AECOM

WORKING SUSTAINABLY AND TACKLING THE CLIMATE EMERGENCY

EMBRACING NATURE

WILL TRANSFORM THE CITIES OF THE FUTURE

Nature can enhance cities — increasing resilience and improving the health and wellbeing of those who live there. Ecologist and environmental specialist, **Ash Welch** makes the case for nature-based approaches and biophilic spaces as long-term investment solutions to help cities secure a successful, sustainable future.

Once the vision of a futuristic city was shiny glass and high-rise architecture. But, with the threat of climate breakdown increasing, future cityscapes are now more likely to be inspired by modernised buildings, bursting with life, such as the high-rise vertical forest of Milan's Bosco Verticale [1].

A community of nature working together

This new vision embraces the concept of 'biophilia', the innate positive psychological and physiological response that we humans experience when interacting with the natural world. It involves implementing nature-based solutions (NBS) which are a core component of biophilic cities [2]. Using NBS, these cities work to protect nature and biodiversity, and improve living standards for their residents.

Nature-based solutions can include green infrastructure, such as living walls and roofs on buildings, and blue infrastructure, such as urban wetlands. These features and habitats are extremely valuable when connected at a ground level, especially with urban green spaces, such as parks. For example, woodlands, wetlands, grasslands and marshlands can effectively absorb carbon dioxide and sequester carbon, mitigating emissions.

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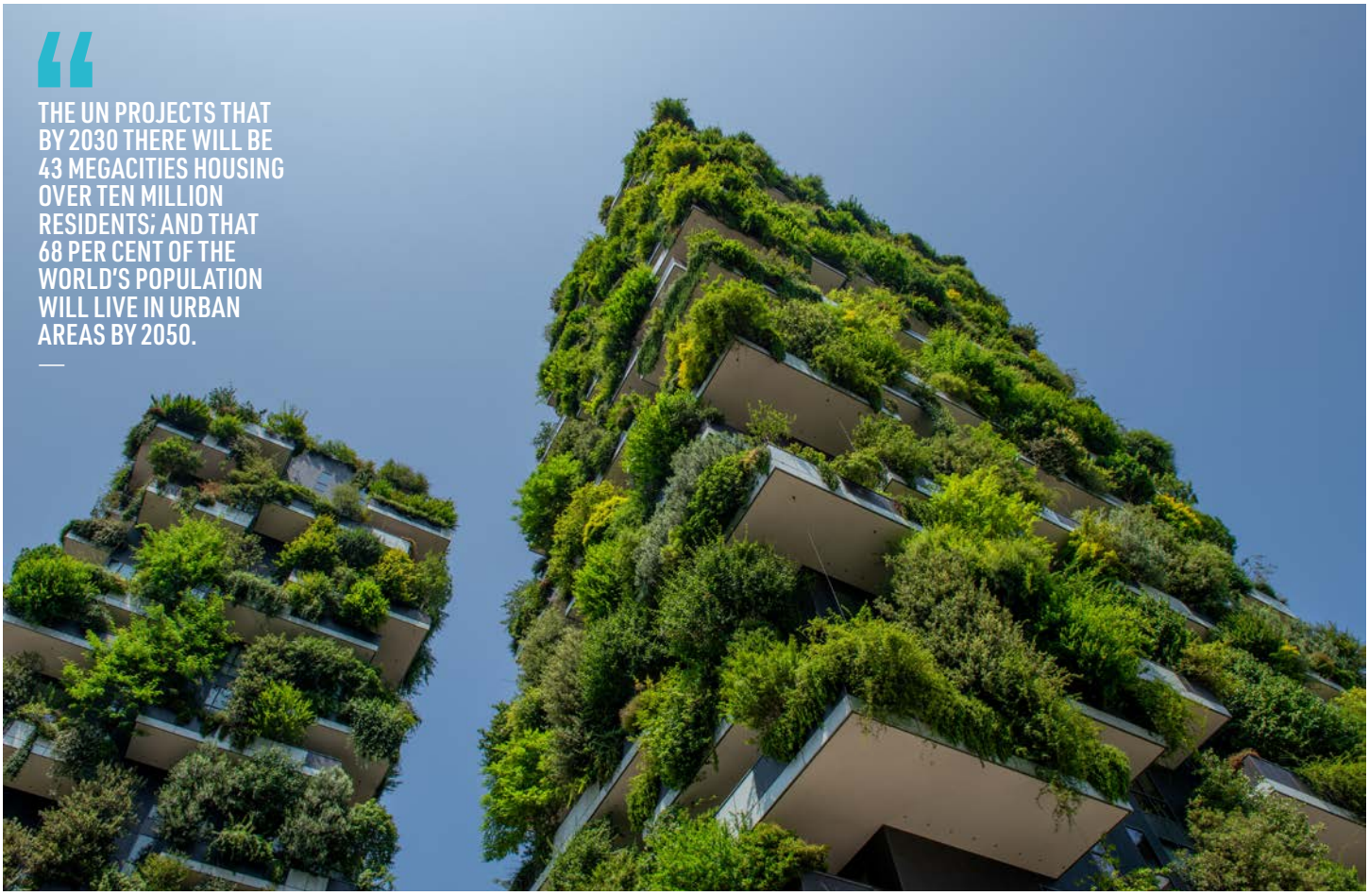
The rise of the city

Historically however, cities have been built for people (and increasingly, in the last century, motor vehicles), limiting room for green space, natural habitats or wildlife. Across the world, that urban pressure on natural resources continues to grow.



