

# Bridging biodiversity protection and economic development in Brunei

A site-specific approach led to mangrove restoration success following the Pulau Muara Besar bridge project



This project created valuable learnings that will guide and benefit future mangrove restoration activities



The site was restored to conditions accepted by local environmental agencies and the client could fulfil their obligations in the EIA



Two years on, the mangroves are thriving and yielding better results than similar mangrove restoration projects in Brunei

## Challenge

The Pulau Muara Besar bridge was a major construction project to link the Brunei mainland with Pulau Muara Besar, a developing industrial island in Brunei Bay. For large-scale development projects in Brunei and around the world, environmental impact assessments (EIAs) are mandatory to evaluate the project's potential impact on the surroundings. At the end of the project's lifecycle, contractors are often required to restore sites to their original states as far as possible.

To execute the bridge construction project, China Harbour Engineering Company Ltd (CHEC) had to clear a nearby site – mainly characterised by mangroves – to be used as a temporary construction yard. After the project was completed, it was time to restore the mangroves.

But it's not just about planting random species onsite and hoping that they thrive. Many mangrove restoration projects fail because of a lack of understanding of the site hydrology, poor site and species selection as well as the absence of long-term monitoring and management. Recognising that mangrove restoration endeavours tend to have low success rates, CHEC decided to work with an experienced team that could help the mangroves increase their chances of survival.

## Solution

DHI's team in Brunei was called in to lead the project. Numerous site visits were made to understand the environmental factors that would impact the mangrove restoration process. From the site observations, CHEC and DHI carried out these site-specific steps:

- Site preparation works, including the creation of a small stream to allow better water flow. This has established the environment needed for natural restoration to take place.
- Mangrove species selection and sourcing, with support from the Forestry Department. Suitable mangrove species were selected and a total of 1,530 plant materials from seven mangrove species were sourced from locations around Brunei.
- Soil preparation to ensure optimal planting conditions
- Germination, care and planting, where plant materials underwent daily and weekly care for up to three months until they were ready for transplant at the site

Some of the main considerations included understanding the sediment types and tidal flow onsite, identifying suitable mangrove species to plant, knowing where and how to source and care for them as well as adopting appropriate planting techniques.

*'As a company committed to sustainable growth, it is important for CHEC that a project's site is left in a similar condition as it was before the project existed, if not better. It's not just about fulfilling obligations in the contract, it's more about doing our part for the environment. Successful mangrove restoration is not easy to achieve and having an approach that takes site-specific conditions into account makes all the difference to the overall restoration success.'*

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