UNIVERSITI PUTRA MALAYSIA

PREFERENCES FOR TIMBER SPECIES AMONG VALUE-ADDED WOOD PRODUCT MANUFACTURERS IN MALAYSIA

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By

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for the Degree of Master of Science

PREFERENCES FOR TIMBER SPECIES AMONG VALUE-ADDED WOOD PRODUCT MANUFACTURERS IN MALAYSIA

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September 2017

Chairman : Professor Jegatheswaran Ratnasingam, PhD
Faculty : Forestry

In the recent past, value-added wood products manufacturers in Malaysia have been increasingly using important wood materials to supplement the local resources. Although previously thought that the reducing supply and increasing cost of local wood resources is leading to increasing wood imports, these arguments have remained unsubstantiated. In fact, research investigating the attributes of sawn timber that influence its usage by the wood based manufacturers in Malaysia have been limited and unreported. Therefore, the objective of the study was to assess the attributes of sawn timber species for door, flooring and furniture manufacturers in Malaysia. Apart from identifying the success factors of the preferred species for particular wood products manufacturing, the study would also identify the general attributes that predetermines the success of the wood species selected in the manufacture of the three value-added wood products. The attributes explored were: cost, market/buyer preference, aesthetic quality, working properties, supply/availability, environmental friendly, product specification, durability, strength and hardness, and price premium for finished good. It is apparent that sawn timber attributes are important for many types of value-added product manufacturers in term of market opportunities and consumer preference. A questionnaire based survey was carried out in 2015 on 30 value-added manufacturer, in which there were ten manufacturers from each wood product category: door, floor and furniture. From each product category, 5 of the manufacturers relied on imported wood species, while the other 5 manufacturers used predominantly local wood species in their production. Such differentiation allowed for a constructive evaluation of the preferential usage of wood species in the various wood products categories. The respondents chosen were all export-oriented large-sized manufacturers, who had consented to participate in the study, located throughout Peninsular Malaysia. The study evaluated three aspects: the choice of sawn timber species for a particular types of wood products, the source of origin of sawn timber and the attributes of sawn timber that are perceived to be important in determining the choice of sawn timber species for a particular product . The result from the evaluation showed that the common local sawn timber species include Rubberwood (*Hevea*

brasiliensis), Meranti (*Shorea spp*.), Merpauh (*Swinntonia spp*.), Merbau (*Intsia spp.*) and Kempas (*Koompassia malaccensis*) while, the imported timber species preferred by the value-added wood products manufacturers were White Poplar (*Liriodendron tulipifera*), Oak (*Quercus spp*.), Cherry (*Prunus spp.*) and Pine (*Pinus spp*.). The factor analysis on the ten attributes of sawn timber that affected its preferential usage were further simplified into 3 main groups: i) sawn timber properties ii) raw material sustainability and iii) consumer preference. Group 1 include variables such as working properties, aesthetic quality, durability and strength and hardness; Group 2 include variables such as environmental friendliness, supply/availability and price premium for finished good. Group 3 include variable such as product specification, cost and market preference. Although the choice of wood species used for particular application may differ, the general attributes that predetermines the wood species preferences for the manufacture of particular value-added wood products could be generalized. In this context, the results indicated that the cost, supply/availability, and market/buyer preference were among the most important factors influencing the selection of sawn timber species for the manufacturer of value-added wood products. This would seem to indicate that the wood products manufacturers appeared to emphasize on price stability, reliability of supply and preference of market/buyer. In other words, these manufacturers could not, or would not accept rapid price fluctuation, as considerations, in selecting their choice of sawn timber species. The results of the study has a far reaching implication on ensuring raw materials sustainability to ensure the continuous growth of the wood products industry in the country. As demonstrated in this study, wood species preferences are important criterion that must be taken into consideration on the wood raw materials supply management in the country.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Master Sains

