

Chapter 5

Urban Greening and Its Role in Fostering Human Well-Being

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Abstract Population growth coupled with urbanisation has led to a decline in natural ecosystems throughout the world. Particularly in cities, urban developments continue to displace natural ecosystems and lead to cities being dominated by concrete and steel. However, with increasing recognition of the benefits of human interaction with nature, planning and design professionals are now making more deliberate attempts to introduce greenery into the built environment. Indeed, the fields of urban planning, public health, and park planning provide a rich account of the role that urban greening plays in human well-being. History of urban planning and greenspace began in Europe and America in the early 1800s. Early park settings were intended to benefit urban dwellers and factory workers who lacked exposure to clean air and greenery, whereas today planners develop green recreation areas for passive and active leisure pursuits. An interesting programme that started in the United States is ‘Park Prescriptions’, which is ‘designed in collaboration with healthcare providers and community partners to utilise parks, trails, and open space for the purpose of improving individual and community health’. Horticultural therapy is another compelling initiative which promotes greater inclusion of greenery and active movement within healthcare settings, both inside buildings and the nearby environment. In such initiatives, park planners and managers work closely with urban planners and neighborhood developments to enhance access and leisure services in order to maximise associated physical and mental health and social benefits.

Keywords Parks · Landscapes · Health · History · Benefits

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5.1 Introduction

Population growth coupled with urbanisation has led to a decline in natural ecosystems throughout the world. Such changes in land composition are seen most starkly in cities, where dense urban developments with concrete and other building materials continue to displace natural ecosystems. In many urban developments, urban planners and landscape architects also attempt to reintroduce greenery but these often occupy a small footprint of the built-up spaces. In rural areas, where population growth is less, nature has a better chance of retaining its natural states, particularly where parks and green corridors have been purposefully preserved. Urban planners, urban citizens, developers, and policymakers in cities are beginning to collectively see that urban greening and parks are tied directly to quality of life and indirectly to economic value. The global cities of Paris, London, Tokyo, Singapore, New York City, and Chicago have long histories of creating parks and green areas within their growing cities. Parks and gardens afford urban dwellers a place that is different than their apartment or house where a yard is lacking or small. The landscapes were originally conceived as a playing or gazing ground for the elite and their grandiose houses. Urban parks originated as social places where adults and children could spend their leisure time and mingle as a family or with friends. The exposure to sunlight and fresh air along with being able to view growing trees, grass and flowers provide renewal to the otherwise stressed city worker or wealthy landowner. These reasons to be outdoors and in a leisure green space still resonate today.

This chapter captures the importance and contribution of parks and urban greening to human well-being. We will look into a few hundreds years of history. The British have always loved their parks and gardens, and during its colonisation history, introduced numerous parks in the areas which they colonised. More recent history illustrates that we continue to revere urban greenery. These views, that parks and greenery are essential for healthy living, have been substantiated with an increasing body of scientific evidence from social and environment disciplines highlighting a myriad of benefits. These benefits range from visual stimulation through looking at nature, yielding attention and focus benefits, to healing of patients in hospitals by engaging in horticultural activities. We propose that parks and green spaces are the basis of quality living in urban areas.

In this chapter we first provide a history of parks contributing to well-being. This section provides a historical overview of the theme of health in green space planning in early urban park movements. The second section features recent concepts of preventative health care in conjunction with the placement of parks and greenery close to where we live, work, and transit. Recent efforts around the world have touched on daily doses of nature and visits to parks as a way to overcome inactivity. The third section of the chapter provides an overview of the health and social benefits derived from park exposure. Modernisation has resulted in lifestyles that are increasingly sedentary and urban dwellers spend most, if not all, of their time indoors. Physical benefits from being outdoors and active in outdoor recreation, as

well as the psychological benefits from observing nature and resting from work and household activities are described. The social benefits of being outdoors, whether alone or with others are highlighted. Along with benefits, an overview of the types of green spaces necessary to appeal to various users is profiled. The final section of the chapter considers how the evidence about parks contributing positive health and social outcomes can be leveraged in future plans, designs, and implementation efforts, particularly in urban settings.

