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Not out of the woods

Malaysia is embarking on an ambitious plan to plant 100 million trees in the next five years to reverse biodiversity loss and climate change from deforestation.

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A RECENT Facebook post showing an image of the trunk of a massive cengal tree, a rare tropical hardwood species, stripped of its branches and strapped atop a trailer flatbed had many Malaysians dismayed and up in arms.

Uploaded on May 23, the picture of the trailer, purportedly parked at a rest and recreation area along the East Coast Expressway near Temerloh, Pahang, was shared more than 5,400 times and received over 12,000 reactions.

Put up by Khaidir Ahmad, a former journalist known for his coverage of environment news on the East Coast, the post drew the ire of conservationists too, especially after it was discovered that the 500-year-old tree in the Sungai Nipah Forest Reserve has been felled in logging approved by the Terengganu government.

Found only in Peninsular Malaysia, Singapore and Thailand, cengal, or *Neobalanocarpus heimii*, is known to have a lifespan of over a 1,000 years and can grow up to 60m tall. It is classified as "vulnerable" on the IUCN's (International Union for Conservation of Nature) Red List of threatened species. The oldest cengal tree, also found in Terengganu in 1999 and fondly dubbed cengal besar, is believed to be over 1,300 years old.

In a year in which Malaysia kicks off its ambitious 100 Million Tree-Planting Campaign, the sight of that felled cengal certainly feels like a jarring fall back into reality.

This is particularly so when it makes more sense to conserve and protect the country's existing forests and ecosystems such as the Central Forest Spine, rather than plant trees to replace whatever has been felled.

It makes more economic sense, too.

Conservation costs in Malaysia, according to one forestry official, can amount to RM25,000 per hectare, in addition to the time that it will take for a forest to restore itself, somewhere between 30 and 40 years at the earliest.

However, if done right, restoring natural landscapes damaged by human exploitation can be one of the most effective and cheapest ways to combat the climate crisis, according to a study highlighted in the journal *Nature* last year.

Scientists contend that if a third of Earth's most degraded areas are restored – on top of conserving existing forests – it would store enough carbon to halve all human-caused greenhouse gas emissions since the Industrial Revolution in the 19th century. The research shows that this can even prevent up to 70% of predicted species extinctions.

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'Crown shyness' demonstrated by white meranti trees at the Forest Research Institute Malaysia. — Handout

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Re-planting Malaysia the right way



"The main thing we need to understand is the complexity of our tropical rainforests," he stressed.

The campaign was launched by Prime Minister Tan Sri Muhyiddin Yassin, who planted a merbau sapling on the grounds of Seri Perdana on Jan 5.

Farrah said that the 100jutapokok.gov.my website has registered 8.56 million trees to be planted. This is 42.8% of the target of planting 20 million trees a year, with the top two states being Sarawak with 4.75 million and Sabah with 1.43 million registered.

On Jan 9, Malaysia Forestry Department director-general Datuk Mohd Ridza Awang was reported by Bernama as saying that some of the tree species to be planted are the merbau, meranti tembaga and merawan siput jantan, and that RM20mil would be set aside for saplings, planting work and to upgrade nurseries.

The department currently has some 45 nurseries nationwide.

Missing the forest for the trees

Botanist Dr Francis Ng thinks that simultaneously with the campaign, existing forests in Malaysia should be protected to conserve the thousands of species of other plants and countless other forms of life that are not trees.

He argues that all big trees over 60cm in diameter should be left to act as "mother" trees to reduce the damage when large logs are dragged out of the forest during logging.

"Only medium trees below two feet (60cm) in diameter should be cut. Leaving the big mother trees untouched will ensure better forest regeneration and environment protection.

"It would be wonderful if the Forestry Department could be rebranded as the Department of Forest Conservation and for the rules governing the extraction of trees from production forests to be changed in keeping with modern environmental values and expectations," says the former deputy director-general of the Forest Research Institute of Malaysia in response to queries from *The Star*.