KEUTAMAAN UNTUK SPECIES KAYU Di KALANGAN PENGILANG KERJA KAYU TAMBAH NILAI Di MALAYSIA

Oleh

LIM CHOON LIAT

September 2017

Pengerusi : Profesor Jegatheswaran Ratnasingam, PhD
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Pada ketika ini, pengilang produk kayu nilai tambah di Malaysia semakin meningkatkan penggunaan bahan-bahan kayu import untuk menampul sumber-sumber tempatan. Walaupun sebelum ini ada pendapat bahawa pengurangkan bekalan dan peningkatkan kos sumber kayu tempatan yang membawa kepada peningkatkan import kayu, hujah-hujah ini kekal tidak berasas. Malah, penyelidikan menyiasat sifat-sifat kayu gergaji yang mempengaruhi penggunaannya oleh pengilang kayu yang berpangkalan di Malaysia adalah terhad dan tidak dilaporkan. Oleh itu, objektif kajian ini adalah untuk menilai sifat-sifat spesies kayu bergergaji yang di guna pakai oleh pengilang pintu, lantai dan perabot di Malaysia. Selain dari mengenal pasti faktor-faktor kejayaan spesies pilihan oleh pengilang produk kayu tertentu, kajian itu juga akan dapat mengenal pasti sifat-sifat umum yang bakal menentukan kejayaan spesies kayu yang dipilih dalam pengilangan tiga produk kayu bernilai tambah. Sifat-sifat yang diterokai ialah: kos, keutamaan pasaran / pembeli, kualiti estetik, sifat kerja, pembekalan / ketersediaan, mesra alam, spesifikasi produk, ketahanan, kekuatan dan kekerasan, dan premium harga untuk barangan siap. Ia adalah jelas bahawa sifat-sifat kayu gergaji adalah penting untuk pelbagai jenis pengeluar produk nilai tambah dari segi peluang pasaran dan pilihan pengguna. Satu kajian berdasarkan soal selidik telah dijalankan pada tahun 2015 ke atas 30 pengilang nilai tambah, di mana terdapat sepuluh pengilang dari setiap kategori produk kayu: pintu, lantai dan perabot. Dari setiap kategori produk, 5 pengilang bergantung kepada spesies kayu yang di import, manakala 5 pengilang yang lain kebanyakannya menggunakan spesies kayu tempatan dalam pengeluaran mereka. Pembezaan sedemikian membenarkan penilaian yang membina mengenai keutamaan penggunaan spesies kayu dalam pelbagai kategori produk kayu. Responden yang dipilih ialah semua pengilang bersaiz besar berorientasikan eksport dari seluruh Semenanjung Malaysia, yang telah bersetuju untuk mengambil bahagian dalam kajian ini. Kajian ini menilai tiga aspek: pilihan spesies kayu bergergaji untuk sesuatu jenis produk kayu, sumber asal kayu bergergaji dan sifat-sifat kayu bergergaji yang di anggap penting dalam menentukan pilihan

spesies kayu bergergaji oleh produk tertentu. Hasil daripada penilaian ini menunjukkan bahawa spesies kayu gergaji tempatan biasa termasuk Kayu Getah (*Hevea brasiliensis*), Meranti (*Shorea spp.*), Merpauh (*Swinntonia spp.*), Merbau (*Intsia spp.*) dan Kempas (*Koompassia malaccensis*) manakala spesies pilihan kayu yang di import oleh pengilang produk kayu bernilai tambah adalah White Poplar (*Liriodendron tulipifera*), Oak (*Quercus spp.*), Cherry (*Prunus spp.*) dan Pine (*Pinus spp.*). Analisis faktor pada sepuluh sifat-sifat kayu bergergaji yang menjejaskan keutamaan penggunaan telah dipermudahkan lagi kepada 3 kumpulan utama: i) sifat-sifat kayu bergergaji ii) kelestarian bahan mentah dan iii) keutamaan pengguna. Kumpulan pertama termasuk pembolehubah seperti ciri-ciri kerja, kualiti estetik, ketahanan serta kekuatan dan kekerasan; Kumpulan dua termasuk pembolehubah seperti keramahan mesra alam sekitar, bekalan / ketersediaan dan harga premium untuk barangan siap. Kumpulan ketiga termasuk pembolehubah seperti spesifikasi produk, kos dan pilihan pasaran. Walaupun pilihan spesies kayu yang digunakan untuk aplikasi tertentu mungkin berbeza, sifat-sifat umum yang menentukan terlebih dahulu spesies kayu pilihan untuk pengeluaran produk kayu bernilai tambah tertentu boleh diumumkan. Dalam konteks ini, keputusan menunjukkan bahawa kos, bekalan / ketersediaan, dan pasaran / keutamaan pembeli adalah antara faktor yang paling penting yang mempengaruhi pemilihan spesies kayu gergaji oleh pengilang produk kayu bernilai tambah. Ini seolah-olah menunjukkan bahawa keutamaan pengilang produk kayu adalah memberi penekanan kepada kestabilan harga, ketersediaan bekalan dan pilihan pasaran / pembeli. Dalam erti kata lain, pengilang-pengilang ini tidak boleh, atau tidak akan menerima turun naik atau perubahan harga yang mendadak, sebagai pertimbangan mereka dalam pemilihan spesies kayu gergaji. Hasil kajian ini mempunyai implikasi yang meluas di dalam usaha untuk memastikan kelestarian bekalan bahan-bahan mentah dalam usaha untuk meningkatkan pertumbuhan industri produk kayu yang berterusan di negara ini. Seperti yang ditunjukkan dalam kajian ini, keutamaan spesies kayu adalah kriteria penting yang perlu diambil kira dalam pengurusan bekalan kayu mentah di negara ini.

