



Urban Agenda Platform

The global platform for sharing progress, action and knowledge on the implementation of the New Urban Agenda to achieve sustainable urban development.

Chulalongkorn University Centenary Park

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| Region | Asia and the Pacific |
| Award Scheme | Dubai International Award |
| Themes | Regeneration |
| Sustainable Development Goals | Goal 11 - Make cities and human settlements inclusive, safe, resilient and sustainable |

Summary

With unexpected climate causes heavy rainfall, low-lying cities across the globe are bracing for flooding disasters. As sea levels rise and concrete infrastructure multiplies, Bangkok is sinking 2 cm. every year. For the first time in 30 years, an invaluable land—11 acres of land and 1.3 km. avenue — was not turned into another commercial use. It is transformed into a public park.

Background and Objective

Sitting on a floodplain, Bangkok's explosive development ignores the city's delta landscape and its porosity while eating away natural waterways and agricultural land that once absorbed water. Urban sprawl has gone unchecked, and underground water is used excessively. Bangkok no longer adapts to water the way it used to. Currently sinking two centimeters each year, the city is now facing an inevitable reality of climate change. For the first time in 30 years, an invaluable 11-acre property at the heart of Bangkok was not turned into commercial use. Instead, it was transformed into the Chulalongkorn Centenary Park (CCP). The park becomes the first critical piece of green infrastructure in the city to reduce flood disaster risk, all while offering city dwellers a place to reconnect with nature. By harnessing the power of gravity, the park is able sustainably to collect, treat, and hold runoff during heavy rainfall. Sitting on a 3-degree angle, the park is able to hold up to a million gallons during floods for future use during droughts, leaving not a single drop of rain wasted. The first of its kind in Bangkok, the 1.3-kilometre road running perpendicular to the park was revamped to shift priority from cars over to foot and bicycles. The once heavily-congested street now seamlessly connects pedestrians and cyclists directly to surrounding neighbourhoods and roadways linked to the city's major residential, entertainment, and retail facilities. Featuring sustainable drainage systems, green roof wetland, porous area, pond, open swales, small pocket parks, detention lawns, and retention pond, the park is an example of various landscape solutions for urban flood disaster reduction. Bangkok thirsts for more parks, but more importantly, a productive one that can sustainably confront climate uncertainty. The park reminds the city how a park can help the city confront climate change, to live with water, rather than fear it.

Actions and Implementation

In 2019, the Association of Southeast Asian Nations (ASEAN) committees established the "City For All" framework to create an equitable and inclusive community and living space for their urban dwellers. CCP aligns with this convention by incorporating universal design and accessibility principles, as well as promoting social mixing in its core guidelines. An 11-acres of a public park with a 1.3-kilometer stretch of pedestrian-friendly road, the CCP provides a much-needed public green recreational space at the heart of Bangkok, where the ratio of green space per capita is among the lowest in the world. While playing a role in confronting climate risk, the park simultaneously serves as a recreational space and outdoor classroom for the university community, surrounding neighbourhoods, and urban dwellers. CCP reclaims a vital piece of land to create a green corridor in the middle of a dense and heavily-polluted city, taking the first step to creating a healthy environment for all urban dwellers --and its urban wildlife. Like an oasis amidst the concrete jungle, the park offers various functions and activities to accommodate users of all ages., Lining both sides of the park, various outdoor classrooms--including a herb garden, meditation area, reading room, bamboo garden, and playgrounds--serve as a community space for students, rich and poor, and passersby to learn, play and rest. The vast amphitheatre which spreads out across it also hosts regular public events like music and art performances. CCP is one of a few parks in Bangkok where people with disabilities and wheelchairs have easy access, particularly to the highest point of the park to enjoy the city skyline.

