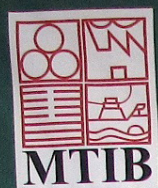




MASKAYU



Signing Ceremony of Memorandum of Understanding Between

Malaysian Timber Industry Board (MTIB)

Myanmar Timber Merchants Association (MTMA)



**MTIB AND MTMA
COLLABORATION INKED**

**RE-VISITING ITALY : EXPLORING
DESIGN AND TECHNICAL
EXPERTISE**

ISSN 0126-771X



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Cover: Malaysia and Myanmar strengthened bilateral ties and collaboration in the timber trade with the signing of an MoU. See page 3 for details.



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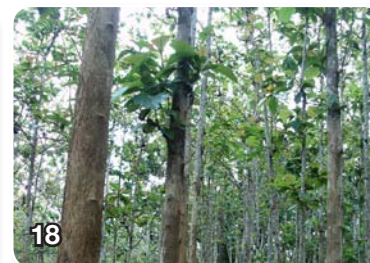
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MTIB AND MTMA COLLABORATION INKED

Malaysia and Myanmar strengthened bilateral ties and collaboration in the timber trade with the signing of a Memorandum of Understanding (MoU) on 28 March in Yangon, Myanmar. MTIB was represented by its Director-General, Dr. Jalaluddin Harun, while Myanmar Timber Merchants Association (MTMA) was represented by its Chairman, Mr. Sein Lwin. The exchange of the two documents was witnessed by YAB Dato' Sri Mohd Najib Tun Abdul Razak, Prime Minister of Malaysia in Naypyidaw on 29 March.

The event took place during MTIB's visit to Myanmar, from 28 to 29 March, which was in conjunction with YAB Dato' Sri Mohd Najib's visit to the country, on 27 March-1 April. MTIB was led by Datuk Madius Tangau, Chairman of MTIB.

The primary objective of the MoU was to establish collaboration between MTIB and MTMA with a view to share expertise and knowledge in their respective areas of excellence to help develop the timber industry in the respective countries as a viable and sustainable sector.



Exchanging of MoU documents between Dr. Jalaluddin Harun, Director-General of MTIB (left) and Mr. Sein Lwin, Chairman of Myanmar Timber Merchants Association.

The main areas of collaboration between MTIB and MTMA in the wood-based industry, as stated in the MoU are :

- Capacity building and skills upgrading
- Promotion of investments in value-added timber products
- Supply of raw materials
- Business matchmaking
- Exchange of market information

With stronger bilateral ties, Malaysia hopes to enhance trade with Myanmar. In 2011, Malaysia's exports of timber and timber products to Myanmar were valued at RM8.4 million, up from RM3.5

million in 2010. Major timber and timber products exported in 2011 were furniture valued at RM4.12 million, fibreboard (RM0.66 million) and particleboard (RM2.25 million). In the same year, Malaysia imported RM64.7 million worth of timber and timber products from Myanmar, a decrease of 14.8% over the previous year. Major timber and timber products imported were sawntimber valued at RM45.3 million, logs valued at RM13.0 million and mouldings valued at RM3.5 million.

Besides trade, there are plenty of other opportunities for Malaysia and Myanmar to strengthen the timber sector. Both countries are endowed with tropical forests which offer a steady supply of raw materials. While Malaysia and Myanmar share some similarities, the timber industry in both countries differs in terms of the level of development. Myanmar is a dominant supplier of primary processed timber, whereas Malaysia has established itself as one of the leading suppliers of downstream processed timber products. The collaboration offers vast opportunities for the timber industry in both countries to undertake joint efforts, to improve their comparative advantages.

There is immense value to reap from the joint programmes that shall be formulated and implemented under the cooperation. Each country has its own strength and by sharing experiences and expertise, Malaysia and Myanmar will be able to complement each other in the respective fields that each excel in and thus generate mutual and multi-fold benefits, especially in raising the profile of tropical timber and deriving maximum value from the resource.

Datuk Madius was accompanied by Dr. Jalaluddin, Puan Hj. Noor Laila Mohamed Halip, MTIB Director of Strategic Planning and Corporate Affairs; Encik Mohd Nor Zamri Mat Amin, Director of WISDEC and Encik Kamaruddin Othman, Assistant Director of WISDEC. Also present was Dato' Baharuddin Hj. Ghazali, forestry consultant cum Director of Tech-Wood Industries Sdn. Bhd.



Datuk Madius Tangau, Chairman of MTIB (centre) presenting a souvenir to Mr. Sann Lwin, Director-General of Ministry of Environmental Conservation and Forestry Planning and Statistics Department. The courtesy visit took place on 28 March.



TIMBER WORLD IN BRIEF

CANADA

New Generation of Wood Highrises Set to Take Shape

A new generation of highrise commercial and institutional wood buildings are planned for British Columbia (B.C.) in the next couple of years. The buildings will feature engineered wood products, such as cross laminated timber (CLT), laminated veneer lumber and laminated strand lumber.

The projects will increase the use of wood from the usual 2x4 wood frame construction, which is common in single family and multi-family residential projects. The B.C. Building Code was recently changed to allow for the six-storey wood frame structures, up from the previous four-storey limit.

A report "A Case for Tall Wood Buildings" commissioned by the Canada Wood Council for the Wood Enterprise Coalition introduces a new construction method using mass timber panels called Finding the Forest through the Trees (FFTT).

Wood highrises are not new to B.C. and other parts of Canada. B.C. has evolved three basic wood building systems: the common 2x4 frame construction; the heavy timber or post and beam common in the older buildings; and the emergent mass timber style using CLT, laminated veneer lumber or laminated strand lumber products in various dimensions and thicknesses.

journalofcommerce.com, April

GHANA

Timber Exports Sought from Cameroon After Forest Reduction

Ghana is seeking to purchase timber from Cameroon after its own forestry resources have depleted. Its Minister of Lands and Natural Resources would like to explore Cameroon's forestry and wildlife and discuss Ghana's offer in the spirit of intra-African trade. He mentioned Ghana could buy logs from Cameroon and in turn share its reforestation experience with the country.

Cameroon wants to reduce its dependence on the international market following economic uncertainty in Europe, which accounts for 80% of wood sales, according to its Minister of Forestry and Wildlife.

Bloomberg.com, April

EUROPEAN UNION

Proof of Legality Required for Wood Imports as from March 2013

The EU Timber Regulation already in force becomes operational on 3 March 2013. As from this date, market

players in the EU are officially prohibited from putting illegally felled timber and timber products on the market. In view of the approaching effective date, the EU timber trade legislation for combating illegal felling was at the forefront of this year's foreign-trade meeting organised by the foreign trade unit of the German Timber Trade Federation on 13 April 2012. The players in the foreign trade sector were informed about the expected bureaucratic requirements that the new EU Timber Regulation will entail for operators who place timber and timber products on the domestic market from outside the EU. At the 2011 foreign-trade meeting, the German "Holzhandels-Sicherungs-Gesetz" (HolzSiG) which was a first step in implementing Council Regulation (EC) No 2173/2005 on the establishment of a FLEGT licensing scheme for imports of timber into the European Community was presented. The HolzSiG is currently being augmented with arrangements for implementing the EU Timber Regulation.

Euwid_wood_products.com, April

NORTH AMERICA

Lumber Production Declined 30% Due to Housing Slump

The combined Canadian and the US lumber industries shrunk by about 30% as a result of the subprime mortgage crisis that, in 2008, sparked the US's worst recession since the Great Depression.

Sharply lower sales forced businesses throughout the hardwood supply chain to downsize operations, reduce employment, curb non-essential spending and delay capital investments. Hundreds of companies did not survive, and those that remain are still trying to recover.

The hardwood industry is much smaller today than it was five years ago. Lumber production bottomed out at 6.7 billion board feet in 2009, edged up to 7.0 billion board feet in 2010, and increased to 7.5 billion board feet in 2011. For 2012, demand of 8.0 billion board feet is expected. The US economy started showing signs of positive economic momentum, including good jobs reports and the expectation that the country will create 1.7 million jobs, in 2012.

Home starts and new-home sales figures improved in the latter part of 2011. Steady sales of existing homes and expected gains in new home construction in 2012 will lead to slightly higher demand for cabinets, flooring, furniture, moulding and stairs.

Hardwood Flooring, April

Raw Log Exports to China Up Sharply

Exports of wood pellets from North America reached a record high of over two million tonnes in 2011 according to the North American Wood Fibre Review. Canada has long been the main exporter of pellets. In the second half of 2011 the US producers exported an equal volume to Canada. In 2011 while Canada drastically raised lumber shipments to China, the US expanded its raw logs export to Chinese lumber manufactures.

The US west coast log exporters shipped logs worth about USD1 billion, up from just USD42 million in four years.

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Shipments of softwood lumber from the two countries reached an all time high in 2011. The greatest increase in the shipments originated in the central interior of BC.

North American Wood Fibre review, April

SOUTH AFRICA **Shortage of Timber as Demand Rises**

South Africa's rising demand for timber in the past six months may lead to shortages and result in imports for the construction and building industries, the Financial Mail reported. The shortage was caused by fires that damaged about 70,000 hectares (173,000 acres) of forestry over the past few years.

Businessweek.com, April

UNITED KINGDOM **Timber Frame Market Set for Boom**

Timber frames is one segment of the UK construction market which is performing well compared with the rest. As carbon reduction and environmental requirements become increasingly significant, this segment is expected to outperform the broader housing market and grow by around 60% in volume and 80% in value between now and 2016.

The timber frame market, like other parts of the construction industry, has been hit by the UK recession. However the sector is in reasonable financial health, with around 60% of manufacturers having "good" or "excellent" credit ratings and just 4% of suppliers currently regarded as being at immediate risk of failure.

Despite the poor economy, sales of timber frame increased by £30 million in 2011. Much of the demand came from timber gaining an increasing share of the house building market. For 2012, the timber frame market is expected to grow by a respectable nine per cent and surpass £400 million in value.

The primary driver behind all this relates to environmental considerations, a combination of low-carbon regulations such as the Code for Sustainable Homes, a positive response from the timber frame industry with regard to meeting changing market demand patterns and influences, and the recognition of timber as a low carbon intensive material as key drivers behind an increasing popularity of timber frames. The sources of growth in the market may shift, with non-residential projects in health and education becoming increasingly important.

designbuildsource.com, April

Contractors Send Strong Signal **on Timber Choice**

The UK Contractors Group (UKCG) has agreed on a new statement on timber procurement and given a major boost to sustainable timber sourcing and supply for the UK construction industry. All timber products purchased for either temporary or permanent use on UKCG member sites will be certified as legally and sustainably sourced, as defined by the UK Government's Central Point of Expertise on Timber (CPET).

CPET currently approves two certification schemes as providing evidence of legal and sustainable sourcing – Forest

Stewardship Council and Programme for the Endorsement of Forest Certification (PEFC). PEFC acts as an umbrella organisation recognising over 30 national schemes, including the North American Sustainable Forestry Initiative, the Canadian Standards Association and the Malaysian Timber Certification System scheme. These are now all acceptable with the appropriate chain of custody documentation for UKCG use.

This UKCG decision gives clear and transparent preference to products that demonstrate compliance with responsible sourcing schemes and certified by a third party. To maintain an unbroken chain of custody, all members of the UKCG will work to a common reporting method and provide documentary evidence, to demonstrate compliance with the stringent auditing process that PEFC certification provides.

The statement comes 12 months ahead of the introduction of new EU regulations. The Illegal Timber Regulation – now commonly called the EUTR – will apply to all Member States from the 3 March 2013 and will make it illegal to place timber and timber products which have been illegally harvested at the point of origin on the EU market.

The PEFC UK programme reported that Green Building is increasingly embraced by planners, architects and contractors in many countries. Leading green building rating systems from around the globe recognise the importance of certified timber including CASBEE in Japan, the Australian Green Star Programme, Built Green in Canada and the US Green Building Initiative. It applauded the UK Contractors Group for demonstrating industry leadership by opting to develop a responsible timber procurement policy.

The announcement will be made in the year of RIO+20 – the United Nations Conference on Sustainable Development. RIO+20 is taking place in Brazil on 20-22 June 2012 to mark the 20th anniversary of the 1992 United Nations Conference on Environment and Development and the 10th anniversary of the 2002 World Summit on Sustainable Development.

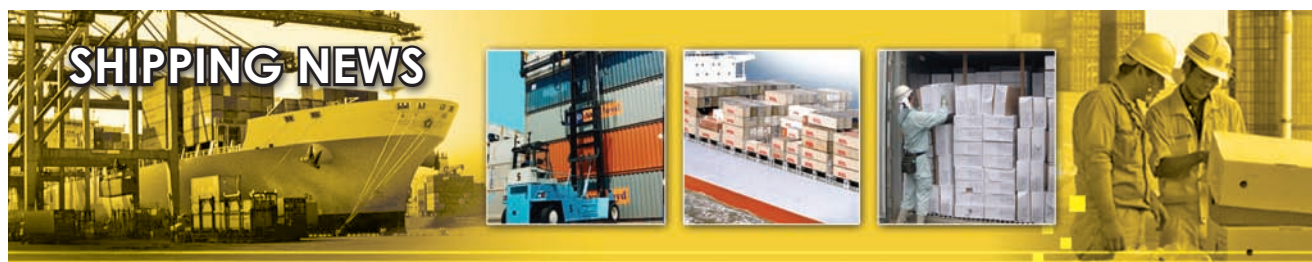
The main objective behind RIO+20 is to secure renewed political commitment for sustainable development, assess world progress to date and address new and emerging challenges for green building and ethical trading. It will involve Heads of State, Government Ministers and many top-level representatives from across the globe.

