

Trends in Malaysian Forest Policy

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Abstract : Forests have played an important role in the resource-based socio-economic development of Malaysia. In 2001, the export value of wood and wood-based products was RM 14.3 billion or 4.3 per cent of the country's total export value and accounted for 3.4 per cent of GDP. Employment created in the forestry sector totaled 337,000 jobs. This paper provides the background to the development of both forestry and the forest-based industries in Malaysia. It also examines the steps that are being taken to ensure that the forests are managed on a sustainable basis. The move towards forest and timber certification is also highlighted. The successful development of the forestry sector through various industrial master plans and relevant forest policies and legislation is also discussed. As the forest resource is fast depleting, forest plantations will become the main source of timber supply in the near future. Natural forests will increasingly be managed more for environmental and ecological services rather than for timber supply.

Key words : Forestry policies, sustainable forest management, forest and timber certification, timber trade, forest-based industries.

1 Overview of forest policy trends in Malaysia

Malaysia was formed in 1963 and consists of three regions, namely, Peninsula Malaysia (composed of 11 Federated Malay States which achieved independence from the British government in 1957), Sarawak and Sabah. Since then, three separate bodies have determined Malaysia's forest policy : (a) Peninsular Malaysia Forestry Department in Kuala Lumpur, (b) the Forestry Department Sabah and (c) the Forestry Department Sarawak.

Under Article 74 (2) of the Malaysian Constitution, forestry is a state matter, and as such, the thirteen state governments have complete jurisdiction over their forest resources. Each state is empowered to enact laws on forestry and to formulate forestry policy independently. The federal government only provides technical advice and assistance on forest management, training, the conduct of research, and in the maintenance of experimental and demonstration stations. Nonetheless, a close relationship between the states and federal government is essential regarding all land and forestry issues.

1.1 National Forest Policy

In Peninsular Malaysia an Interim Forestry Policy was first formulated in 1952 and officially adopted as the National Forestry Policy (NFP) in 1978. In Sarawak, the Sarawak Forest Ordinance 1954 provides the necessary legal framework, while in Sabah, the Sabah Forest Enactment 1968 provides the legal backing to ensure the implementation of state forest policy.

Although the forest policies of Peninsular Malaysia, Sarawak and Sabah have developed independently of each other, they nevertheless share many similarities. They all include provision for the creation of permanent

forests for protective and production purposes. The policies also state that forest resources can be harvested for export purposes. The importance of long term planning and security of tenure is also emphasized in the three forest policies. They also provide for the promotion of "thorough and economical utilization of forest produce on land not included in the forest estate, prior to the alienation of such land" (Radzuan, 1975).

The similarities in the forest policy of the three regions are not accidental, as the colonial master of the three regions often transferred forest officers between the different states. However, in the interpretation and implementation of the respective forest policies, many differences become apparent. One glaring example is the setting of royalty rates for timber species. The rate for *ramin* is only RM 11 per m³ in Pahang (which happens to be a major producer of *ramin*), whereas the rate is RM 88 per m³ in the neighboring state of Negeri Sembilan.

With the formation of Malaysia in 1963, there was a need to unify the forest policies of the three regions. As a result, the National Forestry Council (NFC) was established in December 1971 by the National Land Council (NLC) to facilitate the adoption of a coordinated and common approach to forestry issues, including the planned, rational and effective management and utilization of forest resources. The NFC membership comprises the Chief Minister of each of the thirteen states and is chaired by the Deputy Prime Minister. The responsibility for implementing the decisions of the NFC lies with the state governments unless the matter falls under the authority of the federal government.

As a result of the NFC agenda, an Interim Forest Policy of 1972 was formulated which laid the basis for the 1978 National Forestry Policy (covering all the three regions, Peninsula Malaysia, Sabah and Sarawak).

This National Forest Policy recognizes "the vital role of forests for the welfare of the community and national

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economy through their multiple uses". The policy also forms "a basis for close co-operation among state and federal governments, in the proper and effective management of forests and utilization of forest resources" (FDPM, 1978), as land management in Malaysia is a state matter.

Recognizing the dire need to rationalize land use policies in relation to the conservation of forest resources and their management on a sustainable basis, a National Forestry Policy (NFP) for Peninsular Malaysia was formulated and approved for implementation in 1978. The NFP is implemented through the National Forestry Act of 1984.

Key aspects of NFP are : -

- To dedicate areas of forest land as Permanent Forest Estate (PFE) ;
- To manage the PFE with the objective of maximizing social, economic and environmental benefits in accordance with the principles of sound forest management ;
- To pursue a programme of forest development through regeneration and rehabilitation operations ;
- To ensure thorough and efficient utilization of forest resources, not included in the PFE ;
- To promote sound harvesting techniques and utilization of all forms of forest produce and to stimulate the development of wood-based industries ; and
- To undertake and support a comprehensive programme of forestry training.

In light of the UNCED Conference in 1992, the discussions and agreements reached within ITTO and new research findings, both the National Forestry Policy and the National Forestry Act of 1984 were reviewed and amended in 1992 and 1993 respectively.

The National Forestry Policy was revised to accommodate greater emphasis on environmental protection and the conservation of biological diversity, and the National Forestry Act 1984 was amended to strengthen its effectiveness in dealing with forest encroachment and illegal logging. Thus the penalty for any forest offence was increased from a maximum of RM 10,000 or imprisonment for a term not exceeding 3 years, to a maximum of RM 500,000 and imprisonment for up to 20 years, and a mandatory imprisonment of at least one year (Thang 2002). Provision for the police and armed forces to undertake surveillance of forestry activities was incorporated in the new Act and this, together with the stiffer penalties, has helped to curb illegal logging and forestry encroachment.

1.2 Forest charges

The Malaysian Timber Industry Board (MTIB) is the statutory body responsible for administering federal forest charges in Peninsular Malaysia. MTIB issues export licenses, collects export taxes and acts as an enforcement agency with limited police powers. In addi-

tion, it is mandated to promote and improve trade, encourage the effective utilization of timber, promote efficient timber processing techniques and provide technical advisory services. A portion of the revenue collected by MTIB is used to finance on-going forest activities in Peninsular Malaysia, both at the federal and state level, including research needs.

The individual states also collect forest charges through royalties, premiums and silvicultural cess. This is coordinated by the Forest Rules under the various State Forest Enactments. The silvicultural cess varies between RM 2.80 to RM 10 per m³ (depending on the state) of timber extracted and is retained by the State Forestry Department. The silvicultural cess is used to fund forest rehabilitation projects and for maintaining the forests in the state. On the other hand, premiums and royalties are collected and transferred to the State Consolidated Account and are usually used by the State to fund other developmental projects (*i.e.* non forestry-related activities).

1.3 National policy on biological diversity

In 1998, the National Policy on Biodiversity (MOSTE, 1998) was formulated to protect Malaysia's rich flora and fauna for the benefit of present and future generations. It aims to set the direction for Malaysia to implement strategies, action plans and programmes on the conservation of biological diversity and the sustainable utilisation of biological resources. The policy's mission is "to conserve Malaysia's biological diversity and to ensure that its components are utilised in a sustainable manner for the continued progress and socio-economic development of the nation".