5.2 History of the Modern Park's Contributions to Human Well-Being

A series of factors empowered the urban park movement starting in the 1830s in both Europe and America. Without precedence, these early modern societies were facing a set of unique challenges of an unfamiliar urban environment newly brought about by the Industrial Revolution in the 1800s. Rapid industrial growth and an influx of migrants resulted in urbanisation and crowded dwellings in industrial towns. In the city, dismal living conditions were especially pronounced for the working class who, residing in overcrowded districts, had few outlets for enjoyment (Jordan 1994; Taylor 1995). In Victorian society, the authorities recognised the pressing need to respond to the social issue of urbanisation, as highlighted in the Report from the Select Committee on Public Walks (Parliament House of Commons 1833) on the need for the provision of open space.

In response, one of the first public parks, Derby Arboretum, created by philanthropist Joseph Strutt was opened in England in 1840. Contrary to the idea of 'parks' as an exclusive space for the private affairs of royalty and nobility, Strutt desired an available space for the enjoyment of the working class. He saw the establishment of Derby Arboretum as providing the pioneer step of mitigating the government's concern of the health of the urban population through provision of open spaces for people's use (Butterton 1993). The park movement found itself spreading to America, with the design of Derby Arboretum inspiring the design of New York City's Central Park, as New York City also found itself facing similar social issues as a result of unprecedented wave of urbanisation due to a high influx of migrants living in harsh conditions in tenement housing (Bial 2002).

Adopting a deterministic view of cause and effect, park proponents thought that changing the urban environment through ameliorating the living conditions of the working class could engender a better society (Jordan 1994; Taylor 1995, 1999). They attributed the surge of vices in the city to alienation of urban residents from nature. The wealthy lived in the urban area but they were also likely to own estates and working landscapes such as farms and forests outside cities. These estates preserved nature around the urban core and gave jobs to many in the working class society. Woods and meadows were viewed as restorative to the mind, provided places to stroll for socialisation and fresh air, and allowed for hunting, trapping, and

fishing. Over time, parks were developed in the urban core and outside the city to improve society’s well-being through reproducing nature in an urban environment or restoring original or fragmented nature. Contending that commercial activity was wearying for the working class, immersion in the park would result in visitors feeling recharged and ready to engage in another round of work (Olmsted 1881).

With the primary objective of encouraging nature in fast-growing cities, pioneer American park designers deemed it best to have a large park located on the edge of a city where people could be recharged through indulging in contemplative activities while immersed in nature. Olmsted (1881) thought of the pastoral landscape as a way of counteracting what he considered to be the ‘severe and excessive exercise of the mind’. The creation of a *rus in urbe* environment—one which provided the illusion of the countryside by a park within a city—was deemed essential. In contrast, activities such as energetic children’s play or athletics were not encouraged. Olmsted did not favour recreation that would lead to overstimulation. Instead, he believed that gentle exercise relieved the brain. This first model (Table 5.1) of the modern urban park, commonly known as the Pleasure Ground (1850–1900) (Cranz 1982; Cranz and Boland 2004), was premised on the ideal pastoral landscape with buildings subordinate to the overall landscape. Creating generic spaces within this park was also key in the design of the ideal restorative environment; its

Table 5.1 A comparison of park models over the centuries

	Pleasure ground (1850–1900)	Reform park (1890- early 20th century)	Open-space planning (early 20th century)	‘New-Age’ park (present)
Description	Strong emphasis on creating an illusion of the countryside by a park within a city, its aesthetics, and tranquilising recreation	Less emphasis on the importance of being a picturesque environment, instead balancing ‘utility’ with ‘beauty’	Parks are imagined as part of larger network connecting different green space and public lands	Adult playgrounds, intergenerational parks, restorative gardens
Public goal	Provision of open spaces to prevent alienation of lower-wage workers living in overcrowded urban conditions due to unprecedented urbanisation	Greater involvement of park advocates and designers to directly intervene and directly link the role of parks to change the health status of urban residents through more active recreation	Offer extensive recreational opportunities through provision of larger continuum of space for urban dwellers	Parks of various nature, catering to various social issues such as an ageing population, higher prevalence of chronic illness

Adapted from Cranz and Boland (2004)

design would therefore consist of uniform landscape and plantings. One of the ideas of the first modern urban park was realised with the Olmsted and Vaux plan for Central Park in New York City in 1858.

