INTROPica
HIGHLIGHTS

MEETING GROWING DEMAND FOR WOOD-BASED PRODUCTS: THE ROLE OF FOREST PLANTATION IN MALAYSIA

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INTRODUCTION

Forest plantation has been regarded as a means to meet the deficit in timber supply from natural forests for wood-based processing industries. This article presents the role of forest plantation in Malaysia in the light of meeting the growing demand for wood-based products. In overall, this article is presented in four sections. The first section presents the status of natural forest resource conditions for timber production. The second section provides an overview of production and global demand for the Malaysian wood-based products market. The third section discusses the development of forest plantation in Malaysia and its role in supplementing raw materials for the wood-based processing industry. The final section presents the conclusion of this article.

STATUS OF NATURAL FOREST AVAILABILITY AND LOG PRODUCTION IN MALAYSIA

As of 2016, the total land area in Malaysia is 32.9 million ha, of which 18.24 million ha or 55.4% was under forest cover (DOSM, 2019). Of these forest land areas, Peninsular Malaysia, Sabah and Sarawak cover about 5.77 million ha, 4.56 million ha and 7.91 million ha of area, respectively. The supply of logs for the wood-based industry is usually derived from several land areas namely Permanent Reserved Forests (PRFs) covering approximately 14.55 million ha and state land forests and alienated land with an estimated forest area of 4.74 million ha. While logging and land clearance or conversion is permitted on most of state land forest and alienated land, approximately 11.32 million ha of PRFs have been zoned for timber production and the remaining 3.182 million ha being gazetted as protection, amenity or research and education forests (DOSM 2016).

Figure 1 shows the trend of forest area and logs production in Malaysia from 1990 to 2016. Over the past 26-years period, forest area in Malaysia has declined from 19.62 million ha in 1990 to 18.24 million ha in 2016, a decrease of 7%. This loss of forest areas is a result of the conversion of forest lands to permanent non-forest uses to meet the demand of the growing population for agriculture, settlements, and infrastructure (FAO, 2016).

While there has been a slight decrease (7%) in the forest area in the period 1990-2016, log production from the PRFs indicated a progressive decline over the 26 years (Figure 1). The total production of logs from natural forests in Malaysia had declined by 65% from 40.10 m3 in 1990 to 13.94 m3 in 2016. Although the gradual reduction of forest areas plays a part in the declining trend of log production, several other reasons also contribute to the decreasing trend. Firstly, is related to the annual allowable cut (AAC) allocated for the production forests within the PFRs. As can be seen in Table 1, the AAC has been reduced every five years following the Malaysian Plan periods, especially in Peninsular Malaysia in compliance with sustainable management practices. Secondly, most of the PRFs are logged-over forest and although the forests are capable of producing an economic harvest, however, they are less productive, poorly stocked and contain fewer commercial species after being continuously harvested (Shukri, 2008). In this regard, there is a need for concern on the future supply of logs for the local timber industry given the declining trend of traditional timber resources.

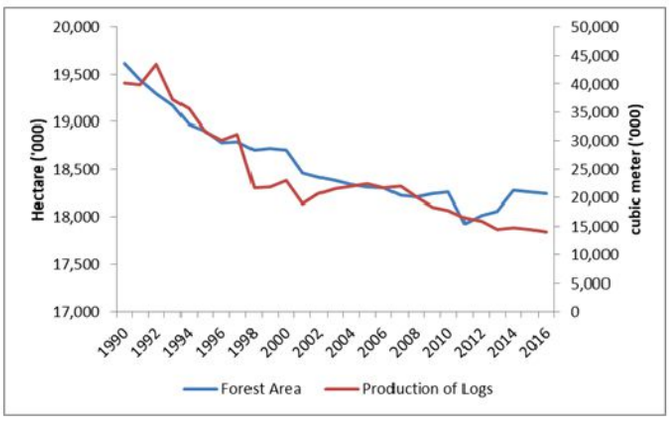

Figure 1: Forested area and log production in Malaysia from 1990 to 2016. Source: FAOstats-Forestry database