Outcomes and Impacts

Sitting equal to the sea level, Bangkok is one of the most climate-vulnerable delta cities impacts in the world. By 2050, much of it could be underwater. It also holds one of the lowest ratios of public green space per capita among megacities in the world, at just about 3 square meters per person. Its urban and peri-urban areas suffer from density and increasing temperatures and worsening air quality toppled by unsustainable development and climate



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uncertainties. By adding more productive green space to the city, CCP offers an innovative and resilient climate solution that aligns with the national sustainable urban development plan. CCP is the first critical piece of green infrastructure in Bangkok to mitigate detrimental ecological issues and reduce disaster risk. The project is one of Thailand's national-level projects to develop and implement Low Emission Development Strategies for UNDP's Integrated Climate Strategies, primarily addressing the UN's SDG 13 (Climate Action), alongside SDG 3 (Good Health and Well-being), 8 (Decent Work and Economic Growth) and 11 (Sustainable Cities and Communities). To prepare for anticipated impacts from extreme weather, floods, droughts, as well as heatwaves, CCP also covers two of six priorities in the country's National Adaptation Plan (NAP), water management and public health. Redefining the purpose of public green space, CCP steps beyond recreation and city beautification, to serve as a productive natural-based architectural solution to mitigate issues surrounding water, air, and heat. While its landscape mechanisms form an entire water management system, its greenery increases urban biodiversity, reduces urban heat islands, cleans the air of toxic pollutants. CCP sets a model for re-implementation in the urban and peri-urban areas of Bangkok and other sinking cities, demonstrating how parks can sustainably become an integral part of climate adaptation.

Sustainability and Scalability

For the first time in three decades, an invaluable plot at the center of Bangkok's commercial district, worth US\$700 million, was not turned into a shopping mall or office building. Instead, it was transformed into a public park. For its 100th anniversary, Thailand's very first university, Chulalongkorn University, wanted to give a gift to society by offering a piece of its property up for a new public park as part of a design competition in 2012. But even after a winner was chosen for the competition, it still took five full years for the CCP to take shape and become what it is today. Now complete, the park is the fruit of the university's and designers' commitment to involving all stakeholders in the co-creating process of designing a park truly built for the whole community. After years of countless meetings and public hearings with a number of committees and boards, students and faculty, community residents, and government officials, CCP was conceived off of a contribution and exchange of ideas from people across a range of all disciplines in the university and backgrounds. While fulfilling the social and environmental impacts it needed to address, CCP also considered the economic benefits for the surrounding neighborhoods to ensure sustainable urban development. Aside from increasing property value and improving urban planning, establishing an inclusive space for the community was key. Building upon a community-oriented design process, the designers developed an activity program that benefits both the park's visitors and the city's climate mitigation efforts. Understanding the rippling benefits of a healthy natural ecosystem on society and the economy, the park restores and recreates a climate-resilient and biodiversity-rich environment in the urban context which takes into account the lifestyles and needs of urban dwellers.

Gender and Social Inclusivity

Where the park sits downtown, traffic congestion can last for hours. Instead of adding on to the problem, CCP shifts its priority from cars to pedestrians and cyclists, as an initiative to create a walkable city and a carbon-neutral future with lowered emissions from transportation and sprawl. By stretching the 1.3-kilometer avenue perpendicular to the park, it takes advantage of its prime location to seamlessly connect pedestrians and cyclists directly to surrounding neighborhoods' residential, entertainment, retail facilities, and public transportation, as a strategy to increase efficiency in time, energy and resources for all urban dwellers. By downsizing its four-lane road into two vehicle lanes, the park makes way for people to walk and bike, freeing up road congestion while increasing foot traffic and physical activity. But providing the infrastructure to increase connectivity for commuting on foot is not enough—CCP also accommodates Bangkokians and surrounding communities with free public electric shuttle buses every 15 mins throughout its stations, with the aim to help commuters travel between academic zones, commercial districts, main sky train stations and other public transportation options with convenience and comfort. Shading passersby from the city's scorching sun, wide green corridors of big trees and rain gardens line both sides of the road to reduce heat, absorb runoff and improve air quality. The first of its kind in the city, this road offers a practical pedestrian-friendly alternative of transportation in a densely populated and commercially-developed zone. All of these efforts enable communities to sustainably commute and reduce their individual carbon footprints while bettering the city's capacity to adapt and recover from climate impacts. The park shows Bangkok the possibility of a pedestrian-friendly, yet commercially-developed area.

