


REGENERATIVE CITIES
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Charting Regenerative Urban Futures: A Working Regenerative City Framework

Bidadari Park is an ecologically-sensitive regional park within the Bidadari estate. The park design seeks to preserve Bidadari's rich history and enhance biodiversity. *Image: Stewart Tan*

In a future where climate change is expected to put greater constraints on how we use resources, a regenerative approach to urban development offers a means for cities to restore natural ecosystems and improve liveability for their residents. The Centre for Liveable Cities (CLC) is thus developing a Regenerative City Framework and testing ideas through the Regenerative City Forum series. This essay unpacks regenerative development and the working Framework, summarises insights from the Regenerative City Forum series, and charts next steps forward.

From Sustainable to Regenerative

Sustainable development has thus far been seen as the solution to mitigate the impact of cities on climate change. Yet, insofar as it seeks to minimise negative impacts, sustainable development may not address the restoration of natural ecosystems or ways to enhance positive impacts.

Where sustainable development focuses on "doing less harm", regenerative development aims to "do more good" by creating net-positive outcomes for people and the environment. With its origins in natural science, regenerative development is underpinned by systemic thinking that maximises co-benefits. This is defined by the Intergovernmental Panel on Climate Change (IPCC) as "the positive effects that a policy or measure aimed at one objective might have on other objectives". A regenerative approach is thus interdisciplinary and considers how urban interventions can achieve co-benefits across social, economic, and environmental domains.

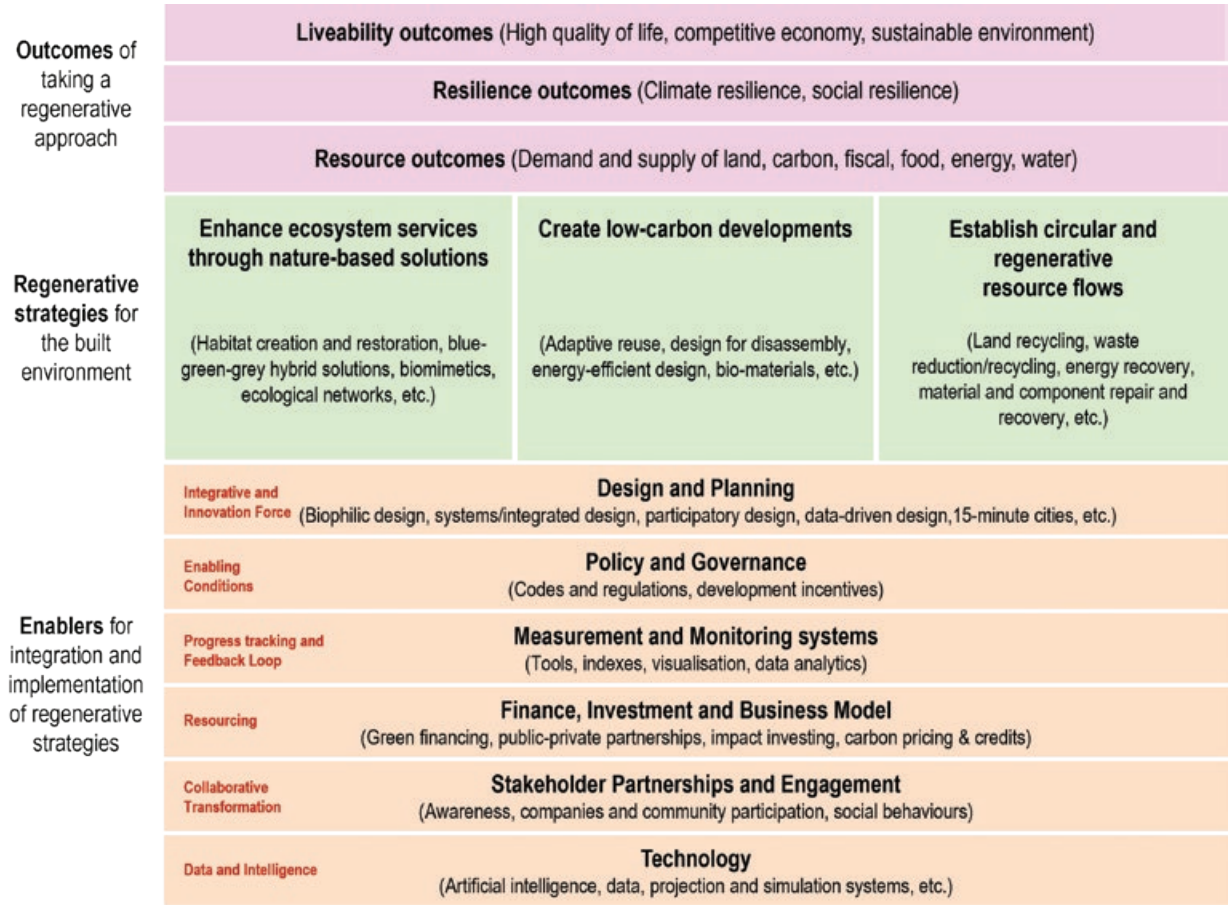
Such approaches can enable cities to adapt to climate change more effectively. Even as cities aim for net-zero, there are still activities that continue to have a carbon footprint. Taking a regenerative lens could help to offset some of these carbon emissions, while generating co-benefits for residents. For example, including more nature-based solutions like restoring wetlands, planting trees, and increasing green spaces could help reduce flood risks and urban heat island effects, while increasing health and wellbeing outcomes. Having such natural ecosystems within cities also enhances liveability and ensures that cities do not become concrete jungles. With increasing rural-urban migration, there could also be opportunities to reforest or rewild spaces just beyond city boundaries, contributing to lower carbon emissions.