Tropical Rainforest Conservation Research Centre's Dzaeman agrees, saying that it's still so much easier and cheaper to maintain natural ecosystems.

Pointing out that there is a threshold when the costs of restoration to make a degraded forest more functional becomes too high, he says it is important for any tree-planting campaign to designate priority areas.

"We look for sites that can serve multiple benefits. So that when a tree-planting programme is taking place, it can tick many different boxes.

"For example, planting trees in wildlife corridors identified by our national Central Forest Spine initiative can mean that we are not only planting trees but also improving connectivity for endangered wildlife.

"Next, we look into ticking the boxes for plant conservation goals as well. For example, we have endangered trees so if we could improve their population by selecting endangered trees to

Along with the tree-planting campaign, Ng thinks that existing forests should be protected to conserve biodiversity. — Filepic

plant, we are improving their conservation status too," he says in an interview after the webinar.

During the webinar, Zahari mentioned that among the key areas identified by the department for the campaign are degraded sites in permanent forest reserves, linkages along the Central Forest Spine, land under the rubber tree programmes and in forest plantations.

Dzaeman says when it comes to each site, it is important to carry out a rapid test to determine how it needs to be restored. Tree planting activities and the species selected, he adds, must account for the variations of the sites.

"Totally degraded sites (bare soil) may require more pioneer species at higher densities. Sites with tree cover but lacking diversity could be enriched by

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The tree planting campaign, which will run from 2021 until 2025, is not the first that Malaysia has embarked on, although it's the most impressive yet. Between 2010 and 2016, the country held a campaign to plant 26 million trees, and between 2015 and 2019, we targeted five million trees.

But just how effective these efforts have been is debatable. So what and how will it be different this time?

Making an impact

For one thing, this time, the Federal Government is engaging conservation groups on how best to achieve the target of 100 million trees and, most importantly, for the campaign to have an actual impact on the environment.

"While we have a long way to go to achieve the target, rest assured that the government is not only looking at the numbers," said Dr Farrah Shameen Ashray, Energy and Natural Resources Ministry under-secretary in her opening remarks during the Greening Malaysia: 100 Million Trees Campaign webinar on May 25.

"I think we have a lot of concerns about that and we also know there are many sceptics.

"We went into this campaign, knowing there are many lessons to be learned ... knowing that we have a lot of things to be improved along the way," she said.

Also present during the two-hour webinar were Forestry Department of Peninsular Malaysia deputy director-general Datuk Zahari Ibrahim, Sarawak Forest Department director Datuk Hamden Mohammad, Sabah Forestry Department Corporate Communication and Innovation Division head Karim Abd Samad, Habitat Foundation's Dr Ahmad Zafir Abdul Wahab, and Tropical Rainforest Conservation Research Centre executive director Dr Dzaeman Dzulkifli.

Jointly organised by the Habitat Foundation and the Society for Conservation Biology, the webinar was part of a series designed to encourage discourse between the

ministry and environmental groups on how to make the campaign a success.

One thing that the ministry has learned from previous campaigns, said Farrah, is that much was done by government and state departments working in silos.

"This time, we want it to be done in a more structured and strategic approach," she said, adding that the ministry also wants the initiative to be "society-wide".

Conservation groups, companies, organisations, societies, even individuals – anyone and everyone – can take part in the campaign by registering at the ministry's website, 100jutapokok.gov.my, and the campaign's mobile app, Penghijauan Malaysia.

Elaborating later during the webinar, Forestry Department of Peninsular Malaysia's Zahari says some of the lessons learnt from previous efforts include the fact that such campaigns need more manpower in seed collection and an aggressive use of research and development if they are to succeed. Also, there was low public awareness about the importance of using quality planting stock.



Penang Island City Council landscape department staff and members of several NGOs planting *Rhizophora apiculata* (bakau minyak) in Kuala Sungai Pinang, Balik Pulau, in December last year. The new tree planting campaign aims to be effective by ensuring departments and agencies will not work in silos. — ZAINUDIN AHAD/The Star

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The centuries-old chengal tree chopped down in Terengganu and being transported. – Photo sourced from social media

planting the canopy species at lower densities.