The UK is the fourth largest net importer of timber in the world. By developing and implementing a responsible timber procurement policy, the UK Contractors Group has demonstrated a commitment to ensuring that the timber and wood-based products it uses come from legal and sustainable sources.

The UKCG policy now delivers a clear message that the procurement of legal and sustainable timber is an essential part of any supply chain and that the adoption of CPET guidance for its member's timber procurement procedures, enables them to tap into an inclusive, wide and diverse choice of material certified by the world's largest forest certification organisation.

www.specificationonline.co.uk/news, April

MARCH 2012



BPHB in Final Talks on New Port

Bintulu Port Holdings Bhd. (BPHB) is in final talks with its major shareholders, including the Sarawak government, on the funding for the proposed Samalaju deepsea port project in Bintulu.

Datuk Mior Ahmad Baiti Mior Lub, Chief Executive Officer of BPHB said discussions should wrap up in the next three months.

The cost of the new port, which is designed to serve energy-intensive industries in Samalaju Industrial Park within the Sarawak Corridor of Renewable Energy (SCORE), is estimated at more than RM1 billion.

The Sarawak government, through the State Financial Secretary, is BPHB's second-largest shareholder with a 30.7% stake after Petroleum Nasional Bhd. which owns 32.8%, according to BPHB 2011 Annual Report.

Kumpulan Wang Persaraan (Diperbadankan) and Employees Provident Fund Board are the third and fourth-largest shareholders with about 9.5% and 3.2% stakes respectively.

Datuk Mior Ahmad said construction works for the new port on 450 ha was expected to begin early next year for full completion in 2016 when they will first build interim facilities, including berths for barges.

BPHB was tasked by the Sarawak government to implement the project and had invited bidders for the construction of the proposed barge berth, which would be 300 metres long with a water depth of 7 metres. The interim facilities that are expected to be ready by the end of this year and be operational in early 2013 would handle barges transporting building materials, equipment and other goods for the construction of manufacturing facilities by SCORE investors.

Source: www.thestar.com.my, 19 March

Malaysia Becoming Green Shipping Hubs in Southeast Asia

The International Maritime Organisation (IMO) is a special United Nations agency responsible for the safety and security of shipping and the prevention of marine pollution by ships.

Malaysia still has a lot to do to develop green shipping and should work together with its neighbours if it wants to be one of the leading green shipping hubs in Southeast Asia.

Mr. Jeroen van Riel, Managing Director of Alfa Laval Aalborg Pte. Ltd. (Singapore) said Malaysia has become more green-conscious since it adopted the IMO treaty in ballast water treatment in 2010. Green shipping is the current trend in the global maritime industry, where players take steps to save costs and preserve the environment.

From the suppliers' point of view, Mr. van Riel said they saw how they could change their products to be more efficient and assist with the reduction of emissions.

Shipments of Timber and Timber Products through Ports in Peninsular Malaysia, March 2012

Products	Port Klang		Kuantan		Pasir Gudang		Tanjung Pelepas		Penang		Total all ports (m ³)	% Change Mar 2012/ Feb 2012
	m ³	% Change Mar 2012/ Feb 2012	m ³	% Change Mar 2012/ Feb 2012	m ³	% Change Mar 2012/ Feb 2012	m ³	% Change Mar 2012/ Feb 2012	m ³	% Change Mar 2012/ Feb 2012		
Sawntimber	27,671	-10	145	361	350	5	68	205	506	-15	28,741	-10
MDF	18,395	-5	0	0	5,072	-40	16,815	-4	13,729	4	54,011	-10
Mouldings	11,673	15	202	-42	2,037	-4	850	-3	2,587	5	17,349	58
Dressed Timber	1,729	10	6	-55	1,538	27	71	-71	887	180	4,231	-6
Plywood	5,929	7	0	0	0	0	0	-100	5,420	-53	11,348	14
Veneer	42	-34	0	0	0	0	0	0	245	240	287	161
Particleboard	33,986	79	0	0	129	-40	2,797	273	46	0	36,912	93
TOTAL	99,425	15	353	-10	9,126	-26	20,602	6	23,419	-17	152,925	12

Source : MTIB

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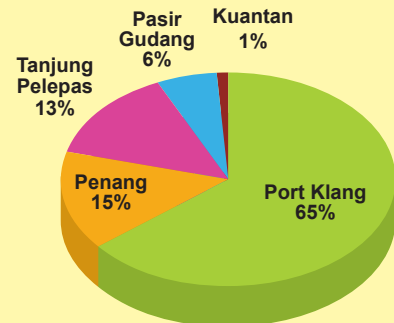
Meanwhile, Mr. Mark Lerche, Danish Marine Group Business Sector Manager also observed the green-conscious tendency within Malaysia's maritime industry. He said Singapore is one of the main green shipping hubs as the island-state is a commercial and operational centre for the region. Thus, Malaysia can work hand in hand with Singapore in order to become a leading hub for green shipping as well.

Green shipping looks more at the lifetime of the vessel industry. It takes into consideration not only a vessel coming out of a shipyard but also the actual cost of the lifetime of the vessel. This includes the operation cost after the vessel has been made and how it is going to be scrapped afterwards.

Mr. Lerche said that green shipping adopts energy-efficient ship designs and daily operations that reduce fuel consumption and carbon-dioxide emissions. He further added that the best way to get things done is to have a dialogue between the stakeholders, authorities, shipowners, suppliers, shipyards, and customers who never think about green shipping.

Source: www.btimes.com.my, 26 March 2012

Shipments of Timber and Timber Products through Ports in Peninsular Malaysia, March 2012



Total = 152,925 m³

Multiple Uses, Variable Styles

Incomparable Malaysian Wood. Choice for those with exclusive preference. Pushing the frontier of imagination and creativity. Our Heritage, Our Pride.

Malaysian Wood
Standing on Excellence



Malaysian Timber Industry Board (Ministry of Plantation Industries and Commodities)

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MARCH 2012

Export of timber and timber products from peninsular Malaysia in March 2012 increased 1% in volume and decreased 4% in value to 236,440 m³ amounted RM275.9 million over the previous month. Cumulative export for the year 2012 decreased by 4.6% in volume and increased 3.3% in value to 656,702 m³ worth RM787 million compared to the previous corresponding period.

Sawntimber

Export of sawntimber in March posted a negative growth with marginal decreased in volume and 4% in value to 90,035 m³ with a value of RM110.4 million as compared to the previous month. However, cumulative exports for the first three months of the year showed an increase of 15% in volume and 13% in value to 247,929 m³ worth RM273.9 million.

Shipments to the EU decreased 33% to 10,636 m³ with most major market decreasing their purchases due to the Euro zone prolong debt crisis. The Netherlands and Belgium reduced buying by 37% and 6% to 3,715 m³ and 1,815 m³ respectively. Likewise, export to Germany, the UK and France 21%, 49% and 37% to 2,152 m³, 1,340 m³ and 1,059 m³ respectively.

Total exports to West Asia also decreased 6% to 8,361 m³ as most countries in West Asia reduced purchases. Exports to Saudi Arabia, Bahrain and Kuwait declined 51%, 37% and 29% to 1,147 m³, 409 m³ and 475 m³ respectively. However, export of sawntimber to the UAE improved 61% to 4,901 m³ while export to Oman increased more than two folds from 190 m³ to 620 m³.

Buying from ASEAN improved 8% to 46,048 m³ over the previous corresponding period. Export of sawntimber to Thailand and Singapore increased 8% and 3% to 33,323 m³ and 11,782 m³ respectively. Singapore and Viet Nam also improved their intakes from 173 m³ to 641 m³ and from 249 m³ to 302 m³ respectively.

Similarly, demand in East Asia recorded positive growth whereby export to East Asia region increased 17% to 13,275 m³. China and Japan, the two major markets, increased buying by 10% and 23% to 8,926 m³ and 2,499 m³ respectively. Export of sawntimber to Taiwan also improved substantially to 1,149 m³ compared to 279 m³ recorded in the previous month. In contrast, imports by South Korea and Hong Kong decreased 13% and 49% to 455 m³ and 172 m³.

Elsewhere, export to the US increased substantially from 243 m³ to 1,212 m³ whilst Canada only purchases 26 m³ worth of sawntimber. Intake by Australia also improved 36% to 1,134 m³. Likewise, import from South Africa also increased 8% to 4,121 m³.

The average FOB prices of sawntimber declined 3% to RM1,226 per m³ from RM 1,269 per m³ in the previous month. Dark Red Meranti was traded at RM2,650 per m³, an increase of 1% also from the previous month. Prices of Dark Red Meranti to the Netherlands decreased marginally to RM2,970 per m³. However, prices of Keruing decreased 4% to RM1,395 per m³. There was no trading for Redwood to the UAE for the month.

Plywood

Plywood exports in March 2012 were 15,349 m³ valued at RM25 million. Cumulative exports for the period January to March showed decrease of 6% in volume to 46,701 m³ but an increase in value at RM75.5 million from the previous corresponding period.

Total exports to EU decreased by 42% to 8,010 m³; imports by the UK decreased 48% to 8,140 m³. Similarly, imports by Netherlands and Denmark decreased to 300 m³ and 385 m³ from 1,231 m³ and 512 m³ respectively in the previous month. However, exports to Belgium and Italy increased by 431% and 90% to 886 m³ and 38 m³ respectively from the previous month. Ireland resumed imports by 219 m³.

Exports to ASEAN region was higher as Singapore and Thailand intakes of plywood increased by 35% and 16% to 2,207 m³ and 1,053 m³ respectively. In East Asia, exports to Japan and Hong Kong decreased by 75% and 68% to 46 m³ and 42 m³ respectively while South Korea resumed import by 42 m³. Total exports to West Asia were slightly higher by 1% to 827 m³ from 817 m³ in the previous month. Export to UAE decreased to 415 m³ from 582 m³ in the previous month while Bahrain resumed import by 86 m³. Kuwait did not make any purchase in March 2012. Elsewhere, export to Australia increased by 6% to 1,725 m³ while the US did not import any plywood. South Africa increased its intake to 859 m³ from 42 m³ in the previous month.

The FOB price of plywood increased to RM1,653 per m³ from RM1,569 per m³ in the previous month, an increase of 5% from the previous month.

Veneer

Total exports of veneer for March 2012 showed decrease of 31% in volume but 5% increase in value to 289 m³ at RM0.5 million compared to the previous month. However, cumulative exports from January to March decreased by 12% in volume and 27% in value to 974 m³ valued at RM1.5 million from the previous corresponding period of last year.

Medium Density Fibreboard (MDF)

Exports of MDF for March 2012 decreased 18% in volume and 13% in value. Exported totalled 60,718 m³ valued at RM23.5 million respectively as compared to previous month.

Exports to East Asia for the month increased 6% in volume to 2,513 m³ from 2,372 m³ in the previous month. Exports to China (Including Hong Kong) recorded an increase of 434% to 849 m³ whilst export to Japan and Taiwan by fell 6% and 43% to 999 m³ and 665 m³ respectively.

On the other hand, demand from the West Asia market recorded a negative growth with a decrease of 34% in volume to 24,802 m³ from 37,784 m³ in the previous month. Export to Kuwait recorded a positive growth of 134% to 4,304 m³ followed by Iran 23% to 7,738 m³, Bahrain 10% to 492 m³ and Saudi Arabia 3% to 4,874 m³. Meanwhile export to

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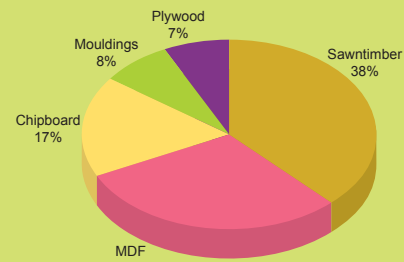
Oman, UAE, Jordan and Syria showed a declined of 48% to 1,092 m³, 62% to 4,834 m³, 97% to 103 m³ and 100% respectively from the previous month.

Elsewhere, exports to the South Africa and the US for the month increased 36% to 1,335 m³ and 21% to 2,369 m³ whilst UK and Australia fell 10% to 836 m³ and 10% to 1,914 m³ respectively.

In ASEAN, export to ASEAN region for this month decreased by 0.7% to 15,046 m³ from 15,153 m³ in the previous month. Exports to Viet Nam increased by 20% to 7,173 m³. However, Indonesia, Philippines and Singapore registered a negative growth of 7% to 6,399 m³, 27% to 841 m³ and 51% to 569 m³ respectively.