Conservation and sustainable utilisation of Malaysia's biological diversity are based on the following principles and considerations :

- a) The conservation ethic, including the inherent right to existence of all living forms, which is deeply rooted in the religious and cultural values of all Malaysians ;
- b) Biological diversity is a national heritage that must be sustainably managed and wisely utilized today and conserved for future generations ;
- c) Biological resources are natural capital and their conservation is an investment that will yield benefits locally, nationally and globally for present and future generations ;
- d) The benefits derived from the sustainable management of biological diversity will accrue, directly or indirectly, throughout every sector of society ;
- e) The sustainable management of biological diversity is the responsibility of all sectors of society ;
- f) It is the duty of the Government to formulate and implement the policy framework for sustainable management and utilization of biological diversity in close cooperation with scientists, the business community and the public ;

- g) The role of local communities in the conservation, management and utilization of biological diversity must be recognized and their rightful share of benefits should be ensured ;
- h) Issues in biological diversity transcend national boundaries and Malaysia must continue to exercise a proactive and constructive role in international activities ;
- i) The interdependence of nations on biological diversity and in the utilization of its components for the well-being of mankind is recognized. International cooperation and collaboration is vital for fair and equitable sharing of biological resources, as well as to ensure access to and transfer of relevant technology ;
- j) Public awareness and education is essential for ensuring the conservation of biological diversity and the sustainable utilisation of its components ; and
- k) In the utilization of biological diversity, including the development of biotechnology, the principles and practice of bio-safety should be adhered to.

1.4 Other legislation relating to forestry

The following is a list of other legislation which is of relevance to the forestry sector :

- Water Enactment Act 1935
- Land Conservation Act 1960
- National Land Code 1965
- National Forestry Act 1984 (Act 313)
- Protection of Wild Life Act 1972 (Act 76)
- Malaysian Timber Industry Board Act 1973
- Environmental Quality Act 1974 (Act 127)
- Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 1987
- National Park Act 1980
- Malaysian Forestry Research and Development Act 1985
- Wood-based Industries (State Legislatures Competency) Act 1984 (Act 314)

The enforcement of these laws is expected to go a long way towards the achievement of national objectives, as they embody a vital change in the philosophy of forest management, away from simply ensuring sustainable yield to actively pursuing sustainable management (Abdul Razak *et al.*, 2002). Henceforth, forest management will be judged not just on the basis of the forests' capacity to produce output in perpetuity, but more so on how the forests are managed to achieve the delicate balance between their various functions. In the 21st century, the dictates of these varied functions will assume greater importance, particularly those pertaining to environmental and conservation considerations.

2 Sustainable Forest Management

2.1 Historical perspective of forest management

Since the beginning of the twentieth century, Malay-

sia has evolved a systematic and sustainable yield policy with regards to the management of her forests. With the establishment of the Forestry Department in 1901, the forests of Malaysia have been systematically managed whereby ecologically and environmentally sound forest conservation and management practices have been developed to ensure forest renewal and sustained yield.

In the early 1920s, forest management by Departmental Regeneration Improvement Felling (DRIF) was aimed solely at improving the existing stock through the removal of inferior species. However, with rising demand for firewood and poles from the mining industries in the 1930s, Commercial Regeneration Improvement Felling (CRIF) was introduced (Wyatt-Smith and Panton, 1995). This involved a 5-year regeneration period coupled with several fellings.

A few years after the Pacific War, Regeneration Improving Felling (RIF) was discontinued because of the increased demand for raw materials. This led to the formulation of the Malayan Uniform System (MUS) in 1948, which consists of removing the mature crop in one single felling of all trees down to 45 cm dbh for all species. This is immediately followed by systematic poisoning of unwanted species to release the natural regeneration of selected saplings and seedlings (Wyatt-Smith and Panton, 1995). The resulting crop becomes more or less even-aged and contains a greater proportion of commercial species.

The MUS however has been found to be unsuccessful in hill dipterocarp forest. Consequently, the Selective Management System (SMS) was introduced in 1978 to allow for a more flexible timber harvesting regime which is consistent with the need to safeguard the environment and at the same time take advantage of demand in the timber market (Appanah and Weinland, 1993).

2.2 Development of the Malaysian Criteria and Indicators

As a member of the International Tropical Timber Organization (ITTO), Malaysia is fully committed to the achievement of sustainable forest management. In this respect, Malaysia has taken several measures to implement the ITTO guidelines for the sustainable management of natural tropical forests and its criteria for the measurement of sustainable tropical forest management. Towards this end, a National Committee on Sustainable Forest Management was established in 1994 under the Ministry of Primary Industries to ensure that the criteria, indicators and activities related to sustainable forest management are put into operation. The National Committee has formulated a total of 92 activities, based on 5 criteria and 27 indicators to implement the ITTO criteria at the national level (Thang, 2002). At the same time, steps have also been taken to identify 84 activities under 6 criteria and 30 indicators at the forest management unit (FMU) level.

Peninsular Malaysia has also formulated 170 and 150 standards of performance for each of the activities identified at the national and FMU levels respectively. Thang (2002) reported that a subset of the MC&I formulated at the FMU level were prescribed for forest management certification (7 criteria, 53 indicators, 162 activities and 142 standards of performance).

These activities will be tested on the ground to establish their applicability. Institutional plans and capacity building are currently being undertaken to monitor the implementation of all these activities to be carried out at the state and FMU level. A Technical Monitoring Committee (TMC) has been established by the Forestry Department of Peninsular Malaysia to monitor the implementation of all the activities undertaken by each State Forestry Department in Peninsular Malaysia.

2.3 The forest resource base

To achieve SFM, Malaysia has committed to maintain at least 50 per cent of her land area under forest cover. With a total land area of 32.9 million hectares, the natural forest base currently stands at 18.9 million hectares. Out of this, a total of 14.1 million hectares of natural forests have been designated as Permanent Forest Estate (PFE) which will be permanently managed to ensure that the proper balance between various functions, such as production, protection, social and educational objectives, will be achieved. In addition 3.39 million hectares have been allocated for protection forests in the form of national parks, wildlife sanctuaries and nature reserves. These protective areas bear testimony to Malaysia's commitment to the maintenance of suitable habitats for fauna and flora to ensure the preservation of bio-diversity.

In the PFE designated as Production Forests, commercial logging is undertaken on a rotational cycle, under a sustained yield management system. Only a few mature trees (7 to 12 trees per hectare) are marked for felling at each harvesting cycle, thus giving the logged over area time for recovery and regeneration before the subsequent round (Thang, 2002). Under this selective logging system, Malaysian forests have the ability to return to their former eco-balance, thereby allowing for better biological functioning of the forests.

Besides the natural forest base, Malaysia has also established a total of 0.17 million hectares of forest plantations as well as 4.8 million hectares of agricultural tree crops, which are similar to re-afforested land. These forest and tree crop plantations play an integral part of sustainable forest management as they represent an important alternative source of renewable timber and fibre materials, which can contribute to reducing the pressures on natural forests. Taking these plantations into consideration, the total area under tree cover in Malaysia is estimated to be 23.86 hectares or 72.6 per cent of the total land area.

2.4 Forest concessions

In Peninsular Malaysia, concessions are categorized by size, each with its own length of tenure. Concessions between 0-1000 hectares are allocated for 1-2 years; 1,001-2000 hectare concessions are allocated for 1-5 years; 2,001-20,000 hectares are allocated for 10-30 years; and those exceeding 20,001 hectares are allocated for 20-30 years. The federal government recognizes that longer agreements provide an incentive for concessionaires to engage in SFM and is keen to encourage the adoption of longer concession agreements. In 1997, the State Government of Sabah introduced the Sustainable Forest Management License Agreement (SFMLA) which provides the right to 'plant, rehabilitate and harvest forest under principles of SFM for a time period of 100 years in a certain Forest Reserve' of approximately 100,000 hectares (Woon 2002). A total of 15 SFMLA were awarded initially. In Sarawak all agreements are for 25 years.

The Federal Government also encourages state forest authorities to allocate concessions to those with a long-term interest in the timber industry. This policy is to encourage companies to move into downstream activities and processes.

On a similar note, Malaysia places increasing emphasis on reforestation in order to rehabilitate degraded land. Areas of forest land that have been deforested or degraded by inappropriate logging practices, shifting cultivation, repeated burning and other human disturbances will be rehabilitated. Transforming degraded forest lands into rehabilitated forests offers many benefits, but faces serious practical and institutional constraints. Knowledge and experience of rehabilitation are still limited, and its needs are inadequately addressed in forest policy, planning and management.

