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Science Talk

## *Can we work with nature to make our cities more prepared for climate change?*

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Singapore is recognised as a champion of urban greenery or so-called urban “nature-based solutions”. ST PHOTO: LIM YAOHUI

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UPDATED 3 HOURS AGO ▾

Green walls, rain gardens, mangrove reforestation and other nature-based solutions are gaining traction globally. As we experience warmer days and more unpredictable rainy seasons, South-east Asian countries are increasingly looking to nature to help us cope with the effects of climate change.

Singapore is recognised as a champion of urban greenery or so-called urban “nature-based solutions”, and its experience and know-how benefit other countries.

Yet let's not forget that Singapore is an exception when it comes to urbanisation in Asia-Pacific: Being a landlocked city-state, its horizontal growth is limited by the social and environmental costs of land reclamation.

Most importantly, Singapore's unique socio-economic policies mean that it is likely the only country in the region without informal settlements or slums – neighbourhoods often with precarious housing and limited access to infrastructure.

According to United Nations estimates, more than one billion people live in informal settlements globally, and South and South-east Asia are currently home to most of them. The residents of quickly growing informal settlements are disproportionately affected by hazards such as heatwaves and floods.

This makes it important to study the win-win potential of nature-based solutions for informal settlements: Not only could these solutions help address current climate hazards – by providing shade for heat mitigation or absorbing water for flood reduction – but they could also help improve living conditions more broadly, by supporting food production or fostering social cohesion.

And the cherry on top is that nature-based solutions also help address the unfolding biodiversity crisis in the region by promoting an ecosystem-based approach and restoring or protecting current ecosystems.



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## What we know about nature-based solutions in informal settlements

To move from theory to practice, we recently reviewed hundreds of documents from South-east Asian and the Pacific countries to examine the state of the art.

We found 37 projects that are already using such solutions in informal settlements – a figure that is a lower bound of the actual number of projects, as not all projects are documented, let alone in English-language literature.

Yet these projects demonstrate that at least six types of nature-based solutions are used in the region, including tree planting, constructed wetlands and coastal reforestation.

These projects are concentrated in eight countries (shown on the map) and are implemented by governments, communities and non-governmental organisations, such as the Asian Cities Climate Change Resilience Network, the Asian Coalition for Housing Rights and the Cities

## Alliance.

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Most of the projects are located in Indonesia and Vietnam, but Cambodia, Fiji and Thailand also have experiences with nature-based solutions in informal settlements.

Our review showed that while mangrove planting and other well-established nature-based solutions can be useful to combat the effects of climate change, lesser-known types of solutions are also key to prepare cities in Asia-Pacific for the future.

Experiences from South-east Asian cities show that various types of projects, ranging from community gardens to constructed wetlands, can also improve the access to food, health and culture in informal settlements.

Large projects such as the Revitalising Informal Settlements and their Environments programme in Indonesia and initiatives funded by The Rockefeller Foundation in Thailand, for example, demonstrate that nature-based solutions can offer multiple benefits, including improving water quality, preventing soil erosion, providing habitat to native species and beautifying cities.

We also found that “grassroots” low-cost initiatives, such as community gardens, play important roles for people living in informal settlements. These solutions, often developed by residents and local organisations, are important to improve food security, create bonds between community members and provide spaces for recreation and connection with nature.

### Future of nature-based solutions in informal settlements

While these initiatives show that nature-based solutions can help communities across the Asia-Pacific be better prepared for the effects of climate change, some challenges remain for their implementation.

Some of these projects, such as an aerated lagoon in Vietnam’s Ho Chi Minh City, occupy a significant amount of land – a precious resource in informal settlements – while some types of urban farming require expensive maintenance efforts.

Many of these projects are also not being monitored, so we don’t know if they are effective and sustainable in the long term. It is important that these projects continue to be implemented, but also that they are managed adaptively to ensure they continue performing as expected and providing all their benefits to their communities.

So where to go from here?

We need more research on how nature-based solutions are being designed, installed and maintained. The examples found in the Asia-Pacific region show that they are more effective when they are connected to local needs and when communities are deeply involved in their implementation and use.

It is key, for example, to understand and design solutions that are appropriate to each context, as some communities might perceive nature as untidy or dangerous. Addressing these concerns during project implementation is essential to ensure that communities feel represented and can be important stewards of nature in the city.

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While the story of how Asia-Pacific cities prepare for climate change is still being written, there is no doubt that nature will play an important role.

The experiences with nature-based solutions in informal settlements demonstrate that having nature in cities can provide vulnerable communities with invaluable opportunities to produce food, clean the rivers and cope with hot days.

If we can leverage their benefits and make sure that nature-based solutions are well-designed and maintained, it is clear they can make our cities more biodiverse, liveable and prepared to deal with the effects of climate change.

## Map of nature-based solutions projects in informal settlements



STRAITS TIMES GRAPHICS

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7/10/23, 10:03 AM

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**inclusive cities in South-east Asia.**

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