Export of Major Timber Products from Peninsular Malaysia, January - March 2012

Volume = 650,625 m³



Mouldings

Export of mouldings for the month decreased 3% in volume and 5% in value to 18,899 m³ at RM50.6 million. However, cumulative export for the first three months reported an increase of 16% in volume and 20% in value to 53,395 m³ worth RM146.6 million over the previous corresponding period of last year.

Export to the EU decreased 5% to 8,295 m³ from 8,701 m³ recorded in the previous month. Similarly, shipments to the UK and Belgium decreased 23% and 48% to 500 m³ and 503 m³ respectively. On the other hand, Netherlands and Germany increased purchases by 11% and 10% to 3,870 m³ and 2,620 m³ respectively.

In Asia, demand from Japan and South Korea declined 2% to 1,849 m³ and 9% to 1,282 m³ respectively. However, export to China improved from 339 m³ in the previous month to 764 m³.

Elsewhere, export to the US decreased 12% to 2,101 m³ while export to Australia and Singapore improved 6% and 20% to 2,267 m³ and 1,284 m³ respectively.

The FOB value for mouldings decreased 2% to RM2,678 per m³ from RM2,723 per m³ in the previous month.

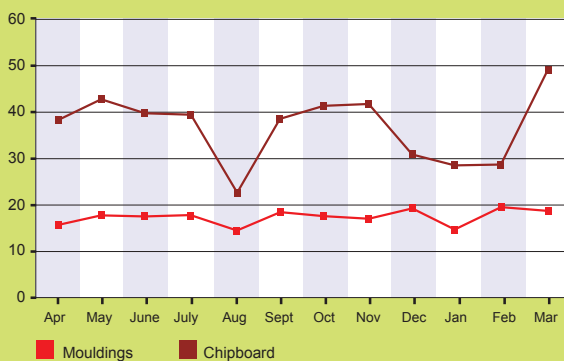
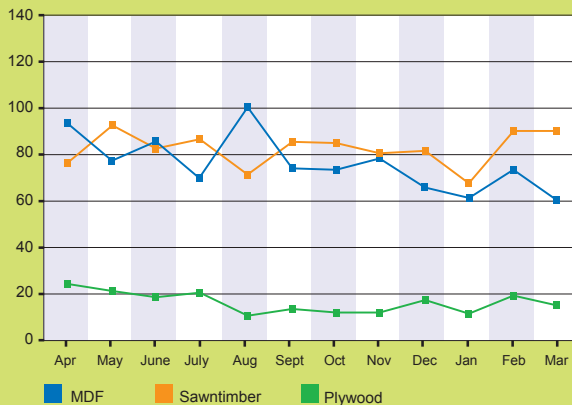
Builders Joinery and Carpentry (BJC)

Export of BJC between January to March declined 4% to RM241.1 million over the previous corresponding period. Export to the EU decreased 17% to RM 71.7 million. However the US increased buying by 2% to RM 17.4 million.

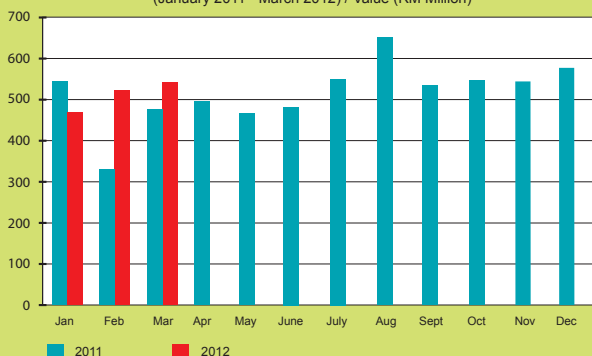
Shipments to the UK and France declined 35% and 17% to RM22.7 million and RM9.5 million respectively. Similarly, Italy and Denmark also decreased their purchases by 17% and 12% to RM4.7 million and RM7.9 million respectively. However, export to Belgium and Sweden increased 36% to RM13.5 million and 11% to RM3.6 million respectively.

In Asia, Singapore and Japan recorded lower their purchases by 54% and 4% worth RM21.6 million and RM27.0 million respectively. Export to Australia and India, on the other hand, increased 19% to RM31.8 million and 15% to RM16.3 million respectively. Similarly, export of BJC to Thailand and South Africa improved 33% to RM7.2 million and RM5.0 million respectively.

Export of Selected Timber Products from Peninsular Malaysia (March 2011 - March 2012) / Volume ('000 m³)



Malaysia: Export of Wooden Furniture (January 2011 - March 2012) / Value (RM Million)



MARCH 2012



Logs

Rainy season hampered logging and transportation activities. Consequently logging supply was extremely tight at batau. Forecast predicted the rainy season would last through early March. Due to tight supply of logs, recorded price was very high and further increases might hamper the production of millers in the domestic market.

Logs species of Chengal, Balau and Merbau were reported to be traded at RM3,460 per tonne, RM2,710 per tonne and RM2,110 per tonne respectively. Meanwhile, prices of Keruing and Kempas remained firm at RM1,360 per tonne and RM1,460 per tonne respectively. Prices for Dark Red Meranti, Red Meranti and Nyatoh were respectively quoted at RM1,360 per tonne, RM1,310 per tonne and RM1,360 per tonne. On the other hand, prices for Mixed Heavy, Mixed Medium and Mixed Light Hardwood continued to be stable at RM1,200 per tonne, RM1,000 per tonne and RM950 per tonne respectively.

Sawntimber

Sawmilling activities had also slowed during the month due to tight supply of logs. Prices for major species held firm with selective demand from millers. Furthermore, millers were also facing difficulties in getting steady and adequate supply of logs.

Prices for sawntimber of Chengal, Balau and Merbau were RM7,620 per m³, RM5,620 per m³ and RM4,820 per m³ respectively. Prices of Keruing and Kempas were quoted at RM3,020 per m³ and RM3,220 per m³ respectively. Prices for Dark Red Meranti were traded at RM3,220 per m³ whilst Red Meranti and Nyatoh were similarly traded at RM2,920 per m³. On the other hand, prices for Mixed Heavy, Mixed Medium and Mixed Light Hardwood remained firm at RM2,500 per m³, RM2,100 per m³ and RM1,900 per m³ respectively.

Plywood

Supply of plywood to the domestic market remained sufficient. Meanwhile, demand for shuttering boards in the building and construction sectors continued to be stiff. Plywood prices in the domestic market maintained at last month's level. Plywood of 4mm, 6mm and 9mm of thicknesses were stably traded at RM16.10, RM25.60 and RM38.50 per piece respectively. Meanwhile, shuttering boards of 12mm of thickness were traded at RM48.50 per piece.

Medium Density Fibreboard (MDF)

Supply of MDF remained sluggish and prices remained uncertain from the previous month. MDF of 4mm, 6mm, 9mm and 12mm of thicknesses were traded at RM13.20, RM16.90, RM23.30 and RM30.10 per piece respectively.

Intra-Malaysia Trade* - March 2012

Shipments of sawntimber from Sabah to Peninsular Malaysia reported a decline of 5% to 989 m³, valued at RM1.3 million. However, shipments of plywood increased by 47% to 13,257 m³, worth at RM19.4 million. Exports of veneer reported to have jumped from 63 m³ in February to 204 m³ with a value of RM285,000.

Meanwhile shipment of logs from Sarawak to Peninsular Malaysia was 101 m³, valued at RM42,000. Export of sawntimber reported a decline of 41% to 1,259 m³, valued at RM0.9 million. However, shipments of plywood reported to jump from 10,565 m³ in February to 56,245 m³ with a value of RM18.8 million. Exports of veneer also improved significantly by 38% to 5,212 m³, valued at RM5.1 million.

No intra trade from Peninsular Malaysia to Sabah and Sarawak were recorded in March 2012.

INTRA-MALAYSIA TRADE - MARCH 2012

From	Products	February 2012		March 2012		% Change in volume	% Change in value
		Volume (m ³)	Value (RM '000)	Volume (m ³)	Value (RM '000)	March 2012/ February 2012	March 2012/ February 2012
SABAH	Logs	0	0	0	0	0	0
	Sawntimber	1,046	1,614	989	1,379	-5	-15
	Plywood	9,033	13,573	13,257	19,399	47	43
	Veneer	63	83	204	285	224	243
SARAWAK	Logs	0	0	101	42	0	0
	Sawntimber	2,117	1,742	1,259	900	-41	-48
	Plywood	10,565	12,701	56,245	18,803	432	48
	Veneer	3,785	3,601	5,212	5,155	38	43

* Source: Department of Statistics, Malaysia

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***AVERAGE DOMESTIC PRICES OF LOGS, SAWNTIMBER, PLYWOOD AND MDF IN PENINSULAR MALAYSIA
MARCH 2012 (RM)**

SPECIES	LOGS (tonne)	SAWNTIMBER (m³)			
	18” UP	GMS		STRIPS	SCANTLINGS
HEAVY HARDWOOD					
Chengal	3,460	7,620		4,500	8,500
Balau	2,710	5,620		3,500	5,700
Red Balau	1,900	3,500		2,200	3,600
Merbau	2,110	4,820		2,600	5,200
Mixed Heavy Hardwood	1,200	2,500		1,500	2,800
MEDIUM HARDWOOD					
Keruing	1,360	3,020		1,550	3,200
Kempas	1,460	3,220		1,650	3,500
Kapur	1,260	2,720		1,530	2,900
Mengkulang	1,250	2,350		1,420	2,550
Tualang	1,150	2,050		1,420	2,350
Mixed Medium Hardwood	1,000	2,100		1,250	2,300
LIGHT HARDWOOD					
Dark Red Meranti	1,360	3,220		1,750	3,500
Light Red Meranti	1,250	2,500		1,440	2,800
Red Meranti	1,310	2,920		1,560	3,200
Yellow Meranti	1,150	2,000		1,340	2,300
White Meranti	1,200	2,100		1,400	2,250
Mersawa	1,210	2,520		1,460	2,650
Nyato	1,360	2,920		1,550	3,100
Sepetir	1,060	2,020		1,350	2,300
Jelutong	1,100	2,100		1,340	2,300
Ramin	1,810	4,120		2,850	4,400
Mixed Light Hardwood	950	1,900		1,100	2,000
MALAYSIAN RUBBERWOOD <i>Hevea brasiliensis</i>	LOGS (tonne)	SAWNTIMBER (m³)			
	145	1” X 1”	2” X 2”	3” X 3”	4” X 4”
		717	855	936	964
PLYWOOD 4’ X 8’ (RM per piece)	4mm	6mm	9mm	12mm	
	16.10	25.60	38.50	48.50	
MDF 4’ X 8’ (RM per piece)	4mm	6mm	9mm	12mm	
	13.20	16.90	23.30	30.10	

Note: Log prices ex-batau. Sawntimber, plywood, MDF and Malaysian Rubberwood (*Hevea brasiliensis*) prices ex-mill.

* Prices are only indicative

Source: MTIB

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TIMBER ROUND-UP

Furniture

Exports of wooden and rattan furniture for the period under review in 2012 picked up momentum by 13.2% compared to the corresponding period of 2011. Total shipments recorded RM1.5 billion against RM1.3 billion in 2011.

Purchase of wooden furniture from Malaysia for the January to March duration increased by 13.4% compared to the same period in 2011, recording RM1.5 billion.

Imports of wooden furniture by the US expanded 22.9% from RM390.2 million to RM479.6 million. Consumption by Japan also picked up 20.2% from RM135.4 million to RM162.7 million whilst intake by Australia increased by 7.5% from RM93.1 million in 2011 to RM100.1 million in 2012. The UK's cumulative imports for the first three months of 2012 shrank 0.2% registering RM98.6 million

Canada improved its performance with a sharp increase of 31.6% with shipments valued at RM71.2 million while consignments to Singapore posted an increase of 5.5%

recording RM69.7 million. The UAE, India and Saudi Arabia cut back on their intake by 5.5%, 13.1% and 12.1% respectively.

Consignments to Germany and Russia were buoyant with exports valued at RM27.0 million and RM22.8 million respectively. Shipments to Netherlands, Norway and Spain registered negative growth. Consumption by South Africa shot up to RM12.4 million from RM8.1 million, a steep 53.4% increase.

Rattan furniture shipments slid to RM5.0 million for the January to March 2012 period compared to RM6.9 million in the first three months of 2012, a drop of 27.6%.

Singapore the main buyer reduced its consumption to RM1.0 million, a dip of 25.1%. The UK cut back on its consumption by a sharp 43.2%, spiralling drastically downwards from RM1.0 million in 2011 to the current RM569,000. Belgium and Greece cut back intake by 71.1% and 2.7% respectively.

RE-VISITING ITALY : EXPLORING DESIGN AND TECHNICAL EXPERTISE

Italy is a major producer of high quality and modern-design furniture, a historical leader in the furniture sector. Fifteen years ago, about 20% of the furniture traded worldwide was of Italian origin; the reputation of furniture "Made in Italy" was recognised by foreign retailers and consumers all over the world. The key factors of this success were large investments in design, a business model based on industrial districts and a high propensity to export. Italy is also universally recognised as a trendsetter, since the Italian traditional design is the product of quality workmanship and constant technological innovation applied to processes and products. Today, Italy is still the leading European furniture exporter and at world level it is the second leading exporter after China.