"So different sites will require different species, different densities and different approaches," he says, urging for the use of technology such as available satellite data to identify the priority areas.

Seeds of change

While the target of "100 million trees" has a nice and punchy motivational ring to it, even one million trees a year will be very difficult to achieve presently, points out Ng.

"To raise one million trees to a height of three to five feet (90cm to 150cm) for planting, the number of seeds needed will be about three million to allow for mortalities.

"Private commercial nurseries can only supply perhaps 10% of that. The bulk of the work will need the involvement of the Forestry Department, which should set up or enlarge tree nurseries in every forest district.

"The department has access to seeds from forests and easier access to land and water compared with private nurseries," he says.

To do the planting, the load, he adds, will need to be distributed among large property developers and town and district councils.

In Sarawak, to ensure that the state reaches its target of planting 35 million trees in the next five years, Sarawak Forest Department's Hamden says the first thing his department did was set up nurseries capable of producing 600,000 seedlings at one time.

"Without the nurseries, we cannot carry out the campaign," he admits, adding that the local community is paid to collect seedlings to be sold to the state government.

The state seems to be refocusing from a strong reliance on logging and timber for revenue to conservation, identifying at least 200,000ha of degraded forest areas for restoration and even planning its own tree-planting campaign much earlier under the 12th Malaysia Plan (2021-2025).

However, the main worry that concerns Hamden is the time lost due to movement restrictions triggered by the Covid-19 pandemic – this has gravely affected the progress of the campaign, he stresses.

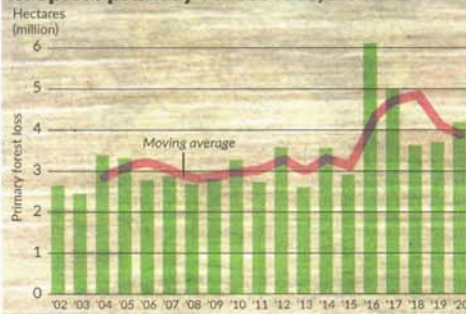
"We may not be able to continue with the conventional way of planting trees as it involves many people," he says.

The department is now exploring "throw and grow" – using custom-made drones for "seed bombing", as is done in some countries.

All is not lost

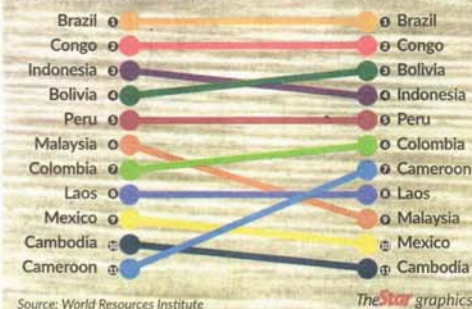
In Sabah, where there is a reforestation effort near Kaboi

Tropical primary forest loss, 2002-2020



The three-year moving average may represent a more accurate picture of the data trends due to uncertainty in year-to-year comparisons. All figures calculated with a 30% minimum tree cover canopy density.

Malaysia is doing better at slowing down the loss of primary (or old growth) forest having moved down from sixth to ninth place over the last four years.



Source: World Resources Institute

TheStar graphics

Lake in the Lower Kinabatangan area, Dr Benoit Goosens says the government's initiative to plant 100 million trees "is welcome if, and only if, it is done properly".

Goosens is the director of the Danau Girang Field Centre which is undertaking a reforestation and carbon mitigation project by Regrow Borneo, the Cardiff University's Sustainable Places Research Institute and community ecotourism cooperative KOPEL Bhd.

"Projects that plant millions of trees can have the majority die whereas projects that plant a few thousand trees can create important sources of biodiversity or carbon sequestration," he says.