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The UN projects [3] that by 2030 there will be 43 megacities housing over ten million residents; and that 68 per cent of the world's population will live in urban areas by 2050.

At the same time, many of the world's cities are upgrading their infrastructure to facilitate future-proof solutions, such as smart roads and highways, connected and autonomous vehicles and smart utilities, to help ease the day-to-day running of their city and citizens' lives. The question for many now in response is how do we use this digital revolution and other tools to not only connect with and protect our cities' natural capital better, but also help it thrive?

A sustainable investment opportunity

Natural capital accounting approaches set out the potential value of NBS in economic terms. As they become a mainstream part of the design and construction process, and NBS become more innovative and affordable, there's an opportunity for biodiverse solutions to help strengthen natural resources, liveability and resilience in more cities.

Developing an internet of nature

As a 2019 paper by Galle, Nitoslawski and Pilla argues [4], we need to consider the potential of an 'internet of nature', where technology and nature are integrated to provide us with real-time data about our natural environment and the essential ecosystem services it supports.

For example, average summer temperatures in Paris are typically around 20°C. In July 2019, temperatures in the capital soared to 42°C — an event that is expected to become the norm in years to come. During the summer of 2019 [5], Parisians were able to use a mobile app, Extrema, to find 'cool spots' in their city. In the future, by recording local temperatures and the transpiration rates of trees, such an app could recommend places offering shade and respite from the heat, along streets and in parks away from the crowds, using live data.

MODERN CITY DESIGN SHOULD EMBRACE BIOPHILIA AS A CORE IDEA AND UTILISE NBS TO IMPROVE THE LIVEABILITY AND HEALTH OF ITS RESIDENTS. NATURAL CAPITAL APPROACHES CAN DRIVE INVESTMENT INTO NBS AND DELIVER GREEN ECONOMIC GROWTH. BUT WE ALSO NEED TO COMMUNICATE THE BENEFITS OF NBS MORE EFFECTIVELY TO ENABLE OUR URBAN NATURAL ENVIRONMENTS AND GROWING CITIES TO SUCCEED SUSTAINABLY.

MAKING THE CASE

To help city authorities make the case for NBS, here are three big reasons why biophilic design offers suitable investment opportunities:

1/ NBS CAN HELP IMPROVE HEALTH AND WELLBEING

As we spend more and more of our lives indoors, research shows that communities with access to the natural world [6], via green spaces, clean rivers, and abundant urban wildlife, experience better levels of physical and mental health.

By improving air quality, providing open recreational spaces for residents and helping to reduce stress, fatigue and anxiety, NBS approaches can ease the burden on local health services and free up resources to target the prevention of ill-health.

2/ NBS STRENGTHENS RESILIENCE AGAINST ENVIRONMENTAL THREATS

NBS create a natural system of resilience against the impacts of the climate crisis — for example, reducing local temperatures, lowering flood risk and defending against storms and tidal surges. Local impacts to natural habitats heavily influence ecosystem functioning, which in turn exacerbates the ferocity of severe weather events. Putting nature back into our cities provides natural protection against these issues.

For example, in areas where flooding negatively impacts residents' homes and livelihoods year on year, the use of urban wetlands as a flood-prevention measure can help deliver greater peace of mind and countless advantages to the local economy.

SINGAPORE – THE BIOPHILIC CITY

Singapore is the world's leading example of a biophilic city that puts NBS at the heart of its communities. As an island state with limited resources of its own, Singapore understands the value of investing in NBS, such as living walls, urban wetlands and green corridors, to help boost investment and mitigate against biodiversity loss, climate change and other environmental issues.

Across Singapore, living walls and roofs are commonplace within the Central Business District, on community centre buildings and even temporary construction hoardings. While artificially created, soft landscaped wetlands like those in Bishan Park function as water attenuation systems, relieving the pressures of frequent tropical thunderstorms. Other NBS, such as floating wetlands can be found throughout the nation's reservoirs, including Sengkang Park and Punggol Reservoir, purifying the water to benefit human consumption and wildlife.

3/ NBS FOSTERS BIODIVERSITY TO BENEFIT ALL

NBS develop vital habitats for urban biodiversity offering a safe refuge from landscapes that have been subject to habitat loss and excessive spraying of pollinator-harmful chemicals. Living walls and roofs are a good example as they both improve the aesthetic beauty of our city centre surroundings and produce suitable and safe conditions for plant life, pollinators, birds and other wildlife to thrive.

Realising the potential

The concept of biophilic cities has been around for several decades, but its potential is only now starting to be realised as our response to climate breakdown and the biodiversity crisis increases in urgency.

Modern city design should embrace biophilia as a core idea and utilise NBS to improve the liveability and health of its residents. Natural capital approaches can drive investment into NBS and deliver green economic growth. But we also need to communicate the benefits of NBS more effectively to enable our urban natural environments and growing cities to succeed sustainably. WL