Malaysia, at the same time, ranks amongst the top ten producers of furniture in the world. The target of the National Timber Industry Policy (NATIP) is RM53 billion in annual export earnings by 2020, with furniture export aimed at RM16 billion. In order to materialise the objective, the Ministry of Plantation Industries and Commodities Malaysia (MPIC) and MTIB have taken initiatives to enhance furniture design, finishing, promotion, marketing and production engineering. One of the latest efforts was the Economic and Technical Mission to Italy on 19-27 April. The mission was a follow-up from the first Malaysia-Italy Joint Economic Committee (JEC) meeting held on 26 September 2011 at Milan, led by the Minister of International Trade and Industry. The mission which aimed to strengthen the collaboration between Malaysia and Italy within the platform of Malaysia-Italy JEC, was led by YB Dato' Hamzah Zainudin, Deputy Minister of MPIC.

The first stop was Politecnico di Milano, the largest technical university located in Milan, Italy. A special MoU signing ceremony between MTIB and



Dr. Jalaluddin Harun, MTIB Director-General (left) exchanging MoU documents with Prof. Giovanni Azzone, Rector of Politecnico di Milano (POLIMI). Looking on is YB Dato Hamzah Zainudin, Deputy Minister of Plantation Industries and Commodities (centre) and other VIPs.



A group photo at POLIMI.

Politecnico di Milano (POLIMI) was also held. For the signing ceremony, MTIB was represented by Dr. Jalaluddin Harun and Prof. Giovanni Azzone, Rector of POLIMI was the representative of POLIMI. The ceremony was witnessed by the Deputy Minister and Secretary-General of MPIC. The area of collaboration that was agreed upon was furniture design enhancement and human capital development.

The delegation also visited the largest furniture fair in the world, the Milan International Furniture Show (Salone Internazionale Del Mobile or I-Saloni). The I-Saloni fair was established about 50 years ago. It is the largest trade fair of its kind in the world. The annual fair showcases the latest in global furniture design and is considered a leading venue for the display of new products by designers of furniture, lighting and other home furnishings. The 2011 fair showcased 2,500 exhibitors and attracted almost 300,000 visitors. Five companies from Malaysia namely Master Sofa Industries



The group visited Milan International Furniture Show 2012.

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RE-VISITING ITALY : EXPLORING DESIGN AND TECHNICAL EXPERTISE

Sdn. Bhd., White Feathers Industries Sdn. Bhd., Signature Manufacturing Sdn. Bhd. and Kuek Brothers Furniture Sdn. Bhd., participated in the fair.

The delegation then visited Silvateam Group in San Michele Mondovi, Italy. The company is currently a world leader in the production and commercialisation of vegetable extracts and its derivatives. It is also internationally recognised as a chemical producer for the leather tanning industry. MTIB has collaborated with Silvateam to carry out an R&D project in extracting tannins from the bark of *Acacia mangium* trees in Malaysia. An MoU was signed between MTIB and Silvateam in Kuala Lumpur on 12 January 2012. The main objective of the R&D project was to examine the bark quality of *Acacia mangium* trees in Malaysia and to evaluate the chemical properties and the applications of extracts from *Acacia mangium* in Malaysia as a new source of vegetable tannins for commercial purposes. The R&D project is under the purview of the Fibre and Biocomposite Development Centre (FIDEC) of MTIB.

The delegation from MPIC led by YB Deputy Minister was taken on a guided tour of Silvateam plant. The company's headquarters also houses its R&D centre, marketing and sales offices. The plant has a production capacity of 65,000 tonnes and processes about 360 tonnes of chestnut logs and trimmings for the extraction of tannins daily. The plant also produces synthetic tannins (or synthans), solvent extracted tannins, fatliquors and leather auxiliaries.

The delegation next visited Scuola Politecnica di Design (SPD), Milan's most prestigious post graduate design school for industrial, furniture, interior and automotive designs. Founded in 1954 by the artist Nino di Salvatore, SPD offers courses ranging from product design to interior design, from communication to multimedia. SPD brings together artists, designers and professionals to work alongside young designers, experimenting with actual projects and designs. The study programmes have a strong orientation towards real projects, keeping in close contact with companies and professionals. The projects are carried out with leading

companies such as Audi, Microsoft, Heineken, and IKEA. The delegation met Mr. Antonello Fusetti, Managing Director of SPD and discussed further on the collaboration with Malaysian institutions, in order to nurture Malaysian designers and improve the implementation of the design enhancement programme.

The delegation also visited Istituto Professionale Di Stato Per L'Industria E L'Artigianato (IPSIA). IPSIA Giuseppe Meroni, located in Milan, is a vocational school which specialises in wood-working and furniture design. It is one of the 18 schools under IPSIA. The main objective of IPSIA is to provide students with a vocational training and it is the oldest furniture design school in Italy. It offers certificate, diploma and advanced diploma courses in wood industry and furniture design. IPSIA also provides training for employees of the furniture industry, in areas related to production and design techniques. The delegation were given a tour of the facilities at IPSIA and were invited to observe students in their workshops.

The delegation also visited Federlegno-Arredo, ASSOCOMAPLAST and ACIMALL Associations. Federlegno-Arredo is the Italian Federation of Wood, Cork, Furniture and Furnishing Industries with over 2,400 member companies. As for ASSOCOMAPLAST, it is a non-profit association that represents 163 leading companies, Italian plastics and rubber machinery, ancillary equipment and moulds manufacturers while ACIMALL is the Italian Woodworking Machinery and Tool Manufacturers Association, was established in Milan in 1966.

The members of the associations were companies possessing high technology and expertise in the field of wood processing, furniture, plastic and biocomposite. As such, discussions between the Malaysian delegates with the associations focused on cooperation in technology transfer and capacity building.

Overall the discussions held during the visit facilitated better understanding on the issues of design and furniture industry development. It is hoped the cooperation would enhance the flow of bilateral trade and investments in the near future and increase the areas of economic cooperation for further knowledge and skills exchange between two countries.

The delegation comprised Datin Paduka Nurmala Abdul Rahim, Secretary-General of MPIC; representatives from Malaysian Timber Council, Malaysian Furniture Promotion Council, Malaysian Palm Oil Board, Malaysian Rubber Export Promotion Council, Malaysian Palm Oil Council, Ministry of Higher Education, Ministry of Education, Malaysian Industrial Development Authority, universities and members of the industry. MTIB was represented by Datuk Madius Tangau, Chairman of MTIB; Dr. Jalaluddin Harun, Director-General of MTIB and Encik Mohd Nor Zamri Mat Amin, Director of Wood Industry Skills Development Centre (WISDEC). 



At Silvateam Group in San Michele Mondovi, Italy.

HELLO KOMODITI PROGRAMME OPENS DOOR FOR CAREER DEVELOPMENT

In its effort to enhance public awareness on career opportunities and to attract more youths to work in the commodity sector, the Ministry of Plantation Industries and Commodities (MPIC) organised the *Hello Komoditi* Programme on 15 April in Kota Tinggi, Johor. The one-day programme was the fifth in the series for 2012. The programme was officiated by YB Dato' Hamzah Zainudin, Deputy Minister of Plantation Industries and Commodities.

Apart from attracting youths to seek career opportunities in the commodities sector, *Hello Komoditi* also aimed to increase public awareness and knowledge on commodities. *Hello Komoditi* comprised four main activities including Seminar for Smallholders, Exhibition on Commodities, Open Interviews and Meet the Client Day. Almost 2,000 people which included school students, students from institutions of higher learning (IPT), school leavers, unemployed youths and smallholders from Johor, attended the programme.

The Smallholders Seminar attracted more than a thousand participants, the bulk of which comprising unemployed youth as well as members of Puteri UMNO from the state of Johor. Four papers were presented by the agencies under the MPIC: Entrepreneurship Oil-based Products (bakery and soap); Aquilaria Wood Entrepreneurship; Chocolate Manufacturing Entrepreneurship and Pepper-based Entrepreneurship.

Sixth agencies under MPIC took part in the exhibition. They were the Malaysian Palm Oil Board, Malaysian Rubber Board, MTIB, Malaysian Cocoa Board, National Tobacco Board and Malaysian Pepper Board. In addition, 11 government agencies and two financial institutions also participated. The agencies were Polis DiRaja Malaysia, Jabatan Pertanian, JobsMalaysia, Jabatan Tenaga Kerja, Jabatan Pertahanan Awam, Tekun Nasional, Amanah Ikhtiar Malaysia, RISDA, FAMA, Agensi Anti Dadah Kebangsaan, Pertubuhan Peladang and Jabatan

Kesihatan while the financial institutions were Agrobank and Bank Rakyat.

Meet the Client Day provided opportunities for the public to seek direct advice, resolve problems, and forward complaints and suggestions related to the services offered by the Ministry and its agencies. The direct approach helped strengthen the relationship between the Ministry and the community.

Overall *Hello Komoditi* has succeeded in meeting its objectives and will continue to serve as a medium to promote and highlight the services offered by the Ministry to the people.



YB Dato' Hamzah Zainudin, Deputy Minister of Plantation Industries and Commodities (second from right) presenting a basket of gaharu products to Tan Sri Syed Hamid Albar, Chairman of the Land Public Transport Commission.



YB Dato' Hamzah Zainudin having a go at wood carving at MTIB booth.

UPDATES ON ANTI-DUMPING AND TRADE REMEDY INSTRUMENTS



Encik Rashidi Said, MITI Senior Principal Assistant Director delivering his talk.



Participants at the briefing.

A briefing session on increasing awareness on anti-dumping and trade defense or remedy instruments for the Malaysian timber and furniture industry was held on 9 April in Kuala Lumpur. The objective of the briefing was to facilitate the domestic industry's understanding of anti-dumping and countervailing legislations of selected countries. While the focus was on the Malaysian timber and furniture industry, the briefing also aimed to safeguard and defend the interest of the domestic industry from unfair trade practice through anti-dumping, countervailing and safeguard measures in accordance with related World Trade Organisation (WTO) Agreements and national legislations.

Dr. Jalaluddin Harun, MTIB Director-General in his welcoming remarks noted that understanding of anti-dumping, and all its relevant procedures and measures, is crucial in globalised timber trade. This is to ensure that Malaysian timber and furniture entrepreneurs and exporters are fully aware of measures to consider when facing anti-dumping allegations by action by importing countries or our domestic timber/furniture market is being dumped with foreign imports. In addition, he also informed the participants that in exploring a new export market, apart from usual research on the market demand, Malaysian exporters are advised to trade with caution in order to avoid anti-dumping action against them. Appropriate pricing strategy should also be adopted to minimise the risk. He also encouraged the industry to actively participate in briefings as well as outreach and consultancy programmes by the Ministry of International Trade and Industry (MITI) for its stakeholders which include trade associations and companies, as part of its continuing efforts to increase awareness on trade remedial actions.

During the briefing, various issues related to anti-dumping were highlighted by the three invited speakers from the Trade Practices Section, MITI. Encik Rashidi Said, MITI Senior Principal Assistant Director, spoke on "Introduction to Trade Remedies." He stated that in essence dumping occurs when a company exports a product at a price lower than the price it normally charges in its own home market. The anti-dumping action will be initiated when the imports cause or threaten to

cause material injury to the domestic industry of the importing country. WTO provides trade remedial measure to offset the injury caused by dumping which comes in the form of additional duty and is usually based on the dumping margin calculated.

Puan Siti Zahara Abu Bakar, MITI Assistant Director, enlightened the participants on "Anti-Dumping Cases against Malaysia". This refers to Malaysian producers and exporters that export products into a foreign market at a price below that at which the same product is usually sold in its domestic market, causing or threatening to cause injury to the domestic industry of the importing country. She said that there are many ways for an industry to demonstrate material injury sustained by the act but they are generally categorised into price, volume and profitability effects. As of November 2011, a total of 13 anti-dumping cases against Malaysia on wood-based products namely plywood, particle board, fibreboard and wooden doors have been initiated by countries such as Australia, India, Korea, South Africa and Indonesia. However, only seven cases were still being investigated.

Encik Mohd. Reza Azman, MITI Senior Assistant Director, spoke on "Anti-Dumping Cases by Malaysia". He advised any company which receives a petition and notice of initiation from a foreign government authority to contact The Trade Practices Section of MITI for the next course of action. MITI will provide advisory service to the alleged company and will follow through the case until the investigation is concluded with a definitive finding for Malaysia. Companies are usually advised to cooperate in the investigation to ensure a fair and objective evaluation by the investigating country. As of September 2008, Malaysia has filed a total of nine anti-dumping cases on wood-based products on countries namely Canada, US, South Korea, Philippines, Indonesia, Thailand, EU, Japan, Poland, Australia and Chinese Taipei. However, only three cases were still being investigated.

The briefing session drew a participation of more than 70 people from various sectors of the timber industry as well as representatives from related ministries and government agencies. 

MALAYSIA AND AUSTRALIA STRENGTHENS FORESTRY AND TIMBER COOPERATION



The co-chairs and members of the Fourth SWG.

