



Absorb new ways to prevent floods

China's 'sponge city' projects may be worthwhile examples for Malaysia.

LAST week, it was the turn of Petaling Jaya, Gombak and Sungai Buloh to be the latest major urban areas in Malaysia to suffer flash floods. Scenes of cars and buildings submerged in muddy water are now almost an everyday thing. The focus should now shift from the bad situations to the solutions.

It was also last week that I attended a briefing organised by civil society groups for Penang and Seberang Perai municipal officials and members. The briefing was on the recent floods.

Later, I came across several articles on how China is turning 30 of its flood-prone areas into "sponge cities" to prevent floods and retain rainwater.

The Chinese plan big and fast. It launched the sponge city project only in 2015, but it aims to retain 70% of rain in 80% of urban areas by 2020. The sponge concept is set to spread rapidly as part of global efforts to reduce the impact of increased rainfall and floods, and climate change.

The concept figured prominently at the briefing chaired by Penang state exco member Chow Kon Yeow. Scientist Dr Kam Suan Pheng introduced it when explaining the floods.

She contrasted the present situation when rain falls with what used to happen. In the past, 50% of the rain seeped through the natural ground cover (trees, grass, etc) and into the ground. There was 10% water runoff (to rivers and drains) and 40% evapotranspiration (water going back to the atmosphere).

The trees and green spaces act as a sponge to absorb the rainwater that infiltrates the soil, preventing the water from building up into flash floods.

Due to urbanisation, the green spaces have been paved over with cement and concrete. Now, only 15% of the rain infiltrates the soil, while the runoff has increased to 55% and evapotranspiration is 30%. The sponge now absorbs 15% of the rainwater compared to the previous 50%.

Dr Kam quoted former Penang Water Authority general manager Kam U-Tee as saying that the October 2008 Penang floods were caused by conversion of the valleys into "concrete aprons that do not retain water". As a result, the water immediately flowed into streams, causing flash floods, even with moderate rainfall.

Given this analysis, a key part of tackling the floods is to reverse the loss of the sponge. In recent decades, Malaysia has seen the conversion of a lot of farms, parks, trees and grass areas into concrete jungles of roads, houses, commercial buildings and car parks.

There now has to be high sensitivity to the valuable environmental and economic roles of trees, gardens, fields and grasslands, and parks. The aim of garden cities is not just to be pleasing to the eye but to be a very important part of development as well.

Now comes the role of sponge cities. The world is applauding the Chinese initiative to counter floods and improve water security by building up the natural cover (or sponge) in its cities.

In 2010, landslides during flooding killed 700 in three quarters of China's provinces. Last year, rains flooded southern China, destroying homes and killing around 60 people.

In 2015, China launched the Sponge City

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initiative, which now covers 30 cities, including Shanghai, Xiamen and Wuhan. The target: by 2020, 80% of its urban areas will absorb and re-use 70% of rainwater.

The many types of projects include:

- > Constructing permeable roads that enable water to infiltrate the ground;
- > Replacing pavements on roads and parks to make them permeable;
- > Building wetlands to absorb and store rainwater;
- > Constructing rooftop gardens (for example, 4.3 million square feet in Shanghai);
- > Plant trees on streets and public squares;
- > Build community gardens and parks to expand green spaces; and
- > Build manmade lakes and preserve agricultural land to hold water.

"In the natural environment, most precipitation infiltrates the ground or is received by surface water, but this is disrupted when there are large-scale hard pavements," said Wen Mei Dubbelaar, water management director at China Arcadis, in words similar to Dr Kam's.

"Now only about 20-30% of rainwater infiltrates the ground in urban areas, so it breaks the natural water circulation and causes water logging and surface water pollution," said Wen in an interview with *The Guardian*.

In Shanghai's Lingang district, the streets are built with permeable pavements. There are rain gardens filled with soil and plants, buildings feature green rooftops and water tanks, and a manmade lake controls water flows, reports *The Guardian*.

Prof Hui Li at Tongji University said the first thing is to preserve or restore natural waterways as that is the natural way to reduce flooding risk.

The problem in Wuhan is that a lot of small rivers were filled in during building. But Lingang still has agriculture land and a lake to hold more water during heavy rain.

What about the cost factor? So far the cities have received over US\$12bil (RM47.4bil) for sponge projects. The central government funds 15-20% of costs, and the rest is from local governments and private developers.

But compare this to the US\$100bil (RM395bil) of direct economic losses due to floods in China between 2011 and 2014, plus the human lives lost.

Sponge cities are the way to go for the future. Our own governments – federal, state and municipal – should study this option seriously, as the public braces itself for more floods ahead.

Martin Khor is executive director of the South Centre. The views expressed here are entirely his own.