Integrating Nature into Cities

11 March, 2025

Nature-based design, combined with the transformation of underlying worldviews, can enhance urban resilience.

Increasing vegetation and green and blue spaces in cities can support both climate change mitigation and adaptation goals, while also enhancing biodiversity and ecological health. **Maibritt Pedersen Zari** (mailto:https://academics.aut.ac.nz/maibritt.pedersen.zari) *(Auckland University of Technology) explains why nature-based solutions (NbS) must be a vital part of urban planning and design.*

Nature-based solutions for climate change

Climate change and biodiversity loss are interconnected and worsening crises that threaten our survival and that of many other species (Pörtner *et al.* 2023). Most of the global human population now lives in urban environments, and cities have been shown to be significant contributors, directly and indirectly, to both these crises (Alberti 2024; Gurney *et al.* 2021), thus, the need for rapid transformation in cities is urgent. Professionals of the built environment, including researchers, designers, and policymakers, must lead the way in driving this.

The benefits of NbS are well-documented (Seddon *et al.* 2020; Pedersen Zari *et al.* 2022; Hobbie & Grim 2020; Frantzeskaki *et al.* 2022), including helping to mitigate urban heat islands, improving air quality, managing stormwater, providing habitat for urban wildlife and potentially increasing carbon sequestration. NbS can also support human physical health, well-being, foster social cohesion and offer opportunities for recreation (Van den Bosch & Sang 2017).

Given these tangible benefits, a radical scaling up and rethinking of how we integrate nature into cities is needed, such that nature is not considered merely as a decorative element but as an integral part of the urban fabric, helping to address climate, ecological and social crises (Tzoulas *et al.* 2007). To achieve this requires an approach that sees cities, and the people within them, as embedded within the broader natural systems they impact, not separate from them.

What is missing from this fast-evolving nature-based discourse in academia and design is an understanding of, not only *what* needs to change technically, but also *why* humans must fundamentally shift their perspective regarding living *within* the planet's ecological and climatic systems (Maller 2021). This touches upon the paradigm shift that regenerative design experts and others have long advocated for (Reed 2007). The current crises stem partly from viewing biodiversity and ecosystems as just resources for human use alone, rather than recognising their intrinsic value as part of a larger living network. The exploration of nature-based design must expand to include investigation and dialogue about what it means to work with nature and how such design can help repair and redefine human-nature relationships.

Learning from Indigenous knowledge

Forward-thinking, nature-based and vegetation-integrated urban and architectural design is a bold vision for future cities; reducing climate change drivers, adapting to its impacts, and improving the health of biodiversity and ecosystems (Lafortezza *et al.* 2018). Some cities are moving towards this vision already through policy and implementation such as Singapore's Green Plan 2023 and Melbourne Green Our City

Strategic Action Plan (Beatley 2023). However, to truly succeed, researchers must not only investigate technical approaches to NbS but also explore and discuss deep values of respect and reciprocity between people and the living world. These values, which see humans as part of the living world, or even kin to it often underpin Indigenous worldviews (Salmón 2000).

Nature-based design is not new (Mihaere *et al.* 2024). Indigenous communities have long developed ways of working with nature that enhance resilience, biodiversity, and sustainability. Practices like agroforestry, rotational land use and certain kinds of water management are often based on an understanding of ecological interdependence and socio-ecological systems design. Examples of Indigenous landscape-scale, nature-based systems that support dense human communities include the ahupua'a system in Hawai'i, tapere in the Cook Islands, and other similar systems throughout Oceania (Latai-Niusulu *et al.* 2024). These socio-ecological systems conserve ecosystems and strengthen human-environment relationships, and are underpinned by a relational way of thinking (Beamer *et al.* 2022).

Indigenous knowledge, which includes vernacular architecture (Piesik 2023), provides both practical tools and philosophies for understanding human-nature relationships (Petzold *et al.* 2020), encouraging people to re-examine their approach to built environment design and construction. These time-tested approaches may provide examples of worldviews needed to achieve long lasting resilience and living systems designs (Watson 2019).

