

Climate change, S'pore's adaptation strategy cannot wait for geopolitics to stabilise

By Winston Chow

The Straits Times, Prime, Page 16,17, Section: SCIENCE

Monday 23 March 2026

1214 words, 1224cm² in size

386,100 circulation

ScienceTalk

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Winston Chow

The global climate agenda has entered a more turbulent phase over the past 15 months.

Major powers are increasingly preoccupied with security and strategic rivalry, while global cooperation on climate change faces new uncertainties.

The retreat of climate leadership from the United States has further complicated efforts to sustain momentum.

The ongoing Middle East conflict has once again pushed energy security and geopolitical tensions to the forefront of international politics and put climate action in the background.

Against this chaotic backdrop, ignoring the increasing physical climate risks will not lead to bliss.

The inertia and inaction on reducing global greenhouse gas emissions will have sobering consequences in terms of intensifying climate impacts for decades to come, especially as the world is rapidly approaching the warming limit of 1.5 deg C above pre-industrial levels set out in the Paris Agreement.

It may even exceed it over the next few years.

Future climate risks will vary between regions, and for South-east Asia, the risks are particularly acute. Rising sea levels, heavier rainfall, extreme heat, and disruptions to agriculture threaten one of the world's most densely populated and economically dynamic regions.

Singapore sits squarely within this risk landscape. As a low-lying island city-state with critical infrastructure along its coasts and deep integration into regional supply chains, its exposure is both physical and systemic.

Recognising that climate impacts are accelerating, Singapore has intensified its focus on climate adaptation. Recently, the Government designated 2026 as the Year of Climate Adaptation and will develop its first comprehensive national adaptation plan to prepare infrastructure, businesses and communities for future climate risks.

The plan builds upon extensive adaptation aspects across key domains including heat, coastal protection, flooding, water security and food supply.

SINGAPORE'S APPROACH

Singapore's approach to climate adaptation reflects a strong emphasis on science and long-term planning.

Coastal protection studies are under way to design long-term measures to address sea level rise, while drainage upgrades and flood management infrastructure are expanding to cope with more intense rainfall modelled by Singapore's Third National Climate Change Study, published in 2024.

Heat resilience has also become a growing priority.

A new Heat Resilience Policy Office has been established to coordinate national responses and develop action plans across infrastructure, health, economic and social sectors.

Scientific research underpins these efforts.

The Cooling Singapore programme has pioneered advanced modelling tools that simulate the city's microclimate.

Using a digital urban climate twin, researchers can evaluate how urban design, nature-based solutions and building materials influence heat exposure across neighbourhoods, and can map

heat risks to local communities and ecosystems.

These investments demonstrate Singapore's tradition of planning decades ahead. But even the most sophisticated domestic adaptation measures cannot fully shield the country from risks that originate beyond its borders.

Singapore imports more than 90 per cent of its food, and regional energy systems and infrastructure networks remain closely interconnected.

Climate disruptions affecting agriculture, transport or hydropower generation across South-east Asia could likely reverberate through supply chains and markets.

The Intergovernmental Panel on Climate Change (IPCC) assesses such dynamics as cascading and compounding climate risks.

Climate shocks in one country can propagate across economies and food systems across space and time.

In an interconnected region like South-east Asia, effective resilience cannot be built by any country alone.

BEYOND THE SCIENCE

The IPCC also emphasises that



climate adaptation is shaped as much by enabling conditions as by technological advances.

Infrastructure, nature-based and engineering solutions are essential, but they must be

supported by strong institutions, sustainable financing, and community participation.

Across South-east Asia, adaptation needs are rising faster than available funding.



Investments are required for flood defences, climate-resilient infrastructure, early warning systems, and heat mitigation strategies. Singapore is well placed to

contribute to this area. As a global financial centre, it has already developed frameworks for green and sustainable finance. The next frontier will be

Singapore has invested heavily in protecting its coasts, managing urban heat and strengthening water security. The next phase of resilience must extend beyond national borders. ST FILE PHOTO

mobilising capital for adaptation and resilience. For instance, blended finance structures, resilience bonds, and insurance mechanisms could help de-risk investments in climate adaptation across the region.

There are also opportunities for Singapore's expertise on climate adaptation to support regional solutions.

Technologies and approaches successfully developed locally, including coastal protection systems, water and heat management strategies, as well as regional weather and climate forecasting, could be upscaled and adapted for use across South-east Asia.

Governance and community engagement are equally important enablers for action.

Climate risks often fall disproportionately on vulnerable groups such as the elderly or outdoor workers exposed to extreme heat. Building resilience therefore requires clear communication, public trust, and local participation.

Singapore's efforts to engage businesses, civil society and citizens in developing its national adaptation plan reflect this broader whole-of-society approach.

Such approaches will become increasingly important across the region as governments seek to translate climate science into practical policies that can protect and support communities.

REGIONAL LEADERSHIP

The next frontier of climate

resilience lies in regional cooperation.

As ASEAN chair in 2027, Singapore can help catalyse new forms of collaboration grounded in science and implementation.

One priority is in strengthening regional climate research networks by sharing knowledge capital.

Universities and research institutes across ASEAN could collaborate on shared modelling platforms and data systems to better understand heat risks, sea level rise and agricultural impacts.

Another priority is mobilising adaptation finance. Singapore's financial institutions could cooperate and work with development banks and regional partners on mechanisms that structure investment vehicles which support resilience projects across South-east Asia.

Capacity building will also be essential.

Expanding training programmes for regional policymakers, engineers and city planners can help ensure that climate science informs infrastructure design, urban planning and disaster preparedness, and likely enhance effective cooperation on climate adaptation.

At a time when global climate diplomacy faces increasing headwinds, regional cooperation on adaptation may offer one of the most practical and effective ways to build and sustain momentum.

Historically, Singapore has already invested heavily in

protecting its coasts, managing urban heat, and strengthening water security. These are essential steps for a small island nation facing a warming planet.

But the next phase of resilience must extend beyond national borders.

By championing science-based adaptation partnerships across South-east Asia, Singapore can help build a region better prepared for the many climate shocks to come.

This is not climate altruism. It is enlightened self-interest as in an interconnected region, resilience is indivisible, and builds stability that enhances sustainable development for its communities.

In a fractured world where geopolitical tensions are rising and global climate leadership is uncertain, regional cooperation on shared climate risks may become one of the most important forms of leadership available.

Singapore has always thrived by looking outwards. In an era defined increasingly by climate extremes, extending our adaptation efforts beyond our shores may prove to be one of the most strategic choices we can make.

• Dr Winston Chow is Lee Kong Chian Professor of Urban Climate at Singapore Management University (SMU) and is co-chair of the Intergovernmental Panel on Climate Change's (IPCC) Working Group on Climate Impacts, Adaptation and Vulnerability. The views expressed are his own and do not reflect the views of SMU or IPCC.