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I certify that a Thesis Examination Committee has met on 13 September 2017 to conduct the final examination of Lim Choon Liat on his thesis entitled "Preferences for Timber Species among Value-Added Wood Product Manufacturers in Malaysia" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Master of Science.

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LIST OF ABBREVIATIONS

ASEAN	Association of Southeast Asian
BJC	Builders' Joinery and Carpentry
DOS	Department of Statistics
EPS	Earnings per Share
EU	European Union
EUTR	European Union Timber Regulation
FAO	Food and Agriculture Organization of the United Nations
FDPM	Forestry Department Peninsular Malaysia
FDS	Forestry Department Sarawak
IFRG	International Furniture Research Grant
IMP	Industrial Master Plan
ITTO	International Tropical Timber Organization
KLSE	Kuala Lumpur Stock Exchange
MDF	Medium Density Fibreboard
MIER	Malaysian Institute of Economic Research
MITI	Ministry of International Trade and Industry
MPC	Malaysia Productivity Corporation
MPIC	Ministry of Plantation Industries and Commodities
MTC	Malaysian Timber Council
MTCC	Malaysian Timber Certification Council
MTIB	Malaysian Timber Industry Board
NATIP	National Timber Industry Policy
NFP	National Forest Policy

PLC	Public listed company
R&D	Research and Development
SFD	Sabah Forestry Department
SFM	Sustainable Forest Management
SME	Small and medium-size enterprises
STIDC	Sarawak Timber Industry Development Corporation

CHAPTER 1

INTRODUCTION

1.1 Background

The Malaysian wood-based industry is an important socio-economic sector to the nation's economy, contributing RM 22.11 billion in export earnings in 2016, while providing employment to almost 240,000 workers (MTIB, 2017). Despite the challenges faced by increasing competition from other low-cost producing nations such as China and Vietnam, the Malaysian wood-based industry has continued to show positive growth over the years (Ratnasingam *et al.* 2013). Even though many would argue that the wood-based industry is a sun-set industry, it continues to grow despite under increasing pressure due to labour and raw material related problems (Ratnasingam, 2012).

The Malaysian wood-based industry started almost one century ago, being a net exporter of primary commodities especially saw logs and sawn timber, to cater for the needs of the colonial masters (Ratnasingam 2003; Ratnasingam and Ioras 2005). Since independence, however, the wood-based industry has been an important economic sector, which not only provides employment to the locals but also earns foreign exchange. The dependence on the export of primary commodities continued until the mid-1980s, when the government launched the 1st Industrial Master Plan (1986 – 1995), which targeted the wood-based industry as a sector that should strive for greater value-addition. Instead of exporting primary commodities, especially saw logs and sawn timber, the wood-based industry was encouraged to move into down-stream manufacturing activities, particularly wood-based panel production, furniture and joinery manufacturing. The 2nd Industrial Master Plan (1996 – 2005) focused on further value-addition activities, with an emphasis on furniture manufacturing and other value-added products. With the implementation of the 3rd Industrial Master Plan (2006 – 2020) the focus shifted towards high value-added products of original design that captures market segment that is willing to pay high prices (Ratnasingam 2003; Ratnasingam and Ioras 2005). With the various incentives and stimulus provided by the government under the various industrial master plan, the wood-based industry has been transformed into a multi-billion ringgit export sector, that continue to power ahead despite the competitive market situation. In fact, the wood-based industry in the country has repeatedly proven that it is not a sun-set industry despite decreasing challenges due to insufficient raw materials and labour supply (MTIB, 2014a).

