

# Therapeutic Gardens for the Tropics: Design Case Studies in Bishan-Ang Mo Kio Park and Tiong Bahru Park

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## Guiding Principles of the Therapeutic Gardens

Studies have shown that human contact with nature reaps benefits. The designs of therapeutic gardens have been mainly based on two theories. The first is the Attention Restoration Theory (ART),<sup>1</sup> which professors of psychology at the University of Michigan, Rachel and Stephen Kaplan, explained that a person has several states of attention, including directed and effortless attention. Prolonged direct attention on specific tasks, such as working on the computer, would result in direct attention fatigue as one's brain capacity to focus on a particular task is limited. To recover from this mental fatigue and restore direct attention capacity, one's attention has to be redirected to a more effortless brain function by being in a natural environment, which is intuitively meaningful. The Kaplans proposed certain characteristics which can be applied in garden design.<sup>2</sup> For example, having a legible and coherent setting would allow people to easily understand and make sense of a place. Yet, the setting should also be complex, by providing a rich setting with a variety of plants and garden elements to provide opportunities for sensory experiences. In other words, a good design of a space would allow users to navigate effortlessly while being fully engaged in their surroundings.

Roger S. Ulrich's (1991) Stress Reduction Theory provides the backbone of the other guiding design principle. It proposed that a person's well-being can vastly improve through being immersed in a natural environment or seeing nature (such as looking at plants or flowing water). In a study conducted by the National Parks Board (NParks) and National University Health System (NUHS) in 2015,<sup>3</sup> 69 elderly participants participated in a therapeutic horticulture programme which includes outdoor gardening, indoor horticultural activities and park visits. The entire programme took place over 12 consecutive weeks, followed by monthly sessions for the last 3 months. Based on examinations conducted before and after the programme, which includes socio-psychological and biomarkers assessments, the study found that therapeutic horticulture elevated participants' scores for life satisfaction, memory, and psychological well-being.

## Background

Following the first therapeutic garden at HortPark, NParks will be developing a network of therapeutic gardens across various parks in Singapore. Two of these therapeutic gardens have been situated in the parks within the vicinity of mature estates, as the growing ageing population has been one of the key factors to prioritise the provision of health-promoting infrastructure for the residents.

Completed in 2017, the Therapeutic Gardens at Tiong Bahru Park and Bishan-Ang Mo Kio Park are the first few additions to the network. Located near various eldercare and senior activity centres, the gardens have design elements and are equipped with features to cater to the needs of the elderly, including those with dementia. With a size of 750sqm and 900sqm respectively, the gardens provide a holistic rehabilitative environment to relieve stress and stimulate restorative effects for the mental well-being of visitors of all ages. During the conceptualisation stage of the project, NParks visited nursing homes and elder care centres located within the vicinity of the gardens to gather information on the needs and requirements of target users. Professional expertise for the therapeutic garden design was also sought from the occupational therapists of the Alzheimer's Disease Association (ADA), as well as gerontological expert Professor Kua Ee Heok from NUHS.

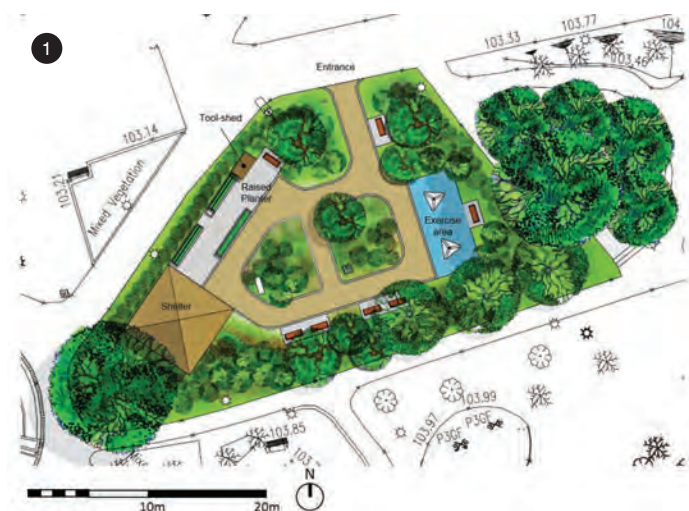
## Selecting a suitable site

There are several factors to consider when selecting a suitable site to build a therapeutic garden. Some of them are:

### Accessibility

Accessibility is especially important for elderly users as most of them cannot walk too far. It is recommended that the garden site be located near vehicular drop-off access points and amenities such as toilets, washing areas and drinking fountains. For Bishan-Ang Mo Kio Park, a handicapped toilet had to be incorporated into the design due to the selected site being too far away from the park's existing toilets.