Later in the 1890s, park designers adopted more rationalistic interpretations of nature into their work. Exemplifying this was the Reform Park, an urban park model principled upon achieving both ‘beauty’ and ‘utility’. While early park advocates made general claims about the therapeutic nature of parks, there were no direct interventions and measurements of the actual health changes of urban residents. Once the parks were designed and developed, the health improvements were left to chance. To achieve greater use of parks for health outcomes, a new group of reformers sought to link the goals of the sanitary reform movement to the goals of the parks and recreation movement more deliberately. Hence, rather than purely providing an immersive nature experience, the park was observed to slowly evolve to include opportunities for a greater variety of activities such as athletics and safer places for children to play (Cranz and Boland 2004; Young 1995). While these reformers subscribed to the health-giving character of parks, the newer parks were however, not built with an eye towards the picturesque or for the purpose of tranquilising recreation. Rather, they were specifically built for active recreation. Furthermore, generic spaces—a homogeneous landscape with uniform selection of plant species—that distinctly characterised the Pleasure Ground were replaced by ornamental horticulture. The latter concept of colourful plantings meant that certain locations within the park would gain prominence over others, thus contrasting with Olmsted and Vaux’s concept of achieving an immersive experience in nature through geometric regularity (Young 1995). As it was difficult to fund elaborate parks based on Olmsted and Vaux’s concept of an ideal park, smaller parks became popular due to the financial constraints faced by many cities.

The third model, Open Space Planning, which adopted a new philosophy of imagining parks, gained traction in the early 20th century. In contrast to the idea of parks as specialised places for recreation purposes, parks are instead imagined as part of a bigger network of public open spaces. Even smaller land parcels were viewed as potentially valuable in this network, meaning that areas within the city, streets, or an abandoned railway site could be part of this integrated green network together with parks. The same period also welcomed the concept of Greenway Planning, a continuous system of green and urban spaces linked by recreational and beautified corridors. Greenways provide alternative corridors which offer attractive visual form of greenery and solace and extensive recreational opportunities for urban dwellers in a larger continuum of space. The President’s Commission on American Outdoors (1987) visualised the role of the Greenway network as such:

A living network of greenways... to provide people with access to open spaces close to where they live, and to link together the rural and urban spaces in the American landscape... threading through cities and countrysides like a giant circulation system (President’s Commission 1987: 102).

Since then, greenways have evolved from their role as park linkages to being a park space where active forms of recreation take place. According to the East Bay Greenway Health Impact Assessment (Heller and Bhatia 2007), trail users were found to have more than a 50% chance of meeting the Center for Disease Control's (CDC) recommendations for exercise. The concept of greenways as a linear park is especially useful in cities with high population density. Singapore is one example where the greenway concept has been successful in enhancing the recreational experience. Faced with acute land scarcity from various competing land use within its land area of 718.3 km², the need to optimise limited land space and yet cater to the recreational need of its urban populace is indeed crucial. Greenways are referred to as the Park Connector Network (PCN) in Singapore. Initially serving as linkages between major parks and nature sites, and also acting as ecological corridors in Singapore's Master Plan 2003 (Urban Redevelopment Agency 2008), the plan has since expanded to make parks more accessible to the general populace. The PCN will be complemented by seven loops, totalling a length of 360 km by 2020, and a 150 km round-island route that creates higher accessibility to nature sites by allowing people to walk, jog and cycle close to the coastline and greenery (Abdullah 2015). The PCN also provides the frame and the tributaries to provide a non-motorised or greener form of transportation in a city (Tan 2006).

Parks are a reflection of society's goals and its underlying issues and challenges. According to an United Nations report (2013) 'World Population Aging 2013', the aged population of the more developed regions tripled between 1950 and 2013, from 94 million to 287 million. The aging population is expected to increase further in coming decades, reaching 417 million in 2050. Coupled with the growing challenges of higher prevalence of chronic diseases resulting from a sedentary lifestyle, the fourth and current style of parks has been moulded into a vastly different model from the ones of the 20th century. The New Age Park include 'adult playgrounds'—public open-air exercise equipment for grown-ups which include frictionless cross-trainers, benches for sit-ups and leg exercisers—and they are a popular feature in many urban parks worldwide. Also, intergenerational parks based on the principle that seniors perform better while surrounded by people of all age groups, are also increasingly popular in urban parks in many developed countries.

The health values of parks and green spaces have been entrenched in the fundamentals of park planning and design since the pioneering park movement during the 19th century. The role that parks and trails play in encouraging physical activity or contemplative recreation have been well recorded in history. Moreover, current research suggests that physical activity is necessary for everyone's well-being, and physical activity in outdoor settings is more effective than equivalent activity performed indoors (Pasanen et al. 2014). This will be highlighted in the next section of this chapter on human well-being.