"Success is not necessarily correlated with numbers. It is therefore important to adopt an approach that favours long-term monitoring of the planted trees."

Funding, says Goosens, remains an obvious challenge for the project although, to him, manpower is not an issue.

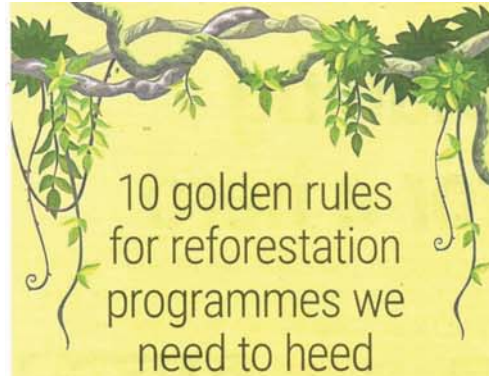
As at September 2020, Regrow Borneo had planted 3ha of degraded forest land with native tree species like the robust and hardy bongkol, mangkapon and salongapid.

"There are a lot of reforestation projects in Malaysia, including Regrow Borneo's, so I think that, overall, the goal is achievable.

"However, it's even more important to stop forest destruction and degradation, and avoid compensating it by replanting somewhere else."

Anyone wishing to take part in the 100 million Tree-Planting Campaign can visit its website, 100jutapokok.gov, or download the mobile app, Penghijauan Malaysia, from Google Play or Apple's App Store.

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10 golden rules for reforestation programmes we need to heed

LARGE-scale tree-planting campaigns, though they may be imbued with good intentions, don't always work. The scientific community is littered with arguments for and against such campaigns, and whether they actually benefit the climate.

Critics have pointed out how the aggressive spread of *Prosopis juliflora*, a woody shrub from Central and South America that was planted in Kenya's Baringo County in the 1980s, has devastated indigenous biodiversity and starved local animals.

In February, a group of scientists from the renowned Kew Royal Botanic Gardens in Britain and Botanic Gardens Conservation International set out 10 "golden rules" for reforestation, published in an open access article in the journal *Global Change Biology*.

> **Protect existing forests first:** Besides being major long-term carbon sinks, old growth (or primary) forests have better resilience to climate change threats such as fire, storms and drought. They can also help adjacent replanting sites recover.

> **Prioritise participation of local people:** Involving the local community is important as they will often be the ones looking after the forest, preparing the land, planting the trees and maintaining the site. This will also allow for employment opportunities.

> **Maximise biodiversity recovery to meet environmental, cultural and economic goals:** Reforestation should not only be about mitigating climate change but also about conserving species, improving economic conditions for local communities, food security, and maintaining the stability of soil and water systems.

> **Select the right site for**

reforestation by planting trees in historically forested area: The best area is previously forested land that has degraded. Landscapes such as natural wetlands, savannah, and grasslands should be avoided.

> **Use natural forest regrowth wherever possible:** Natural regeneration can be achieved by simply protecting the area from further damage, especially in areas close to existing forests. In many cases, it can be cheaper and more effective than planting trees.

> **Select the right tree species to maximise biodiversity:** Plant a mix of both rare and endangered species which are typical of the local natural forest ecosystem. Exotic species should be avoided as they can become invasive.

> **Ensure that trees are resilient to adapt to climate change:** Use tree seeds with appropriate levels of genetic diversity suited to the local climate to ensure the survival and resilience of a planted forest.

> **Plan ahead on how to source for seeds and saplings:** Infrastructure such as nurseries and seed supply systems are essential to the success of any tree-planting programme.

> **Combine scientific knowledge with local knowledge:** Traditional local knowledge is important, especially about birds and plants which are important biodiversity indicators, while science can help in the selection of tree species.

> **Think about a source of income for stakeholders:** The sustainability of forest restoration depends on the income generated from it over that from alternative exploitative land use, and for this to be shared fairly. Among such measures are ecotourism.



Infrastructure such as nurseries and seed supply systems are essential to the success of any tree-planting programme. — AFP