A Proposed Regenerative City Framework

Acknowledging the complexity of adopting a regenerative approach, CLC is developing a Regenerative City Framework to guide the planning and execution of regenerative development. Conceptualised through literature reviews and engagements with experts across a range of disciplines, the working Framework comprises three key layers.

The first layer outlines liveability, resilience and resource outcomes for people and the environment that can be achieved through regenerative development. The second layer identifies broad regenerative strategies that can be applied in the built environment to support these desired outcomes. These strategies refer to enhancing ecosystem services through nature-based solutions, creating low-carbon developments, and establishing circular and regenerative resource flows. The third layer proposes six key enablers that facilitate the implementation of regenerative strategies in integrated ways. They span across sectors and include design and planning interventions, policies and governance structures, measurement and monitoring systems, finance, investment and business models, stakeholder partnerships and engagement, and the use of technology and AI.

By focusing on these three key layers, the Framework provides a structure for considering how different Enablers and Strategies of regenerative development can interact in creative ways to enhance net-positive outcomes, thereby maximising co-benefits in a specific context. It offers a systematic means to map and optimise synergies, correlations, and interdependencies across various components of a system.



Working Regenerative City Framework.
Image: Centre for Liveable Cities

Bidadari Park and surrounding housing estate.
Image: Stewart Tan

Illustrating the Framework: 3 Case Studies

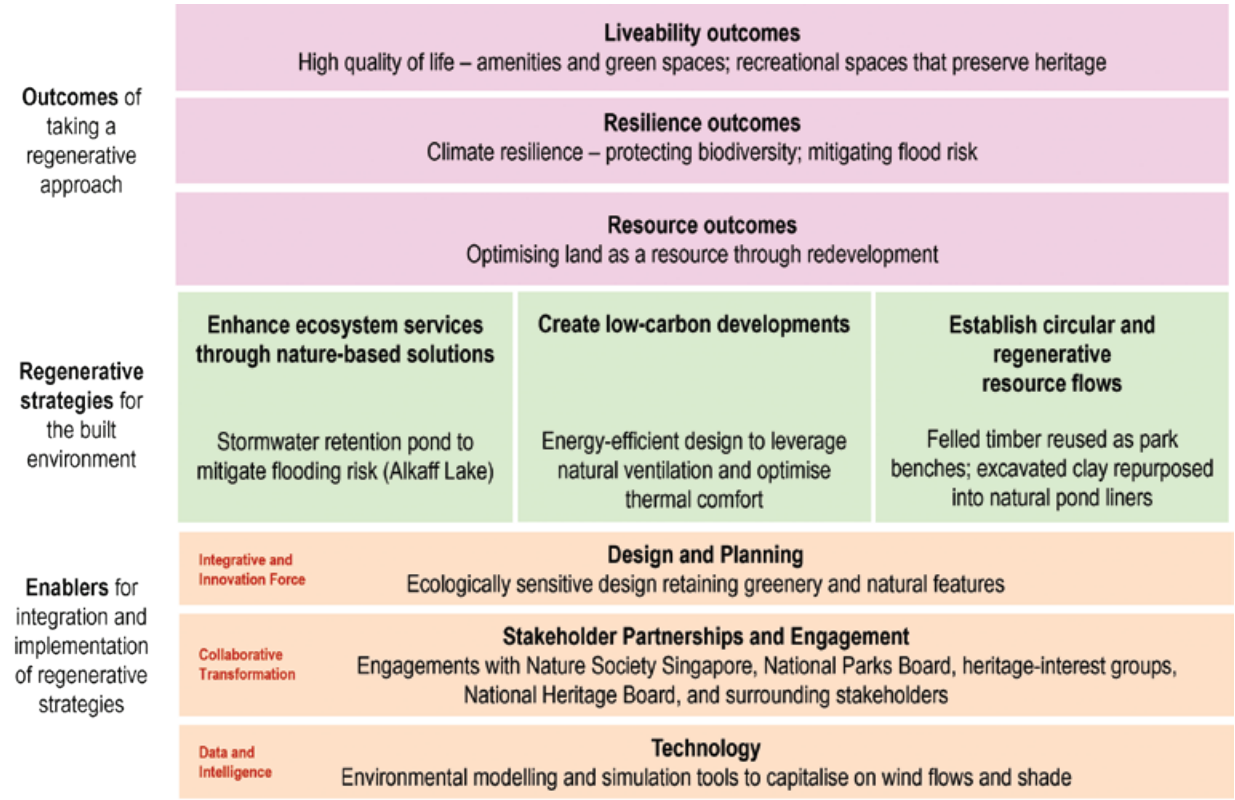
The Regenerative City Framework aids in understanding how planning decisions interact to maximise co-benefits at existing sites. This is illustrated through three case studies in Singapore, London, and Bangkok.