5.3 Green Space as a Health Intervention Measure

At his office in Washington, D.C., Robert Zarr, a pediatrician, writes prescriptions for parks. He pulls out a prescription pad and scribbles instructions — which park his obese or diabetic or anxious or depressed patient should visit, on which days, and for how long — just as though he were prescribing medication.

(Hamlin 2015 October)

The Park Prescriptions movement is an example of a salutogenic, or benefits-based, approach to stimulating interest in using outdoor recreation resources as a tool to improve public health. Originating in the United States, this recent movement seeks to reintroduce people to parks in a bid to increase outdoor physical activity to prevent or treat health problems resulting from a sedentary lifestyle and poor diet through strengthening the connection between the healthcare system and public spaces (Institute at the Golden Gate 2010) (<http://www.parkrx.org>). Proponents of this movement are not merely advocating physical activity, but are urging people to indulge in the outdoors. They base their claim on the findings of a growing body of research which have suggested that exposure to nature and outdoor exercise has significant health benefits ranging from physiological and psychological stress reduction, to psychological restoration.

This salutogenic approach, coined by Israeli American Sociologist Antonovsky (1996), refers to the focus on provisions in the living environment that make some people more resilient when faced with stress in their daily lives. In contrast to traditional healthcare which takes a pathogenic approach that seeks better medical interventions to cure chronic diseases, the salutogenic orientation aims to identify causes of health and implement these predictors of good health in our environment. As nature has been found to positively influence health, salutogenic design often engages the senses to connect people with nature, through both active and passive experiences.

Yet, this belief in the therapeutic effect of exposure to nature can be found as far back as ancient Egypt, where court physicians prescribed walks in palace gardens for royalty who were mentally disturbed (Toyoda 2012; Shoemaker 2004). Around 500 BC, the Persians created gardens that combined beauty, fragrance, music (flowing water) and cool temperatures. This belief was later supported by Dr. Benjamin Rush in 1812, when he reported that patients who worked in gardens had better recovery rates from mental illness compared to those who did not have the same gardening experience. Consequently, veterans of World War II were assigned to on-site gardens in Veterans Administration hospitals for rehabilitation therapies (Sydney et al. 2014).

The concept of using nature to improve human health and well-being was further developed through key research during the 1970s and 1980s. Psychology professors Rachel and Stephen Kaplan proposed the Attention Restoration Theory, which suggests that engrossed attention in performing a task can lead to mental fatigue. Recommending natural settings as a remedy to improve and restore attention, they

attribute this restorative power of the natural environment to four characteristics. They include: (1) the feeling of being away, (2) fascination value of natural elements, (3) extent that the natural environment is replicated in a smaller and manageable one, and (4) the special resonance people have with nature as compared to an urban environment (compatibility) (Kaplan and Kaplan 1989). Wilson (1986) attributes the benefits to 'biophilia', which proposes that humans are more comfortable in nature because that is where they have evolved. Ulrich's research (1984) also demonstrated that patients with views of trees had shorter hospital stays and needed less medication. These studies resulted in an increasing interest and body of scientific evidence on the health benefits of parks and urban greenery.

The practice of horticultural therapy is one example of using nature to restore people's health and well-being. The American Horticultural Therapy Association (2012) defines the practice as 'the engagement of a client in horticultural activities facilitated by a trained therapist to achieve specific and documented treatment goals'. Benefits of this form of therapy have been time-proven, with its techniques employed to assist participants to learn new skills or regain those that were lost. Horticultural therapy helps improve memory, cognitive abilities, task initiation, language skills, and socialisation. A study by Western Michigan University (Wagenfeld and Atchison 2014) revealed that 60 out of 80 occupational therapists used gardening as a therapeutic intervention. The researchers found that occupational therapists thought of gardening as a therapy intervention to be meaningful and purposeful (94%, $n = 56$), motivating (80%, $n = 48$), fun (62%, $n = 37$), and client-centered (32%, $n = 19$). Such studies support the larger role which flowers (and greenery) play in patient's recovery and rehabilitation, rather than a mere form of emotional cheer.