Innovative Initiative

By reclaiming nature back at the heart of the city with a variety of 258 plants and 5,000 forest trees—grown from seeds and young saplings receptive to changing climates—CCP provides a new home and microclimate for pollinators and insects, as much a getaway and breathing space for city dwellers. The main lawn at the park's center is a vast inclined open space. Unlike other flat parks in Bangkok, this sloped park allows for an expansive space and structure to house a multi-purpose amphitheater for public events. Covering 5,200 square meters of rooftop space, CCP is laid with local grass and weeds which attract native animal species while creating a unique scenery of nature against an urban background. A year after its opening, the park has attracted over 30 species of local birds. Underneath this green roof lies a museum and parking space. Additionally, three underground tanks store rainwater which can be used to irrigate the park for up to a month during dry seasons. Excessive runoff from the green roof then flows down to four constructed wetlands. A series of cascading weirs and ponds slow the runoff and increase water aeration, aided by native water plants that filter and clean the water. In this concrete city, the park provides a hidden oasis where kids and adults can explore and interact with wetlands and hear the sound of flowing water. During



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severe rainfall, the retention pond by the lower end of the park can store excessive water and double in size by expanding into the park's main lawn. Visitors, too, can become an active part of the park's water treatment system by hopping onto any stationary water bikes along the pond and using their exercise to keep the water aerated. Featuring sustainable drainage systems, a green roof, wetlands, retention ponds, an open swale, and detention lawns, the park is a premier example of various landscape solutions for urban flood disaster reduction while bringing back biodiversity to the dense concrete city.

Resources devoted to delivery

In September 2019, Bangkok ranked third among the major cities with the most unsafe levels of air pollution in the world. Bangkok also happens to be one of the capital cities with one of the lowest ratios of public green space in the world. Vacant concrete rooftops across the city cause the urban heat islands, which contribute to building energy consumption and air pollution. But rather than concrete surfaces that absorb immense heat, these spaces, when turned green, have been proven to reduce the air pollution and cool surrounding temperatures down by 1-4 degrees celsius. By filling its 5,200 square meters with vegetation, CCP's green roof serves as an air filter that reduces carbon dioxide and removes heavy metals and airborne particles from the atmosphere. Meanwhile, the 5000 trees and plants in the park, especially the rain trees and its refined texture leaves, also filter out a fine particulate matter (PM2.5). Through a process called evapotranspiration, the plants also release moisture and create natural microclimates, which help in capturing toxic pollutants and cooling the air in and around the building and relieving heat from the city as a result. At a time when water can be both scarce and excessive at the same time, CCP is in itself a complete water circulation and management system that addresses both irregular weather patterns and the city's dysfunctional public sewage. More than just a park, CCP acts as a water detention area for the sinking city. The park prevents any water from going to waste by absorbing rain and runoff, storing it for later use in times of need. A million gallons of runoff water can be kept and being reuse in the park. As water flows down through the park's inclined detention lawn, it is also filtered and cleansed of water pollutants along the way. This system is also able to recycle treated grey-water from surrounding buildings and redistribute it for use.

Conclusion

Tackling climate change with zero-emission solutions and materials in every possible aspect of its construction, CCP also encourages and enables sustainable lifestyles in and outside of its confines. Locally-sourced sustainable materials, environmentally-friendly construction practices, and minimized transportation are core to CCP's construction approach. By limiting built hardscapes, CCP reduces heat reflection and maximizes green surface area with trees and plants to promote concrete porous surfaces. All the pathways in the park and its green roof are made from porous concrete pavements that help maximize runoff absorption. Whether in the choice of porous components or locally-sourced materials, these outdoor classrooms pay great attention to detail to best complement the park's main ecological features. Instead of engineering more concrete gutter, CCP utilizes the bioswales and rain gardens as part of its main water drainage. The first time in Bangkok to shift priority from cars over to foot and bicycles, connecting pedestrians and cyclists directly to popular city hubs. This mobility and green engineering solution helps lower carbon footprint and air pollution while also increasing individuals' daily steps and quality of living, creating a low-carbon city that's healthy for both human and environmental health, as well as economic productivity and urban navigation. CCP also defends and expands carbon-sequestering landscapes such as urban forests, wetlands, and grasslands to help drawdown atmospheric carbon dioxide. All organic material produced by the plants in this park is collected for composting organic fertilizer to return to its ground and other green areas around the campus. All plants used in this park are native species brought in at the young age of two to three years old from certified plant nurseries, thus ensuring none of them are transplanted from the old-growth forests we need to be protecting.