BIDADARI, SINGAPORE

Located in Singapore's central region and formerly home to a crematorium and cemetery, the Bidadari area had been left undeveloped since the 1970s. In 2013, the Government announced plans to redevelop Bidadari into a residential estate to provide about 10,000 new homes.

Guided by the vision of Bidadari as a "Community in a Garden", planners adopted ecologically sensitive design to retain greenery and natural features including knolls and hills. For example, multi-storey car parks were integrated into natural slopes, with their rooftops covered by gardens. This provided residents with both parking amenities and green spaces. Environmental modelling and simulation tools were also used to position residential blocks in ways that leverage wind flows and shade, resulting in energy-efficient design that maximises natural ventilation and optimises thermal comfort.

The planning team also engaged and worked closely with local conservation group Nature Society Singapore, as well as the National Parks Board to identify and safeguard existing migratory bird habitats. In addition, there were also extensive engagements with heritage-interest groups, the National Heritage Board, as well



Illustrating the working Framework—Bidadari, Singapore.
Image: Centre for Liveable Cities

as surrounding stakeholders such as Maris Stella High School, Cedar Girls' Secondary School, Cedar Primary School, Gurkha Cantonment and private housing residents from Wan Tho Avenue Estate. Bidadari Park, located within the housing estate, now hosts more than half of the migratory dryland bird species in Singapore. The park also features Alkaff Lake, which can hold up to 40,000 m^3 of water and serves as a stormwater retention pond that mitigates flood risk. The design of the park emphasises circular resource flows, by reusing felled timber as park benches and repurposing excavated clay for use as natural pond liners.