Beyond Europe and America, there is also growing appreciation for the therapeutic use of greenery in other parts of the world. Asian countries, especially those with aged or ageing societies, such as in Japan, Korea, Taiwan, and China, have shown great reception towards employing horticultural therapy for rehabilitation. In Japan, the Awaji Landscape Planning & Horticulture Academy, an institution authorised by the Hyogo prefectural government, trains healthcare professionals to provide healing through structured programmes which include the usage of plants and exposure to the outdoors, and through gardening activities (Toyoda 2012). Before each horticultural therapy session, the client's general mental state is measured using a scale developed by the academy. The scale consists of ten check items each with four levels of rating, and evaluates dimensions such as 'affections', 'mental functions' and 'communication ability'. Likewise, in South Korea, this practice is also becoming increasingly popular. Horticultural therapy is offered in about 1700 facilities such as social welfare organisations, job rehabilitation facilities, hospitals, public health centres, and schools, supported by a pool of about 2000 qualified horticultural therapists (Park et al. 2012).

In an environmental scan on the receptiveness of the healthcare industry in adopting greenery in therapies in Singapore by a research team from the National Parks Board (NParks), the practice of rehabilitating patients with plants and gardens was found to have already been established in several local medical institutions by

occupational therapists. One such medical institution is the Institute of Mental Health (IMH), which has developed a Friendship Garden for its patients, staff, and volunteers (Cheong 2015). About 30 long-stay patients take turns to visit the garden daily, joined by IMH staff and nurses. Thomas (2010), an occupational therapist who oversees some of the gardening activities, shared,

Tending plants delights the patients to see that their plants grow well. Gardening allows patients to soil their hands while enjoying a constructive activity. The patients also enjoy each other's company as they receive instruction from nurses, teaching assistants and occupational therapists.

Therapeutic horticulture is being adopted in many other healthcare institutions in Singapore. One of them is the Saint Andrew's Nursing Home, where its Dementia Care Ward leads directly to an enclosed garden where patients can engage in physical activities and enjoy the outdoor space safely without wandering too far or getting lost. Other programmes have also been developed in the Khoo Teck Puat Hospital and the Salvation Army Peacehaven Nursing Home (Wee 2012). In these establishments, occupational therapists take patients to the outdoor gardens to soak in the sights, sounds and smells of greenery or to exercise their limbs and improve their motor skills by engaging in gardening. Moreover, as Singapore was once an agriculture-based society, many older people still remember growing their own food. Therefore, gardening as a form of activity for seniors can serve to stimulate the brain and memory.

Recognising the high potential of therapeutic horticulture being adopted by occupational therapists, NParks is collaborating with local educational institutions offering occupational therapy programmes to introduce a module on gardening into its curriculum. In the longer term, it would be beneficial for Singapore and other cities to develop a pool of certified horticulture therapists trained by experts and institutions. Both the design principles of therapeutic gardens and horticulture therapy programming can be scaled up and implemented at the community level to reach more beneficiaries.

The benefits of horticultural therapy are not limited to specific groups but are also broadly targeted towards the general public. Singapore, which envisions itself as a city nestled in an environment of trees, flowers, parks and rich biodiversity, has embarked on its plan to create an urban environment that supports ecologically healthy people and habitats. A growing initiative in this dense urbanised landscape is the community gardens movement. As part of the Community in Bloom (CIB) movement, over 1000 community gardens have been realised in neighbourhoods and organisations across Singapore. Programmes like these come under the definition of 'social horticulture', which the American Horticulture Therapy Association (2012) defines as 'a leisure or recreational activity related to plants and gardening, with neither treatment goals defined, nor therapist being present'. To integrate science to the programming, NParks has initiated research to quantify the physical and well-being benefits of exercising in parks and engaging in gardening activities. The studies are conducted in collaboration with medical researchers who designed the first randomised control trials in Southeast Asia to test the therapeutic

effects of greenery with clinical evidence. Alongside the research, NParks is also working with the local Ministry of Health to progressively incorporate more senior-friendly amenities and therapeutic gardens in its network of parks (Ministerial Committee of Ageing Report 2015). The latter will be designed with special treatments such as landscape richness, and elements of surprise to support the mental well-being of park users, including those with dementia.

Complementing the Park Prescription movement by medical practitioners, a new group of researchers are also looking at ways to use neuroscience to inform the design of the environment to benefit public health. Investigating brainwave patterns in people exposed to different landscapes can bring about interesting conclusions about specific human responses to different designs while helping to discover the healing potential of these spaces. According to a study by Olszewska et al. (2014), the settings deemed most contemplative had panoramic vistas with long-distance views of more than 400 m. These settings tended to include large empty spaces, natural asymmetry, clearings and stimulation to look at the sky. In contrast, the least contemplative settings usually lacked these features; instead, they have characteristics such as paths and enclosed spaces (small pocket gardens). Evidence has supported the role which parks play in providing a restorative environment. Understanding the specific design features of a park through nascent neuro physiological research and developing evidence-based design bring us one step closer to eventually developing the 'ideal park' for contemplation.