## Designing the Garden Layout

Both of the therapeutic gardens were designed to have a clear layout with a simple circulation. The circulation in both gardens is a close looped path, in the form of a figure-of-eight to allow users to navigate easily through the spaces. There are also interesting features along the pathway which allow users to engage in purposeful wandering. One of the ways to encourage elderly users who face difficulty from walking too much is to provide more seating along the pathway. In both gardens, a bench is placed within every 5m along the path. This purposeful placement of benches at regular distance would reassure elderly users that they will be able to rest should they be tired from walking. The benches have also been placed to face different directions to provide a variety of views, and also amongst the profusion of colour, texture and scents of the plants which stimulate the senses.

Raised planters have been built to encourage users to interact with plants. Two types of raised planters have been added to the gardens. The first type is placed along the pathway to encourage users to feel the textures of the plants. For example, the therapeutic garden at Bishan-Ang Mo Kio Park features a sloped raised planter for users of different abilities to interact with plants at different heights. The second type is designed to allow wheelchair users to be involved in simple horticultural activities like sowing seeds, pruning and watering of plants. A washing point next to the raised planters is provided in each of the gardens.

In addition, tool sheds are also available for garden tools to be stored. In order to encourage physical movement, fitness areas have been incorporated into the garden. Some of the exercise equipment also catered to wheelchair users. Shelters in the garden allow users to rest and encourage social interaction through group activities and therapeutic horticulture programmes conducted by therapists or volunteer guides.

### Terrain

Both garden sites were chosen for their relatively flat terrains to facilitate users' movement and especially, to ensure the safety of wheelchair users.

### Shade

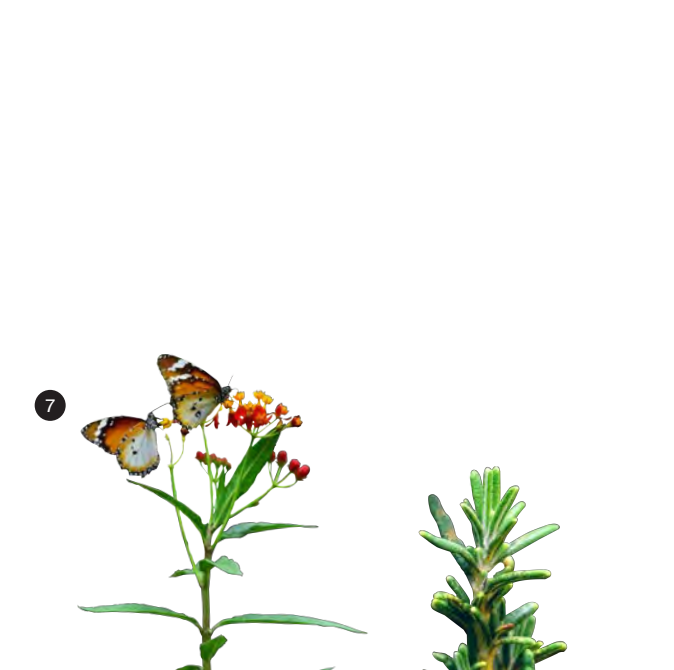
Adequate shade in the form of existing mature trees provides respite for users from the sun. This is evident in studies that show that the temperature in outdoor area shaded by trees can be significantly reduced by 2.5 °C as compared to that in an unshaded outdoor area.<sup>4</sup>

### Borrowed landscape

Selecting a site with existing landscape or scenic views enhances the landscape experience in the garden. The site at Tiong Bahru Park is surrounded by existing greenery which allows integration of the therapeutic garden with its surrounding environment. Likewise, the site at Bishan-Ang Mo Kio is situated beside an existing lake within the park, providing a vantage point for users to admire a scenic view.

