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Turenscape’s Sponge Cities
‘Designing Resilience’
Dr Yu Kongjian, the founder of Beijing-headquartered multi-disciplinary design and engineering firm Turenscape, is a leader in the development of landscapes that combat flooding while repairing ecological damage and winning hearts.
In Asia’s rush towards urbanisation, a post-industrial framework of water management has largely been adopted. It is characterised by draining water away from our cities as quickly as possible, using pipes and concrete drains. Tropical Asian cities, however, unlike their European counterparts, are prone to sudden monsoonal downpours, leading to issues of flooding in cities that are ill-equipped to deal with torrents of water.

Dr Yu Kongjian, founder and Principal Designer of Turenscape and Dean of the College of Architecture and Landscape Architecture at Peking University, presents the idea of Sponge Cities – a concept synthesising modern water management systems with the ancient Chinese agricultural wisdom deployed in rice paddies and ponds.

Sponge Cities retain and slow down the flow of water through the use of terraces, ponds and dykes. Urban landscapes become active systems that absorb excess water during monsoon rains, retain and filter it within a meandering landscape, and release it for use during dry seasons. The Sponge City solution to urban inundation has been applied in over two hundred cities in China and beyond, gaining credence as the Chinese government’s adopted urban ecology framework.

Singapore has built so much, all its rivers are channelised. Ramboll Atelier Dreiseitl did a great job with Bishan-Ang Mo Kio Park, but you have 100 more canals to deal with,” he jests. Singapore will soon see an initial test bed of some of Dr Yu’s strategies, as Turenscape was awarded noteworthy Rail Corridor commissions for the adaptive reuse of Tanjong Pagar Station and integrated housing at Choa Chu Kang with MKPL Architects. Their proposals involve transforming the linear corridor into a social nexus that retains cultural heritage as well as ecological flows through the site.

Living with water is the third strategy. “It’s about adaptation. When water turns into a flood it’s too late – the water is too powerful then. Today, people depend on flood walls to protect cities. A better way to deal with water is through Sponge Cities. The city adapts to the water instead,” Yu says. In Yunnan, a concrete flood wall was demolished and the landscape transformed into bush, brimming terraces accredited by lightweight pedestrian bridges.

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Streams should be meandering, not straightened. By slowing down a river, water can become productive, life-supporting and beautiful,” Dr Yu shares. Turenscape’s project Minghu Wetland Park in Liupanshui beautifully illustrates the slowing down of water using pond terraces, creating inviting and fruitful urban spaces that connect people with their city.

He shares four key strategies that are needed for Sponge Cities to work. Firstly, retaining water at its source. Turenscape was appointed in 2009 to solve the urban inundation problem in Harbin with the Quali Stormwater Wetland Park project. Storm water is collected within the parkland using a pond-and-dyke system. Ash trees are planted along the perimeter of the park, becoming a sponge band that filters rainwater before it flows into the central ponds, which are planted with native shrubs. A boardwalk above encircles the periphery, allowing people intimate access to nature.

The second Sponge City strategy is slowing down water as it flows. “Streams should be meandering, not straightened. By slowing down a river, water can become productive, life-supporting and beautiful,” Dr Yu shares. Turenscape’s project Minghu Wetland Park in Liupanshui beautifully illustrates the slowing down of water using pond terraces, creating inviting and fruitful urban spaces that connect people with their city.

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Singapore’s ecological development, Dr Yu raises several pertinent points. “Singapore has built so much, all its rivers are channelised. Ramboll Atelier Dreiseitl did a great job with Bishan-Ang Mo Kio Park, but you have 100 more canals to deal with,” he jests. Singapore will soon see an initial test bed of some of Dr Yu’s strategies, as Turenscape was awarded noteworthy Rail Corridor commissions for the adaptive reuse of Tanjong Pagar Station and integrated housing at Choa Chu Kang with MKPL Architects. Their proposals involve transforming the linear corridor into a social nexus that retains cultural heritage as well as ecological flows through the site.

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Welcoming Wetland

Yanweizhou Park in Jinhua City has been designed to embrace floods. To Dr Yu Kongjian of Turenscape, a resilient landscape absorbs water rather than resisting it using flood walls. Jinhua used to be plagued by annual floods, which had to be countered by ever-taller concrete flood walls. Turenscape designed a series of floodable terraced embankments. During flood season, silt deposits enrich the native vegetation. The vibrant Bayong Qiao bridge hovers above flood levels, so people can still enjoy their early morning jog during rainy months.
“[I]f you can integrate an ecological mind set into the civil engineering system, Singapore can become a sponge nation, reach its goal of being self-sustainable, and solve the problem of floods.”

Dr Yu Kongjian

Opposite: Dr Yu in his studio. Above: Dr Yu is also interested in applying the principles of sponge cities at the granular level of the individual home. He collects storm water at his roof garden and uses this to irrigate vegetable and ornamental gardens including a green wall within his living room (not shown), which acts as an ‘air-conditioner’. During summer, he calculates that he has saved 2,000kW of energy, collected 52 cubic metres of storm water, and produced 52 kilograms of vegetables annually.