

Sub-theme 2: Sustainable Forest Management: Technology, Innovation and Practices

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STRATEGIC MANAGEMENT AND COMMERCIALISATION OF TECHNOLOGIES TOWARDS SUSTAINABLE DEVELOPMENT OFFOREST-BASED INDUSTRIES

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Abstract

Evolution of Malaysia's R&D in tropical forestry began in 1920s and carried out by the Forest Research Institute. Started with fundamental research towards understanding the basic timber properties, the R&D gradually shifted towards specific uses and industrial applications. This trend continued until the formation of Forest Research Institute Malaysia (FRIM) in 1985. Among the important milestones are establishment of laboratories and referral centres resulted from successful R&D programmes. After 37 years, FRIM today emerged as the Malaysian research institution providing a full-fledged function and roles in research, development, commercialisation and application (R,D,C&A) pertinent to forestry, encompassing upstream and downstream activities. To date, 31 FRIM laboratories have become service providers of 206 certified and/or accredited tests. FRIM experts also provide consultancy services of 35 different fields, to industries. Of Intellectual Properties (IP), Innovation and Commercialisation Division is managing systematically the institute's IP portfolios via a strategic technology route. The roadmap looks into IP registration and protection at MyIPO, followed by technology incubation and advancement towards a complete technology package for commercialisation purpose. Governed by FRIM Act 782, FRIM Incorporated Sdn Bhd was established in 2017. The company enjoys the first right of refusal status and becomes the institute's collaborator in spearheading the transfer of technology to industries.

Keywords: commercialization, intellectual properties, technology incubation, advancement, technology transfer

1 INTRODUCTION

Evolution of Malaysia's organised research and development (R&D) activities in tropical forestry could be traced as early as in 1920s. These chapters of early beginning were carried out by the Forest Research Institute (FRI) and was aimed at laying the foundation for forestry and forest products research (Jenny et al., 2001). Started with fundamental research towards understanding the forestry and timber properties, the R&D were gradually shifted towards specific uses and industrial applications. As such, through years of continual R&D, the better understanding on the tropical forestry and timber technology, had driven and directed R&D in FRI with ultimate goals of advancement of sciences and technological discoveries towards the progressive development of wood-based industries in Malaysia. This trend continued until the formation of Forest Research Institute Malaysia (FRIM) in 1985.

Since then, FRIM has gone through multiple phases of development with present perspectives of its R&D are geared towards meeting the needs of the forestry sector and to remain relevant to the challenges of globalisation. As a result, FRIM's R&D scope has expanded to include new areas such as climate change, natural products, urban forestry, biofuels and social forestry as an addition to the long history of Malaysian forestry research, backed by more than 100 years of track records. After 37 years of establishment, FRIM nowadays emerged as the leading Malaysian research institution in providing a full-fledged function and roles in research, development, commercialisation and application (R,D,C&A) pertinent to the forestry sector. Among the FRIM's notable milestones, upon years of successful R&D programmes, are establishment of five key R&D divisions namely Forestry and Environment; Forest Biodiversity; Forestry Biotechnology; Forest Products; and Natural Products. These R&D divisions are pivotal towards advancement and understanding of relevant sciences and technological appreciation in forestry and forest products R&D. Further, there are 10 thematic FRIM Research Stations throughout Peninsular Malaysia. To date, a total of 31 FRIM laboratories or centres providing 206 different types of tests are also recognised as competent service providers via accreditation and/or certification schemes governed by various authoritative bodies locally and internationally.

2 INTELLECTUAL PROPERTIES AND COMMERCIALISATION

In order to sustain continual economic growth as well as to maintain our wood-based industries' competitiveness in the global market, the government has emphasised the importance of commercialising R&D outputs. The forestry sector as a whole thrives on sustainable management practices on the upstream. Whilst, adequate timber supplies coupled with technological advancement and innovation of products are crucial on the downstream end (Gan et al., 2001).

Innovation and technologies derived upon systematic R&D activities in FRIM have their own uniqueness and strength as they were invented/initiated by FRIM's home grown scientists. The products and technologies developed by FRIM's scientists used local and sustainable raw materials, thus offering environmentally-friendly solutions to various applications. Transforming these intellectual properties (IP) into commercial uses are therefore vital in the entire forestry industries value-chain in ensuring resilience and competitiveness of our wood-based industries in the local and global markets.