1. Design Layout for Therapeutic Garden @ Tiong Bahru Park. Image by National Parks Board

2. Design Layout for Therapeutic Garden @ Bishan-Ang Mo Kio Park. Image by National Parks Board



Calming and restorative

Familiarity and comfort



CREATING A  
SENSORY EXPERIENCE  
WITH PLANTS



Mind stimulation

Observation and appreciation



3. Entrance of the Therapeutic Garden @ Bishan-Ang Mo Kio Park. Image by Tham Xin Kai

4. View of Therapeutic Garden @ Tiong Bahru Park. Image by Chuah Hock Seong

5. View of raised planter and bench in Therapeutic Garden @ Bishan-Ang Mo Kio Park. Image by Tham Xin Kai

6. Senior-friendly exercise equipment in Therapeutic Garden @ Bishan-Ang Mo Kio Park. Image by National Parks Board

7. Flora and fauna found in the therapeutic gardens.

#### References

- <sup>1</sup> Kaplan, R. and Kaplan, S. (1989). The experience of nature: A psychological perspective. New York: Cambridge University Press.
- <sup>2</sup> Kaplan, S. (1979). Perception and landscape: Conceptions and misconceptions. Proceedings of Our National Landscape: A Conference on Applied Techniques for Analysis and Management of the Visual Resource (Incline Village, Nevada, April 23-25 1979), pp. 241-248.
- <sup>3</sup> National Parks Board (2017). Design Guidelines for Therapeutic Gardens in Singapore, pp. 13-14
- <sup>4</sup> Yafei, W., Frank, B., Rudolf, G., Heinrich, W. and Rik, L. (2015). Effects of urban trees on local outdoor microclimate: synthesizing field measurements by numerical modelling. Urban Ecosystems, 18(4), pp 1305.
- <sup>5</sup> ds, B., Spector, A., Jones, C., Orrell, M. and Davies, S. (2005). Reminiscence therapy for dementia. Cochrane Database of Systematic Reviews, 18(2), CD001120. Serrani Azcurra, D. J. (2012). A reminiscence programme intervention to improve the quality of life of long-term care residents with Alzheimer's disease: A randomized controlled trial. Rev Bras Psiquiatr, 34(4), pp. 422-433.

### Creating a sensory experience with plants

Great emphasis has been placed on plant selection as the different characteristics of plants create a range of sensory experience. The plants have been specially curated into four zones, creating a gradual mental transition from a calming and restorative experience into one which stimulates the mind. The delightful yet intense fragrance exuded by the bread flower (*Vallis glabra*) especially in the evening, and the passive fragrance of the common culinary Pandan (*Pandanus amaryllifolius*), would first signal to the visitor his or her arrival to the garden. The Fragrant Zone at the garden's entrance, is also where scented plants and flowers with cool colours are planted, as cool colours have been shown to be restorative through its tendency to create a calming experience. At this zone, the user is also welcome to interact more with the natural elements. For instance, the scents of the plants is released through the rubbing or crushing of leaves.

Edibles, including herbs and spices, make up the second zone. Plants like the Thai basil (*Ocimum basilicum*) and the Laksa Plant (*Persicaria odorata*) which are commonly used for cooking, engage visitors through evoking a sense of familiarity and comfort associated with the dishes which use the plants as an ingredient. The third planting zone is filled with plants of different colours and textures. Here, users will be able to touch and explore many different leaf textures, from the fine and feather-like leaves of the Red Fountain Grass (*Pennisetum x advena* 'Rubrum'), the hairy and soft leaves of the Shaggy-Leaved Fig (*Ficus villosa*), to the thick and succulent leaves of the Japanese Rose (*Portulaca grandiflora*). The curated flowers in this zone are also warm coloured to create an uplifting impact by stimulating the mind. They range from the bright yellow flowers of the Creeping Daisy (*Sphagneticola trilobata*) to the reddish leaves of the Painted nettle (*Plectranthus scutellario*).



With the engagement of the five senses through the three planting zones, the garden also creates opportunities for users to observe and appreciate wildlife in the fourth zone through wildlife-attracting plants. Examples of some of these plant species include the butterfly-attracting Scarlet Milkweed (*Asclepias curassavica*) and the Red Leea (*Leea rubra*). The flowers of these plants are pollinated by butterflies and fruits eaten by birds.

Research has shown that patients with dementia tend to retain large amounts of long-term memories. Thus, familiar sights, smells and sounds can be used to stimulate positive sensory experiences. Plants which are culturally significant or encountered during one's childhood and daily life may help to bring back memories and evoke feelings of nostalgia. Some of these plants include the Pomegranate (*Punica granatum*), a symbol of good luck in Chinese culture, Balsam (*Impatiens balsamina*), commonly grown in kampong houses, and the Henna tree (*Lawsonia inermis*), whose leaves are the source of red-brown dye widely used in henna painting.

### Programming to Support On-Going Use of Garden Spaces

Programming makes up another essential part of therapeutic horticulture. Currently, a series of therapeutic horticulture programmes are held in the gardens. Volunteers and staff from NParks conduct these programmes with nursing homes, eldercare centres and other social service organisations. Through these programmes, participants will have an enriching experience with nature by participating in activities which help to engage the senses. The programme also aims to promote physical activities and social interaction amongst programme participants to enhance physical and mental well-being. In addition, collecting programme feedback from users enables NParks to better understand the garden features which users may like or dislike and is an essential tool in refining the design of future therapeutic gardens. 