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IT is mid-morning in the middle of a dry, hot season but you wouldn't know it under the heavy, leafy cover of the Forest Research Institute Malaysia in Kepong, Selangor.

With the sun barely peeking through the dense branches, it is hard to see past the towering trees.

But this is not one of the centuries-old rainforests that Malaysia is renowned for. This is a jungle that began life just a little over 100 years ago in a desolate area scarred by open cast tin mining and pockmarked by terraced vegetable farms.

While it might be hemmed in on the east now by the vast residential tracts of Kepong and surrounded by highways channelling vehicles from one end of the Klang Valley to the other, the 54ha institute remains one of Malaysia's most valuable natural treasures.

FRIM, the acronym by which the institute is commonly known, isn't just a vast park that thousands of residents can easily access to revel in nature in the middle of the Klang Valley's concrete jungle – it is also a carefully curated and incredibly valuable collection of flora.

It houses 116 of the country's threatened plant species, has over 350,000 plant specimens, some of which date back to the 1880s, as well as a formidable collection of fungi, moss, and insects. On top of all this, it hosts over 200 bird species, including hornbills and kingfishers, as well as wild boars, squirrels, and monkeys.

Representing about 9% of the total number of threatened plants recorded in Malaysia, FRIM's tree collection is so valuable that during the movement restriction at the height of the Covid-19 pandemic that began in 2020, intruders broke in and cut down 40 karas trees, one of the most expensive woods in the world whose resin – known as gaharu or agarwood – is used in the manufacture of perfume and incense.

The amazing thing is that this is all man-made.

"FRIM is the largest tropical rainforest restoration programme in the world," declares director-general Dr Ismail Parlan during an interview with *The Star* recently.

And it's a rare success too where others have tried and failed. What was touted in 2017 as the largest tropical forest restoration project in the world in the Brazilian Amazon stalled in 2020 having achieved less than 20% of its original goal due to fires, the



Foxworthy's masterstroke was planting as many species as he could source, not discriminating among them. – FRIM



Beautiful example of the relatively rare phenomenon called crown shyness in the collection of camphor trees, *Dryobalanops aromatica*, at FRIM. These economically valuable trees are being lost in the wild. – Photos: FAIHAN GHANI/The Star

pandemic, and a lack of political will. And that wasn't even on totally degraded land like FRIM's original condition.

Ismail, who says he had wanted to work here even as a forestry student at Universiti Putra Malaysia decades ago, is our enthusiastic guide on a tour of FRIM after the institute submitted its nomination to become a World UNESCO Heritage Site (United Nations Educational, Scientific and Cultural Organisation).

The submission was made in Paris by Malaysia's Tourism, Arts and Culture Ministry earlier this year, for consideration in UNESCO's 2024/2025 evaluation session. The bid by FRIM – officially known as FRIM Selangor Forest Park in the submission – will be evaluated between July and November, with a decision announced next year.

**FRIM's firm bid**

If FRIM's bid is successful, it will join several other UNESCO sites in Malaysia: Sarawak's Gunung Mulu National Park and Sabah's Kinabalu Park, which



Looking at some of the earliest specimens at FRIM's herbarium are (from left) head of FRIM's Flora Biodiversity Programme, Dr Sam Yen Yen; Ismail, Ng, and the institute's Forest Biodiversity Division director Dr Lee Soon.

were listed in 2000; George Town and Melaka, listed in 2008; and the Lenggong Valley, Perak, in 2012; the Niah caves in Sarawak is currently on the tentative list.

So why is FRIM deserving of being on this prestigious list? FRIM is unique, according to Ismail, precisely because it is man-made.

"If we don't explain it to you, you wouldn't believe that this is a man-made, planted forest.

"It's a man-made forested landscape that reflects a fusion of colonial British and local Malay knowledge and cultural values in a mature tropical rainforest created on severely devastated land.

"It's an exceptional testimony to the combined work of man and nature. And this is FRIM's outstanding universal value that is worthy of being a UNESCO World Heritage Site," Ismail explains.

While George Town and Melaka are renowned for their historical and architectural significance, FRIM offers a unique narrative centred on the transformation of severely devastated land into a mature tropical rainforest through the collaboration of dif-

ferent cultural and scientific communities.