1.2 Problem statement

The wood-based industry in Malaysia processes almost 28 million m^3 of wood raw materials per annum (Lim *et al* 2016). With an installed processing capacity of almost 47.8million m3, there is a shortfall of almost 40 % in capacity utilization (Lim *et al.* 2016). On the other hand, the production of raw materials, particularly from the natural forests and plantation (including rubberwood and other species only accounts for 20 % of the needs of the industry. Therefore, with the declining supply of timber resources in the domestic market for the manufacture of value added wood products, many manufacturers are exploring other wood resources from overseas, especially New Zealand, North America, and Europe. In 2014 for instance, almost 303,000 m^3 of imported wood resources was brought into the country (MTIB, 2015). Although the volume of imported wood resources is increasing, there is no apparent trend to the type and nature of wood resources imported (Ratnasingam and Lim, 2015). Therefore, the subject of preference for specific wood resources for value-added wood products manufacturing is an interesting research question. In fact, this topic has not been researched on previously in the Malaysian context.

Understanding the shift and historical developments in the use of imported wood materials by the Malaysian wood based manufacturer is important for industry practitioners, when anticipating the future competitiveness of the Malaysian wood based industry (Ratnasingam *et al.* 2015).

The increasing demand for green and environmental friendly wood-based products, in terms of legality and sustainability of the wood resource utilized, especially in the traditional market place such as Europe, USA and Australia, has necessitated Malaysian wood based product producer to comply with the various green label and certification as specified by the buyer (Ratnasingam *et. al*, 2008a, 2008b; NEPCon., 2016). Wood-based manufacturers have to adjust to the public-procurement policies of importing countries which require the timber products be manufactured from sustainable and legally source timber (Brack, 2014; ITTO., 2015). With the on-set of the Europe Timber Regulation (EUTR) in March 2013, wood resources used for the manufacturing of timber products, being logs and sawn timber from natural forest, must be certified as being legal and sustainable, even if it is from the state-owned forest (Ratnasingham *et. al*, 2014; European Commision, 2016).

Although plantation wood resources, such as rubberwood (*Hevea brasiliensis*) is considered as being environmental-friendly, it has its short comings, in that it is available as short length, and supply being affected during the rainy season (Hong, 1995, Hong et al., 1999). Despite being the primary wood resource for furniture manufacturing, there is an apparent shift towards other alternative wood resources that is eco-label compliant, and yet is suitable for its end use (Ratnasingam, 2013). The wood resource must fulfill the criteria, such as easy to work-on in terms of machining, relative ease of sanding and take finishes well and fulfills the structural strength expected of the product (Meyer *et. al,* 1992*;* Briggs *et al.*, 1995).

1.3 Objectives

Therefore the general objective of this study is to determine the preferences of the imported wood resources, among value added wood based manufacturers in Malaysia, that are suitable and economically viable for use in long sustainable basis. The specific objectives of this study are:

i. To establish the current trend and species of wood of imported wood resources used in selected value-added wood products manufacturing sectors (furniture, flooring and door manufacturers), and
ii. To determine the primary drivers of using imported wood resources among these value-added wood products manufacturers.

1.4 Scope of Study

For the purpose of this study, the imported wood resources is confined to the sawn timber used in the wood-based industries in Malaysia, especially furniture and secondary wood based producer such as mouldings, furniture components, engineered door, and engineered floor manufacturer. This primarily due to the fact that these industries have shown a much more consistent tendency to use imported wood resources over the years compared to the other sectors within the wood-based industries.

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