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Mangroves — making it right



The need to preserve the country's remaining tracts of swamps and to reforest eroded coastlines has never been more pressing than after the tsunami. This plot in Sg Hj Doranim, Sg Besar, Selangor, is where FRIM tries to find the best way to plant mangroves.

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The good thing about the Asian tsunami which ripped up stretches of coasts five years ago was the recognition it gave to mangroves. Replanting work sprouted across the region soon after, but it wasn't until a month ago that a successful technique was perfected in Malaysia, writes CHAI MEI LING

THERE'S something riveting about a budding patch of green rising up from a bed of mire.

The tenacity in which those seedlings try to break loose from the deluge of mud, its shoots reaching up for air and life, is a sign of revitalised hope. Like a spark of life amid the murk.

But by the end of a year, for every one that survives, six fail to last out the harsh elements.

The survival rate of replanted mangroves is dismal to say the least, says expert Dr Shamsudin Ibrahim.

For years, the country's foresters and many green groups and firms have spent endless hours and millions of ringgit rehabilitating mangrove forests the usual way, which is to lodge the seedling into a hole in the swamp and tie it to a stick for support.

Unfortunately, the young plant is no match for waves, wind and bad sediment.

The sleepy, scenic fishing village of Sg Hj Dorani, Sg Besar, Selangor is one example. Mud along the coast is so soft that no trees would grow.

"During high tides, the mud moves. If you plant it here, the next day, the plant moves elsewhere.

"There's no chance for the seedling to establish itself," says Shamsudin, forestry and environmental director of the Forest Research Institute Malaysia (FRIM).

How can delicate saplings rise above towering crashes of waves, strong winds and liquid mud to anchor themselves firm enough into the ground and grow then?

This is where the challenge is for FRIM, tasked under a national initiative to find the best way to plant mangroves.

FRIM chose the worst place to start — the 120km-from-

town Sg Hj Dorani — where erosion is so bad it is listed as risk 1, imminently threatening properties and economic activities nearby.

Mangroves stretching 1km out into the sea half a decade ago are now a mere 200m strip left holding up the Kuala Bernam forest reserve.

But Dr Raja Barizan Raja Sulaiman, project leader for the innovative planting technique component, found that

the answer lies in a little intervention and creative planting methods.

The Department of Irrigation and Drainage used RM1 million to build four geotubes, each a giant sack stuffed with sand and water, to break the waves in front of the 2ha study plot.

More than 5,000 seedlings were then planted with the help of fishermen using the conventional method and three other innovative ways — the comp-pillow, comp-mat and bamboo encasement methods.

During low tides, the team waded gingerly into the thigh-high slush to sow the seedlings in. To reach plots further out, they glided across the mud in wooden boxes called *tongkah*.

One and a half years on, the backbreaking efforts paid off. Today, row upon row of apple

green stalks dot the otherwise sombre mudflat.

Not all seedlings rose to the occasion though. Some are playing catch-up while others washed away.

Those which survived progressed well under comp-mat, especially the two *Rhizophora* species — bakau kurap and minyak — with a survival rate of over 70 per cent.

Seedlings are protected in a coated wire mesh filled with

loose coconut fibre and mud.

Within three weeks of being lodged soundly into the mud, roots develop and bind themselves to the cage for support.

Comparatively, only a quarter survived under conventional planting.

"Anything less than half the survival rate is not successful," says Raja Barizan, adding that FRIM is applying for intellectual property rights over the invention.

As for the api-api or *Avicennia alba*, it thrives best under comp-pillow, where the seedling nestles in compressed coconut fibre held together by nylon strings.

Its pencil roots are free to spread out and anchor themselves to the ground.

The five-year research may still be in its early days, but both Shamsudin and Raja Barizan are confident of the outcome.

The two successful methods are being applied in Perlis, Kedah and Penang. FRIM has also been invited to rehabilitate degraded forests in Pulau Bintan, Indonesia and Singapore.

Mangroves have made their lack of presence truly felt.



Seedlings prepared the comp-mat style (left) are placed in coated wire mesh filled with loose coconut fibre and mud. The healthy sapling (right) more than a year later.

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Dr Shamsudin Ibrahim showing how barnacles, which feed on algae, can weigh a seedling down so much that the stem breaks. Roots of seedlings planted using comp-mat, however, are sturdy enough to withstand the barnacles' weight.