2.5 Availability of rubberwood

Malaysia has made tremendous progress in utilizing rubberwood since the late seventies. The export value of wooden furniture increased from a mere RM 120 million in 1988 to more than RM 4 billion in 2002. It has been estimated that 80 per cent of the wooden furniture exported from Malaysia is made of rubberwood. Norini *et al.* (2001) reported that there were 290 mills engaged in processing rubberwood logs in 2000 as compared to 128 mills in 1994. With such a rapid growth in this sector, there is now a concern that in the near future there will be a shortage in rubberwood sawn timber supply to meet the industry's demand.

A major factor that gives rise to this concern is the decreasing rate of rubber replanting carried out by smallholders. As rubber trees are generally felled for replanting after 25 years (considered as the economic life span for latex production) the decreasing area replanted with rubber is a major cause of concern. This is further compounded by the preference of planters both at the estate and smallholding level to switch from rubber to oil palm as the latter provides a better return. The total

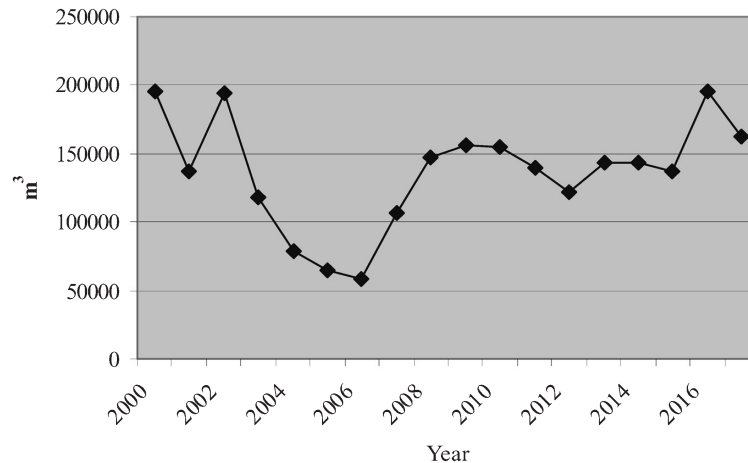


Fig. 1 Potential availability of rubberwood sawn timber, Peninsular Malaysia (2000–2017).
Source : Norini *et al.* (2000).

area planted with rubber in Malaysia decreased from 2.0 million hectares in 1980 to 1.4 million hectares in 2000.

Norini *et al.* (2001) projected the trends of rubberwood sawn timber availability for the period 2000 to 2017 (Figure 1) in Peninsular Malaysia. The trend fluctuates between 0.59 million m³ to 2.0 million m³. The lowest level is projected to be in 2005 and 2006, when respectively only 590,000 m³ and 650,000 m³ of rubberwood sawn timber will be available for further processing. The projected demand for rubberwood sawn timber is estimated to be 1.59 million m³ (290 processing mills) for those two years. This means that a shortage will occur and wooden furniture manufacturers, whose staple raw material is rubberwood, will be adversely affected.

The government has started to encourage the private sector to invest in rubber forest plantation. One of the objectives stated in the National Agricultural Policy (NAP, 1992-2010) is to increase the area under rubber through rubber forest plantation. However, Woon and Norini (2000) estimated that to get a 10 per cent return (internal rate of return, IRR) from rubber forest plantation the price of rubberwood logs should be at least RM 168 per m³. Given the current rate of RM 90 per m³, investment in rubber forest plantation would not be attractive. The Malaysian Government has taken steps to provide better incentives through the Pioneer Status (PS) and Investment Tax Allowance (ITA) schemes, introduced through the Promotion of Investment Act (PIA) 1986.

Nonetheless, despite the introduction of PS and ITA, rubber forest plantations remain financially unattractive since they only yield a return after 15 years at the earliest. This inherent cash flow issue makes them problematic. Woon (2002) reported that the Malaysian Government is willing to consider giving better incentives to forest plantation investment on a case by case basis. It is too early to assess whether this will be effective.

Another option that could be taken is to encourage the furniture industry to use other alternative species, but

this will take time and market acceptance from the major markets is still uncertain.

Currently, most rubber smallholdings are located in isolated areas and are of limited area, making it uneconomical to harvest the rubber trees. Efforts have been made by the Rubber Industry Smallholders Development Authority (RISDA) to organize rubber smallholdings within an area to carry out replantings at the same time. This will provide the economy of scale required for harvesting and transporting the logs to the mills. Furthermore, RISDA has taken steps to set up long term agreements with furniture manufacturers to guarantee a continuous flow of rubberwood log supply.

The Malaysian Government is also looking into developing policy which encourages the industry to use larger rubberwood logs for sawn timber conversion only. The smaller logs or branches (10 cm diameter and below) could be used by Medium Density Fibreboard (MDF) manufacturers. In this way, there will be less competition for the limited supply of large rubberwood logs and thereby help ensure that furniture manufacturers have an adequate supply of raw material.

3 Forest and timber certification

Thang (2002) reported that in mid-1996, a pilot study on timber certification using the MC & I for certifying three FMUs in Peninsular Malaysia was initiated under the Malaysia-Netherlands Joint-Working Group. This was done to enable the 'certified' timber products to enter the Keurhout Hallmark Programme implemented in the Netherlands. SGS (Societe Generale de Surveillance) Malaysia was appointed to undertake the study. Further study was initiated in 1999 when Malaysia adopted the revised MC & I. As of 28th February 2001, a total of 97,838 m³ of certified sawn timber had been exported to the Dutch market. As of 31st December 2000, a total of 47 companies in Peninsular Malaysia had been awarded Chain-of-Custody Certificates by SGS (Thang, 2002).

Recognizing the need to implement timber certification as a means to encourage and ensure SFM, the Malaysian Government established the Malaysian Timber Certification Council (MTCC) in 1998. The MTCC operates as a non-profit organisation and as an independent national certifying and accrediting body.

In October 2001, the MTCC certification scheme commenced operations using a phased approach. The phased approach provides an avenue for credible scheme a certain time period to meet all the requirements that are stipulated in certain internationally accepted scheme. The current status is that a certification scheme is rejected outright even though only minor requirements are not met. The standard currently used for assessing FMUs are the MC & I developed by the Forestry Department of Peninsular Malaysia. As of 31st December 2002, the MTCC had certified three FMUs (Pahang, Selangor and Terengganu) and issued certificates for Chain-of-Custody to 16 companies in Malaysia (Thang, 2002).

The MTCC is currently in the process of developing a set of standards which is compatible with the Principles and Criteria (P&C) of the Forest Stewardship Council (FSC). In addition, a multi-stakeholder National Steering Committee (NSC) is currently revising the MC & I to make them compatible with the FSC P & C. A National Working Group (NWG) has been established to formulate a standard for submission to the FSC for endorsement (Chew, 2002).

In a recent development (late 2002), the MTCC has been admitted as a member of the Pan-European Forest Certification (PEFCC) Council. MTCC intends to submit its scheme for PEFCC endorsement soon. As the European market is a major market for Malaysian timber products, the application for PEFCC endorsement should help Malaysia maintain or even expand its business in the European market.

On the ASEAN front, Malaysia is pushing for a Pan-

ASEAN forest certification scheme. A working group has been established to look into the matter and the working group held its first meeting in late 2002.

4 The wood-based industries

The wood-based industries have developed from a primary processing industry (sawmilling and plywood mills) into a diversified value-added industry (with products including furniture, builder's carpentry and joinery [BCJ] materials and engineered wood products such as medium density fibreboard [MDF] and particleboard).

Rajoo (2002) reported that in 2001 there were a total of 1,099 sawmills, 156 veneer and plywood mills, 14 MDF, 15 particleboard and over 2300 furniture, joinery, moulding and other woodworking plants in Malaysia (Table 1).