"This emphasis on ecological restoration and cultural fusion sets FRIM apart from other applicants, showcasing a different aspect of Malaysia's rich heritage and environmental stewardship," says Ismail.

Although FRIM was only officially named in 1985, the herculean restoration efforts stretch way back to the 1910s.

That was when American Dr Fred William Foxworthy, who had a doctorate in forestry from Cornell University, was headhunted from the Philippines to become the first Forest Research Officer of then British Malaya.

Foxworthy's set of bound, type-written diaries in FRIM's library detail his daily life as well as those of his staff and workers, revealing what they did and what they were thinking when going about restoring the land – a treasure trove of the trial and error that led to eventual success.

At that time, much of hilly Kepong was being mined for tin on the lower slopes while the hills had terraces cut into them for vegetable farming, says eminent botanist Dr Francis Ng, who edited a compilation of Foxworthy's diaries.

"Foxworthy wanted to take up the biggest challenge possible, converting waste land into productive forest.

"He said if you want to show how we can grow a forest, let's pick the toughest area possible so there will be no doubt that we can do it," says the former deputy director-general in a special video presentation available at FRIM's Facebook account.

One of the brilliant things Foxworthy and his team did, said Ng, was to plant hundreds of different species.

"He didn't distinguish [among them] because he said he didn't

know enough to be able to select one or two, and put all his money on them.

"That turned out to be a masterstroke. It was scientific methodology in the sense that all the plants were recorded and they learned from what they were doing. But they didn't have a pre-set idea of what they should do – they fiddled about, shifted and changed, and if something was not suitable for a particular area, they would do it again until they got it right," Ng explains in the video.

Today, Foxworthy has a road named after him at the institute, a gently winding lane under the cool sweep of boughs from the thousands of trees planted over the years.

**Preserving the heritage**

While UNESCO status has brought George Town and Melaka prestige and fame as well as the inevitable boom in tourism, Ismail says of FRIM's ambition that, "We want to keep it like this".

"By gaining UNESCO Heritage Site status, FRIM aims to highlight the importance of conserving natural resources and the environment, particularly in the context of reforestation efforts and biodiversity conservation," he says, adding that the institute also seeks to preserve and promote the unique architectural heritage within its landscape.

That means preserving several buildings on its premises such as the stately administrative office from 1929, the former residence of the chief researcher, the *Villa Aromatica*, and the original staff quarters. Harking back to the 1960s, the quaint Malay-style wooden quarters with meranti flooring held up by stilts of balau and kempas continue to function as the residence of FRIM staff.



The enthusiastic Ismail wants to share with the world FRIM's hardwon experience in restoring completely devastated land successfully.



Wooden staff quarters built in the 1960s are still in good shape and are a part of FRIM's UNESCO submission.



One of the earliest specimens at FRIM's herbarium. This dates back to 1885.

However, Ismail does concede that UNESCO recognition could enhance FRIM's potential as an ecotourism destination, attracting visitors interested in experiencing and learning about the unique ecological aspects of the site.

"But then, actually, we are not keen on talking about numbers, we want to maintain it like this," he reiterates.

Locally, FRIM is on the national heritage list under Malaysia's Heritage Department, as well as Selangor's list of 24 must-visit spots. Before the pandemic, it used to receive some 500,000 visitors a year.

One of its immensely popular attractions is the Forest Skywalk, a 250m-long structure made up of 11 towers and eight bridges between 18m and 50m high that winds through part of the grounds; it saw close to 57,000 visitors even at the height of the pandemic between 2020 and March 2023.

**Green dreams**

But FRIM's biodiversity conservation is more than the sum of its trees.

It has been leading research focusing on identifying, documenting and cataloguing the country's flora in projects such as the "Flora of Peninsular Malaysia" and "Tree Flora of Sabah and Sarawak". Compiled into 20 volumes, the projects thoroughly studied and fully documented 2,235 species – or 63.9% – of 3,500 tree species in Sabah and Sarawak, as well as 1,358 species – or 16.4% – of 8,300 vascular plant species in Peninsular Malaysia.