The Malaysia-Australia Agricultural Cooperation Working Group (MAACWG) – Fourth Meeting of the Forestry and Timber Sub-Working Group (SWG) was held on 17 April in Langkawi, Kedah, and was attended by 16 delegates comprising government officials from both countries. The meeting was co-chaired by Encik Low Yew Eng, Under-Secretary of the Timber, Tobacco and Kenaf Industries Development Division, Ministry of Plantation Industries and Commodities, Malaysia and Mr. Ben Mitchell, Director, International Forestry Policy Section in the Forestry Branch of the Climate Change Division, Department of Agriculture, Fisheries and Forestry, Australia.

The meeting aimed at strengthening and further developing cooperation in the forestry and timber industries between the two countries. Discussions centered on issues of common interest to both parties, pertaining to the two industries. Updates on the implementation of the Malaysian Timber Certification Scheme (MTCS), current developments pertaining to the Australian Illegal Logging Prohibition Bill 2011, and areas of possible collaboration with Australia in various areas in sector were among the main points discussed.



Some of the delegates at the Fourth SWG.

At the meeting, Australia indicated it was seeking to formally recognise the role of the Forestry and Timber SWG as a forum in which to openly discuss illegal logging issues and promote trade in legal timber and timber products. Australia is presently in the process of finalising its Illegal Logging Prohibition Bill 2011 and will be seeking to implement the associated regulations over the coming years.

Malaysia presented an update on the implementation of the Malaysian Timber Certification Scheme (MTCS). The meeting was informed that currently there were more than 4.65 million hectares of the Programme for the Endorsement of Forest Certification (PEFC) certified forests under the MTCS, with a total of 174 companies holding PEFC Chain of Custody (CoC) certification on a wide range of timber products. Malaysia also noted that the standard for forest management certification currently used under the MTCS (MC&I 2002) has been revised and will be implemented beginning 1 June 2013 after a 17-month transition period.

Australia acknowledged Malaysia's efforts to implement timber certification and MTCS will assist Australia's importers in meeting the requirements of the Illegal Logging Prohibition Bill 2011. Malaysia added that the MTCS will provide assurance on the sustainability of the timber resource. Legality issues can be addressed through the FLEGT VPA process which is currently being developed for the EU market. Malaysia expects the same system to meet Australia's requirements under the said Bill.

Australia reported that it would be seeking to develop regulations that would contain effective and practical control mechanisms to combat trade of illegal timber, while taking great care not to repeat any shortcomings of similar measures being implemented in other markets. Australia then made a presentation on the latest status of the Illegal Logging Prohibition Bill 2011. The meeting discussed a number of other issues, including the timeframe for the finalisation of the Bill, formulation of regulations, and possible implications for Australian importers and Malaysian exporters.

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DEVELOPING PRODUCT COSTING SKILLS FOR MANAGERS

MTIB, through its Bumiputera Entrepreneur Development Division, organised a course entitled Effective Cost Management in Furniture Production and Marketing on 3-5 April in Kuantan, Pahang. The objective of the course was to develop product costing skills for managers and entrepreneurs through the application of various methods for solid wood products as well as panel product lines. The three-day course was conducted by Facts Consultance and it was attended by 30 participants from Bumiputera furniture companies mainly in Pahang, Terengganu and Kelantan.

Two speakers presented talks on the various topics. Tuan Hj. Saiful Anwar Abu Hasan covered the topics related to Product Costing, Product Pricing for Different Markets, Break Even Point Analysis as well as Cost Management and Control. He elaborated on the calculation of production cost which comprised material, labour and overhead cost. He stated that entrepreneurs should understand the timber volume in tonnage and work on the recovery of materials in order to get the actual material usage of every single furniture component. He explained that wastage or rejection rates should be minimised in order to achieve higher material recovery and this will result in cost effectiveness in the furniture production. Some cost reduction approaches and pricing strategies were also discussed. Step-by-step calculation on pricing from ex-factory to Free on Board (FOB) and Cost, Insurance, Freight (CIF) prices were explained to participants.

Prof. Madya Dr. Mohd Ariff Jamaludin discussed topics related to Factors Affecting Reduction in Production Cost mainly on Design Aspect, Material Selection, Productivity and

Quality Improvements. He stated that product development begins with the designing of the furniture concept for *manufacturability* and concurrent engineering so that standardisation of materials, component sizes, common parts and features could be achieved. He added that the Lean Manufacturing Practices, Six Sigma and JIT methods are some of the approaches used in productivity improvement activities which could result in cost saving. Product Reengineering which involves redesigning the whole product development process has to be implemented once the product fails to perform due to quality problems or faults in design or material selection.

The participants were divided into three groups and each group presented its costing format in preparing quotations for retail, project and export markets. The course ended with closing remarks and a certificate-award ceremony presented by Encik Jumat Ahmad, MTIB Senior Deputy Director of Bumiputera Entrepreneur Development.



Speakers and participants of the course.

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MALAYSIA AND AUSTRALIA STRENGTHENS FORESTRY AND TIMBER COOPERATION

Malaysia discussed possible areas of collaboration on research and development on four key areas: Timber industry – timber drying using microwave technology and utilisation of forest residue; Climate change – reducing emissions from deforestation and forest degradation (REDD+); Forest Biodiversity and Conservation – timber tracking system using DNA profiling technique and conservation of threatened tropical species; Ecotourism and Identifying potential training and vocational institutes in furniture and woodworking.

Malaysia also sought Australia's assistance in providing information on developing the local pulp industry as well as identifying potential collaboration partners in areas related to using Radio Frequency Identification Devices in timber tracking, using Unmanned Aerial Vehicles in forest monitoring

and adopting the best practices on managing crocodile population, natural World Heritage Sites, RAMSAR/Wetland Areas as well as marine conservation.

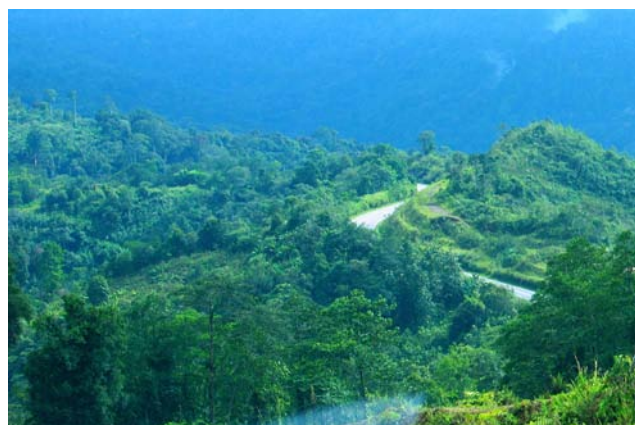
The SWG meeting provided a good forum and opportunity for Malaysia and Australia to share experiences and discuss matters related to forestry and timber industries in both countries. The meeting enabled both countries to engage in an open and detailed dialogue.

MTIB was represented at the meeting by Tuan Hj. Mahpar Atan, Director of Industry Development; Cik Hj. Robiyah Hj. Husin, Deputy Senior Director, Trade Development Division; Tuan Hj. Wan Draman Wan Salleh, Enforcement and Licensing Division and Puan T. Selvee, Trade Development Division.

MONITORING CARBON STOCKS UNDER REDD+

The United Nations Framework Convention on Climate Change (UNFCCC) aims to draft a legally binding global agreement by 2015 on the provisions to stabilise Greenhouse Gas (GHG) concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. This goal can be only achieved, when also the forest sector contributes to the mitigation actions. Land use change due to deforestation and forest degradation accounts for about 18% of global GHG emissions - the second largest source of GHG emissions globally which had contributed about 6 billion tonnes per annum resulting from about 13 million hectares of forests cleared each year (IPCC 2007), thus exceeding the share of the entire global transportation sector.

In response to Stern Report (2006), which identified deforestation as one of the major sources of emissions driving climate change and global warming, Costa Rica and Papua New Guinea proposed a mechanism to compensate countries for reducing deforestation and forest degradation and conserving intact forest areas. While both Clean Development Mechanism (CDM) and Reducing Emissions from Deforestation and Forest Degradation (REDD) are intended to reduce emissions, the CDM accomplishes this through afforestation and reforestation (A&R) - hence A&R CDM, and REDD through reducing deforestation rates and managing forest degradation (e.g. selective harvesting and/ or reduced or low impact logging <RIL or LIL>) in ways that minimise GHG emissions. REDD is an effort to create a financial value for the carbon stored in forests. The REDD concept is based on the assumption that forests will contribute to climate change mitigation only if their value increases to a level that make protecting forests consistent with viable development strategies (Angelsen et al. 2009). Within the mechanism of REDD, developed countries are allowed to pay for protecting tropical forests as a cost-effective alternative to cutting their own GHG levels. Developed nations can buy credits from developing nations that are supported by reliably measured



A study had identified deforestation as one of the major sources of emissions driving climate change and global warming and for that reason, the forest needs to be protected.

carbon stored in tree growth, thereby offsetting the higher cost of achieving corresponding reductions by cutting their own emissions. The “REDD+” scheme has widened the scope of REDD by including also forest conservation, sustainable management of forests and enhancement of forest carbon stocks into a REDD financing mechanism (Angelsen et al. 2011).

To participate in REDD+, developing countries are encouraged to develop national reference emission levels and forest reference levels that provide the benchmark against which GHG emission reductions can be measured. This includes Monitoring, Reporting and Verification (MRV) activities for estimating GHG emissions from changes in forest area, forest carbon stocks and forest condition over time. The Intergovernmental Panel on Climate Change (IPCC) has proposed three different options for estimating GHG emissions. These options are specified at different levels of detail (“Tiers”). For example, different Tiers represent different methodological complexities: whereas Tier 1 is the most basic and simple estimation methodology, Tier 3 is the most rigorous and demanding (IPCC 2006). Tier 2 is an intermediate level between Tier 1 and Tier 3. At Tier 3, higher accuracy—if it can be verified—is rewarded by a much higher compensation level per ton of carbon due to better reliability of the assessed amount of carbon captured in forests.

Tier 3-level estimations of forest carbon stocks can be achieved and verified through the application of remote sensing techniques. The following is an overview of two remote sensing techniques that have proven useful for growing stock estimation:

- Hyperspectral Remote Sensing
- Light Detection and Ranging

Hyperspectral Remote Sensing

Hyperspectral Remote Sensing, also known as imaging spectroscopy, is a relatively new technology. It has its origins in the conventional spectroscopy which is used to record spectral radiation of any material and stores the information

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REDD is an effort to create a financial value for the carbon stored in forest. Developed countries are allowed to pay for protecting tropical forest as a cost-effective alternative to cutting their own GHG.

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The estimations of forest plantation carbon stocks can be achieved and verified through the application of remote sensing techniques.

in a “spectral library”. Hyperspectral data are typically composed of 100 to 200 narrow spectral bands. The numerous bands provide a continuous spectral measurement across the electromagnetic spectrum, ranging from visible wavelengths over near and short-wave infrared up to the thermal infrared spectrum. Sensors can be mounted to a plane or satellite. Airborne systems reach the best spatial resolution down to one metre, while some spaceborne demonstration instruments produce down to 18-metre data for exploring the capabilities of imaging spectrometers for large-scale environmental monitoring.

Images produced from hyperspectral sensors contain a lot more data than those of multispectral sensors. The data can be presented similar to 3D data consisting of x and y axes that show the spatial location on a map, while the z-axis represents the sequence of measured spectral bands for each location. Hyperspectral sensors are more sensitive to subtle variations in reflected radiance of ground vegetation and therefore, have greater potential to detect differences in the vegetation cover. The recorded data reflect biochemical and biophysical characteristics of vegetation such as water, nitrogen content and leaf chlorophyll. Several scientific studies have shown that hyperspectral imaging may provide crucial information for assessing canopy biochemistry and physiology (Asner et al. 2006; Asner & Vitousek 2005; Darvishezadeh 2008) as well as leaf-to canopy-scale structure (Asner et al. 2008a; Kalacska et al. 2007a).

Airborne and satellite hyperspectral sensors have been found useful for the spectral discrimination of tree species, functional groups, species richness and biodiversity for tropical and sub-tropical forests (Asner et al. 2008b, Carlson et al. 2007; Clark et al. 2005; Kalacska et al. 2007b; Lucas et al. 2008). Leaf water and leaf pigments such as chlorophyll absorb certain wavelengths of the spectrum and thus, form a characteristic reflectance pattern that varies depending on the type of vegetation.

Hyperspectral data can also be applied to derive information on forest health condition (Ustin 2008). Vital vegetation

reaches maximum reflectance in the near and middle infrared spectrum. For example, the Forestry Department of Sarawak, Malaysia operates an airborne system to detect and map the distribution of specific fungus infection in oil palm trees. The health condition in individual palm trees can be mapped at high resolution by applying this method.

Due to the complexity and size of hyperspectral data, their pre-processing and analysis is greatly more complex compared to working with multispectral optical data. Fast computers and large data storage capacities are required for processing and interpreting the multi-dimensional information contained in the data. For image interpretation, the dimensionality of the data is usually reduced through image transformation techniques such as minimum noise fraction transformation that excludes redundant information from the data, thus, resulting in a much smaller data size.

