



Forest Research Institute Malaysia strives for a more sustainable future through innovative timber solutions by Chow Ee-Tan

Forest Research Institute Malaysia (FRIM)—a renowned leader in tropical forest research and a valued contributor to global initiatives for conserving and sustainably managing forest ecosystems—focuses its research and development (R&D) and product development towards the sustainability of forestry materials, particularly timber, in the building industry. According to Dr. Sharmiza binti Adnan, the managing director of Product Certification Services (PCS) at FRIM, the institute is actively engaged in various sustainability programmes, which include a tree planting initiative, ongoing research and development into new raw materials, and the development of germplasm to ensure a sustainable and documented source of timber species, among others.

There is a growing trend in the building construction industry today towards using timber as an alternative to traditional materials, such as concrete and steel. One of the main reasons for this shift is the environmental impact of traditional construction materials like concrete, whose production is responsible for 8% of global CO₂ emissions.

“Timber is renewable and has a lower carbon footprint than other construction materials that consume a lot of fossil fuel energy to produce,” said Dr. Sharmiza binti Adnan, Managing Director of Product Certification Services (PCS) at Forest Research Institute Malaysia (FRIM). “It is also cost-effective, requires less time for assembly than traditional methods, produces less pollution to the environment, and consumes less natural materials from earth resources. In addition, its production takes less electricity and energy from other building materials.”

FRIM, under the umbrella of Malaysia's Ministry of Natural Resources, Environment and Climate Change (now known as Ministry of Natural Resources and Sustainability), is a premier research institution in Malaysia dedicated to the advancement of forestry and forest-related research, development, conservation, and commercialisation. The institute has

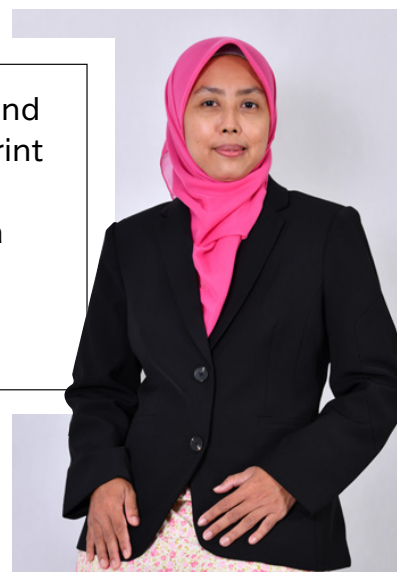
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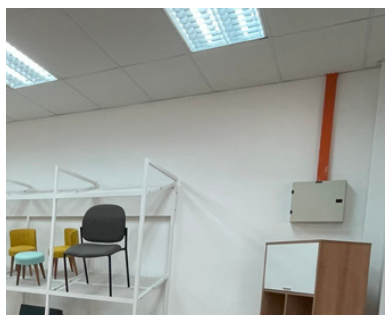
played a pivotal role in the development and management of Malaysia's forest resources, as well as in the promotion of sustainable forest management practices.

In an interview with *Furnish Now*, Dr. Sharmiza said there are several sustainability programmes being undertaken by FRIM. Among them are tree planting programmes, research and development into new raw materials, new product development, development of germplasm to ensure sustainable and documented sources of timber species, and development of demonstration forest plantations for various species in FRIM's research stations throughout Peninsular Malaysia—taking into consideration the types of soil and species suitability.

Dr. Sharmiza binti Adnan is the Managing Director of FRIM Product Certification



Services since 2020. She works closely with Mr. Hashim W. Samsi, head of Technical PCS and head of the product quality program at FRIM. Throughout more than 26 years of career in R&D, she has been involved in more than 50 research and consultancy projects, co-authored more than 70 publications and involved in more than 40 human capacity building programmes. She is also involved in various technical committees in standard development. Dr. Sharmiza is happily married with four kids and loves to cook during her free time.



Green Furniture Showroom at FRIM



Mr. Hashim W. Samsi, Head of Technical PCS and Head of Program Wood Product Quality, FRIM

On timber and sustainability

According to Dr. Sharmiza, sustainability has become the keyword when using timber as a building material.