5.4 Health and Social Benefits Derived from Park Exposure

Exposure to nature offers a range of health and social benefits that contribute greatly to well-being. These benefits, documented since the 19th century, showed that mere exposure to nature is associated with stress reduction and psychological restoration. But even before then, human life depended on nature for food and shelter. As society advanced, this relationship with nature changed. Most societies today may neither have direct use nor harvest nature to supply their basic needs, instead spend time in nature largely for leisure or non-consumptive uses.

Through public pressure and organised labour movements, the industrialised society was afforded leisure time in nature with time off from work so that families could spend time together. Weekends and holidays were created from labour laws that recognised the need for workers to restore their physical and mental well-being, as well as build social relations. As workers earned higher wages, families could spend more time in urban parks or take vacations to the rural areas where water-based activities were popular and people of all ages could enjoy a more natural setting that the city often did not provide. Sessoms and Henderson (1994) highlight that even with new labour laws that afforded weekend and vacation time from work, the individual or household had to be motivated to be outdoors and visit

public or private places designed as parks. Barriers to park use and constraints of intrapersonal, interpersonal and structural reasons for not visiting parks play an important role in understanding park underutilisation and social avoidance of outdoor public spaces (Jackson 1988).

Another social change that has allowed for greater time for leisure and spending time outdoors is the modernisation of society through technology. An agrarian society had many home and farming responsibilities to tend to on a daily basis. There was often no time for leisure, play or enjoyment. The invention of mechanical appliances which reduced the amount of time a family needed to spend on food production and house cleaning afforded extra time each day for recreation, fitness, and play. Technologies thus increased efficiencies in menial tasks to free up time for leisure and tranquillity (Godbey 1997). More recent information technology advances in smart-phones and televisions are also enabling people to structure the timing of their media consumption and entertainment, rather than on scheduled programming. For example, media firms now provide subscriptions which allows the viewer to watch television shows, movies, and other forms of media whenever and wherever a person chooses, including on a smart-phone in a park. On the other hand, broadcast television restricted viewers to scheduled timings on a single home appliance.

Many cities were designed with a single park or several large parks as a prominent feature of the urban landscape (Cranz 1982). New York City is well-known for Central Park designed by Frederick Olmsted, the founder of the landscape architecture profession (Wellman and Propst 2004). On the other hand, Paris was designed with straight, tree-lined boulevards, diagonals, squares, parks, and vistas across its 20 arrondissements. New York City and Paris, as cities surrounded by rural areas, also provide urban dwellers alternatives outside the city. The state of New York preserved land by creating the Catskills and Adirondack preserves where natural resources could be 'forever wild' and city residents could vacation in. Paris is known for its private chateaus and rural villages, which afforded urban dwellers an escape.

Gobster (2001) documents the use of scale to achieve varying levels of environmental and social conditions in park and green spaces from rural to urban neighbourhoods. Select cities, such as New York City and Paris over 200 years ago and more recently Singapore, had early visions of green cities with public space. Singapore's model, a city-state with much less space than New York City or Paris, has a layering of natural areas to achieve biodiversity and social outcomes (Fig. 5.1), ranging from primary and secondary forests to neighbourhood parks. The protected nature parks are managed by the national resource agencies (NParks and Public Utility Board), while the management of the 'convenient everyday parks' are shared amongst housing agencies, both public and private, and community groups. Parks are often centrally located to maximise access to neighbourhoods and commercial or business districts. Planners attempt to place parks along transportation lines that may have included subway, bus, road or foot traffic. A large centralised park could also attract higher levels of awareness of the park by residents and tourists in comparison to neighbourhood parks tucked into dense