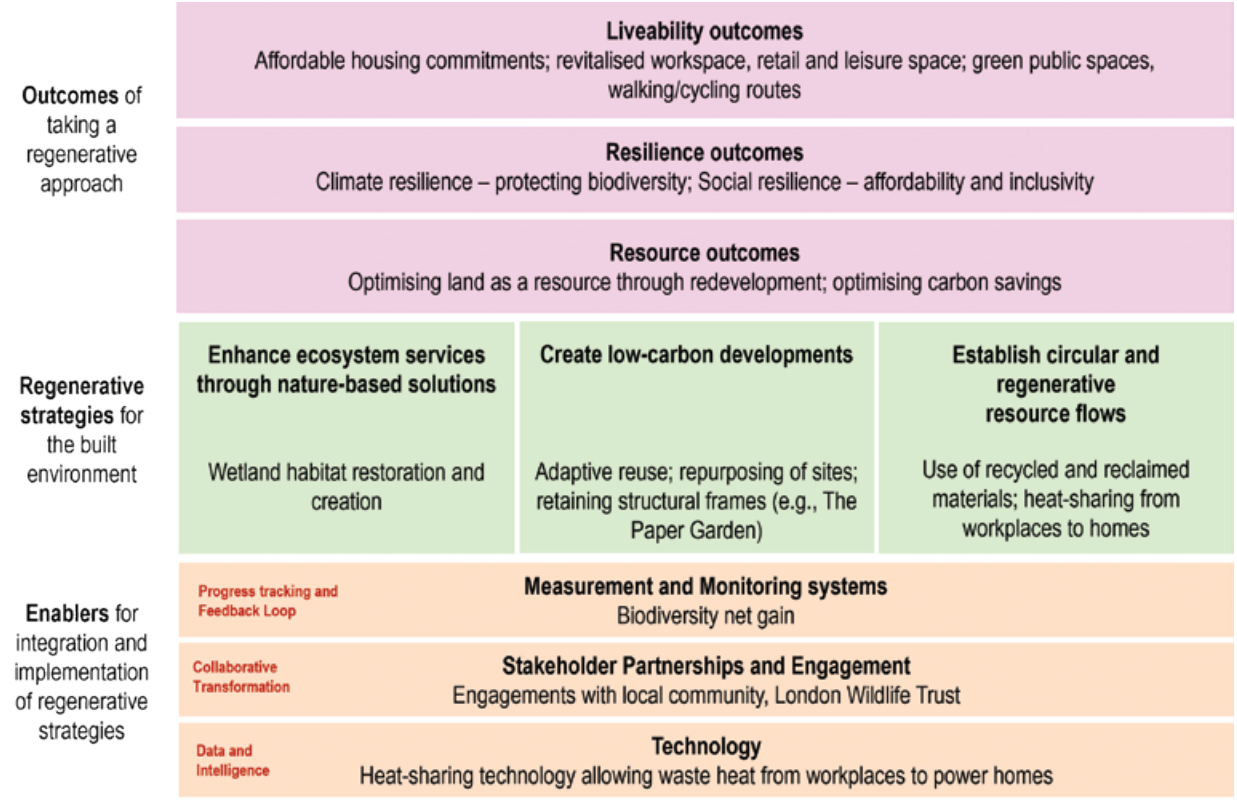
CANADA WATER, LONDON

The Canada Water Masterplan is a 53-acre rejuvenation project that aims to revitalise the former docklands in the south-east of London. When completed, the Masterplan will provide up to 185,806 m^2 of workspace and up to 92,903 m^2 of retail and leisure space, as well as 3,000 new homes, 35% of which will be designated as affordable housing.

Developer British Land partnered with the London Wildlife Trust to restore Canada Water's existing wetlands. This effort saw the creation of three new wetland habitats and seven wetland islands that support local biodiversity. According to British Land, Canada Water could create 28% biodiversity net gain for hedgerows and habitats when completed, exceeding the 10% statutory planning requirements. The development will also feature open spaces including a 3.5-acre park and a new town square, alongside walking and cycling routes that enhance connectivity.