4.1 Historical development of the forestry- and forest-based industries

The development of both the forestry- and forest-based industries (FBIs) in Malaysia, started as early as 1900. The early development involved mainly primary activities, such as logging, sawmilling and plywood/veneer production. The basic products, such as sawn timber and plywood/veneer, were mostly consumed locally rather than exported. It was only in 1959 that forestry and FBIs started to expand as the Malaysian Government placed more emphasis on the manufacturing sector.

At that time, sawing in sawmills was mainly carried out with handsaws. According to Ho *et al.* (2000), mechanization of sawmilling took place only in 1932, though handsaws were not fully replaced until after 1946. It was only after the Second World War that band-sawing technology was introduced in Malaysia. Today, the technology in sawmills involves a breakdown saw, with either a semiautomatic or a fully automatic carriage. A team of four, consisting of a *kepala* or chief sawyer, an assistant chief sawyer and two assistants, is the common set-up in

Table 3 Numbers of selected forest-based industries in Peninsular Malaysia.

Industry	P. Malaysia	Sabah	Sarawak	Total
Sawmill	671	182	246	1099
Plywood/veneer mill	52	50	54	156
Moulding plant	166	90*	23	279
Furniture, joinery & other plants	1687	-	336	2023
Particleboard plant	10	1	4	15
Wood cement board plant	3	-	2	5
MDF plant	10	1	3	14
Woodchip mill	1	2	4	7
Parquet factory	26	1	n.a.	27
Picture frame factory	25	1	n.a.	26
Pre-fabricated house manufacturer	10	n.a.	n.a.	10
Pulp & paper mill	-	1	-	1
Match factory	4	1	2	7
Pencil manufacturer	3	-	n.a.	3
Kiln drying plant	122	56	47	225
Wood preservation plant	102	23	25	150

Source: Rajoo (2002). Note: n.a. = data not available.

* includes furniture, joinery and other wood working plants.

Table 2 Number of selected forest-based industries in Peninsular Malaysia.

Industry	1980	1994	1995
Sawmilling	603	711	711
Plywood/veneer	36	49	48
Moulding	103	105	124
Furniture*	55	446	485
Parquet flooring	11	25	25
Medium density fibreboard	n.a	5	6

Source: Ministry of Primary Industries, Malaysia (1992, 1998). *Export-oriented companies.

Note: n.a. = data not available.

small sawmills, especially in Peninsular Malaysia. However, big sawmills with high paid-up capital can now afford to have a semi-automatic carriage or even fully automatic sawing, operated by a single operator (Norini, 2000). Because of the timber-supply problem, an automatic sawing process is more commonly found in Sabah and Sarawak than in Peninsular Malaysia.

4.2 Development before and after the Industrial Master Plan 1 (1986-1995) and Plan 2 (1996-2005)

To ensure the development of the manufacturing sector in general and of forestry and FBIs in particular, the Investment Incentive Act was introduced in 1968. Under this act, all sectors involved with manufacturing activities were given a variety of incentives, such as export allowances, investment tax credits and others. This method of industrial extension was called the aggressive export strategy (AES). Another important strategy, termed Free Zones (FZ), was introduced in 1971. It was during this period that plywood/veneer mills started to expand. Official records indicate that plywood/veneer mills were established in the early 1960s and Ho *et al.* (2000) claim that plywood/veneer mills today, especially in Peninsular Malaysia, are outdated in terms of technology, *i.e.* they are equipped with machinery suitable only for peeling large-diameter logs. In addition, veneer grading, sorting and patching are done manually (Ho *et al.* 2000). On the other hand, moulding mills were predominantly established in or after 1965 and underwent expansion in the 1980s. This stage of development, *i.e.* the introduction of new plants such as moulding mills, indirectly indicates a shift from primary to secondary processing.

With regard to furniture, a small number of family owned companies are known to have started their operations in the 1980s. These furniture mills were small and employed fewer than 50 workers. Unlike other FBIs, such as plywood/veneer mills, output from furniture makers at that time was tailored more for domestic consumption. It was only in 1994 that furniture mills started to make an impact when, for the first time in Malaysian history, their export earnings climbed as high as RM 1.4 billion. The excellent performance of the furniture mills in the last two decades has been mainly due to the successful introduction of rubberwood as a raw material. The acceptance of rubberwood furniture

worldwide further encouraged interest in planting rubber trees as a forest plantation species.

The particleboard and medium-density fibreboard (MDF) industries have also made substantial contributions in terms of export earnings lately. The two strategies mentioned in the preceding paragraphs have attracted many large multinational companies to establish export-oriented operations in Malaysia.

4.3 Industrial Master Plan 1 (1986-1995)

Another package of incentives, instituted through the Promotion Investment Act (PIA), was introduced in 1986. Under this act, foreign investors were allowed to have up to a 100 per cent share of equity in any newly established company (Malaysian Industrial Development Authority 1986). To further encourage the development of the manufacturing industries in general, the Industrial Master Plan 1 (IMP1) was introduced, which covered the period 1986 to 1995. Twelve sub-sectors were identified as having potential for development. These include seven resource-based industries (rubber products, palm-oil products, food processing, wood-based/forest-based products, chemicals and petrochemicals, nonferrous metal products and nonmetallic mineral products) and five non-resource-based industries (electrical and electronics, transport equipment, machinery and engineering products, iron and steel and textiles/apparel).

4.3.1 Number of FBIs under IMP1

Table 2 indicates that the number of secondary and tertiary processing mills, especially in furniture production, has increased over the past two decades. Stated differently, it is no exaggeration to say that the strategies contained in IMP1 have successfully changed the structure of the Malaysian economy from producing solely primary products to producing high value-added products.

4.4 The Industrial Master Plan 2 (1996-2005)

A slightly different approach has been adopted in the IMP2. In fact, the so-called cluster approach of the IMP 2 is seen as another step towards strengthening the growth not only of the manufacturing sector but also of existing supporting industries, including the services sector. Indeed, along with the manufacturing sector, the services sector has been identified as the next engine of growth for the Malaysian economy.

4.4.1 Number of FBIs under the IMP2

The log-deficit situation does not seem to have had a substantial impact on the FBIs in Peninsular Malaysia from the perspective of the number of registered mills, excluding sawmills. In fact, the number of plywood/veneer mills decreased by only two mills between 1998 and 2000, whereas the number of sawmills declined from 711 in 1997 to 667 in 2000 (Table 3). The number of sawmills is expected to have decreased further to 660 in 2001 (FDPM, 2001). Of the 667 mills registered in 2000, only 499 were in operation, *i.e.* more than 25 per cent had to cease their operations because of the problem of timber supply.

In fact, positive developments in terms of the numbers of FBIs have been observed for the last 17 years, especially for industries like furniture, moulding and MDF. For instance, the number of export-oriented furniture factories increased from a mere 55 in 1980 to 530 in 1996, an almost nine-fold increase. A similar development was observed for other industries, such as parquet and MDF, though their numbers do not show such dramatic increases.

4.5 Foreign direct investment

Table 4 indicates the importance of foreign direct investment (FDI) in supporting the development of the FBIs for the last 10 years. Clearly, the share of FDI in FBI projects over the 10-year period was as substantial as local investment. Of the RM 13.1 billion capital investment over the last 10 years, the FDI share was RM 4.9 billion, *i.e.* approximately 37 per cent of the total investment. Probably what interested the public most during the ten-year period since 1990, was the potential employment created by the newly approved projects. With a total of 937 projects approved, the potential employment created was 178,760 jobs (Table 4).