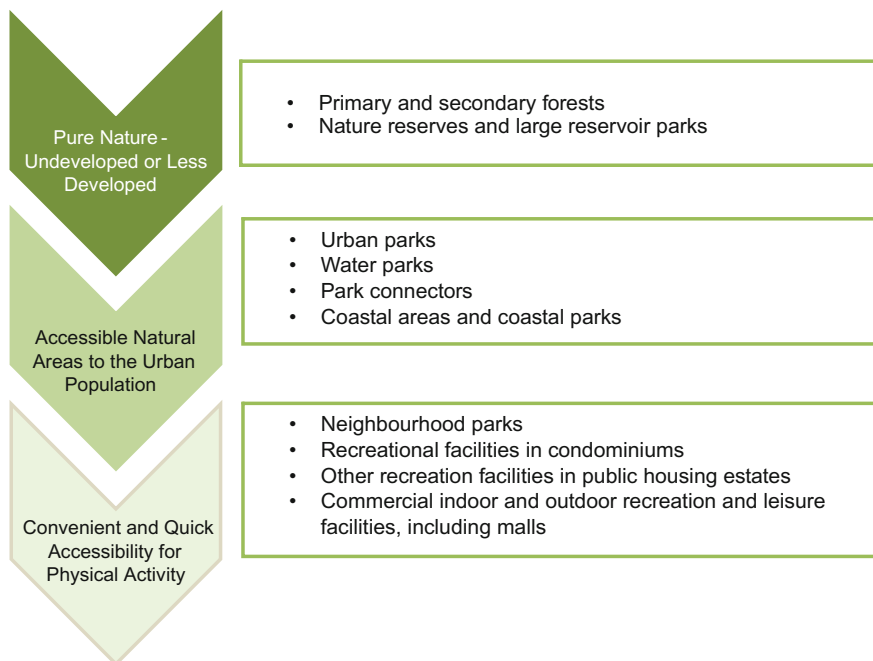


Fig. 5.1 Hierarchy of green spaces and other recreational facilities in Singapore

housing plots. Planners have found that the larger the park and the more prominent its location, the more likely people would use it (Giles-Corti et al. 2005). Events held at large parks serve as additional publicity. Music concerts, food festivals, art installations, and sport events like marathons are some of the contemporary forms of park uses that elevate the popularity of both the city and its park.

Urban planners are no longer the sole advocates for highly mobile and active cities as private corporations, such as Nike Inc., are participating in discussions that contribute to ways that a city can be mobile and active. A hotspot for testing these new sustainability approaches are global cities, which house a majority of the world's population. A city, therefore, becomes a place where benefits are maximised because of planning, policy, and promotions. The 2012 report, jointly produced by Sustran, Active Living Research and Nike (www.designedtomove.org), outlines that active cities have four successes—physical activity is a priority for all, existing resources are used, places are designed for people, and a legacy of lasting change. It promotes sustainability planning in cities around the globe to reinvigorate our thinking on where people desire to live, work and play. The report highlights research evidence of cities documenting less crime, reduced destructive effects of climate change, lower rates of depression and anxiety, better social cohesion, and more job growth from active living approaches. Patagonia is another corporation that

has a long history of advocating for outdoor physical pursuits and supports conservation projects around the world.

Given the mounting scientific evidence that people need parks and urban greenery to achieve necessary health and social benefits, why is there then not a clear pathway for park investments in urban areas? The answer is often economics. Park development and management are often linked to the financial performance of cities. As one of many public services that compete for limited public funding, the budget of park departments are often in competition with safety departments like the police and fire which public administrations argue cities absolutely cannot do without. Despite funding challenges, park and urban planners appear to be moving forward with some new approaches and partners to deliver on quality outdoor spaces. Corporate partners, such as Nike and Patagonia, can help fill some of the gaps in funding and reach out to engage audiences. In the 1990s, a group of federal recreation staff and scholars created a new lens to promote conservation, parks and recreation. However, rather than highlighting the features of a place or the activities performed in a place, the lens shifted towards the achievement of goals or benefits. The benefit-based model places emphasis on social outcomes through the use of parks and recreation activities (Driver et al. 1991; Driver 2008). Driver, a United States Forest Service researcher, engaged local, state, and federal professionals to enumerate the extent of benefits and the park and greenery features that enabled these benefits to be realised. Driver and his co-authors used research to convince practitioners and policy makers that parks could be directly linked to improved human conditions. The results are an empirically based rationale that parks and their features are necessary for our well-being (Table 5.2).