Research for nature-based design

It is essential to consider cultural context when designing cities and buildings for climate change adaptation and addressing ecological degradation. Without this consideration, adaptation design risks becoming an accidental vehicle for neo-colonisation (Mihaere *et al.* 2024). This is particularly relevant given that Indigenous peoples are more likely to be affected by climate change (Ford *et al.* 2020) and that 80% of the world's remaining biodiversity is preserved by Indigenous peoples (FAO 2021).

In Aotearoa New Zealand, for instance, *Tangata Whenua* (Indigenous people) see themselves as literally related to certain mountains, rivers, oceans and other ecological elements, all of which are considered to have *mauri*, or a kind of life essence. This worldview is reflected at national policy level to a certain extent through recognition of legal personhood of certain rivers, forests, and mountains (Magallanes 2018). NbS that involve altering an urban river, for example, will have vastly different implications for Indigenous people in Aotearoa New Zealand, who may see that river as their ancestor, compared to how the same intervention might be perceived in a place without such a worldview. As urban transformations accelerate by necessity, it is crucial that nature-based design supports just transitions (Mihaere *et al.* 2024). Understanding nature-human worldviews is therefore key to ensuring nature-based interventions are socially and culturally respectful, just, and appropriate (Pineda-Pinto *et al.* 2021). Understanding these worldviews alongside technological innovations can inform new ways of designing cities that are more sustainable, equitable, and connected to the ecosystems on which they depend. As investigation into nature-based urban and architectural design increases, researchers and implementers must be mindful of this, and be willing to follow or partner with local knowledge holders and question their own perceptions.

Conclusion: research to support change

While nature-based urban interventions may offer immediate local benefits, real transformation requires a shift in mindsets; valuing integration and reciprocity with nature. High-tech NbS alone will be insufficient without the values and knowledge that ensure their longevity and meaningful impact. Nature-based design, combined with the transformation of underlying worldviews, offers practical, culturally grounded methods to enhance resilience. Vegetation-integrated cities with hybrid blue, green, and grey infrastructures provide a vision for reimagining the built environment, driving the rapid transformation needed to mitigate and adapt to climate change and biodiversity loss. Beyond mitigation and adaptation, well-researched, strategic NbS could help cities evolve into living systems, positioning them not as ecological and social challenges, but as catalysts for global regeneration, supporting biodiversity, ecological health, and human well-being.

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Will NDC 3.0 Drive a Buildings Breakthrough? (https://www.building ndc-drive-buildings-breakthrough.html)

12 June, 2025

To achieve net zero GHG emissions by mid-century (the Breakthrough Agenda) it is vital to establish explicit sector-specific roadmaps and targets. With an eye to the forthcoming COP30 in Brazil and based on work in the IEA EBC Annex 89 (https://annex89.iea-ebc.org/), **Thomas Lützkendorf (https://www.iip.kit.edu/engl** **Foliente (https://au.linkedin.com/in/f** *and* **Alexander Passer (https://graz.elsevierpure.co passer)** *argue why specific goals and measures for building, construction and real estate are needed in the forthcoming round of Nationally Determined Contributions (NDC 3.0).*

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Self-Organised Knowledge Space as a Living Lab (https://www.building organised-living-lab.html)

21 May, 2025

While Living Labs are often framed as structured, institutionalised spaces for

innovation, ***Sadia Sharmin*** *(Habitat Forum Berlin (https://habitat-forum-berlin.de/page/about-habitat-forum-berlin.html))* reinterprets the concept through the lens of grassroots urban practices. She argues that self-organised knowledge spaces can function as Living Labs by fostering situated learning, collective agency, and community resilience. The example of a Living Lab in Bangladesh provides a model pathway to civic participation and spatial justice.

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