The city reimagined: why in design, ecology matters

Cities across the world seem to buckle under the strain of the pandemic. Here are some takeaways from Asia, where designers grapple every day with ecological loss and risk, within a pressure cooker of density. **By Nirmal Kishnani**

THERE is much talk these days of a post-pandemic city, one better prepared for future crises. Some say it needs more social space; others, new ways of working and commuting. There is great interest in health, understandably. Should we expand green space? Or make buildings work harder at keeping us safe? Each idea, up close, makes perfect sense.

Stepping back, however, it is clear just how invested we are in a particular way of thinking. We take a problem, break it down, focus on a part and make that better. In the process, we miss the forest for the trees – sometimes, literally. This really is a problem of how we define a problem.

Some 60 years ago, American author and activist Jane Jacobs, asked "(what) kind of problem the city is."

It was, she concluded, a problem of "organised complexity", one of several types discussed in scientific literature. In this category, a multitude of variables come together to form organic wholes: networks of intricate, interconnected relationships that add up to more than mere agglomerations of parts. Framing a city as the wrong problem type could lead to solutions that imperil urban life and character.

The ecology conundrum

Jacobs did not, at the time, speak of ecology explicitly nor did she speculate how nature is affected by, or survives within, a changing city. Since then, the friction between human settlements and natural systems has grown exponentially, particularly in Asia, which has witnessed an explosion of metropolitan populations. Here, urban systems have become houses of cards, where one crisis can easily cascade into several others.

The population of the Mumbai Metropolitan Region (MMR), for instance, increased three-fold in the years between 1972 and 2011; in the same period, built-up area increased 450 per cent. As the city densified, 37 per cent of forest and green cover in Greater Mumbai (core of the MMR) was cut down. Water bodies shrank by 12 per cent; wetlands, 32 per cent. When a flood paralysed the city in 2005, the disaster was attributed in part to one of the city's waterways that had been altered to make way for a new business district and an extension to an airport runway. With a tally of some 14,000 homes destroyed, and over 1,500 people dead, the price of ecosystems losses was suddenly in sharp focus.

This episode, like countless others in Asia, highlights tipping points in complex systems. The current pandemic, as it happens, has raised concerns about wildlife markets, factory farms and deforestation, all of which are said to trigger the emergence of zoonotic diseases. That same indifference to life, except our own, has led to the other big crisis on our plate: climate change. It seems we disregard nature until our actions boomerang on us unexpectedly, and often in catastrophic ways.

Nature-inspired solutions

Of the many systems that planners juggle, natural is possibly the least appreciated. Nature is typically classified as amenity – managed green areas such as parks – that enhances urban well-being. Vegetated building facades and roofs are trendy for the same reason, and also because they offer free cooling. But greenery, especially if integrated with water, can do so much more, from cleaning air to regulating water cycles and sequestering carbon. Some Asian designers are awakening to this idea of ecosystem services and putting it to work.

Yanweizhou Park in Jinhua City (China), for instance, sits on land that was once contaminated. Using select vegetation and water features, it now mitigates seasonal floods, filters water, supports the proliferation of wildlife and offers a lively civic space to a crowded city of 5.5 million. Yu Kongjian, its lead designer, calls this "the art of survival – planning and design based on ecology, wherein rivers, wetlands, and forests provide ecological services. Overlaid onto this layer is human culture: buildings, roads, public spaces, etc. The natural and the human reinforce each other." The process begins with an inventory of natural assets that are first protected and then integrated into a network of pedestrian pathways and buildings. This approach, though not new, is now enshrined in some of China's national and city codes, thanks in part to activists like Yu.

Notwithstanding ecosystems within a city, the question of how a city behaves externally, extracting sustenance from nature, is even more pressing. To minimise or possibly reverse damage to planetary systems, cities ought to produce what they need, locally, taking advantage of new processes and technologies. For now, this is seen in small, ad hoc solutions – think community farms – that are often symbolic. The challenge ahead is how to scale them up.

A recent proposal for a residential development in Jakarta shows what this might look like. It deploys vast connected roofs as food farms and solar canopies that make the estate self-sufficient. Buildings are elevated to free the ground for public space and habitats for fauna. It engages these multiple systems simultaneously and can accommodate 210,000 people within an area of 730 ha, or roughly 28,000 people/sq km, which is on the high side of average metropolitan densities.

Richard Hassell, co-founder of the design

Above: Yanweizhou Park in Jinhua City, China, sits on land that was once contaminated. Using select vegetation and water features, it now mitigates seasonal floods, filters water, supports the proliferation of wildlife and offers a lively civic space to a crowded city of 5.5 million. PHOTO: YU KONGJIAN

Below: A recent proposal for a residential development in Jakarta deploys vast connected roofs as food farms and solar canopies that make the estate self-sufficient. But the proposal was too radical and was shelved. PHOTO: WOHA ARCHITECTS

firm, Woha (Singapore), explains the concept: "We've been looking at ways of stacking greenery on roofs and other areas of buildings. Once you have an infrastructure of life-bearing areas, you can think strategically about what it's for. It can perform services such as energy production, farming or supporting ecosystems." What is remarkable here is the scale and synchronicity, how it alters the form and structure of a dense neighbourhood.

Blueprint for transformation

To anyone familiar with how planning works, it may come as no surprise that the Jakarta proposal was never implemented. Too radical, too divergent from what we have come to expect, it was shelved, even though some of its ideas were applied to smaller buildings and precincts elsewhere. The world of construction is risk averse and weighed down by inertia. And so, perhaps, what developers choose to do is less critical than what they are obliged to do. This is where policy steps in.

Like DNA, policies are blueprints that drive change organically, inside out. Among cities, Singapore has a reputation for strategic policies on land use optimisation, necessary for an island with a finite amount of space. Its parks and green spaces, for instance, have evolved from mere neighbourhood amenities to also function as connectors within ecological and hydrological networks at the city scale. And there is now space set aside for urban farming: 30 per cent of the food needed by its population will be grown locally by 2030, up from the current 10 per cent. The plan is backed by incentives for vertical farms, some floating off the coastline.

But what if policy-makers in Singapore were to ramp up that number? In light of recent disruptions to global supply chains, why not aim for 50 per cent? Maybe 60 per cent or 80 per cent? Planners might flinch at the thought; a target that high would likely upend the urban fabric of a land-constrained city. Large commercial farms would need to be meshed into neighbourhoods where people live and work. The knock-on effects on community and economy are difficult to foresee.

To embrace uncertainty, we must defer to Jacobs: visualise the city as a whole, knit together by flows and exchanges. Intervening in a complex structure, the goal must be to safeguard good connections and facilitate new reciprocities. If an industrial-scale farm is to be sited within a residential enclave, can it double up as a social space with farmers markets and restaurants? Can areas that capture rainwater for irrigation be conceived as wetlands, and act as habitats for fauna? If the vast amount of food discarded from homes is transformed into fertiliser, might this pave the way for businesses specialising in waste management?

Reimagining the city is less a pragmatic response to a crisis, more a projection to a desired end state. The messy complexity of the metropolis, its unwieldiness, can become an opportunity to restore harmony between us and the natural world.

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