The documentation also led to the assessment and publication of *Malaysia Red List: Plants of Peninsular Malaysia*, the first volume of which came out in 2021.

Both these projects, says Ismail, received the full commitment of dedicated local research teams as

well as support from research institutions and universities worldwide.

It's not even half of the estimated number of plant species Malaysia has but they at least represent a start on the main ones, Ismail says.

"All of FRIM's grounds are a sanctuary for threatened plants," he points out, adding that the ex situ collection first started with the establishment of the Dipterocarp and Non-Dipterocarp Arboreta in 1929.

Similarly, FRIM's ethnobotany division documents the traditional botanical knowledge of indigenous peoples, particularly the Orang Asli in Peninsular Malaysia, and other local communities.

For this, the institute was conferred the 2021 Unesco Sultan Qaboos Prize for Environmental Conservation, just one in the array of awards, including 44 from the *Malaysia Book of Records*, that adorn the walls of the main office.

They include as well the prestigious 2009 Mahathir Science Award for FRIM's pioneering research on the properties of rubberwood in the 1970s. Once confined to firewood and charcoal production for tin smelting, rubberwood made up 80% of all Malaysian wooden furniture in 2019, with global exports worth RM11.15bil in 2022.

"The colour of rubberwood is whitish so it's easy to give it whatever colour you like, and furthermore, it's very easy to handle," explains Ismail.

FRIM's collaboration with a local company in the development and commercialisation of various products has also clinched multiple awards, including the Ciera line of environmentally-friendly insect repellent and disinfectant.

**More than a jungle**

If FRIM were to successfully clinch the highly sought after

UNESCO status, it would surely be one of the most prestigious awards to hang on those walls.

Ismail says success would serve as a valuable reference for the world in several ways.

"Our success in preserving Malaysia's tropical forests and biodiversity can serve as a model for other countries facing similar conservation challenges. "By sharing our expertise and best practices, FRIM can inspire global efforts to protect and sustainably manage natural resources," he says.

He adds that UNESCO Heritage Site recognition would also underscore the cultural significance of Malaysia's forests and indigenous knowledge systems, and contribute to the preservation of intangible cultural heritage.

Also, Ismail points out that FRIM's integration of conservation with sustainable development initiatives demonstrates the feasibility of balancing environmental protection with economic growth.

"By promoting ecotourism, research and education, FRIM is an example of how natural heritage sites can contribute to local livelihoods and economic prosperity while safeguarding natural ecosystems."

As a UNESCO Heritage Site, says Ismail, FRIM would serve as a beacon of hope and inspiration for global conservation efforts.

This is especially important when scientists around the world are increasingly calling for the restoration of habitats not only to halt biodiversity loss but also to tackle the impact of climate change, as restoring forests would sequester carbon.

If anything, FRIM stands as a symbol that time – plus a lot of human effort, political will, and many, many trees – heals all wounds, even a scorched earth.

**FRIM fun facts**

■ The largest tree in FRIM is a keladan tree, the *Dryobalanops oblongifolia*. Measuring 115.8cm in diameter at breast height and at 36.4m tall, its total biomass is estimated to be 20.3 tonnes with a carbon storage of 9.3 tonnes.



■ The 'crown shyness' phenomenon observed among the kapur trees in FRIM, also known as camphor trees is among the few ever observed in nature. This feature refers to the crowns of fully stocked trees not touching each other but leaving gaps between their branches.



■ Set up in 1908, FRIM's National Herbarium holds 350,000 reference plant specimens, some 6,500 of which are more than 100 years old and date back to the 1880s.



■ FRIM has seven arboreta, also known as living museums. They are Dipterocarp, which is a family of tropical hardwood trees, Non-Dipterocarp, fruits, bamboo, conifers, monocots such as palm and ginger, and an Ethnobotanical Garden for culinary and cultural practices.

■ Specimens of new plant species collected by FRIM are also sent to Singapore's Botanic Gardens and the Kew Gardens in London, England, as "backup".



FRIM staff members by a keladan tree at the century-old Dipterocarp arboretum. Dipterocarpaceae is a family of trees considered valuable as timber, playing a significant economic role South-East Asian countries.