Light Detection and Ranging (LiDAR)

Airborne laser scanning, also known as Light Detection and Ranging (LiDAR), is an active remote sensing modality. LiDAR sensors use laser beams to measure the three-dimensional structure of vegetation canopies and sub-canopy topography, as illustrated in **Figure 1**. With LiDAR both accurate vegetation height and ground elevation measurements can be acquired (Boudreau et al. 2008). LiDAR systems are classified as either discrete return or full waveform systems, and may further be characterized as profiling systems or scanning systems. Generally, full waveform LiDAR systems operate with relatively coarse horizontal spatial resolution (a footprint of 10 to 100m) combined with a fine and fully digitised vertical spatial resolution resulting in full sub-metre vertical profiles. Usually discrete return data achieve a spatial resolution between 0.1m and 2m, depending on scanning altitude and settings, such as opening angle.

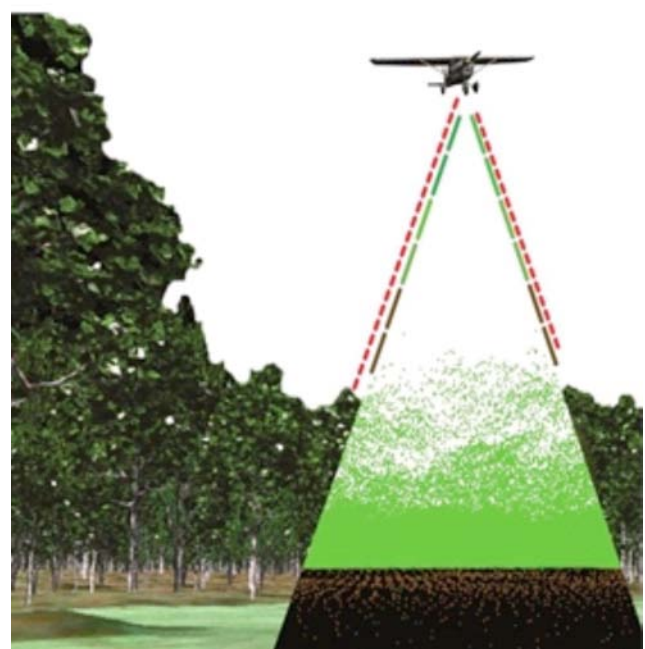


Figure 1 : Airborne laser scanning captures three dimensional data of natural and plantation forests.

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The greatest added value of LiDAR technology, when combined with advanced statistical models calibrated on sample plots, is forest degradation assessment. Forest biomass and carbon content can be predicted with high accuracy regressing LiDAR pulse height and density distribution properties with data from field measured biomass plots (**Table 1**). In addition, there is no more accurate technique to assess forest canopy closure than LiDAR (Korhonen et al. 2011).

There is a strong correlation between LiDAR response and above-ground biomass. LiDAR is the only remote sensing technology to provide measures that have been demonstrated to scale linearly with the full range of biomass values, which is of special interest for REDD monitoring (Drake et al. 2003). Although there have been major advances in conventional satellite remote sensing technology in recent years, none of these have been able to overcome the saturation problem that makes it difficult to detect forests with high above-ground biomass volume and to assess degradation (Næsset 2009). LiDAR provides a possibility to solve this saturation problem in biomass estimation because laser pulses penetrate even deeply through a dense multi-layered canopy. In contrast, conventional optical satellite images only see the topmost layer of the canopy.

As LiDAR is the most powerful remote sensing technique to cover full spatial variability of forest carbon stocks, this property can be utilised to generate surrogate sample plot values with LiDAR metrics based regression models. These surrogate plot values are applied to calibrate satellite imagery with a full geographic coverage over the area of interest. Thus, LiDAR can occupy a precise and significant role in temporal carbon stocks estimation and monitoring, especially with regard to the tropical region and the REDD+ scheme. Since 2009, there has been conducted a number of LiDAR-Assisted Multisource Programme (LAMP) pilot projects for carbon stock assessment, e.g. in Peru, Nepal, Madagascar and Ghana.

	LAMP approach, wall-to-wall LiDAR	LAMP approach, two-phase sampling	Very High Resolution Imagery (Aerial imagery etc.)	Medium Resolution Imagery (ALOS, Landsat)
Canopy cover	< 5%	5-10%	5-10%	~20%
Basal area	10-20%	20-30%	x	x
Mean height	3-8%	15-20%	x	x
Mean dbh	3-8%	15-20%	x	x
Stem volume	8-15%	25-35%	35-50%	40-60%
Above ground biomass	< 20%	25-35%	35-50%	35-55%

Table 1 : Experienced precision of forest resource estimation with different remote sensing data. Here the relative mean estimation errors (RMSE) refer to 1-hectare spatial resolution.

Similar to hyperspectral imaging, wall-to-wall LiDAR acquisition is more costly than conventional satellite remote sensing due to the sensor mobilisation, flight crew, and fuel costs. Nevertheless, LiDAR costs per hectare strongly



Two remote sensing techniques found to be useful for growing carbon stock estimation are Hyperspectral Remote Sensing, and Light Detection and Ranging.

decrease with increasing project area, i.e. for carbon stock estimations of larger areas, when LiDAR sampling is adopted instead of wall-to-wall LiDAR, costs per unit area become quite similar to conventional satellite imagery. Hence, it has to be kept in mind that carbon estimates at high accuracy levels, as achieved with LiDAR application, will result in higher compensation payments through REDD+.

Conclusion

LiDAR can support forest biomass assessment at various spatial levels, ranging from individual trees to vegetation on community, district, regional or national scales. It is envisaged that a synergy of information from LiDAR and hyperspectral sensors can improve estimates of biomass and other forest structural properties. It is expected that future remote sensing studies of biodiversity will benefit from explicitly connecting chemical and physical properties of the organisms to remotely sensed data.

In the context of REDD+, the combination of both techniques will provide an optimal way to achieve high-resolution carbon stock estimates and help developing effective national monitoring systems in the long-term. Integrating hyperspectral data in LAMP forest inventories provides an opportunity to make distinction between above-ground and deadwood pools which reflects to vitality and growth rates of the forests. Variables reflecting forest type or species-group biomass properties from hyperspectral data can be used to enhance/fine-tune the prediction process. There is also a tremendous market potential for hyperspectral remote sensing technology serving tropical forest concession planning purposes, in case some commercially valuable species or species groups can be pointed out reliably over vast and inaccessible areas in the future.

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JAPAN CONTINUES TO LEAD

Japan, a country of islands, extends along the eastern or Pacific coast of Asia. The four main islands, running from north to south, are Hokkaido, Honshu (or the mainland), Shikoku, and Kyushu. Okinawa Island is about 380 miles southwest of Kyushu. About 3,000 smaller islands are included in the archipelago. In total land area, Japan is slightly smaller than California. About 73% of the country is mountainous, with a chain running through each of the main islands. Japan's highest mountain is the world-famous Mount Fuji (12,388 feet). Since so little flat area exists, many hills and mountainsides are cultivated all the way to the summits.

As Japan is situated in a volcanic zone along the Pacific depth, frequent low-intensity earth tremors and occasional volcanic activity are felt throughout the islands. Japan has total area of 377,915 sq km and total population 127 million.

Even though Japan has a land area of 377,915 sq km, 70% of its land is forested and unsuitable for agricultural, industrial or residential uses. With only about 12% of its land being arable, Japan imports about 60% of grain and fodder crops from other countries and relies on the imports of commodities such as fuels, foodstuffs, chemical, textiles and raw materials from various countries for its industrial sectors. Japan is the world's third largest oil importer, with 5.033 million barrels per day to meet 45% of its energy needs. Japan boasts the largest fishing fleets in the world, accounting for almost 15% of the global catch.

Japan's industrialised, free-market economy is the third-largest in the world. Its economy is highly efficient and competitive in areas linked to international trade, but productivity is far lower in protected areas such as agriculture, distribution and services. Japan's reservoir of industrial leadership and technicians, well-educated and industrious work force, high savings and investment rates, and intensive promotion of industrial development and foreign trade produced a mature industrial economy.

Japan has few natural resources, and trade helps it earn the foreign exchange needed to purchase raw materials for its economy. In 2011, Japan's GDP growth rate was at negative 0.5%. The services sector contributed 74.6%, industry 24% and agriculture 1.4% to the GDP. GDP per capita is at USD34,300.

Forestry

Japan's 10 million hectares of planted forests, mainly planted in the 1950-60's, have reached the maturing stage. The planted forests are now shifting from "resource development stage" to "resource use stage". Given such resource condition, large-scale sawmills and plywood mills are shifting their procurement from imported logs to the domestic logs, in response to the uncertainty of international market, caused



by the growing demand of wood in emerging economies such as China and India, as well as drastic increase of export tax on logs in Russia. Under such circumstances, the forestry sector is now strongly expected to supply raw materials from planted forests to wood mills sustainably, contributing to the mitigation of global warming and creating jobs in the mountainous areas.

Forest ownership in Japan is characterised by a large number of small, fragmented, and scattered forest owners; almost 90% of forest owners own less than 10 hectares of forests. These forest owners tend to be reluctant in forestry practices due to low profitability. The mountainous areas cover 60% of total forest area, or 50% of total land area in Japan. In 2008, the gross forestry output was 444.9 billion yen, approximately 38% of its record high in 1980. Among the gross output, output derived from wood production was 213.3 billion yen, 5.4% decrease from the previous year, mainly due to the decline of production and lower prices.

Industrial wood demand in Japan fell to 78 million m³ in 2008, 5.3% decrease compared to the previous year due to the decrease of new housing starts and economic downturn since autumn in 2008. It was the first time in 42 years that the volume of wood demand went under 80 million m³ in Japan. Domestic wood supply, particularly for pulp, chip and plywood use, increased slightly, while imported wood supply decreased considerably. As a result, the self-sufficiency rate of wood reached as high as 24% in 2008.

Malaysia's Bilateral Trade with Japan

Malaysia's bilateral trade with Japan is substantial. In 2007, total trade was at RM120.7 billion. In 2008, total trade increased to RM136.9 billion. Imports from Japan have always been higher than Malaysia's exports to Japan and trade has always been in Japan's favour. However, in 2008, Malaysia's export increased by 30% to RM71.8 billion, thus

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recording a surplus of RM6.7 billion. In 2009, due to the global economic downturn, Malaysia's export fell to RM54.4 billion with a surplus of RM136 million. In 2010, exports increased to RM66.3 billion but Malaysia imported more from Japan and a deficit of RM251 million in Japan's favor. Malaysia's main exports to Japan include timber and timber products, petroleum, gas and agricultural products, while imports from Japan comprised of manufactured goods, machinery, and chemicals.

Malaysia – Japan Bilateral Trade (Value : RM million)

Year	Exports F.O.B.	Imports C.I.F.	Total Trade	Balance of Trade
2006	52,215	63,568	115,783	-11,353
2007	55,241	65,539	120,780	-10,298
2008	71,793	65,099	136,892	6,694
2009	54,424	54,288	108,712	136
2010	66,295	66,546	132,841	-251

Source: Statistics Department, Malaysia

Malaysia's Timber Trade with Japan

Japan is Malaysia's largest market for timber and timber products particularly for plywood and other value-added timber products such as furniture and MDF. In 2006, total timber exports were RM5.7 billion. In 2007, due to the weaker economic growth and lower housing starts, exports fell 18% to RM4.7 billion. Exports showed a marginal decrease of 2% to RM4.6 billion in 2008. In 2009, exports registered a decline of 23% to RM3.5 billion. In 2010, it was at RM3.6 billion and in 2011, total exports increased to RM4.4 billion.

In 2007, export of logs to Japan fell to 706,843 m³ compared to 1.04 million m³ in 2006. The volume accounted for 15% of Malaysia's total log exports. In 2008 and 2009, log exports fell 17% and 42% to 589,140 m³ and 342,830 m³ respectively. Exports of plywood similarly declined in 2007 to 1.9 million m³ from 2.5 million m³ in 2006. However, plywood exports increased to 2.04 million m³ in 2008 but fell to 1.5 million m³ in the following year.

Currently, Japan is the largest market for Malaysia's plywood. Malaysia overtook Indonesia as the largest supplier of plywood to Japan. Apart from logs and plywood, Japan is also Malaysia's major market for wooden and rattan furniture. Exports of furniture to Japan totaled RM577 million in 2006 and in 2007, furniture exports rose to RM622 million. Furniture exports in 2008 totaled RM608 million. In 2009, furniture exports increased to RM712 million. Exports of MDF in 2007 amounted to RM212 million and increased to RM215.3 million in 2008. Exports fell marginally by 7% to RM200.7 million in 2009. However, in 2010 it increased to RM232.1 million and in 2011 it was at RM256.1 million.

Malaysia's Import of Timber Products from Japan

Malaysia's import of timber products from Japan shows a fluctuating trend. Total import in 2007 amounted to RM7.9 million and in 2008; imports fell to RM6.2 million. Imports rose to RM12.2 million in 2009. However, in 2010 it dropped to RM4.4 million and increased to RM5.6 million in 2011. The major products imported by Malaysia in 2011 were furniture totalling RM1.9 million, followed by sawntimber at RM1.8 million.

