

Living in a Garden

The Greening of Singapore

Text by Tim Auger

Photography as credited

The article is an excerpt from *Living in a Garden: The Greening of Singapore*, published by the National Parks Board to commemorate 50 years of greening Singapore. *Living in a Garden: The Greening of Singapore* is available at all major bookstores and Singapore Botanic Gardens retail outlets.

The Straits Times announced: “Lee begins the tree campaign.” On 16 June 1963, Singapore’s then Prime Minister Lee Kuan Yew toured the Ulu Pandan constituency. At that time, the junction of Farrer Road was a roundabout, known as Farrer Circus. There, he planted a tree.

As reported in the newspaper, the ceremony was the start of an island-wide tree-planting campaign. Singapore would be a “garden city beautiful with flowers and trees, and as tidy and litterless as can be”, the Prime Minister said in May 1967.

Who could have imagined in the 1960s what Singapore would look like 50 years on?

Today, despite the changes, some five percent of Singapore’s primary vegetation remains, as well as larger areas of mostly regenerating secondary rainforest, stretches of mangroves, and parts of the shoreline hosting a rich diversity of marine life.

The Importance of Greening

By the 1970s, urban development was going at full tilt. Nevertheless, Lee Kuan Yew made it clear that greening was a priority.

Why was it so important to plant trees? Lee’s idea was to make Singapore distinct from its neighbours. He wrote in his memoirs, “One arm of my strategy was to make Singapore into an oasis in Southeast Asia, for if we had First World standards, then businessmen and tourists would make us a base for their business and tours of the region.” This emphasis on long-term attention to appearances was key to the transformation of Singapore into a garden city then, and it is still important.

The government gave the task of greening Singapore to the Parks and Recreation Division, formed in 1974 within the Ministry of National Development (MND). Its first head was Wong Yew Kwan, transferred from the Primary Production Department (PPD). Two years

later, in 1976, when the Parks and Recreation “Division” became a “Department” (PRD), Wong became the first Commissioner of Parks and Recreation. His team was small, some 40 strong. It included only a handful of local graduates and one graduate botanist, although a number of recruits had Taiwanese degrees in horticulture or agriculture.

Moving as One

For the greening of Singapore to succeed, the whole of government had to pull in the same direction. Planting had to be a priority and not sidelined. Ensuring this was, and still is, the job of the Garden City Action Committee (GCAC), originally formed in the late 1960s. Its members represent all the ministries and statutory boards contributing to the greening effort. It hears reports on operational and maintenance issues, streetscape greenery, developments affecting the parks, the Singapore Botanic Gardens, and the nature reserves—no aspect of the greening of Singapore escapes its notice.

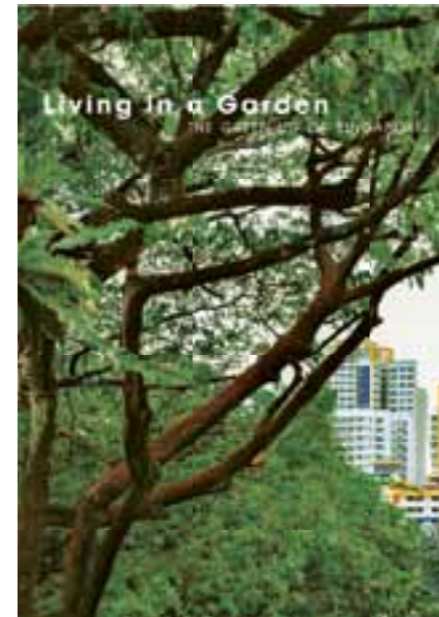
In 1978, according to the first parks commissioner Wong Yew Kwan, the Prime Minister called a meeting and made it clear to civil servants that they should channel increased resources to it. By 1980, the budget was nearly 10 times what it had been in 1973, after inflation is taken into account.

What to Plant?

Up to the end of the 1970s, PRD officers chose trees mostly for shade, rather than for colourful foliage or flowers. Some of these trees were “native”—they grew in the primary forests. Others were introduced from overseas, although the range available was smaller than today. Seeds collected abroad were put into quarantine; cuttings were treated to eliminate pests and diseases. After that, the successful newly introduced species could be grown in bulk.

How to Move a Tree

Trees take time to grow but Singapore needed quick results.



The solution was “instant trees”. PRD officers transplanted young trees from tree banks, allowing large areas to be greened up quickly. Rain Trees and Angsanas were particularly successful.

Saplings transplanted into a city environment when they are young and small do not create a lush, green effect immediately. So saplings are sometimes planted out first in tree banks on vacant land and moved to their final positions when they have grown bigger.

Researchers in Singapore have taken the “instant tree” concept further, growing trees in extra-large containers, 1.5 metres high and 2.0 metres in diameter. This approach makes sense, say, when road widening is planned for the future. Trees in containers can go into position temporarily and move somewhere else later.

A More Colourful City

In 1979, PRD began a new phase in the development of Singapore as a garden city. There was a need for more variety. This came in the form of colourful flowers and foliage.

By the end of 1980, the PRD had planted 56,000 flowering trees. In 1984, nearly two-thirds of all the new plantings in Singapore were flowering shrubs. The emphasis on colour and variety has been maintained to this day.

A Softer Touch

All over the world, cities built mostly of concrete have become drab. Apart from being ugly, bare concrete reflects glare and heat. Singapore has worked to avoid these effects, to create pleasant surroundings for living and working.