Another key priority at Canada Water is low-carbon development. Through the collective efforts of 3,000 volunteers including local students and residents, a former Daily Mail paper warehouse on site has been repurposed into a community and educational space known as The Paper Garden. The project retained the warehouse's structural frame and used recycled materials, including materials reclaimed from the original site. Beyond adaptive reuse, Canada Water is also adopting heat-sharing technology that allows waste heat from workplaces to power homes, thus optimising energy flows.

View of Canada Water, with restored wetlands in the foreground.
Image: Alysia Wee

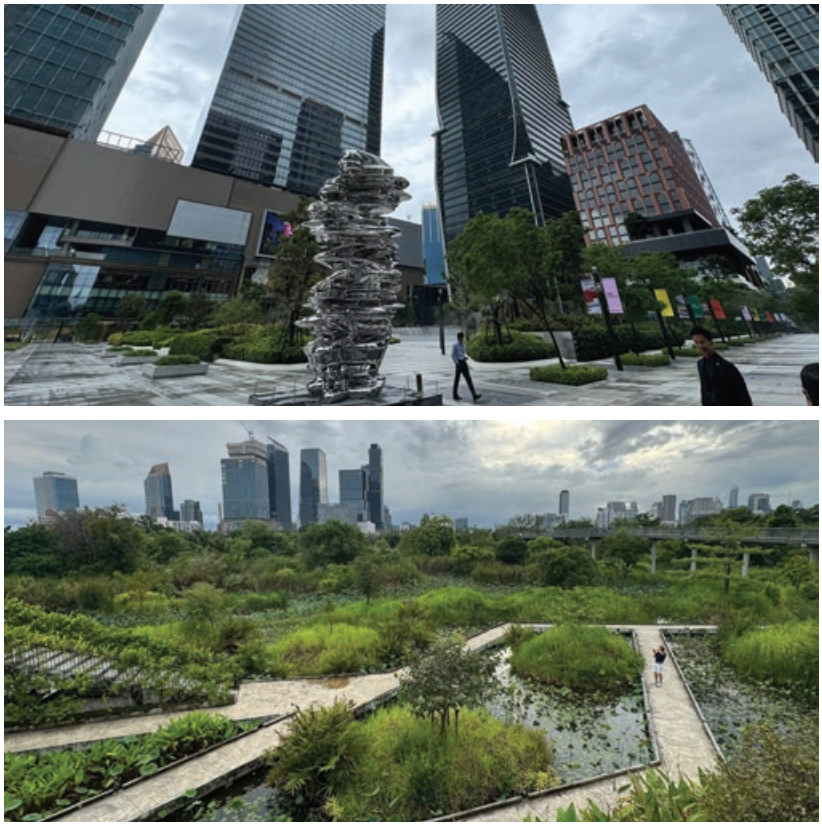


Illustrating the working Framework—Canada Water, London.
Image: Centre for Liveable Cities