“Wood is the only renewable construction material and can be found in every part of the world. It is an eco-friendly material that lowers the percentage of CO₂ emission in the atmosphere. Wood can replace other building materials which require a large amount of fossil fuel energy in their production,” she explained.

“Timber is renewable, and can be sourced from sustainably managed forests or plantation forests. The supply is replenished as the material is used. Wood is a more environmentally friendly choice than materials like concrete and steel, which have a larger carbon footprint due to the energy required in production. Likewise, timber has a lower carbon footprint than these materials, as it absorbs and stores carbon dioxide while it grows,” added Mr. Hashim.

Another advantage of the use of timber as a building material is its cost-effectiveness.

“Timber requires much less time for assembly than traditional methods associated with other building materials. Although, initially, the machinery used to process timber may be more expensive, the overall cost of timber building is often more economical than other building materials, i.e., concrete material,” shared

Dr. Sharmiza. She added that the use of prefabricated timber will furthermore save a lot of time spent at construction sites, as the wood can be easily transported to the building site and assembled quickly.

Dr. Sharmiza said that contrary to popular belief, wood is actually processed in a way that it has insulating properties that prevent it from burning uncontrollably. Manufacturers or designers are able to create timber components that are resistant to fires.

“While there are concerns about the safety of timber structures, these can be addressed through proper design and construction techniques. As a construction material, timber offers a number of benefits that make it an attractive option for builders and homeowners alike. There are presently ongoing initiatives to reuse fallen logs and other tree parts for R&D in timber preservation, and these parts are also used to produce wooden furniture, souvenirs and other gift items,” she added.

Some important timber quality traits for furniture application are stability (low expansion-shrinking), load-bearing strength, durability against degradation or pests and finishing properties.

“Nowadays, climate change is forcing us to conserve natural forest areas by reducing logging to a significant level. Thus, we have to concentrate our effort on helping the establishment of forest plantations as a sustainable source for the furniture industry and other wood-based

industries,” she continued. She added that timber has the potential to be the future of the construction industry due to its sustainability, abundance, cost-effectiveness, time-saving and safety qualities if it is implemented properly.

“However, timbers from forest plantations usually do not have as good quality compared to natural forests. This is where FRIM’s R&D plays an important role in improving the properties of forest plantation timbers until the timbers are suitable for furniture or other products,” Dr. Sharmiza emphasised.

Advancing forestry R&D

From a few decades back, FRIM had initiated its R&D efforts to reduce dependency on timber from natural forests as a raw material for furniture. An example is its R&D on rubberwood in the 1980s, which allowed the properties of rubberwood timber to be improved to cater to furniture specifications accepted by domestic and foreign markets.

Dr. Sharmiza reckoned that future trends will be based on the development of advanced and latest technology. Thus, research on forestry needs to be intensified so that forest resources can be managed more effectively and efficiently. For its R&D on forestry and environment, FRIM has also developed technologies and provided solutions to support the sustainable management of resources and ecosystem services of the forest.

“FRIM’s R&D is aligned to the chain-of-custody requirement in Malaysia’s trade agreements and the Malaysia Policy on Forestry 2022 related to the sustainable utilisation of forest resources,” she shared. Among the research carried out by its Forestry and Environment Division is the improvement of the existing forest management system for the second-growth forest, in terms of determining the optimum felling cycle, production rate and optimum growth stock. It was also found that the management of unique forests, such as peat swamp forest, kapur forest, seraya forest and hill meranti forest, needs to be more scientifically based.

However, because many forest areas have been converted to other uses, they are fragmented. In addition to that, damaged forests require effective and comprehensive restoration methods. Therefore, ecological and restoration



Verification of raw materials used and specifications of green furniture products by FRIM auditors



A sample undergoing testing at the FRIM Furniture Testing Laboratory

studies are necessary, said Dr. Sharmiza, stressing that basic studies involving ecological study and forest growth need to be continued.

