

S'pore takes first steps on plan to protect its coasts

Study to include dealing with rising sea levels and saving low-lying areas

By **GRACE CHUA**
ENVIRONMENT CORRESPONDENT

SINGAPORE is looking for expert help to adapt to possible sea-level rise.

At the end of last month, the Building and Construction Authority (BCA), which is in charge of protecting the island nation's coasts, called a tender for a coastal adaptation study – the most extensive one done here yet – to come up with a framework to keep low-lying areas safe.

It also wants a list of adaptation options, new design-and-maintenance guidelines, an instrumentation and

monitoring programme, and suggestions for a coastal flood insurance system.

And it wants contractors – who must have technical and engineering know-how – to work with research institutions that have at least a decade of experience and research data in Singapore coastal and biodiversity work.

According to United Nations climate scientists' last comprehensive report, global sea levels were projected to rise by between 0.18m and 0.59m this century.

The same could be true for Singapore, and mean sea levels in the Straits of Singapore have in-

creased by about 3mm per year over the past 15 years.

Since 1991, all new reclamation projects have been built to 1.25m or more above the highest recorded tide level; in 2011, this was raised to 2.25m or more for new projects.

In addition, the BCA is reinforcing existing hard walls and stone embankments to protect Singapore's coast from erosion.

A BCA spokesman said: "For the long term, we need to understand better how our coastal lands can be further protected. Therefore, we are conducting specialist studies, such as the Risk Map Study and Coastal Adaptation Study, to look into this.

"This is part of the larger inter-governmental effort to advance our understanding of climate change risks, and develop

adaptive measures to address these risks."

Professional engineer Chong Kee Sen, who is vice-president of the Institution of Engineers, Singapore (IES), said the study was significant and the first done for Singapore on this scale.

But he declined to identify possible coastal-adaptation options, saying it was premature for IES to comment.

In 2005, Yale University economist Robert Mendelsohn and student Wei-Shiuen Ng concluded in a paper that the cost of building, adding to and maintaining sea walls – to protect Singapore's coasts from various degrees of rising sea levels – would range from US\$300,000 to US\$5.7 million by 2050, to US\$900,000 to US\$16.8 million by 2100.

✉ caiwj@sph.com.sg



A rod surface elevation table being installed in a mangrove swamp.

PHOTO: DANIEL FRIESS, NUS DEPARTMENT OF GEOGRAPHY

Need for wetlands monitoring in S-E Asia

WETLANDS in South-east Asia need better monitoring, say researchers, to work out which ones are especially vulnerable to rising sea levels.

Mangroves and salt marshes store carbon dioxide and protect inland areas from storm surges, while fish shelter in them, feeding on nutrients there.

But just a metre of sea level rise could destroy more than 60 per cent of the developing world's coastal wetlands, according to the World Bank.

A group of scientists has proposed developing nations use rod surface elevation tables (RSETs), a low-cost existing method, to build networks to keep tabs on coastlines.

This involves drilling a rod into the mud until it hits bedrock. The rod serves as a benchmark with measurements taken by comparing it to vertical pins on the soil surface.

This method is being proposed by assistant professor Daniel Friess and associate professor Edward Webb of the National University of

Singapore, plus others at the US Geological Survey.

Together they wrote a paper published online in April in the journal *Nature Climate Change*.

They think installing sufficient RSETs to monitor all 34 countries with vulnerable wetlands would cost about US\$1.3 million (S\$1.6 million).

In South-east Asia, there are RSETs in only a few spots in Indonesia, Singapore, Thailand and Vietnam. Few other developing countries use it.

Policymakers could use the information RSETs provide to decide where best to protect the coast and what methods to use.

Dr Gordon McGranahan, of think tank the International Institute for Environment and Development, called the paper "refreshing", but added that "there is a need to go beyond monitoring to ensure that local policy-makers and residents in vulnerable areas are provided with information of value to them, or can collect this information themselves".

GRACE CHUA