In 2010, FRIM registered a trademark namely FRIM TECHNOLOGIES™ as part of our continuous effort to echo government aspiration towards commercialising R&D findings. This trademark carries quality recognition and assurance to a range of products and technologies developed by FRIM, and further expanded by various industry chains and stakeholders. As a licensee or holder of this trademark, any business entity would benefit greatly upon the application of FRIM's sound and proven technologies that conform to the requirements of relevant industries standards. Any granted use of FRIM TECHNOLOGIES™ will be fully protected by the Malaysian law based on the scope, terms and conditions of its registration with the Malaysian Intellectual Property Corporation (MyIPO).

On top of 31 FRIM laboratories or centres that have become service providers of 206 certified and/or accredited tests, FRIM scientists are also providing consultancy services of 35 different upstream, midstream and downstream fields, to industries. During the period of 2007–2021, FRIM produced more than 400 Invention Disclosures, 64 filed IPs and 36 granted IPs. Of these, 13 FRIM inventions also hold international patent rights. During the years from 2009 to 2012, FRIM had run a flagship Incubation Programme for 10 FRIM technologies of high commercial potentials. The incubation programme upon collaboration with Malaysian Technology Development Corporation (MTDC), has resulted in two spin-off companies successfully commercialised FRIM technologies under the product brands of Le Natura and Ciera. A total of nearly 300 Malaysian Standards have been developed upon technological inputs from FRIM since the era of 1970's. As such, output and impact from FRIM's IP commercialisation have paved way towards supporting our government's mission of driving the economic growth via appreciation of sciences, technology and innovation (STI).

3 STRATEGIC TECHNOLOGY ROUTE

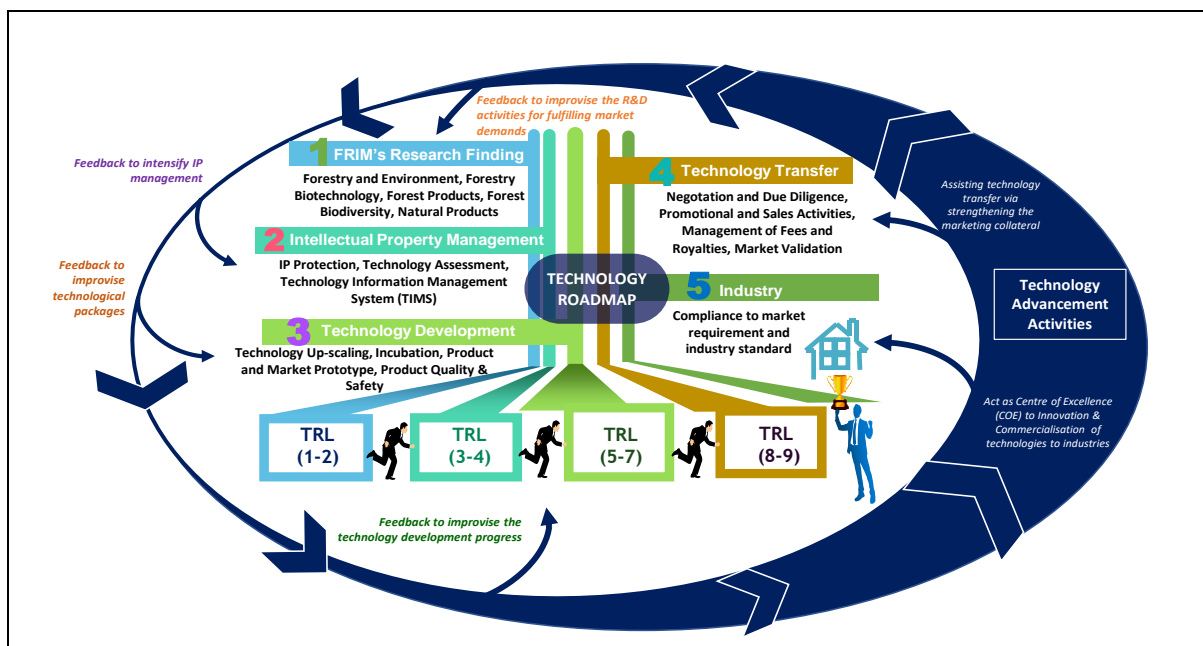
The Innovation and Commercialisation Division (ICD) of FRIM is tasked to systematically manage the institute's IP portfolios via a strategic technology route. The roadmap looks into IP registration and protection at MyIPO, followed by technology assessment, technology incubation either in-house or via strategic partnership with a third-party, and further advancement towards development of a complete technology package prior to subsequent promotion and marketing for commercialisation purpose.