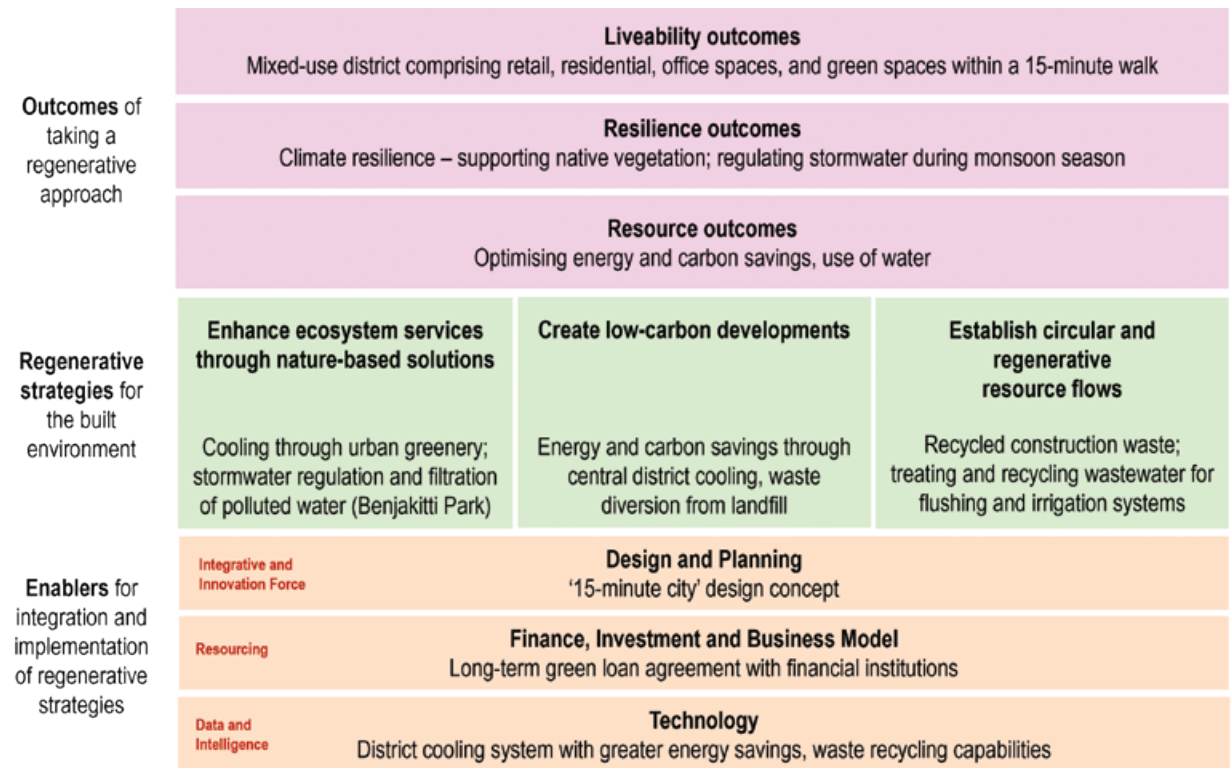
ONE BANGKOK

Situated in central Bangkok, One Bangkok was opened in 2024 as a mixed-use district comprising retail, residential, and office spaces. It was developed by TCC Assets and Frasers Property based on a "15-minute city" concept, where homes, offices, shops, and green spaces are located within a 15-minute commute.

One Bangkok features more than 5 km of tree-shaded pedestrian walkways as well as the One Bangkok Urban Park, which provides about 80,000 m^2 of green and open space. The presence of shade trees and strategic landscaping has made the urban park approximately 2–3°C cooler than the surrounding city, offering an important



One Bangkok and Benjakitti Park.
Image: Andy Tan



Illustrating the working Framework—One Bangkok, Bangkok.
Image: Centre for Liveable Cities

ecosystem service in a tropical climate. One Bangkok is also connected to nearby Lumphini Park and Benjakitti Park, where native vegetation and urban wetlands help to filter polluted water from a neighbouring canal. The wetlands are also expected to retain up to 200,000 m^3 of stormwater during the monsoon season, contributing to climate resilience.

Beyond ecosystem services, resource savings and circular waste management are other key features of One Bangkok. The development's central district cooling system serves to reduce peak energy load, delivering up to 22% energy savings as compared to traditional HVAC systems, and reducing annual carbon emissions by 9,000 tonnes. More than 75% of the development's construction waste was diverted from the landfill and recycled into components such as precast panels and sound barriers, while wastewater is treated and recycled for flushing fixtures and landscape irrigation systems. Leveraging its resource and energy efficiency, One Bangkok has secured a long-term green loan agreement with five of Thailand's leading financial institutions to support its further development and operations.

These case studies illustrate how the Regenerative City Framework can be used to understand how existing sites support regenerative development and maximise co-benefits. Once fully validated, the Framework could be used to guide sites undergoing (re)development, by actively structuring and enabling the integrated planning of regenerative features.