The largest investment over the last 10 years has been in the plywood/veneer industry (Table 5). This is followed by moulding and furniture, which have individually attracted total investments of RM 2 billion and almost RM 2 billion, respectively. The plywood/veneer industry, in the context of investment, includes both hardboard and particleboard mills. Even though these two types of mill are treated together, their outputs are not measurably different from that of plywood/veneer as a whole. On the other hand, moulding includes planing mills, window and door mills and joinery works,

Table 3 Numbers of selected forest-based industries in Peninsular Malaysia.

Industry	1996	1997	1998	1999	2000
Sawmilling	712	711	708	672	667
Plywood/veneer	46	50	50	50	48
Moulding	136	141	149	150	153
Furniture*	530	n.a	n.a	n.a	2,801
Parquet flooring	26	n.a	n.a	n.a	26
Medium density fibreboard	6	7	7	7	8

Source: Ministry of Primary Industries, Malaysia (1992, 1998). *Export-oriented companies.
Note: n.a. = data not available.

Table 4 Total approved FBI projects in Malaysia, 1990-August 2000.

Year	Number of projects	Potential employment (no. of jobs)	Local investment (RM 000)	Foreign investment (RM 000)	Total capital investment (RM 000)
1990	113	23,981	1,133,788	651,330	1,785,118
1991	125	32,196	672,173	828,352	1,500,525
1992	64	12,809	380,275	317,816	698,091
1993	69	11,580	382,823	316,888	699,211
1994	105	23,224	1,541,534	957,205	2,498,736
1995	117	27,998	1,202,709	852,403	2,055,112
1996	78	11,267	754,706	214,425	969,131
1997	65	8,473	549,189	135,950	730,139
1998	89	15,221	931,403	350,309	1,281,712
1999	77	7,769	315,583	112,288	427,871
2000*	34	3,322	273,731	180,736	454,467
Total	937	178,760	8,182,912	4,917,703	13,100,615

Source: MIDA (2000). *Data for the year 2000 is up until the end of August only.

Table 5 Breakdown of approved FBI projects in Malaysia, 1990-August 2000.

Industry	Number of projects approved	Potential employment (no. of jobs)	Local investment (RM 000)	Foreign Investment (RM 000)	Total Investment (RM 000)
Plywood/veneer	296	92,941	5,452,593	3,489,153	8,941,746
Moulding	221	28,609	1,487,809	562,011	2,049,820
Other related industries	25	2,474	69,426	65,656	135,082
Furniture	395	54,736	1,173,085	778,780	1,951,865
Total	937	178,760	8,182,912	4,917,703	13,100,615

Source: MIDA (2000). Note: Data for the year 2000 is up until the end of August only.

Table 6 Export of major timber products by Malaysia in 2001.

Product	Volume (million m ³)	RM million - fob
Logs	5.04	1,546.70
Sawn timber	2.56	2,488.60
Plywood	3.52	3,517.49
Veneer	0.66	481.68
Mouldings	n.a.	640.74
Woodchips, Chipboard & Particleboard	0.28	159.27
MDF	1.06	873.25
Wooden Frame & BJC	n.a.	777.63
Wooden furniture	n.a.	3,778.65
Rattan furniture	n.a.	69.41
Total	13.12	14,333.42

Source: MTIB (2002). Note: n.a. = data not available.
fob – free on board

whereas other related industries include prefabricated wooden houses, other wood products, wooden and cane containers and small cane ware, and wood and cork products not classified elsewhere. A high total investment in the furniture industry indicates a positive move towards more high value-added products.

5 The timber trade

Malaysia has benefited significantly from forestry activities, particularly in terms of income generation and employment creation. In 2001, the export value of wood and wood-based products was RM 14.3 billion (Table 6) or 4.3 per cent of the country's total export value (3.4 per cent of GDP). In the same year, employment created in the forestry sector in Malaysia totaled 337,000 jobs (Ministry of Primary Industries, Malaysia, 2001).

5.1 Export of logs and veneer logs

The decrease in export earnings in 2001 was partially due to the lower volume of logs extracted from the forest. Table 7 indicates that log production over the past twelve years has decreased as the area opened up for logging activity has declined. For example, Peninsular Malaysia has scaled down log production from 12.8 million m³ in 1990 to 5 million m³ in the five years since

1998. A similar trend of log production is also observed for the state of Sabah.

Malaysia is the world's third largest producer of non-coniferous (NC) logs and veneer logs in the Asian region, after China and Indonesia. FAO statistics indicate that the production of logs and veneer logs from Malaysia was 34 million m³ in 1996 and declined to 20 million m³ in 1998 and 1999 (Table 8). The production figures recorded by the Ministry of Primary Industries, Malaysia, differ from the statistics published by FAO because the former quoted figures for industrial round wood in the rough, whereas the latter refer only to logs and veneer logs. The production of logs and veneer logs from China was almost 22.2 million m³ in 1996 and 19.9 million m³ in 1999 (FAO, 2001a). Among the Association of the South-East Asian Nations (ASEAN), Malaysia is almost on a par with Indonesia in terms of production, whereas the other nations are now net importers.

Malaysia is one of the three leading world exporters of industrial round wood in the rough, the other two being Gabon and Papua New Guinea. The term *industrial round wood in the rough* includes logs and veneer logs, pulpwood round and split, and other industrial round wood. In 1998 alone, Malaysia exported more than 5.5 million m³ (25.8 per cent of the total production) and

Table 7 Production of logs in Malaysia, 1990–2000 (in thousands of m³).

Year	Peninsular Malaysia	Sabah	Sarawak	Malaysia
1990	12,818	8,443	18,838	40,099
1991	12,285	8,163	19,411	39,859
1992	13,031	11,633	18,848	43,512
1993	11,234	9,300	16,735	37,269
1994	11,389	7,965	16,318	35,672
1995	9,030	6,520	16,892	31,842
1996	8,418	5,638	16,038	30,094
1997	7,379	6,959	16,823	31,161
1998	5,100	5,265	11,307	21,672
1999	5,300	3,380	13,096	21,776
2000	5,072	3,729	14,274	23,075

Source: Ministry of Primary Industries, Malaysia (1999, 2000, 2001).

Table 8 World production of logs and veneer logs (NC) (in million m³).

Region	1996	1997	1998	1999
World	316.1	310.5	291.2	293.8
Africa	19.0	19.8	19.5	19.2
Malaysia	34.0	29.7	20.0	20.0
Indonesia	32.3	32.3	21.8	24.9
Singapore	nil	nil	Nil	nil
Thailand	0	0.1	0.1	0.1
Philippines	0.3	0.2	0.5	0.5
Brunei Darussalam	0.2	0.2	0.2	0.2
Viet Nam	2.2	2.2	2.2	2.2
Cambodia	0.4	0.4	0.4	0.4
Laos	0.4	0.4	0.3	0.4
Myanmar	1.7	2	2.3	2.3
Subtotal ASEAN	71.5	67.5	47.8	51
China	22.2	21.1	21.3	19.9
Other Asia	22.1	22.1	22.1	22.3
Central America	84.8	85.9	86.5	87.1
S. America	41.3	39.6	38.4	38.7
Europe	46.6	46.6	48.2	48.1
Oceania	8.6	7.9	7.4	7.5

Source: FAO (2001a). Note: totals may not add up exactly because of rounding off.

Table 9 The three leading producing and consuming countries of industrial round wood in the rough (NC), 1998 (in thousands of m³).

Major importer	Major exporter				Total
	Malaysia	Gabon	Papua New Guinea	Others	
China	2,101	579	268	1,219	4,167
Japan	2,225	51	910	241	3,427
India	741	10	0	649	1,400
Others	516	1,133	435	3,346	5,430
Total	5,583	1,773	1,613	5,455	14,424

Source: FAO (2001a).

Table 10 The three leading producing and consuming countries of industrial round wood in the rough (NC), 1999 (in thousands of m³).