FRIM as the country's leading forestry research institution has placed its vision to be the leader in R,D,C&A in tropical forestry by year 2030. As such, strategic and action plans related to the management and protection of IPs as well as commercialisation of FRIM technologies have been formulated and planned in accordance with the National Intellectual Property Policy (NIIP, 2007) and The Intellectual Property Corporation of Malaysia Act, 2002 (IPCM, 2002).

FRIM–MyIPO strategic alliances since 2015 to date, have benefited greatly FRIM's research communities, a host of beneficiaries comprising small and medium enterprises (SME), state's economic development corporation (SEDC) and entrepreneurs. They were engaged in a world class capacity building programme organised and sponsored by the World Intellectual Property Organization (WIPO). FRIM is affiliated to WIPO as one of Malaysia's host institutions in providing Technology Innovation Support Centre (TISC). With TISC status, ICD of FRIM adheres to the implementation of best practices in IP management that are recognised worldwide. Hence, all IPs registered and managed by FRIM are safe and secure towards rationalising their true values and potential upon commercialisation.

Fig 1 shows the systematic operational mechanisms within the strategic technological pathway that applies to all types of technologies developed in FRIM. The whole cycle demonstrates a five-phase processes that exemplifies the critical technology incubation stage that evolved towards ensuring Technology-Readiness-Level (TRL) of such prototype matches targeted market requirements and industries standards. The cycle repeats once every technology undergone substantial upgrade and/or update that expands the initial target market segmentation.

To gauge acceptance of markets as well as gaining crucial marketing access and promotional coverage, FRIM products and technologies were exhibited in several prestigious innovation and exposition events. At least a total of selected five FRIM technologies would be packaged to participate in each of these events namely the International Invention, Innovation and Technology Exhibition (ITEX); Malaysia Technology Expo (MTE); Selangor R&D and Innovation Expo (SRIE); Persidangan dan Ekspo Antarabangsa Ciptaan Institusi Pengajian Tinggi (PECIPTA); Malaysia Commercialisation Year (MCY); and Malaysia Innovates.



Source: Mahmudin S. et al. (2022)

Fig 1. Technology roadmap demonstrated as a strategic technology route towards commercialisation

4 COMMERCIALISATION AND STRATEGIC PARTNERSHIP

Beginning with the transformation into a statutory body on 1 October 1985, FRIM's journey continues to be a leading forestry research institution in generating valuable knowledge in the form of innovative products, services, processes and techniques that meet the requirements of market demands. With the FRIM Act 782 enacted in 2016, FRIM has strengthened its approach and strategies by enhancing its organisational structure to include a commercialisation arm. FRIM Incorporated Sdn Bhd (FRIM Inc), the institute's wholly owned business entity was established in 2017 to undertake commercialisation endeavour of technologies and services for FRIM.

FRIM Inc enjoys the first right of refusal status and becomes the institute's collaborator in spearheading the transfer of technology to industries. With such approach, it epitomises the significance of strategic partnership with various industries and stakeholders towards successful transfer of technologies that the institute has adopted for many years. It is envisaged that the aforementioned strategic management and commercialisation of FRIM technologies would elevate government aspiration on intensifying steady development of STI-based industries producing local products of homegrown technologies. As such, by doing so, it is hoped that more local products will capture government's green procurement in the near future.

5 CONCLUSION AND WAY FORWARD

FRIM's continual effort on strategically managing and commercialising its technologies is crucial towards addressing the arduous challenges faced by the forest-based industries in the long run. This is due to the fact that most of FRIM's homegrown technologies were uniquely developed and a number of notable 'green technologies' generated are capable of empowering the development of the forestry sector sustainably. To bring about optimum return from its R,D,C&A activities, FRIM therefore looks forward to be a referral centre for innovation and commercialisation of industrial technologies for tropical forestry sector particularly industries that are associated with forestry and biodiversity, wood-based products, forestry biotechnology and natural products.

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