. (See also chapter 22.) At present, however, only about 37 per cent of Sarawak and 45 per cent of Sabah is under the gazetted Permanent Forest Estate.

Stateland forests are also available for conversion to non-forest use, such as agriculture and urban expansion. In Sarawak, stateland forests are still extensive, probably in the region of 35,000 sq. km, and there is room to gazette further areas under the Permanent Forest Estate. During the 1990s the Forest Department intends to increase the PFE to about 63,000 sq. km or 51 per cent of the total land area. In Sabah stateland forests outside the Permanent Forest Estate are believed to be virtually non-existent since the FAO projected total forest area for 1990 is already smaller than the PFE itself. The Sabah Forest Department has available a map *State of Sabah: Tree Crop Areas* (1988) that shows the stateland forests, but it does not indicate how much (if any) of this remains under natural forest.