Major importer	Major exporter				Total
	Malaysia	Gabon	Papua New Guinea	Others	
China	3,029	935	454	1,013	5,431
Japan	2,236	25	943	322	3,526
India	840	0	26	593	1,459
Others	893	1,378	560	3,365	6,196
Total	6,998	2,338	1,983	5,293	16,612

Source: FAO (2001a).

Table 11 Production of sawn timber in Malaysia, 1990–2000 (in thousands of m³).

Year	P. Malaysia	Sabah	Sarawak	Malaysia
1990	6,513	1,910	733	9,156
1991	5,610	2,403	913	8,926
1992	5,542	2,797	1,119	9,458
1993	4,927	2,855	1,442	9,224
1994	4,733	2,248	1,722	8,703
1995	5,593	1,820	1,762	9,175
1996	4,441	1,510	1,542	7,493
1997	4,139	1,415	1,622	7,176
1998	2,796	1,014	1,281	5,091
1999	3,229	796	1,191	4,420
2000	3,299	806	1,451	5,556

Source: Ministry of Primary Industries, Malaysia (1999, 2001).

almost 7 million m³ in 1999 (32.1 per cent of the total production) of industrial round wood in the rough (Table 9 and Table 10). Of the 5.5 million m³ exported, more than 5 million m³ was from Sarawak and the balance of 577 thousand m³ was from Sabah (MTC, 2002). This indirectly indicates that exporting primary products such as logs is still an important activity in those two States. A similar situation was also observed in 1999.

The volume of industrial round wood in the rough exported from Malaysia formed more than 38.7 per cent and 42.1 per cent of the total world export in 1998 and 1999, respectively (Table 9). Hence, Malaysia's share of the world export market of industrial round wood in the rough has been growing yearly.

China, Japan and India are the major importers of industrial round wood. China imported more than 4.1 million m³ in 1998 and 5.4 million m³ in 1999 (Tables 9 and 10). On the other hand, Japan imported more than 3.4 million m³ in 1998 and 3.5 million m³ in 1999. The total volume of imports by China, Japan and India constituted about 62.4 per cent and 62.7 per cent of the total industrial round wood in the rough consumed by the world in 1998 and 1999, respectively.

Considering the production of industrial round wood in the rough from the perspective of total forest area availability in these three countries, it is unlikely that Malaysia can sustain its role as the world's leading exporter. Gabon, the second leading producer of round

wood in the rough, not only has a larger forest area but also a greater volume of timber per hectare of forest. Gabon had a total forest area of 21.8 million hectares and a wood volume of 128 m³ per hectare in 2000, whereas Papua New Guinea had 30.6 million hectares of forests and a wood volume of 34 m³ per hectare that same year (FAO, 2001b).

5.2 Export of sawn timber

Table 11 indicates that the production of sawn timber in Malaysia has declined throughout the nineties from more than 9.1 million m³ in 1990, to around 4 to 5 million m³ from 1998 onwards. The volume of production is closely related to the amount of logs processed, as well as the recovery rate of individual species.

Table 12 gives the amount of sawn timber allocated for domestic processing in the period 1999 to 2000. In earlier years, more than 50 per cent of the sawn timber produced was destined for export. It was only in 1996 that the proportion of export relative to local consumption began to change. From 57.7 per cent in 1990, the percentage of export declined to 48.8 per cent and 41.9 per cent in 1996 and 1997, respectively (Table 12). Nonetheless, such a high dependence on the export of primary products indirectly indicates that the FBIs in Malaysia are still doing a lot of primary processing.

On the international front, Malaysia was ahead of Indonesia in terms of sawn timber production between 1996 and 1999 (Table 13). Malaysia holds a reasonable

Table 12 Production versus export of sawn timber in Malaysia, 1990-2000.

Year	Production (000 m ³)	Export (000 m ³)	Export (RM million)	Surplus (000 m ³)
1990	9,156	5,283	3,071	3,873
1991	8,926	4,932	2,901	3,994
1992	9,458	5,417	3,409	4,041
1993	9,224	5,371	4,422	3,853
1994	8,703	4,560	4,140	4,143
1995	9,175	4,796	3,626	4,379
1996	7,493	3,660	3,048	3,833
1997	7,176	3,007	2,745	4,169
1998	5,091	2,703	2,556	2,388
1999	4,420	2,788	2,820	1,632
2000	5,556	2,901	3,067	2,655

Source: Ministry of Primary Industries, Malaysia (1999, 2000, 2001).

Table 13 World production of sawn timber (NC) (in million m³).

Region	1996	1997	1998	1999
World	53.1	56.6	49.2	48.8
Africa	0.5	0.6	0.8	0.8
Malaysia	4.1	4.5	3.9	3.9
Indonesia	9.6	9.6	7.1	4.5
Singapore	0.3	0.3	0.3	0.3
Thailand	0.2	0	0.1	0.1
Philippines	0.6	0.5	0.2	0.2
Brunei Darussalam	nil	nil	nil	nil
Viet Nam	0.1	0.1	0.1	0.1
Cambodia	0.1	0	0.1	0.1
Laos	0.2	0.2	0.2	0.2
Myanmar	0	0	0	0
Subtotal ASEAN	15.2	15.2	12	9.4
Other Asia	11.3	14.2	10.6	12.6
N. Central America	18.9	19.4	17.6	17.8
S. America	2.2	2.1	2.1	2.1
Europe	4.6	4.7	5.7	5.6
Oceania	0.4	0.4	0.4	0.5

Source: FAO (2001a). Note: totals may not add up exactly because of rounding off.

Table 14 The three leading sawn timber-producing and consuming countries (NC) in 1998.

Major importer	Major exporter (000 m ³)				Total
	Indonesia	Malaysia	China	Others	
Japan	2,341	1,247	38	312	3,938
China	1,197	1,342	0	120	2,659
USA	961	356	64	674	2,055
Others	2,925	686	738	5,305	9,654
Total	7,424	3,631	840	6,411	18,306

Source: FAO (2001a).

share of the total world export of sawn timber, although lately the percentage has declined somewhat. Besides Malaysia and Indonesia, the production of sawn timber from other ASEAN member countries does not have a significant impact on the world trade.

Table 14 and Table 15 indicate that Malaysia was one of the leading exporters of sawn timber (NC), besides the USA and Canada, in 1998 and 1999. On the other hand, countries like China, Italy and the USA are classified as major world importers of sawn timber. For instance,

China imported more than 2.5 million m³ and slightly more than 2.0 million m³ in 1998 and 1999 respectively, whereas Italy, as the second most important consumer of sawn timber, imported about 2.0 million m³ and 390,000 m³ in 1998 and 1999, respectively.

5.3 Export of plywood/veneer

Like other timber products, the production of plywood/veneer from Malaysia has experienced both upward and downward trends. In the early 1990s, Penin-

Table 15 The three leading sawn timber-producing and consuming countries (NC) in 1999.

Major importer	Major exporter (000 m ³)				Total
	Malaysia	USA	Canada	Others	
China	619	381	19	1,019	2,038
Italy	29	135	31	195	390
USA	43	-	716	759	1,518
Others	2,097	2,274	573	12,610	17,554
Total	2,788	2,790	1,339	14,583	21,500

Source: FAO (2001a).

Table 16 Production of plywood/veneer in Malaysia, 1990–2000 (in m³).

Year	P. Malaysia	Sabah	Sarawak	Malaysia
1990	1,206,704	464,812	299,866	1,971,382
1991	1,227,064	674,496	397,029	2,298,589
1992	1,368,380	1,238,061	758,144	3,364,585
1993	1,344,997	2,338,528	1,204,941	4,888,466
1994	1,201,750	2,414,373	2,020,054	5,636,177
1995	955,725	2,368,703	2,679,254	6,003,682
1996	1,085,467	2,175,879	1,680,444	4,941,790
1997	1,055,310	1,846,088	2,709,900	5,611,298
1998	657,506	1,311,902	2,694,000	4,663,408
1999	770,743	1,291,022	3,068,775	5,130,540
2000	758,484	1,513,092	3,219,208	5,490,784

Source: Ministry of Primary Industries, Malaysia (1999, 2000, 2001).

