

Best Practices Award in Urban Regeneration and Public Spaces

Large cities and metropolitan areas

Title of the Best Practice / Research

Chulalongkorn University Centenary Park

The Location of Best Practice Implementation

Country	Thailand
City	Bangkok
Project Website	landprocessdesign.wixsite.com/landprocess/cucentenarypark

Personal Information

First Name	Kotchakorn
Middle Name	
Last Name	Voraakhom
Mobile	+660876931566
Landline Phone	
Email Address	landprocess@landprocess.co.th

The Category Applied for

Best Practices Award in Urban Regeneration and Public Spaces

Focus Area

Large cities and metropolitan areas

Project 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. Chulalongkorn Centenary Park is the first critical piece of green infrastructure in Bangkok to mitigate detrimental ecological issues and reduce urban flood disaster risk. By harnessing the power of gravity, The park is able to collect, treat, and hold runoff. Sitting on a three-degree angle—leaving not a single drop of rain wasted, the park is able to hold up to a million gallons of water during heavy rainfall. The park is an example of various landscape solutions for urban flood reduction. It reminds the city how a park can help the city confronts climate change, to live with water, rather than fear it.

Project logo or Main Photo



Type of submission

Organization	
Name of the Organization	LANDPROCESS
Location Of Organization	Thailand
City/Town,Postal Code	Bangkok
Mailing Address	landprocess@landprocess.co.th
Phone Number	+66645560040

Contact Person	Kotchakorn Voraakhom
Email Address	kotch@landprocess.co.th
Organization Website	landprocess.co.th
Type of Organization	LANDPROCESS

Partners in Executing the Practice

Name	Organization Type	Other Organization	Address	Contact	Support Type
N7A Architects	Others	Architecture Office	45th FL The Offices @ Central World, Bangkok, Thailand 10330	Chakdao Navacharoen info@n7a.co.th 02 251 0202	Others Architectural Design
Chulalongkorn University	Academic/Research		254 Phayathai Rd, Wang Mai, Pathum Wan District, Bangkok 10330	Korb Limsuwan korb.l@chula.ac.th 66877049943	Administrative Support

Financial Profile

Annual Budget	Partner Name	Year	Contribution Amount	Support Type
32000000.00	Property Management of Chulalongkorn University	2017	32000000.00	

Level of Activity

Metropolitan

Key Dates

Date	Significance
2017-03-26	Opening Ceremony

Scope and Criteria

The project is expected to address successful usage of smart, innovative solutions and technologies in design and execution.

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-kilometer 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 neighborhoods 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, to 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.

The project is expected to show the provision of significant number of affordable housing while promoting social mix.

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 neighborhoods, 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 at all ages. Lining both sides of the park, various outdoor classrooms--including an 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 amphitheater 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.

The project is expected to illustrate on the social and environmental links between urban, peri-urban and rural areas, and national planning approaches (spatial).

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 topped by unsustainable development and climate 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.

The project is expected to depict the use of participatory approaches to urban planning, that support positive economic, social cohesion, and environmental integration.

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.

The project is expected to show dynamic, and mixed use of urban areas, green areas, land use, public spaces and biodiversity planning approaches.

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 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.

The project is expected to include solutions that ensure safe, affordable & sustainable transportation systems and comprehensive mobility solutions.

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.

The project is expected to include solutions that lead to zero emissions lifecycle, and carbon neutral/negative cities approaches, and techniques, plus the efficient use of local materials.

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.

The project is expected to include solutions that ensure efficient and effective resources usage, and waste and pollution reduction.

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.

The project is expected to address disaster management planning and measures plus ability to absorb heat and rain, in addition to safety and security sufficient measures.

With rising sea levels, Bangkok—part of which already lies below sea level—is threatened by its own rapid development that has left insufficient room for natural waterways. On top, with climate change, unexpected heavy rainfalls can suddenly cause flash floods in the city, where its limited public sewage systems are often unprepared to handle such loads. But with a green roof, detention lawn, three underground rainwater tanks, four wetlands, and one retention ponds, CCP offers the park solution as city's water detention area to living with water harmoniously again, instead of fearing it. On good weather days, the main lawn at the center is a vast inclined open space for recreational activities, serving as an amphitheater for public events. As for stormier days, the lawn absorbs rain and runoff, gravitating it and sending it down to the retention pond by the low end of the park. During severe flooding, this retention pond can store excessive water and double in size by expanding into the park's main lawn. Taking into account a 50-year period of rainfall intensity, CCP can hold up to a million gallons of water by inclining the whole park to absorb and collect every drop of rain. The park can then use the collected rain to irrigate itself for up to a month during dry spells. This green infrastructure prepares the community for water disasters, for both the extreme ends of its wet and dry. While a single park cannot control flooding across an entire city, CCP is a big, bold first step. Bangkok thirsts for more parks, but more importantly, a productive one that can sustainably confront climate uncertainty. CCP gives Bangkok a spark of aspiration in how the city can choose to address its threatened future while allowing new landscape architecture strategies to emerge. In doing so, it serves as a role model for other at-risk cities to look to land porosity, urban waterscapes, and green space as promising solutions for sustainable, climate-resilient cities of the future