Refining the Framework: Insights from the Regenerative City Forum Series

To sharpen the Framework's efficacy as a guiding tool for regenerative development, there is value in refining and validating it with experts and practitioners. In 2025, the CLC's Regenerative City Forum series was launched to enhance the Framework's applicability in both local and international urban contexts.

The series comprised workshops with multi-sectoral stakeholders in Singapore (March 2025) and London (June 2025), engaging about 100 participants from public agencies, industry partners, academia, and international organisations across both cities. Structured around hypothetical sites inspired by existing projects and indicative of urban typologies, workshop discussions explored how regenerative urban development could enhance, measure, and communicate various co-benefits to stakeholders, and how the Regenerative City Framework could support these efforts.

Workshops as part of the Regenerative City Forum series in Singapore (top) and London (bottom).
Image: Centre for Liveable Cities

Insights from the Regenerative City Forum series can be distilled into six key themes:

Six key themes from the Regenerative City Forum series.
Image: Centre for Liveable Cities

First, to maximise co-benefits and outcomes, the application of regenerative design must consider time as a core dimension. For instance, whole-life-cycle planning—which considers decisions from conceptualisation to completion and eventual demolition—would enable greater optimisation of outcomes including maintenance needs, operational costs and environmental impact. Taking a long-term view also enables feedback loops to be incorporated at each stage of the development process, to holistically measure and optimise co-benefits.

Second, district-scale interventions that are enabled by collaborative systems and partnerships offer key opportunities to maximise co-benefits. District-scale developments can tap on synergies across shared facilities such as district cooling, waste disposal systems, and material processing hubs. Such closed-looped systems can strengthen resource circularity for multiple tenants and users, offering an optimal scale to implement regenerative approaches and achieve co-benefits across entities.

Third, social and ecological systems are interdependent and equally important in realising potential co-benefits. Regenerative principles envision creating a conducive environment where humans and nature have a mutually dependent and beneficial relationship. For example, green spaces that are safeguarded for biodiversity can also support recreational activities among residents.

Fourth, measurement tools and frameworks that can track the integrated co-benefits of regenerative development are instrumental, especially at a district scale. Holistically tracking social and environmental co-benefits and outcomes can allow regenerative interventions to be prioritised in decision-making. However, this would require addressing challenges around data ownership and sharing, as well as complexities around aggregating and interpreting data across both individual entities and the whole district.

Relatedly, measuring the performance of regenerative developments would require both place-based as well as more universal indicators. While regenerative thinking prioritises local contexts and place specificities, such place-based indicators are insufficient on their own. Broader standardised indicators are also needed to provide a common language that enables mutual learning and benchmarking across urban typologies and contexts. To scale the application of regenerative design, this tension between place-based and universal indicators must be navigated carefully.

Finally, the co-benefits of regenerative development must be communicated in targeted ways according to stakeholders' priorities. While developers may prioritise co-benefits that optimise existing systems in terms of water and energy usage, residents and the wider community would typically prioritise co-benefits that matter to and affect their lived experience more directly, such as access to green spaces or thermal comfort. To enable productive partnerships with diverse stakeholders, it will be necessary not only to measure co-benefits accurately, but also to communicate them effectively.

Conclusion

The Regenerative City Forum series has provided rich insights and a useful foundation for refining the working Regenerative City Framework. The Framework will continue to be enhanced through an ongoing collaboration between CLC and the Singapore University of Technology and Design. This work seeks to establish a scientifically validated definition of a regenerative city, which can help to anchor international discourse and application. Responding to the gap in measurement mechanisms, the enhanced Framework will also propose an integrated self-assessment tool to track and measure the co-benefits of regenerative approaches at the district scale.

With its emphasis on enhancing co-benefits and creating net-positive outcomes for people and the environment, regenerative development provides a viable urban development pathway for cities in a world increasingly affected by climate change and resource constraints. The development and adoption of practical tools like the Regenerative City Framework will go a long way towards creating regenerative cities that restore natural ecosystems and ensure liveability for all.