Table 17 World production of plywood (in million m³).

Region	1996	1997	1998	1999
World	53.1	56.6	49.2	48.8
Africa	0.5	0.6	0.8	0.8
Malaysia	4.1	4.5	3.9	3.9
Indonesia	9.6	9.6	7.1	4.5
Singapore	0.3	0.3	0.3	0.3
Thailand	0.2	0	0.1	0.1
Philippines	0.6	0.5	0.2	0.2
Brunei Darussalam	nil	nil	nil	nil
Viet Nam	0.1	0.1	0.1	0.1
Cambodia	0.1	0	0.1	0.1
Laos	0.2	0.2	0.2	0.2
Myanmar	0	0	0	0
Subtotal ASEAN	15.2	15.2	12	9.4
Other Asia	11.3	14.2	10.6	12.6
N. Central America	18.9	19.4	17.6	17.8
S. America	2.2	2.1	2.1	2.1
Europe	4.6	4.7	5.7	5.6
Oceania	0.4	0.4	0.4	0.5

Source: FAO (2001a). Note: totals may not add up exactly because of rounding off.

sular Malaysia took the lead with a production level of more than 1.36 million m³ (40.7 per cent of the total production) in 1992 (Table 16). Sabah and Sarawak followed with 1.2 million m³ and 758,000 m³ in 1992, respectively.

Sabah and Sarawak soon became important producers as timber resources became scarce in the Peninsula. With a plentiful timber resource, Sarawak, which was once a minor producer, has exported the highest volume of plywood/veneer since 1997. If the production of plywood and veneer are treated individually, the share of both plywood and veneer have shown upward and

downward trends. For instance, the share of plywood production was 78.7 per cent in 1990, compared to 61.4 per cent and 80 per cent in 1995 and 2000, respectively (Malaysia, Ministry of Primary Industries 2001). Of the 4.4 million m³ of plywood produced in 2000, Sarawak accounted for some 2.8 million m³, whereas production in Sabah and Peninsular Malaysia was 1 million m³ and 571,000 m³, respectively.

Indonesia was the largest producer, with more than 4.5 million m³ of plywood production in 1999, followed closely by Malaysia with 3.9 million m³ of plywood production that same year (Table 17). The world production of

Table 18 The three leading plywood-producing and consuming countries in 1998.

Major importer	Major exporter (000 m ³)				Total
	Indonesia	Malaysia	China	Others	
Japan	2,341	1,247	38	312	3,938
China	1,197	1,342	0	120	2,659
USA	961	356	64	674	2,055
Others	2,925	686	738	5,305	9,654
Total	7,424	3,631	840	6,411	18,306

Source: FAO (2001a).

Table 19 The three leading plywood-producing and consuming countries in 1999.

Major importer	Major exporter (000 m ³)				Total
	Indonesia	Malaysia	China	Others	
Japan	2,789	1,662	45	389	4,885
China	821	461	52	1,206	2,540
USA	973	479	0	157	1,609
Others	3,185	738	648	5,414	9,985
Total	7,768	3,340	745	7,166	19,019

Source: FAO (2001a).

Table 20 Production of mouldings in Malaysia, 1990–2000 (in m³).

Year	P. Malaysia	Sabah	Sarawak	Malaysia
1990	178,036	n.a	48,015	226,051
1991	205,139	166,200	43,907	415,246
1992	179,313	219,690	34,016	433,019
1993	204,606	252,155	34,289	491,050
1994	174,375	289,355	35,514	499,244
1995	277,275	340,171	25,086	642,532
1996	275,140	313,650	22,444	661,234
1997	354,602	346,160	42,180	714,942
1998	321,948	282,762	39,902	644,612
1999	316,303	294,365	25,770	633,438
2000	416,955	275,607	22,641	715,203

Source: Ministry of Primary Industries, Malaysia (1999, 2000, 2001).

Note: n.a. = data not available.

plywood has decreased since 1998. The decline in plywood production has been attributed mainly to the reduction in supply from Indonesia, from 9.6 million m³ in 1997 to 4.5 million m³ in 1999 - a reduction of more than 50 per cent. The Asian economic turmoil of late 1997 has in a way affected all of the ASEAN producers because buyers of plywood were mainly from Asia. A similar situation is true for Malaysia, although the reduction in supply was somewhat smaller.

Besides Indonesia and Malaysia, China was also categorized as one of the major world exporters of plywood in 1998 and 1999. Of the total 18.3 million m³ of plywood exported in 1998, Indonesia contributed about 40.6 per cent, and Malaysia and China individually contributed 19.8 per cent and almost 4.6 per cent, respectively (Table 18). The trend for exporters was similar for 1999, except that the percentage share of particular nations declined (Table 19). The FAO (2001a) listed Japan, China and the USA as major importers of plywood in 1998 and 1999. Besides being leading world producers, China and the USA were also categorized as leading

importers. However, Japan imported more than 3.9 million m³ in 1998 and almost 4.9 million m³ in 1999 to support growing domestic demand (Tables 18 and Table 19). Of the total volume of plywood produced in Malaysia, only 7.7 per cent and 15.4 per cent were consumed locally in 1998 and 1999, respectively.

5.4 Export of mouldings

The moulding industry is doing reasonably well compared with other FBIs, even though the production is not as substantial as that of sawn timber or plywood/veneer. The production of mouldings continued to increase throughout the 1990s. In fact, the moulding industry experienced a record high production of more than 715,000 m³ in 2000 (Ministry of Primary Industries, Malaysia 2001). Of this total, about 417,000 m³ came from Peninsular Malaysia; the balance was made up of almost 276,000 m³ and 23,000 m³ from Sabah and Sarawak, respectively (Table 20).

Export earnings recorded in Malaysian Ringgit for the past 10 years (*i.e.* from 1990 to 2000) indicated that ex-

Table 21 Export of mouldings from Malaysia, 1990–2000.

Year	(RM 000)
1990	487,810
1991	543,312
1992	712,556
1993	585,045
1994	633,461
1995	618,200
1996	671,579
1997	782,517
1998	745,213
1999	824,945
2000	894,900

Source: Ministry of Primary Industries, Malaysia (1999, 2000, 2001).

Table 22 Export of wooden and rattan furniture from Malaysia, 1990–2000 (RM).

Year	Wooden furniture	Rattan furniture
1990	214,661,922	54,834,096
1991	403,329,314	75,486,611
1992	578,742,419	81,829,983
1993	935,635,396	90,381,024
1994	1,413,367,730	111,543,677
1995	1,673,788,664	91,487,118
1996	2,088,689,700	80,769,930
1997	2,531,016,976	82,470,509
1998	3,246,102,132	86,111,363
1999	3,900,300,000	60,900,000
2000	4,419,000,000	69,700,000

Source: Ministry of Primary Industries, Malaysia (1999, 2000, 2001).

ports are increasing. Export earnings were affected slightly by the economic turmoil in late 1997, declining by 4.7 per cent over 1996. However, the demand for mouldings started to improve by 1999 and 2000, with total export earnings reaching RM 825 million and RM 895 million, respectively (Table 21).

Japan is still the major buyer, followed by the USA and Australia. The value of exports to Japan was almost RM 220 million in 2000. Japan's share is estimated to have increased from 24.6 per cent in 2000 to 30.5 per cent in 2001 (Ministry of Primary Industries, Malaysia, 2001).