The project is expected to address efficient infrastructure and food security aspects.

As global environmental biodiversity declines, the food supply becomes more vulnerable and unsustainable. The importance of maintaining biodiversity to food security is interconnected. Urban biodiversity has a definite role in food security in cities. CCP offers not only the much-needed green space but also the rich growing biodiversity of 258 native plant species and 5,000 forest trees right at the heart of Bangkok. Over 40 percent of insect pollinators, which contribute to 35 percent of global food production, are highly threatened globally, including Thailand's native bees, insects, and pollinators. But with suitable conditions and proper care, bees can safely thrive in an urban environment. Alongside its education programs on sustainability and bee conservation, CCP is in itself a public green space that increases urban biodiversity. CCP's 1.3-kilometer avenue connects two of the city's major roadways. It has expanded space for the convenience and safety of pedestrians and cyclists. As an initiative to revolutionize Bangkok's green development, its streetscape spreads biodiversity into the main arterials of the city's urban fabric. By creating a park that extends from an existing green corridor, the park breaks through concrete to begin urban forestry, a vision beginning downtown and with hopes to spread further beyond for the health of the city and all livings. CCP's green space and avenue aim to address habitat fragmentation by piecing together with its other existing green spaces, with room for future extension. Covered with natural low-maintenance vegetation, its green roof provides an easily-accessible home for small birds, bees, and other pollinators in the dense concrete city. Giving high significance to plant material, CCP takes into account a diverse range of native seasonal flowering shrubs, native grasses, various scales of trees, shrubs, and ground cover to ensure that urban pollinators feel at home in our modern-day cities.

Narative

Innovative, leap-frogging, and affordable technological advancement use.

Today, as our constantly-fluctuating climate causes rising sea levels, storm surges, and heavy rainfall, worldwide low-lying cities are bracing for an urban flooding disaster. As concrete infrastructure multiplies, Bangkok is sinking two centimeters every year. Bangkok is a flat city. By harnessing the power of gravity, CCP can collect, treat, and hold runoff during heavy rainfall. Sitting on a 3-degree angle, the park pulls rain and runoff down through its slope to generate a complete water circulation system, leaving not a single drop of rain wasted. Taking into account frequently overwhelmed public sewage system, the park can hold up to a million gallons of water during floods, for future use in times of drought. Featuring sustainable drainage systems, a green roof, wetlands, detention lawns, and a retention pond, the park is an example of various resilient landscape solutions for urban flood reduction. CCP reminds the city how to live with water, rather than fear it.

Introduces a positive cultural change

While playing a role in confronting climate risk, CCP simultaneously serves as a recreational space and outdoor classroom for the Chulalongkorn University, its surrounding neighborhoods, and all urban dwellers. Built on the land of Thailand's leading university, it provides space for knowledge exchange and social interaction between students, faculty, and visitors of multiple disciplines and areas of expertise. The park's landscape features and outdoor spaces serve as an outdoor classroom for existing academic subjects, as well as a new alternative to learning from the park's ecological elements. Lifelong learning being part of the university's mission for its young generations, the park redefines itself as more than just a public green space, but as a place of urban and natural exploration, a source of creativity and innovation inspired from nature, outdoor classrooms for collaboration and sharing outside the traditional libraries and lecture halls.

