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Newater storage tanks at Tampines Newater Service Reservoir. Singapore could prepare for drier conditions by scaling up the Newater process for recycling treated used water, says the writer. Unlike the large emitters, Singapore and other smaller countries are not able to affect significantly the carbon emissions that are causing global warming. But in world forums, the experience and voice of small nations can help influence global directions to slow climate change. More pertinently, their own actions dealing with climate change provide two-way lessons on dealing with this crisis for all. ST FILE PHOTO

Singapore's role in climate change action

Its experience in climate change adaptation can be useful for others

Vinod Thomas
For The Straits Times

Record-breaking storms and heatwaves have hit developed and developing economies alike this year. Because Singapore is in a region highly exposed to the more extreme weather driven by climate change, it has a vested interest in seeing a slowdown in global warming. But for now, for Singapore and others with small carbon footprints, the priority will be to adapt to a changing climate.

Unlike the large emitters, Singapore and other smaller countries are not able to affect significantly the carbon emissions that are causing global warming.

But in world forums, for example, the ongoing United Nations conference on climate change in Katowice, Poland, the experience and voice of small nations can help influence global directions to slow climate change. More pertinently, their own actions dealing with climate change provide two-way lessons on dealing with this crisis for all.

In this respect, Singapore's experience in these areas carries weight beyond its size.

RISING SEA LEVELS

Lying on the Equator, Singapore tends to be spared the tropical cyclones that wreak so much havoc elsewhere in South-east Asia. The Philippines, for example, gets on average 20 of these every year.

But low-lying Singapore will be vulnerable to rising sea levels from increases in ocean temperatures and melting ice.

Global average temperature, by one estimate, has risen by about 0.85 deg C since 1970, while the average temperature rise for Singapore in roughly the same period was an estimated 1.1 deg C. The 2015 National Climate Change Study from Meteorological Service Singapore warns that atmospheric warming could lead to the nation's temperature rising by between 1.4 deg C and 4.6 deg C. The average sea level rise in the Strait of Singapore over the past 50 years has been about 1.5mm a year, and it could rise by up to 1m more by the end of the century.

Faced with the inevitability of increased vulnerability to storms and floods, Singapore is gaining experience in adjusting to climatic changes, which needs to be a part of shared lessons for all.

A study by the Building and Construction Authority will form the basis of a national framework for coastal protection measures. Proposed measures include raising minimum land reclamation levels from 3m to 4m above the mean sea level, and installing hard walls or stone embankments in at least 70 per cent of coastal areas.

COOLING MEASURES

Carbon emissions – the biggest component of greenhouse gases – related to human activity are making the atmosphere warmer and contributing to more extreme heatwaves and droughts.

The Cooling Singapore project – a research initiative launched last year – is dedicated to improving the country's "thermal comfort" with initiatives to adapt to more intense heat. Measures include maximising shade, enhancing wind flow and increasing green spaces.

DROUGHT AND FLOOD PLANS

A warming Singapore has great implications for droughts and the water supply, and here too there is much experience in climate adaptation.

Water use in Singapore is high, relative to other cities. National water agency PUB is reducing the exposure to shifting rainfall patterns, but Singapore's heightened vulnerability to flash floods has become noticeable in recent years.

On the flip side, there has been no enforced water rationing due to dry conditions since independence in 1965. A prolonged El Nino, strengthened by climate change, could repeat 2016's low water levels in Johor's Linggiu Reservoir, from where Singapore gets a sizeable portion of its water.

The Republic could prepare for drier conditions by scaling up the Newater process for recycling treated used water and increasing the production of desalinated water. Reducing water losses from water distribution systems – including leakages and reservoir overflows – and cutting further excessive or wasteful water use would also help.

Aside from its effects on drought conditions, warmer air also holds more moisture, resulting in heavier rainfall and more energy for storms.

Devastating floods – in developed countries (Italy) and developing ones (India, in its Kerala state) – were prominent in this year's weather disasters. Beyond the human toll, the prospect of more frequent flooding poses not just a threat to individual economies, but also to global supply chains, which Singapore is especially vulnerable to.

The unusually severe monsoon floods that hit Thailand's economic heartland and affected global manufacturing supply chains in 2011 showed this risk.

At the high investment end of climate adaptation, Japan has devised the world's largest underground flood-water diversion system to bolster Tokyo's flood protection, completed after 17 years of work in 2009. And after 40 years of construction, the Dutch in 1997 finished major engineering project Delta Works, a flood protection system. These are highly capital-intensive infrastructure, but their benefits are estimated to far exceed the costs, and they hold lessons for Singapore.

CARBON TAX

But building better defences against climate change will not be enough to avert massive socioeconomic setbacks unless the world's biggest carbon emitters take the lead in shifting to a low-carbon economy.

The pledges countries made at the 2015 Paris climate summit are an important set of measures to implement and exceed. Singapore's commitment to reducing carbon emissions by 36 per cent below 2005 levels by 2030 would seem to be a relatively weak target, and the country has the capacity to overshoot it significantly, which would also model climate action.

The Republic is set to levy a carbon tax on businesses of $5 a tonne next year and this will treble by 2030. Carbon tax has been recommended by economists as an efficient environmental policy and has been adopted recently by Chile, Germany, Mexico and Britain.

Singapore is also reaching out to climate-change scientists. The Centre for Climate Research Singapore is expanding its capabilities and partnerships. The Geneva-based World Meteorological Organisation has opened its office for Asia and the south-west Pacific here. And the Singapore-MIT Alliance for Research and Technology plans to attract international experts in climate research.

Singapore's economic strength has given it a seat at regional and international forums, as the 2018 chair of Asean, a participant at the Group of 20, chair of the G-20 Eminent Persons Group on Global Financial Governance (in Deputy Prime Minister Tharman Shanmugaratnam), and 2017 chair of the Global Governance Group.

Together with other countries in comparable situations, including Switzerland and those in Scandinavia, Singapore's voice and experience will be valuable for bringing urgency to climate action.

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