Today's park professionals around the globe better understand how the management and marketing of park and greenery features produce specific and desirable outcomes. In densely populated cities like Singapore, park planners segment parks into activity areas to achieve a multitude of benefits. For instance, in Bishan-Ang Mo Kio Park, the Kallang River traverses through the park and activity areas such as playgrounds, seating areas and a lily garden for contemplation situated next to the river. Another example of parks delivering multiple uses and benefits is the Yishun Pond Park, which was designed to create a 'multi-generational and health-promoting garden' (Khoo Teck Puat Hospital et al. 2010). The pond's 2010 makeover surrounding the development of the then new Khoo Teck Puat Hospital saw the integration of newer health facilities (including the new Yishun Community Hospital which was recently completed in 2015), with an older park (Yishun Park), and the addition of a waterfront promenade with a 2.6 km trail. With the integrated trail, patients and their caregivers from the hospitals can make use of the place for recuperation and social interactions, whereas residents also use this trail for recreation and exercise. These examples demonstrate how well-planned and well-designed park features can create a multitude of social benefits. This suite of features that are directly linked to benefits is the new dialogue of park and planning professionals.

Table 5.2 Well-being benefits associated with park or greenery attributes

Benefits or outcomes	Park and greenery features
Physiological—human needs based on environment	Sun Fresh, clean air Trees Healthy ecosystem
Emotional-achieving restorative and mental health, as well as happiness	Beauty Quiet spaces within a city Presence of other urban dwellers Safety Presence of wildlife
Physical Activity—exercise, self actualisation	Trails Exercise areas
Social Gathering and Interaction—moving toward features with more engagement	Playgrounds Adventure activities (boating, ziplines and challenge courses) Benches Tables and pavilions for games and eating Barbeques Proximity to neighbourhoods Cafes Dog parks or bird cage areas
Human Development—learning, curiosity	Recreation activities with physical facilities Creative places like playgrounds for kids Programs of all types Exposure to living nature (animals, plants, weather)
Nourishment (Food)	Community gardens Fishing Gathering of people for community good

Adapted from Driver et al. (1991)

5.5 Leveraging the Park and Greenery Effects for Greater Human Well-Being

Thus far, this chapter has profiled many social and health outcomes that parks and greenery at various scales have produced across the globe. The evidence is compelling—those who use parks or are exposed to nature can benefit in a myriad of ways. So what is next for practitioners and scholars to employ to further leverage nature for greater human well-being?

Glover (2015), a leisure scholar, advocates that leisure research which is partly embedded within the parks and recreation field can illuminate opportunities for greater social innovation. He summarises many other scholar's work to show how parks can play a role in social justice in providing a safe place for all citizens, environmental justice as a place where physical activity can be offered for children and adults, and stewardship and opportunities for caring for nature and people through programmes held at parks. Recreational activities, park programmes, and the research that evaluates their impacts identify the stakeholders that are needed. These will help in enhancing the park experience and also measure the well-being impacts on the stakeholders. Knowledge about the contribution of programmes in parks needs to move us beyond status quo into action for even greater benefits for every one as societies struggle with many issues that diminish well-being including chronic health issues, overworked and stressed children and workers, and crime. A better informed planning model with social innovation as the core concept can inform government policies and the practices of private developers. It can also engage citizens on the multitude of possibilities that parks and green spaces can endow for the health and success of all ages, races, and ethnicities.

Recent efforts to align park, forestry, planning professionals, and scholars with the medical profession is another way to leverage applications and solutions for human betterment. In America, the foundation of the Johnson & Johnson health-care company, Robert Wood Johnson Foundation (www.rwjf.org), plays a leadership and funding role in igniting research and community practices that engage park and recreation, planning, health care, and public health fields to improved human outcomes. In Singapore, public agencies work across families and neighbourhoods, healthcare organisations, and employers to achieve high levels of health and physical activity across their society. As illustrated in this chapter, a more socially and physically networked approach to co-locate parks and medical facilities can provide greenery exposure to hospitalised patients; and trails and outdoor fitness equipment can provide for patients needing rehabilitation. Continued collaborations between parks, planning, and healthcare can effectively reach a broad cross-section of urban dwellers.

In conclusion, parks have a varied history of emphasising the aesthetic value of landscapes for human pleasure and contemplation. Some efforts are directed at conserving existing untouched wilderness and, at other times, directed at restoring 'used' landscapes. Today, parks continue to play a central role in urban planning for both conservation and restoration. Social innovation approaches and connectivity to health care require planners to deeply consider how humans can be exposed to maximum levels of nature, particularly in dense urban settings. While public agencies and public funding remain a key player in parks, the future is likely to have many more stakeholders from the private and non-profit sectors. A more engaged set of stakeholders will enable broader social responsibility for and greater use of and appreciation for parks and public natural resources.

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