5.5 Export of furniture

The development of the furniture industry in Malaysia, especially in the Peninsula, has been largely dependent on the growth in use of rubberwood. Its cream-white color, which is easily stained, has made it readily acceptable in the international market, especially in Japan. With a substantial quantity of rubberwood generated as a by-product of the replanting programme, the furniture and furniture components sector has expanded over the years. However, with a shift in areas planted from rubber to oil palm, coupled with a decrease in the area planted with rubber trees and increasing demands from other users, the deficit situation is expected to be serious in the future (Ismariah and Norini, 1994; Norini *et al.*, 2001). Unless some form of regulation as to the use of rubberwood is introduced, the existing competition may

force the furniture industry to search for alternative species. The trends of wooden and rattan furniture exports are shown in Table 22.

The USA and Japan are the two most important importers of Malaysian furniture. Together, the two countries imported about 51.7 per cent and 51.1 per cent of the total furniture exported in 1999 and 2000, respectively (Table 23). Individually, the percentage share of the USA dropped by almost 3.3 per cent from 1999 to 2000. The decrease in the USA's demand was due to the marked slowdown in the economy. A similar situation is also discernible with regard to Japan's demand (Table 23).

6 Conclusion

Malaysia has been successful in the development of its forestry and forest-based industries in the last few decades. This success has been guided by a set of well-formulated forest policies and industrial development plans. The commitment towards achieving sustainable forest management (SFM) has led to the formulation of the Malaysian criteria and indicators (MC & I) and the subsequent establishment of the Malaysian Timber Certification Council (MTCC). Recognizing the important role of the forest in providing environmental and ecological services to mankind, the Malaysian National Policy on Biological Diversity was formulated in 1998. In the near future, most of the natural forests will

Table 23 Export of wooden furniture from Malaysia to major destinations (RM million).

Country	1982		1998		1999		2000	
	RM	%	RM	%	RM	%	RM	%
U.S.A.	8.31	55.2	1,269.63	39.1	1,452.17	37.2	1,494.96	33.8
Australia	3.34	22.2	169.04	5.2	267.41	6.9	305.80	6.9
Japan	0.25	1.7	508.99	15.7	564.83	14.5	763.24	17.3
Canada	0.42	2.8	88.68	2.7	94.76	2.4	101.70	2.3
Singapore	1.27	8.4	279.16	8.6	342.41	8.8	329.69	7.5
U.K.	0.58	3.9	213.82	6.6	336.80	8.6	408.45	9.2
Sub-total	14.17	94.3	2,529.35	77.9	3,058.38	78.4	3,403.84	77.0
Others	0.87	5.8	716.78	22.1	841.88	21.6	1,014.15	23.0
Total	15.04	100.0	3,246.13	100.0	3,900.26	100.0	4,417.99	100.0

Source: Ministry of Primary Industries, Malaysia (2000, 2001).

be managed for their environmental and ecological services (such as for water, soil erosion control, wildlife conservation and others).

Raw material supply for the wood-based industries will be produced from forest plantations and agricultural waste products derived from the plantation sector (e.g. oil palm trunks, empty fruit bunches). To encourage the development of forest plantations, the government is reviewing the effectiveness of the current fiscal incentive package given to investors. The trend will increasingly be towards policies that are friendly to the environmental and ecological functions of the forest.

References

- Abdul Razak M.A., Woon, Weng-Chuen and Lim, Hin-Fui, 2002. Challenges in implementing forest related policies in Malaysia. Paper presented at The International Workshop on Forest Science and Forest Policy in the Asia-Pacific Region : Building Bridges to Sustainable Future, Chennai, India, 16-19 July.
- Apanah, S. and G. Weinland, 1993. Planting quality timber trees in Peninsular Malaysia - a review. Malayan Forest Record No. 38. Published by Forest Research Institute Malaysia. 221 p.
- Chew, L.T. 2002. The impact of certification on forest management. Paper presented at the National Seminar on Practicing Sustainable Forest Management : Lessons Learned and Future Challenges, 20-22 August, Kota Kinabalu, Sabah, Malaysia.
- FAO, 2001a. *Yearbook of Forest Products*. FAO Forestry Series No. 34. FAO Statistics Series No. 157. Rome.
- FAO, 2001b. State of the world's forests, 2001. Website : <http://www.fao.org/docrep/003/y0900e/y0900e00.htm>
- FDPM, 1978. National Forest Policy. Forest Department of Peninsular Malaysia. 22 p.
- FDPM, 2001. *Forestry Statistics, Peninsular Malaysia 2000*. 125 p.
- Ho, K.S., H. Norini and H.F. Lim, 2000. *Malaysian Forest-Based Industries on the Move*. A consultancy report submitted to the International Labor Office (ILO) in Geneva.
- Ismariah, A. and H. Norini, 1994. Availability of rubberwood resource in Peninsular Malaysia. Pp. 7-15 in Hong, L.T. and Sim, H.C. (Eds.) *Rubberwood Processing and Utilization*. Malayan Forest Records No. 39. Forest Research Institute Malaysia, Kepong.
- Malaysia, Ministry of the Primary Industries. 1992. *Statistics of Commodities*.
- _____. 1996. *Statistics of Commodities*.
- _____. 1998. *Statistics of Commodities*.
- _____. 1999. *Statistics of Commodities*.
- _____. 2000. *Statistics of Commodities*.
- _____. 2001. *Statistics of Commodities*.
- MIDA, 1986. *Malaysia : Investment in the Manufacturing Sector - Policies, Incentives and Procedures*. Malaysian Industrial Development Authority.
- MIDA, 2000. Official statistics provided directly by Malaysian Industrial Development Authority.
- MTC, 2002. Malaysian Timber Council website : www.mtc.com.my.
- MTIB, 2002. Maskayu Bulletin Vol. 4, April issue. Monthly Timber Bulletin published by the Malaysian Timber Industry Board.
- MOSTE, 1998. National policy on biological diversity. Ministry of Science, Technology and the Environment, Malaysia. 38 p.
- Norini, H., W.C. Woon and H.C. Sim, 2001. Supply and demand of rubberwood in Peninsular Malaysia. Pp. 9-22, in Ahmad Shakri, M.S., Ho, K.S. and Mohd Dahlan, J. (Eds.). *Proceedings of the National Seminar on Alternatives to Rubberwood*. 26 September 2000. Forest Research Institute Malaysia.
- Norini, H. 2000. Structural Interdependence of Malaysian Industries with Special emphasis on the Forest-Based Industries. Ph. D. Thesis, The University of Wales, Aberystwyth, United Kingdom.
- Promotion of Investments Acts (ACT 327). As at 31st August 1989. Published and printed by MDC Sdn. Bhd., Ulu Kelang, Selangor. 192 pp.
- Radzuan Abdul Rahman 1975, "The economics of the timber industry in West Malaysia : a case study," Ph. D. thesis, Ithaca : Cornell University.
- Rajoo, M. 2002. The Malaysian timber industry - current status, trends and opportunities. Paper presented at the 7th Malaysian Business Forum, 25-26 November, Kuala Lumpur, Malaysia.

- Thang, H.C. 2002. Towards achieving sustainable forest management in Peninsular Malaysia. Paper presented at the National Seminar on Practicing Sustainable Forest Management : Lessons Learned and Future Challenges, 20-22 August, Kota Kinabalu, Sabah, Malaysia.
- Woon, W.C. 2002. Revision of the Forest Revenue System in Sabah, Malaysia. Consultancy Report prepared for the Deutsche Gesellschaft FUR Technische Zusammenarbeit (GTZ) GmbH, 65760 Eschborn, Germany. 47 p.
- Woon, W.C. and H. Norini, 2000. Reassessment of planting rubber as forest plantations. Unpublished report.
- Wyatt-Smith, J. and W.P. Panton. 1995. Manual of Malayan silviculture for inland forest. Malayan Forest Record No : 23. Vol : 1 (second edition). Published by Forest Research Institute Malaysia.