

To reduce flooding, tackle the root cause

On The Ground



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Measures to adapt to climate change must go hand in hand with push to curb global warming

Flooded pavements across Singapore on Saturday beg the question: Going forward, can such events be prevented altogether?

After all, Singapore has spent \$2 billion on drainage improvement works over the last decade, and plans to put close to \$1.4 billion more into such projects in the next five years.

Two key considerations might help in answering this question.

The first revolves around infrastructure and whether Singapore has done enough to prevent flash floods from happening. The country has close

to 8,000km of drains, rivers and canals, according to national water agency PUB's website.

On top of that, PUB tries to mitigate flash floods by working with developers to ensure there is adequate infrastructure in areas where flooding may occur.

Since January 2014, all new developments and redevelopments of 0.2ha or more are required to implement solutions to slow down stormwater run-off from entering the public drainage system, through measures such as the installation of detention tanks.

Steps, ramps and flood barriers

also help prevent floodwater from entering buildings or underground MRT stations.

Determining whether all these measures are enough to prevent flash floods warrants consideration of the second issue: The cause of heavy rain.

Last Saturday's deluge was brought about by the confluence of two weather phenomena.

The first was the development of a Sumatra squall, an organised line of thunderstorms that developed over Indonesia's Sumatra island before sweeping eastward over Singapore, said the Meteorological Service Singapore. The other was the influence of Typhoon Surigae near the Philippines, which racked up winds so strong, it was classified as a Category 5 storm – the

strongest – by the United States Joint Typhoon Warning Centre.

Both of these events resulted in the heavy rain, and Singapore on Saturday experienced its highest April daily rainfall since 1980.

Politicians here have warned that with climate change, such intense bouts of rain will only become more frequent.

Science backs up this assertion. "For each degree of warming, the air's capacity for water vapour goes up by about 7 per cent," said the Centre for Climate and Energy Solutions, a US-based non-profit organisation, on its website.

"An atmosphere with more moisture can produce more intense precipitation events."

PUB has said that it is working to tackle flooding threats holistically,

by studying how the country will be affected by the twin effects of more intense rainfall and sea-level rise – the latter being another symptom of climate change.

To this end, it is working with the National University of Singapore and water management solutions provider Hydroinformatics Institute to develop a coastal-inland flood model. Projections made under this model will enable PUB to make plans to adapt to the changing climate.

But as Professor Benjamin Horton, director of the Earth Observatory of Singapore at the Nanyang Technological University, pointed out during a climate change webinar hosted by The Straits Times on Wednesday, the root cause of climate change impacts is a warming world, and action needs to be taken to reduce heat-trapping emissions. He said: "If we don't get at the root cause, adaptations are meaningless."

There are limits to how many drains can be dug or widened after all.