"This is because the findings are very important in streamlining forest management, and the study also takes into account the effects and impacts of climate change on forests. Today, the conservation of biological diversity resources is not only focused on protected forests but also on production forests. Therefore, methods to ensure conservation in the production forest must also be produced through research," she further explained.

Engineered wood, high-temperature drying, as well as preservation and finishing based on nanotechnology are parts of R&D areas explored by FRIM to achieve the above objectives.

Dr. Sharmiza added that based on the current local and international requirements, forest resources need to be managed more effectively and intensively to achieve the goal of sustainable forest management. The future trend is more inclined to manage forests for forest services while managing timber production will continue to play an important role in some states. There is also ongoing R&D in timber preservation to reuse the fallen logs for both furniture and decorative items.

Green practices and awareness

With its strength in R&D, FRIM also wants to create awareness based on different areas of research. Recently, the institute organised a Green Furniture Symposium in Putrajaya on November 21 to 22, 2023. The symposium gathered stakeholders from various government agencies, furniture manufacturers associations, and researchers to provide an understanding of the importance of sustainable furniture development and certification from a social, economic and environmental context.

FRIM invited 15 renowned speakers to deliver papers from various perspectives, such as the current status of SDG achievement in Malaysia, the green furniture industry, sustainable raw materials, green government procurement, design, circular economy and experience sharing from industry players.

FRIM is also working closely with the Ministry of Natural Resources, Environment and Climate Change in supporting the 2024 budget announcement through the endorsement of tree planting and environmental conservation projects. An Energy Saving Campaign is also underway at FRIM, utilising infographics and the Director General's circular to enhance awareness and appreciation among the FRIM community regarding the vital role of energy efficiency. This effort is important in ensuring that the country achieves

its targets and commitments to reduce greenhouse gas emissions.

Other ongoing efforts include working in sync with the 12th Malaysia Development Plan 2021-2025 by developing green furniture products from the design stage, prototyping, testing and certification. Led by Mr. Hashim, in this project more than 100 new and improved designs have been completed, and some of the designs and prototypes are on display at the Furniture Gallery located in the MTDC Building at FRIM. ^h

Green Certification Scheme by FRIM



Forest Research Institute Malaysia

The establishment of FRIM Product Certification Services (FRIM PCS) in 2013 aimed to help local industry in manufacturing products with consistent quality—ensuring the wood-based industry meets the specifications and standards determined by stakeholders and users, and aligned with the standard requirements of local and international markets.

FRIM PCS now offers several certification schemes, which include furniture, fire resistance doors, authentication of herbal raw materials and paper products. In December 2014, FRIM was accredited by the ISO/IEC 17065 Conformity Assessment - Requirements for bodies certifying products, processes and services from the Department of Standards Malaysia as the eighth product Certification Body (CB) in Malaysia. Standards Malaysia is recognised by 97 global accreditation bodies participating in the International Accreditation Forum (IAF) in addition to 81 Pacific Accreditation

Member Countries Cooperation (PAC). As a Standards Malaysia accredited CB, customers with products certified by FRIM are eligible for double tax deduction under Section 34(6)(ma) Income Tax Act 1967 (Act 53).

The Green Certification Scheme offered by FRIM PCS covers several products, namely furniture, doors, handicrafts, and paper products. This green certification comes with criteria, such as sustainable raw materials, product performance, safety, durability, and health. Product quality is tested against international and/or industrial standards, such as British Standard (BS), European Norms (EN), American Standards (ASTM/ANSI) and the Business and Institutional Furniture Manufacturers Association (BIFMA).

In terms of material and health requirements, the Green Furniture Certification Scheme offered by FRIM takes into account global requirements, such as the European ecolabel, FEMB - European Federation of Office Furniture and BIFMA. This ensures that furniture certified under this scheme also fulfils global requirements.

For further information on certification, visit pcs.frim.gov.my or by sending an email to pcs@frim.gov.my.

(Source: FRIM PCS)