Table 1: Annual allowable cut in permanent reserved forests (hectare/year)

Malaysia Plan (MP)	Peninsular Malaysia	Sabah	Sarawak	Total
7th MP (1996-2000)	46,000	60,000	170,000	276,000
8th MP (2001-2005)	42,870	60,000	170,000	272,870
9th MP (2006-2010)	36,940	60,000	170,000	266,940
10th MP (2011-2015)	39,833	60,000	155,000	254,833
11th MP (2016-2020)	41,888	50,000	155,000	246,888

▶ PRODUCTION AND TRADE OF MAJOR FOREST PRODUCTS

Table 1 gives an overview of the production and trade of major forest products in Malaysia. Over the 26 years (1990-2016), wood-based panel production especially particleboard, oriented strand board (OSB) and medium-density fiberboard (MDF) recorded impressive growth from a mere 0.110 million m3 in 1990 to 1.76 million m3 in 2016. Trade of particleboard, OSB, and MDF also recorded an increasing trend from 1990 to 2016. These increasing trends in production and trade are due to the Malaysian policy supports for downstream processing and value-added production such as furniture through the log export ban from natural forests especially in Peninsular Malaysia which started in 1987.

As expected, the production of industrial roundwood (wood in the rough form such as sawlogs and veneer logs, pulpwood and other industrial roundwood) fall by 66% from 41.26 billion m3 in 1990 to 13.86 million m3 in 2016 (Table 2). This downward trend was also observed for sawnwood production of which in 2016 recorded production of 3.42 million m3 compared to 8.85 million m3 in 1990, a decrease of 61%. Similarly, export volume for industrial roundwood and sawnwood declined by 84% and 63%, respectively during the 26 years. The deficit in roundwood and sawnwood production has been supplemented by imported timber for domestic timber needs for raw materials. Between 1990 to 2016 import volume of industrial roundwood and sawnwood grew by 130% and 705%, respectively. In fact, imports of wood-based panel products have increased tremendously between 1990 and 2016 as shown in Table 2.

Table 2: Production and trade of major forest products in Malaysia

Product	Unit	Production			Export			Import		
		2016	1990	% change	2016	1990	% change	2016	1990	% change
Industrial roundwood	thousand m³	13856	41260	-66%	2844	18084	-84%	23	10	130%
Sawnwood	thousand m³	3423	8849	-61%	1981	5332	-63%	228	28	705%
Wood-based panels	thousand m³	5411	1473	267%	4258	1058	303%	1279	56	2174%
Plywood and veneer	thousand m³	3656	1363	168%	2657	1017	161%	643	30	2043%
Particleboard, OSB and fibreboard	thousand m³	1755	110	1495%	1602	41	3808%	636	26	2323%

Source: FAOstats-Forestry database

International trade of forest products has undergone intense changes over the years as a result of various factors including globalization, population growth, economic growth, rising energy prices, environmental policies and regulations, and technology development that affect the production and consumption of wood-based products. Global consumption of wood products is expected to increase especially in Asia, mainly stemming from the rapid growth in demand from emerging economies such as China and India (FAO 2009). Although Malaysia has traditionally focused its production for the export market, local market consumption will undoubtedly increase in the future given the rapid development of the domestic economy coupled with the growing population.

▶ FOREST PLANTATION IN MALAYSIA AND ITS ROLE TOWARDS SUPPLEMENTING RAW MATERIALS FOR THE WOOD-BASED PROCESSING INDUSTRY

Based on the previous discussion, there is a need for concern on the dwindling supply of timber from natural forests in meeting the growing demand for wood-based products. In this regard, forest plantation has long been recognized to play an important role in reducing reliance on the natural forest as the main source for timber. In fact, forest plantation in Malaysia began way back in the early 1920s with trial plots establishment to rehabilitate and restore degraded forest areas caused by tin mining and farming in several locations in Selangor using native and exotic tree species (Hashim et al., 2015). The first large-scale commercial forest plantation, however, only started in 1967 with the establishment of softwood plantation using tropical pines and araucarias in a relation to a proposed pulp and paper mill in Peninsular Malaysia (Freezailah and Fielding, 1971). Nevertheless,

