Headline: Studying Mangroves To Save Coast
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Singapore and Dutch groups team up in $5.2m project to help preserve saltwater-resistant plant

This area of Sungei Api Api in Pasir Ris looks all natural today but the mangrove trees had been planted by man to re-establish the original habitat. Efforts are ongoing here and in the region to preserve stretches of mangroves, native to tropical and sub-tropical regions. ST FILE PHOTO

OVER the next four years, a group of researchers here will be taking notes on the natural and man-made factors that affect the survival of mangrove swamps.

They want to know, for example, how sea waves, sediments, storms and even the amount of shipping activity build up or curb the growth of these saltwater-resistant trees and shrubs native to tropical and sub-tropical coastlines.

The data they collect will be used here and in the region, where efforts are ongoing to preserve stretches of mangroves.

There are two reasons to protect them: Mangroves provide natural protection against erosion of the coastline. and they also play host to ecosystems of other plants and animals.

The world has already lost two-thirds of its mangroves – as much as 40,000 sq km – in the last century; here, if one goes back further to precolonial times, an estimated 97 per cent is already gone, in part through land reclamation and development.

Governments in the region are also looking into reversing the loss of mangroves, either through replanting, ensuring development respects the natural environment or by factoring mangrove conservation into projects.

The $5.2 million study is the baby of researchers from the Singapore-Delft Water Alliance, an inter-disciplinary research centre set up by the National University of Singapore (NUS), Dutch water specialist Delft Hydraulics and national water agency PUB.

Researchers will home in on five mangrove habitats here, including Sungei Buloh, Pasir Ris and Pulau Ubin.

The project's principal investigator, Assistant Professor Edward Webb of NUS' department of biological sciences, said the study has "important implications" for the restoration of mangroves and their ecosystems.

Already, the team has noted, for example, that sandy beaches pounded incessantly by waves are unsuitable sites for mangroves to take root.

"So we need the right combination of hydrodynamics and sediment input to support mangroves," he explained.

Prime mangrove-growing conditions have come together to give rise to the thriving mangrove forests of Sungei Buloh Wetland Reserve and Pasir Ris Park, which are regularly used by students as outdoor classrooms.

Dr Daniel Friess, a geomorphologist from NUS also working on the project, said mangroves play an ecological role, in that the nutrients they produce can, for example, support offshore fish farms.

Mangrove forests, with their complex tangle of roots and trunks, can also fulfil an all-natural engineering role: Aside from preventing shoreline erosion and reducing sedimentation in coastal waters, they can act as natural barriers against tsunamis.

The tsunami of December 2004 wiped out many coastal towns, but villages on coasts fringed by mangroves were protected from total destruction.

Dr Friess added that with sea levels expected to rise by up to 59cm by 2100 as a result of global warming, low-lying areas could go under water. Mangroves left as they are could complement man-made sea walls to minimise the damage.

Associate Professor Vladan Babovic, the director of the Singapore-Delft Water Alliance, pointed to this use of mangroves to restore parts of Singapore's ecological landscape that includes fish, seagrass and corals.

To overcome the effects of climate change, a combination of "hard" and "soft" methods is needed, he said.

"Building concrete sea walls can fulfil a certain function, but by promoting biodiversity, we can also use nature to reinforce the engineering function," he explained.