The surfaces of concrete structures were roughened and given a coat of stucco. Climbing plants became widespread, and today, Climbing Fig (*Ficus pumila*) softens the look of concrete all over Singapore.

During the construction of the East Coast Parkway and Pan Island Expressway, Lee Kuan Yew insisted that greenery should cover the ugly crash barriers.

Lee drew attention to the spaces under flyovers, the “cavernous depths”, as he described them. With little light and moisture, plants do not grow well there. The GCAC considered artificial light, but rejected it on energy grounds. There was even a plan to use mirrors to reflect natural light! This was rejected as being too distracting to drivers. One creative solution was to split flyovers and elevated highways into two carriageways with a 1.5-metre gap between them, to let light and rain through.

New Thinking Needed

In the 1990s, park users were becoming better informed, more cosmopolitan and more sophisticated. Dr. Kiat Tan, who would head the newly formed National Parks Board (NParks) from 1990 and later become CEO of Gardens by the Bay, recalled, “In the early days, land was allocated to parks because it was not economically useful. Parks tended to be far away from where people lived, patches of land that would get in the way of later development. With the building of new towns and increasing cooperation between government agencies, that all changed; but the key underlying factor was public engagement.”

The need to try out a different kind of organisation led to the formation of NParks in 1990. Dr. Tan wanted, in particular, to restore professional skills to their rightful place and so reinstate Singapore Botanic Gardens in its professional role. This, in his opinion, was only achievable outside the PRD. The permanent secretary of MND agreed to the formation of a new statutory board. As Dr. Tan was already secretary to the Nature Reserves Board, his new portfolio included the reserves and also Fort Canning Park as CEO. In 1996, NParks took over the entire park-management role of PRD.

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The Importance of Expertise

In 1972, the Singapore Botanic Gardens set up a School of Ornamental Horticulture, offering full- and part-time diploma courses. Initially, it trained around 10 people annually to work on the greening of Singapore.

Ideally, these diplomas would have been reflected in salaries. In fact, they were not seen as equivalents to college qualifications, and so training shifted to the tertiary institutions, Ngee Ann Polytechnic, in particular.

More recently, NParks revived the idea of having its own training institution. As a result, with input from the Singapore Workforce Development Agency, the Centre for Urban Greenery and Ecology (CUGE) opened in 2007. It provides skills training and professional certification for the landscaping industry in general. In its first five years, it trained more than 6,000 locals.

CUGE also carries out research. Its programmes cover: the performance of plants, such as different kinds of grass, in urban conditions; the integration of greenery, including skyrise greenery, into the built environment; and urban ecology, including pests and disease.

The landscaping industry itself plays a central role in the development of management and technical skills and the maintenance of standards. Its efforts are coordinated through the Landscape Industry Association (Singapore) (LIAS).

Greening the Streets

From the 1970s onwards, the network of streets and roads lined by greenery steadily increased. So did the responsibilities of the people who planted and maintained them. Today, around 129 staff, plus contractors and their labourers, are backed by an annual budget of some 21 million SGD. According to former streetscape director Simon Longman, "It's the standard of maintenance that justifies using public resources at this sort of level. It also distinguishes Singapore from some other countries that have tried to follow the greening path."

Gardening in the Sky

When space for gardens at ground level is limited, as it is in Singapore, you go upwards. Showing the creativity that has increasingly charac-


terised Singapore's greening efforts in the 21st century, planners and developers began to apply greenery—grass, ground-cover plants, shrubs, and even trees in containers—to roofs.

Some of the benefits are practical. Greenery helps reduce the heat island effect, whereby built-up areas can be up to four degrees Celsius hotter than forests. It is a heat insulator, reducing air-conditioning costs. It filters the air. It acts as a "sponge" for rainfall, reducing the danger of flooding. Properly installed, it can reduce maintenance costs.

For Housing & Development Board, rooftop planting began with multistorey car parks. Because older buildings were not designed to take the weight of conventional gardens, designers came up with a patent, lightweight tray system, which uses little soil and is easy to irrigate. Architects incorporated more ambitious rooftop gardens into new housing developments, as at Sengkang and Punggol. The designers do not have a totally free hand when it came to plant selection—they have to choose plants with shallow roots, able to tolerate exposed, dry conditions, and that are not too heavy and easy to maintain. Trees cannot be too tall and must be suitable for growing in stone, plastic, or fibreglass planter boxes.

The Urban Redevelopment Authority introduced planning rules encouraging private developers to use vertical greenery, balcony planting, communal planter boxes, landscaped decks, sky terraces, and roof gardens. Although the government initially set the direction, skyrise greenery soon proved commercially attractive.

A Wall of Green

Plants on vertical walls improve the look of modern buildings and help protect them from the weather. They provide sound insulation. They provide a habitat for birds, butterflies, and other small animals. Above all, they have a psychological benefit, helping to make the urban environment less stressful. Vertical vegetation is usually planted in modular cassettes or planters attached to a trellis or framework. For example, cassette planting is being used on some of Land Transport Authority's ventilation blocks for the new North-South and Marina Coastal expressways. 



1. A tree being moved by crane to be transplanted (Photo: Land Transport Authority).

2. The planting of bougainvilleas along overhead bridges and flyovers was an important innovation. It made a big impression on visitors and still does (Photo: National Parks Board).

3. Assessing decay in a tree, using a resistograph, which measures physical resistance to drilling (Photo: National Parks Board).

4. The rooftop garden at Orchard Central shopping mall offers breathtaking views of the city (Photo: Elmich Pte Ltd).