planting efforts ended due to the discontinued proposed pulp and paper mill project and lack of natural regeneration of the pine species under local climate conditions (Abd Latif et al., 2018). In 1985, the Compensatory Forest Plantation Programme (CFPP) was initiated with a total target reforestation area of 188,000 ha with fast-growing exotic species including *Acacia mangium, Eucalyptus spp., Gmelina arborea, Maesopsis eminii and Paraserianthes falcataria*. Of all of these species, *Acacia mangium* were planted in most of the reforestation project area due to better site adaptability and growth performance. The reforestation project, however, suffered from many problems including the incidence of heart rot disease.

Realizing the importance of forest plantation in supplying raw materials for the wood-based industries, government efforts to increase the sustainable supply of wood from plantation sources continue in 2003 with the introduction of forest plantation development program administered by the Ministry of Primary Industries. Unlike the previous reforestation program, the new forest plantation program involves full private sector participation to establish large-scale commercial forest plantations. A total of 375,000 ha of forest plantations were targeted to be established by 2020 which focused mainly on two species namely Rubberwood (*Hevea brasiliensis*) and *Acacia mangium*. Other additional species promoted under the program include Teak (*Tectona grandis*); Sentang (*Azadirachta excelsa); Khaya (Khaya ivorensis/ Khaya senegalensis); Kelempayan/Laran (Neolamarckia cadamba*); Batai (*Paraserianthes falcataria*) and Binuang (*Octomeles sumatrana*) (MTIB, n.d).

In Peninsular Malaysia, forest plantations must be developed on a state or alienated (privatized) land with prior approval from the state forestry departments. In Sabah, approved areas are in zones for Industrial Tree Plantation (ITP) under the Sustainable Forest Management License Agreement (SFMLA) while in Sarawak areas with a License for Planted Forest (LPF) can be developed (Abd Latif et al., 2018). As of 2016, a total of 114,355.43 ha have been developed in Peninsular Malaysia under the forest plantation development program involving about 50 companies with an expected yield of 700,000 m^3 of timber to be harvested in the beginning 2021 (Bowden, 2018). In Sabah, a total of 238,000 ha out of a targeted area of 400,000 ha had been planted in 2012 largely with *Acacia mangium, Paraserianthes falcataria, Eucalyptus grandis, Eucalyptus deglupta, Eucalyptus pellita, Neolamarckia cadamba, and Dipterocarp* spp. (Anon, 2012). Meanwhile in Sarawak, by 2009, a total of 238, 641 ha out of 2.8 million ha approved areas have been planted with different species mainly *Acacia Mangium, Neolamarckia cadamba, Paraserianthes falcataria, and Eucalyptus* spp. (Forest Department of Sarawak, n.d.).

The surge in total plantation areas over the years in Malaysia indicates the important role of forest plantation in supplementing timber from the natural forest for the wood-based industry. Indeed, forest plantation has received great attention and support from the government. Nevertheless, several issues and challenges faced by the forest plantation industry need to be addressed carefully since Malaysia's experience in forest plantation can be considered at an early stage, although forest plantations have started over a century ago (Hashim et al., 2015). Among of the issues include extensive use of exotic species which has several drawbacks in terms of pest and disease incidence, invasiveness and other environment, ecological and biodiversity effect, lack of silvicultural knowledge and growth and yield data especially for native timber species, access to forest lands especially in Sabah and Sarawak which may potentially have an impact to the local people livelihood, and other technical and economic issues such as economic feasibility.

▶ CONCLUSION

Based on the previous discussions, forest plantation is playing an increasingly important role in reducing the gap between natural forest timber supplies and demand from the wood processing industry for raw materials. Efforts from both government and private sectors are needed to determine how plantation can be environmentally, technically, economically, and socially feasible to ensure a sustainable forest plantation in Malaysia that benefits not only the wood-based industry but also to the national economy and the whole society.

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