Malaysia : Export of Timber and Timber Products to Japan (Value: RM '000)

Products	2006	2007	2008	2009	2010	2011	2012 (Jan-Feb)
Logs	533,920	354,786	310,389	170,790	212,097	229,295	26,576
Sawntimber	246,794	237,300	224,260	137,577	150,292	161,874	28,590
Plywood	3,839,844	2,975,972	2,953,229	2,022,654	2,159,743	2,704,383	412,532
Veneer	49,855	54,297	46,518	32,031	30,766	36,565	5,307
Mouldings	165,783	167,491	152,497	107,492	91,033	110,058	16,056
BJC	80,488	54,293	82,947	132,544	84,374	111,004	19,210
MDF	216,107	211,958	215,251	200,744	232,057	256,083	54,732
Particleboard	4,989	8,641	17,920	15,127	14,115	22,072	2,822
Wooden Furniture	574,916	619,849	607,878	711,006	607,507	775,098	117,644
Rattan Furniture	1,739	1,761	170	973	16	366	0
Total	5,714,435	4,686,348	4,611,059	3,530,938	3,582,000	4,406,798	683,469

(Volume : m³)

Products	2006	2007	2008	2009	2010	2011	2012 (Jan-Feb)
Logs	1,036,939	706,843	589,140	342,830	355,135	360,495	43,677
Sawntimber	149,390	140,927	131,194	74,350	68,189	86,810	29,689
Plywood	2,527,655	1,937,933	2,041,790	1,485,148	1,238,252	1,496,873	240,785
Veneer	32,882	33,948	28,420	18,289	14,131	18,977	2,485

Source: MTIB, DOSM

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Malaysia : Import of Timber Products from Japan (Value : RM '000)

Products	2008	2009	2010	2011	2012 (Jan-Feb)
Logs	1,064	1,072	1,168	1,849	0
Sawntimber	1,152	521	865	503	33
Plywood	223	0	250	169	16
Veneer	1,096	1,136	0	133	0
Particleboard	119	13	29	73	0
Mouldings	23	241	23	168	0
BJC	36	7,298	104	135	217
Fibreboard	1,193	457	330	287	27
Wooden Furniture	1,139	1,431	1,229	1,950	109
Rattan Furniture	158	20	355	290	42
Total	6,203	12,189	4,353	5,557	444

Source: MTIB, DOSM

Japan's Import of Timber and Timber Products

Import of timber and timber products by Japan had been substantial due to its high consumption. However, in 2008, imports recorded a sharp decline due to the global economic slow down. In 2007, total import of logs, sawntimber and plywood totalled to 20.7 million m³. In 2008, total imports fell 35% to 13.4 million m³. Imports fell lower to 11.4 million m³ in the following year. In 2010, it increased heftily by 20% to 13.8 million m³.

Japan: Import of Timber and Timber Products (Volume: '000 m³)

Products	2004	2005	2006	2007	2008	2009	2010
Logs	12,683	10,654	10,562	8,973	6,032	4,090	4,611
Sawntimber	9,491	8,721	8,873	7,673	3,769	4,471	6,284
Plywood	4,940	4,574	4,881	4,008	3,560	2,844	2,893

Source: Japan Lumber Reports

Logs

Log imports have declined during the last few years. In 2008, log imports fell 22% to USD1.4 billion from USD1.8 billion in the previous year. Imports fell lower to USD817 million in 2009. However, in 2010 it increased to USD1 billion. Japan's imports of logs are mainly from the US, Canada, Malaysia, New Zealand and Russia.

Japan : Import of Logs, 2000-2010 (Value. : USD million)

Countries	2006	2007	2008	2009	2010
USA	607	565	539	377	412
Canada	234	208	221	163	270
Malaysia	233	187	146	80	112
New Zealand	87	101	105	53	97
Russia	592	618	316	111	78
Total	1,836	1,761	1,379	817	1,007

Sawntimber

Imports of sawntimber in 2007 amounted to USD2.6 billion and fell 11% to USD2.4 billion in 2008. Imports declined further to USD1.9 billion in 2009 and in 2010, it increased to USD2.3 billion. Sawntimber imports were mainly from Canada, Russia, Sweden, Finland and the US.

Japan : Import of Sawntimber , 2000-2010 (Value : USD million)

Countries	2006	2007	2008	2009	2010
Canada	1,053	810	869	591	770
Russia	270	325	245	261	275
Sweden	249	233	195	213	240
Finland	335	349	243	185	200
USA	91	104	122	119	175
Total	2,733	2,641	2,361	1,892	2,305

Source: Comtrade

Plywood

Japan's import of plywood has been fluctuating. In 2006, imports amounted to USD2.4 billion and in 2007; imports fell to USD2.1 billion. In 2008 and 2009, imports fell to USD1.9 billion and USD1.4 billion respectively. However, in 2010 it increased to USD1.7 billion. Plywood import mainly came from Malaysia, Indonesia and China.

Japan : Import of Plywood, 2000-2010 (Value : USD million)

Countries	2006	2007	2008	2009	2010
Malaysia	1,180	1,015	974	677	778
Indonesia	868	726	557	455	559
China	267	306	298	207	288
New Zealand	22	25	16	16	25
Taiwan	20	15	10	6	17
Total	2,419	2,154	1,900	1,402	1,722

Source: Comtrade

Furniture

In 2007, Japan imported USD4.3 billion worth of furniture and increased to USD4.5 billion in 2008. However, imports fell to USD3.9 billion in 2009. In 2010, it increased to USD4.4 billion. Most of the furniture imports were mainly from China, Viet Nam, Indonesia, Taiwan, Thailand and Malaysia.

Japan's furniture production in 2007 amounted to USD11.9 billion and rose to USD12.1 billion in 2008. In 2009, production fell to USD11.5 billion. Similarly, exports of furniture fell 18% to USD739 million in 2009 from USD898 million in the previous year. It increased heftily to USD1 billion in 2010.

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In 2009, Japan's furniture production amounted to USD11.5 billion.

Japan : Furniture Sector , 2004-2010 (Value : USD million)

Sector	2004	2005	2006	2007	2008	2009	2010
Production	13,643	13,022	12,289	11,895	12,122	11,534	12,136
Export	422	506	574	703	898	739	1,023
Import	3,773	3,899	4,062	4,278	4,475	3,854	4,356
Consumption*	16,995	16,415	15,776	15,470	15,698	14,649	15,469

* Apparent consumption = Production + Import - Export

Source: CSIL

Japan : Origin of Furniture Imports

Countries	Percentage
China	53.80%
Viet Nam	7.90%
Indonesia	5.40%
Taiwan	5.10%
Thailand	5.10%
Malaysia	4.90%
Mexico	4.10%
Italy	1.80%
Philippines	1.70%
Austria	1.70%

Source: CSIL

Timber and Timber Import Tariffs Imposed by Japan

Products	Percentage
Logs	0%
Sawntimber	0%
Veneer	0% - 6%
Mouldings	0% - 7%
Particleboard	5% - 6%
MDF	2.60%
Plywood	6% - 10%
BJC	2% - 5%
Furniture	0%

Import tariffs on timber products in Japan are low. While tariffs for sawntimber, mouldings and furniture are at 0%. Tariffs for tropical hardwood plywood under HS Code 4412.13 (less than 6mm thickness) are 6% to 10%. For softwood plywood, tariff is at 6%.

Prospects

Japan has currently registered positive economic growth despite global economic crisis pressures. But like any other

countries, Japan too has also been significantly affected by the current financial crisis. Growth predictions for Japan are on a lower side, considering its capabilities to ward off adverse effects of global economic crisis.

Japanese economy is now recovering from the catastrophic 11 March earthquake and tsunami at a faster rate than initially expected. It is believed that Japanese manufacturers will return to pre-earthquake output levels by the second half of this year whereby the disruption to Japan's manufacturing supply chain would be fully restored. However, Japan is still vulnerable to disruptions in its power supply, which may result in some Japanese companies relocating their factories overseas.

With this possibility, Japan urged ASEAN member countries to make further efforts in improving the business environment for Japanese companies operating in the region. Japan has been the top source of foreign direct investment (FDI) for ASEAN, contributing USD5.2 billion to the region's economy in 2009. Trade between Japan and ASEAN rebounded from USD160.9 billion in 2009 to USD215 billion last year. Despite the 11 March earthquake and tsunami disaster, Japan is hopeful that trade with ASEAN will rebound soon.

Besides FDI expansionary prospects, housing, starts in Japan also rose 7.5% in February from a year earlier, the first rise in six months, indicating intensifying rebuilding efforts after the earthquake and tsunami incident. Annualised housing starts totalled 917,000 compared to 822,000 in January. February's figure also exceeded the 840,000 figures. In addition, orders received by 50 major construction companies dropped by 0.3% from the previous drop of 1.8%.

Based on the economic scenarios, the prospects of increasing the shipments of Malaysia's timber and timber products to the Japanese market appears to be promising in the coming years.

References:

- <https://www.cia.gov>
- <http://www.fco.gov.uk>
- <http://www.thegrainsfoundation.org>
- <http://www.bbc.co.uk>
- <http://www.bloomberg.com>
- <http://www.reuters.com>
- <http://www.hktdc.com>

CNC ENGRAVING TECHNOLOGY

Although CNC engraving technology is not new, advancements in technology, software and machinery continue to increase - making it a more viable, user-friendly and efficient option for producing high-quality multi-level engravings. This CNC engraving can be used for wood processing, craft manufacturing, precision cutting, carving, drilling and machining on all kinds of material for 3-D engineering prototyping, product development, art, production work and education purpose, easily transferring 2D to 3D Artwork by Hybrid software.

As CNC engraving technology continues to advance, so too do the many advantages it offers. Artwork can be immediately transferred to the engraver digitally; therefore, neither cost nor time is lost with film output and transfers. Digital artwork also facilitates a precise translation to the CNC engraving programme. In addition, CNC engraving allows a machining programme to be executed repeatedly, producing multiple quantities in exact replication, which can result in quicker, more precise set-up on press. Finally, because the CNC machining programme is stored digitally by the diemaker, customers can reorder dies without having to resupply the artwork.



There are also rapidly enhancements by way of software development to streamline the production process of CNC engravings. Over the last few years, a gradual transition from traditional methods of engraving to computerised design and manufacturing has taken place. This has allowed companies to cut lead times into at least half because they can quickly create intricate designs in engravings,

which then automatically calculate and produce toolpaths for machining. These programmes provide design methods that are more in tune with how an artist or sculptor would create a die manually. The programmes are faster and easier to learn and operate than mechanical CAD/CAM programmes, while still providing the same tools for designers that prefer them.

To be ahead and competitive, Malaysian manufacturers must constantly keep abreast of current technological developments in this particular field. As such, WISDEC as a training centre, has endeavoured to impart relevant and latest knowledge through its courses to bridge knowledge gaps. One of its efforts to ensure timber industry personnel is kept abreast with the latest technology is by providing a CNC engraving machine technology training programme. WISDEC officers who need to acquire knowledge and skills to equip themselves with the necessary expertise and competency attended the CNC in-house training programme from 16-19 April in WISDEC, Banting.

The officers were trained by Encik Au Yong Mun Loon, an instructor from Advance Artistic Technology Sdn. Bhd. and Encik Hafizul Hazmir Hashim from PassionArt Creations. The course covered installation, software programming and machine processing. It is hoped that through the training programme, WISDEC officers can be fully equipped with theoretical and practical knowledge to operate the machine, which was recently installed in WISDEC, Banting.

WISDEC will also commence training programmes for the industry as well as implement projects for optimum application of the CNC engraving machine. For those who are interested to learn more about the machinery, feel free to contact WISDEC Selangor at 03-31492924.



Hands-on session.



Course instructors and participants.

STAKEHOLDER CONSULTATION ON FLEGT VPA

Stakeholder consultation is an important instrument in the formulation of the legality assurance system under the Malaysia-EU Forest Law Enforcement, Governance and Trade Voluntary Partnership Agreement (FLEGT-VPA). In this regard the Ministry of Plantation Industry and Commodities organised the Seventh Multi-Stakeholder Consultation on FLEGT VPA on 26 April in Kuala Lumpur.

Encik Low Yew Eng, Under-Secretary of the Timber, Tobacco and Kenaf Industries Development, Ministry of Plantation Industries and Commodities (MPIC) when officiating the function remarked that the FLEGT VPA process is to ensure that only legal timber enters the European market. This is in line with Malaysia's objective to ensure trade in legal timber. He also emphasised the importance of having stakeholders' support in the FLEGT VPA negotiation process that is currently undertaken by MPIC.

MTIB, as the licensing authority that will issue FLEGT licences is required to implement the control procedures of the Timber Legality Assurance System (TLAS) for timber and timber products covered under the VPA product scope. Within this context timber products which are accompanied by the FLEGT licences are deemed to have complied with the laws, regulations and procedures dealing with forest harvest licensing, mill licensing, export and import licensing of Malaysia.