Positive outcomes on sustainable development at either economic, environmental and social level

In Southeast Asia, urbanization is increasing at a higher rate. As unexpectedly heavy rainfall becomes a new normal, tremendous runoff increases the frequency of urban flash floods and traffic congestion. Bangkok's public sewage system remains far behind to cope with rain and the demands of its growing city. Breaking the conventional approaches of engineering, CCP serves as a much-needed green space, and a solution for mitigating urban flood risk by managing on-site runoff --in reality, a concept which should be an obligation of every development project to ensure economic growth which aligns with sustainable development. CCP improves human well-being in order to then enhance economic growth sustainably. As a productive, inclusive and accessible public green space, the park and its avenue alleviate air pollution and traffic congestion by reducing car use and encouraging foot travel, in turn improving the physical and mental health of urban dwellers and economic productivity of the city

Favors least developed human settlements, promotes gender equality and social inclusion

Bangkok is predicted to be hit by serious flooding once every decade. Surges from the sea, rainfall, and flooding from the north are bound to all arrive at once can happen. This will drastically hurt all inhabitants and the economy, the poor will still be the hardest-hit. Today, they live in areas poorly protected and are at risk of displacement because of flood prevention redevelopment projects around the city's canals. Rather than another megaflood prevention project, CCP looks to on-site water management, rainwater tanks, rainwater recycling, and runoff collection as ecocentric solutions that are environmentally-conscious, feasible, and cost-effective. Implementable in every development plot as a strategy for climate adaptation, its blueprint offers a healthy living. With an inclusive design for all ages and genders, as well as universal design accessibility, the park also provides recreational activities that better physical and mental health for anyone to enjoy free of charge.

Aims to Improve quality of life in either developing or developed countries/communities

In celebrating its 100th birthday, the Chulalongkorn University looked to its iconic symbol, the rain tree, as an inspiration. The rain tree has a very far-reaching root system and branches which overreach and create shade, absorb water and an ecosystem for its surroundings. Adopting this concept into design, the CPP is filled with 258 plant varieties and more than 5,000 trees to recreate a healthy ecosystem for urban dwellers, as well as urban wildlife. Green spaces have been proven to have an abundance of psychological and physical health benefits, and in a dense city like Bangkok, they are much needed. An instant escape from the city's hectic scene, CCP is a haven where Bangkokians can reconnect with nature in the fresh air, after long days of stagnant office work, hectic city noise, bustling rush hours, and traffic congestion.

Demonstrates potential for transferability, adaptability, and replicability, including partnership models

A single park cannot control flooding across an entire city, but the CCP is a big, bold first step. This park gives Bangkok a spark of aspiration in how the city can choose to address its threatened future while allowing new landscape innovation to emerge. CCP serves as a role model for other at-risk cities to look to land porosity, urban waterscapes and green space as promising solutions for sustainable, climate-resilient cities of the future. Unlike other parks, the CCP is not just for recreation or city beautification. With the city's climate-prone future, the public green space combines traditional knowledge with modern green technology to produce a new climate adaptation solution. The park's inclined slope and ecological features are equipped with an autonomous water management system learned from nature and ancient wisdom from Thailand's water-based communities. With similar situations, this park and its components are the potential models for sinking cities across Southeast Asia

Improving the ecological footprint.

CCP bridges pedestrian ways and bike lanes together in order to reduce carbon emissions from personal car use, all while reducing air pollution and increasing Bangkokians' physical activity. In an attempt to re-green the city, the park lengthens the existing green corridor in the heart of the capital, giving commuters easy access into Bangkok's most popular districts. By reconnecting fragmented green spaces together, it also provides home for urban wildlife. As part of its architecture, three rainwater tanks collect every drop of rain, letting no valuable water go to waste. Through a series of wetlands and native water plants, the park also cycles and purifies the water for recycled use within its facilities and for surrounding buildings to make the most out of it and keep its footprint at a minimum. 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.

Personal Attachments

Document Name	Document Summary	Attachment
Organization website		External link
Organization website		External link
Organization website		External link
Founder Profile	Kotchakorn Voraakhom CV	Kotchakorn_CV.pdf
Orgazination Profile	LANDPROCESS Work Sample	LANDPROCESS Work Sample.pdf

Project Attachments

Document Name	Document Summary	Attachment
Project Logo		CU100-Chulalongkorn_University_Centenary.jpg
Project Information	a) Project background and short description b) Motivations, Inspirations and problems tackled c) Technical details and information d) Results and impact	Project Information - CU Centenary Park.pdf
Project photo	Images, site plan, section and diagram	External link
Project Graphic Concept	A1 Board Concept Explanation	External link
Project website		External link

Other Attachments

Document Name	Document Summary	Attachment
World Economic Forum	Bangkok has built a special park that controls floods	External link
World Landscape Architect	2019 WLA Awards winners announced	External link
2019 ASLA Professional Award	Chulalongkorn University Centenary Park Honor Award General Design	External link
The Guardian	As Bangkok sinks, could this anti-flood park be the answer?	External link
Fast Company	This new park is designed for a future of flooded cities	External link