Encik Wan Mazlan Wan Mahmood, Under-Secretary of the Strategic Planning and International of MPIC gave a brief background on the FLEGT VPA process and update on the progress made by Malaysia in its efforts to conclude the VPA. He further elaborated on some of the outstanding issues on FLEGT VPA. He also mentioned that some issues on Third Party Monitoring, Independent Market Monitoring and the TLAS for Peninsular Malaysia have yet to be finalised. He reiterated that the TLAS is a living document and therefore it would continue to be refined and improved from time to time.

Encik S. Rajan, MTIB Director of the Licensing and Enforcement provided an update on the progress of formulation of the TLAS. He pointed out that Malaysian timber and timber products exported to the European Union amounted to RM2.1 billion, RM2.86 billion and RM2.29 billion in 2009, 2010 and 2011 respectively. This gives an overall average of 12% of Malaysia's total exports of timber products being exported to the EU market. Meanwhile, the total export of the four VPA products namely logs, sawntimber, plywood and veneer amounted to about 30% of the total

export to EU. He stressed that TLAS is a system that will be continuously improved based on feedback, system improvement and new knowledge. Currently, it has been amended to provide greater clarity and details such as legal requirements and related control procedures, elaboration on the column on verification and frequency of control procedures. He also emphasised that the success of TLAS's implementation would depend very much on the support of and coordination with several implementing and enforcing department and agencies.

The Consultant, Dato' Dr. Baharuddin Hj. Ghazali, gave a brief introduction on the outcome of the linkages study on the implementation of Malaysia's TLAS. These recommendations are aimed at establishing systems of linkages and information flow that would provide for a seamless implementation and verification procedures. These recommendations needed special attention to strengthen linkages within the TLAS before the successful conclusion of the FLEGT VPA.

A copy of the Consultant's report entitled "Mechanisms to Strengthen Coordination for the Implementation of Malaysia's Timber Legality Assurance System" was circulated to all participants.

MPIC thanked and congratulate the moderator, Emeritus Prof. Dato' Dr. Abdul Latiff Mohamad from the Faculty of Science and Technology, Universiti Kebangsaan Malaysia for successfully chairing the Seventh Multi-Stakeholder Consultation sessions. Ninety-nine participants comprising 61 participants were from government ministries, agencies and departments; 31 participants from non-governmental organisations and industries, and the other seven participants were from the academia attended the consultation. 



Attendees at the briefing.

MEMPENING – SUITABLE FOR HEAVY CONSTRUCTION

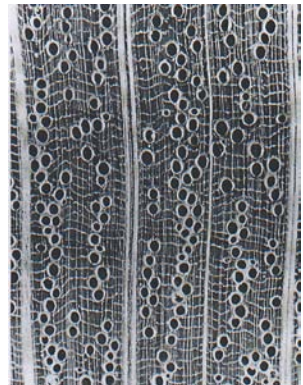
Mempening is the product of species from two genera, *Litchocarpus* and *Quercus*. In Malay it also known as *empenit*, *empilit* (Iban), *salad* (Kayan, Kelabit, Kenyah, Melanau, Murut, Punan) and *tekulud* (Dusun). About 300 species, mainly in the tropics and subtropics of NE India (Nepal, Bhutan), Myanmar, China, Korea, Indo-China and Thailand. In Sabah and Sarawak, the genus is represented by 61 species. Found scattered in the higher altitudes but also in the lowland rain forests, on different types of soils, including limestone substrate. Mempening is a medium hardwood and moderate durable. For permanent construction, preservative treatment is a prerequisite. The timber is classified under Strength Group 4 (SG 4) according to the Malaysian Standard (MS 544:Part 2:2001)-Code of Practice For Structural Use of Timber'.

General Description

Sapwood is not always well-defined but is usually lighter in colour than the heartwood, which varies between yellow-brown and red-brown, sometimes quite dark red. Grain is straight to interlock and a true oak-like silver figure is prominent on the radial surface. Vessels are few to moderately numerous,



Wood colour and texture.



Cross section of Mempening.

medium-sized to very large, mostly large, exclusively solitary and arranged in bunched group (festoons); tyloses are abundant in some species but scanty in others. Wood parenchyma is abundant, in short tangential lines running across the rays, appearing like rungs of a ladder. Rays are of two distinct sizes; the large ones are extremely broad, the fine ones are only visible with a hand lens.

Uses

The timber is suitable for medium to heavy construction under cover such as house post, beam joineries and flooring. Duly process, it is also suitable for furniture, cabinet making, interior fittings, paneling and other decorative interior. The wood can be use to manufacture plywood and sliced veneer.

References:

- *Tree Flora of Sabah and Sarawak (Volume 3)*, Jointly publication of Sabah Forestry Department, FRIM and Sarawak Forestry Department.
- *100 Malaysian Timbers, MTIB (Fourth Reprint: December 2003)* 



Application of Mempening.

Physical Properties

Air – Dry Density	575 – 1,010 kg / m ³
Tangential	1.9 %
Seasoning	4.2 %
Recommended Kiln Schedule	Seasons moderately slowly with slight degrade
Durability	Moderate durable

Mechanical Properties

MOE	18,100 – 19,400 N/mm ²
MOR	115 – 122 N/mm ²
Compression Strength (Perpendicular To) Grain	11.93 – 12.17 N/mm ²
Compression Strength (Parallel To Grain)	61.70 – 63.20 N/mm ²
Shear Strength	12.80 – 16.50 N/mm ²

Working Properties

Planing	Easy	Finish	Smooth
Boring	Easy	Finish	Fairly smooth
Turning	Difficult	Finish	Rough
Nailing	Poor		

MTIB Moments



A study team from Japan International Cooperation Agency was in Malaysia recently to collect data on forest plantation. Dr. Takaki Toyoda, Director of Operation and Mr. Hajime Naganawa, Senior Technical Advisor visited Sykt. Acacia Industries Sdn Bhd. on 3 April 2012 in Gua Musang, Kelantan accompanied by MTIB and FPDSB Sdn Bhd. officials.



A blood donation programme was held at Menara PGRM, Kuala Lumpur jointly organised by MTIB, National Blood Centre and Cempaka Sdn. Bhd. on 25 April 2012. More than 100 people participated in this programme.



MTIB organised a Course on Sketch-up Drawing in Furniture Designing (kitchen cabinet and receptionist counter) on 26-28 April 2012 in Johor Bahru.



MTIB organised a malaysianwood.net Workshop for the Sabah timber industry on 26 April 2012 at MTIB, Kota Kinabalu.



Twenty-two MTIB officers attended a Course on Effective Report Writing from 26-27 April 2012 in Kuala Lumpur.

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References:

- Angelsen, A., Brown, S., Loisel, C., Peskett, L., Streck, C., Zarin, D. 2009. *Reducing Emissions from Deforestation and Forest Degradation (REDD): An options assessment report*. Prepared for the Government of Norway by the Meridian Institute, ISBN 978-0-615-28518-4. Available online: www.REDD-OAR.org
- Angelsen, A., Boucher, D., Brown, S., Merckx, V., Streck, C., Zarin, D. 2011. *Guidelines for REDD+ Reference Levels: Principles and recommendations*. Prepared for the Government of Norway by the Meridian Institute, ISBN 978-0-615-56023-6. Available online: www.REDD-OAR.org
- Asner, G.P. and Vitousek, P.M. 2005. *Remote Analysis of Biological Invasion and Biogeochemical Change*. *Proceedings of the National Academy of Sciences* 102(12): 4, 383-4, 386.
- Asner, G.P., Martin, R.E., Carlson, K.M., Rascher, U., Vitousek, P.M. 2006. *Vegetation-climate Interactions Among Native and Invasive Species in Hawaiian Rainforest*. *Ecosystems* 9: 1106-1117.
- Asner, G.P., Knapp, D.E., Jones, M.O., Kennedy-Bowdoin, T., Martin, R.E., Boardman, J., Field, C.B. 2007. *Carnegie Airborne Observatory: In-flight Fusion of Hyperspectral Imaging and Waveform Light Detection and Ranging (wLiDAR) for Three-dimensional Studies of Ecosystems*. *Journal of Applied Remote Sensing* 1, doi:10.1117/1.2794018
- Asner, G.P. and Martin, R.E. 2008a. *Spectral and Chemical Analysis of Tropical Forests: Scaling from Leaf to Canopy Levels*. *Remote Sensing of Environment* 112: 3958-3970.
- Asner, G.P., Jones, M.O., Martin, R.E., Knapp, D.E., Hughes, R.F. 2008b. *Remote Sensing of Native and Invasive Species in Hawaiian Forests*. *Remote Sensing of Environment* 112: 1912-1926.
- Boudreau, J., Nelson, R.F., Margolis, H.A., Beaudoin, A., Guindon, L., Kimes, D.S. 2008. *An Analysis of Regional Aboveground Forest Biomass Using Airborne and Spaceborne LIDAR in Québec*. *Remote Sensing of Environment* 112: 3876-3890.
- Carlson, K.M., Asner, G.P., Hughes, R.F., Ostertag, R., Martin, R.E. 2007. *Hyperspectral Remote Sensing of Canopy Biodiversity in Hawaiian Lowland Rainforests*. *Ecosystems* 10: 536-549.
- Clark, M.L., Roberts, D.A., Clark, D.B. 2005. *Hyperspectral Discrimination of Tropical Rainforest Tree Species at Leaf to Crown Scales*. *Remote Sensing of Environment* 96(3-4): 375-398.
- Darvishzadeh, R. 2008. *Hyperspectral Remote Sensing of Vegetation Parameters Using Statistical and Physical Models*. Dissertation, International Institute for Geo-information Science and Earth Observation, Enschede (ITC) and Wageningen University, the Netherlands.
- Drake, J.B., Knox, R.G., Dubayah, R.O. 2003. *Above-ground Biomass Estimation Inclosed Canopy Neotropical Forests Using LiDAR Remote Sensing: Factors Affecting the Generality of Relationships*. *Global Ecology and Biogeography*, 12: 147-159.
- IPCC. 2006. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. Prepared by the National Greenhouse Gas Inventories Programme, Eggleston H.S., Buendia L., Miwa, K., Ngara T., Tanabe, K (eds). Published: IGES, Japan, ISBN 4-88788-032-4. Available Online: www.ipcc-nggip.iges.or.jp/public/2006gl/
- IPCC. 2007. *Climate Change 2007: Synthesis Report. The Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, UK and New York, USA.
- Kalácska, M., Bohlman, S., Sánchez-Azofeifa, G.A., Castro-Esau, K., Caelli, T. 2007a. *Hyperspectral Discrimination of Tropical Dry Forest Lianas and Trees: Comparative Data Reduction Approaches at the Leaf and Canopy Levels*. *Remote Sensing of Environment* 109: 406-415.
- Kalácska, M., Sánchez-Azofeifa, G.A., Rivard, B., Caelli, T., White, H.P., Calvo-Alvarado, J.C. 2007b. *Ecological Fingerprinting of Ecosystem Succession: Estimating Secondary Tropical dry Forest Structure and Diversity Using Imaging Spectroscopy*. *Remote Sensing of Environment* 108: 82-96.
- Koetz, B., Sun, G., Morsdorf, F., Ranson, K.J., Kneubühler, M., Itten, K.I., Allgöwer, B. 2007. *Fusion of Imaging Spectrometer and LiDAR Data Over Combined Radiative Transfer Models for Forest Canopy Characterisation*. *Remote Sensing of Environment* 106: 449-459.
- Korhonen, L., Korpela, I., Heiskanen, J. & Maltamo, M. 2011. *Airborne Discrete-return LiDAR Data in the Estimation of Vertical Canopy Cover, Angular Canopy Closure and Leaf Area Index*. *Remote Sensing of Environment* 115(4): 1065-1080.
- Lucas, R.M., Bunting, P.J., Paterson, M., Chisholm, L. 2008. *Classification of Australian Forest Communities Using Aerial Photography, CASI and HyMap Data*. *Remote Sensing of Environment* 112(5): 1088-2103.
- Næsset, E. 2009. *Effects of Different Sensors, Flying Altitudes, and Pulse Repetition Frequencies on Forest Canopy Metrics and Biophysical Stand Properties Derived from Small-footprint Airborne Laser Data*. *Remote Sensing of Environment*, 01/2009, Volume 113, Issue 1, p.12.
- Rosenqvist, A., Milne, A., Lucas, R., Imhoff, M., Dobson, C. 2003a. *A Review of Remote Sensing Technology in Support of the Kyoto Protocol*. *Environ. Sci. Policy* 6 441-55.
- Stern, Sir Nicholas. 2006. *Stern Review. The Economics of Climate Change*. Cambridge University Press, Cambridge, UK.
- Swatantran, A., Dubayah, R., Roberts, R., Hofton, M., Blair, B. 2011. *Mapping Biomass and Stress in the Sierra Nevada Using LiDAR and Hyperspectral Data Fusion*. *Remote Sensing of Environment* 115 (11): 2917-2930.
- Ustin, S. 2008. *Analysis of Hyperspectral Remote Sensing to Detect and Map Tree Decline at Ft. Benning, Georgia*. Center for Spatial Technologies and Remote Sensing, University of California, Davis. 