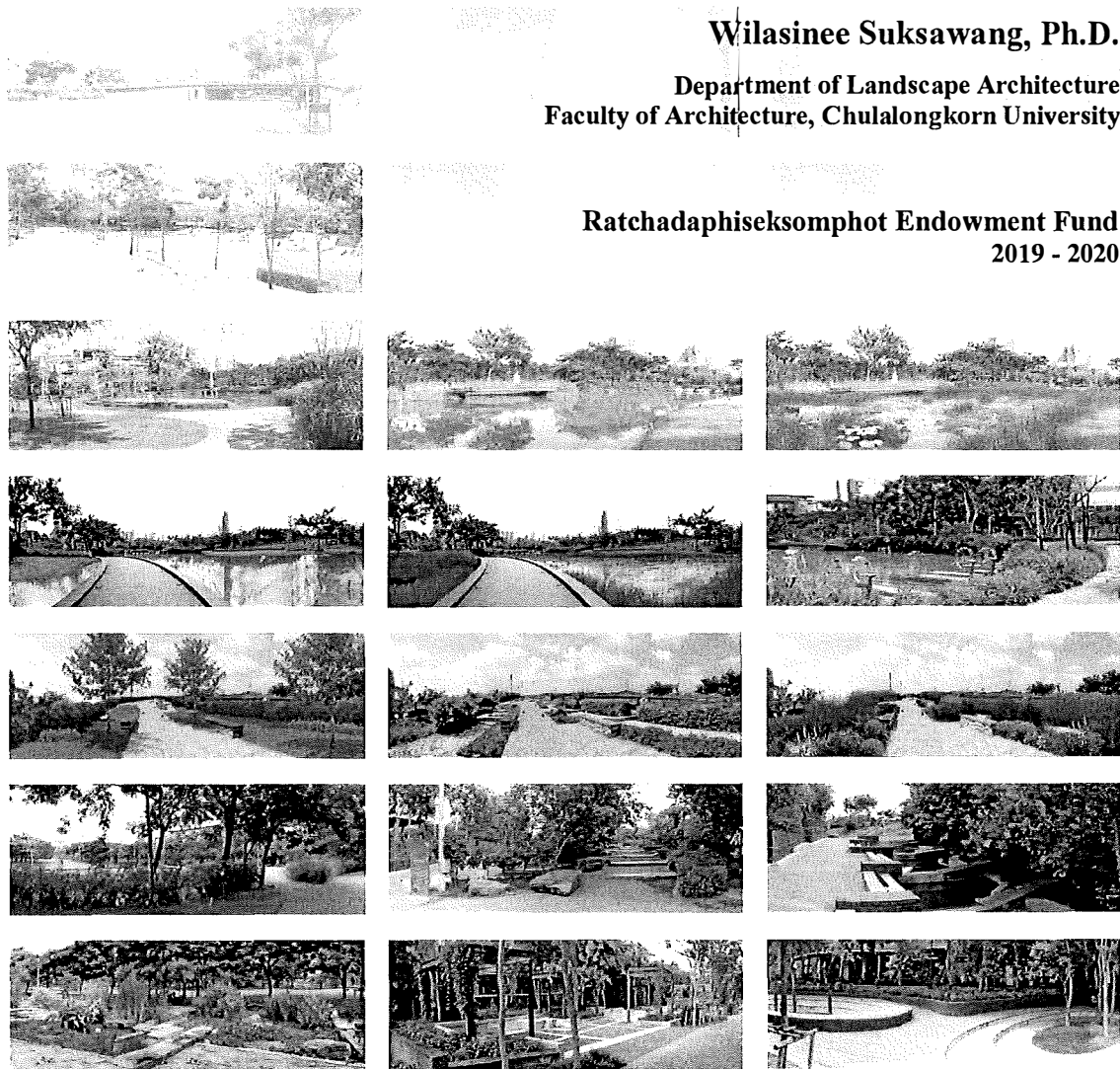


Public Response to the Appearance of Ecological Landscape Design: A Case Study of Chulalongkorn University Centenary Park

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Foreword

The research on landscape perception and preference is very crucial to the education and profession of landscape architecture since it provides information and insight useful to the advance of knowledge in the field. This research is considered a pioneering effort to study landscape perception and preference of Thais, with the focus on their response to the ecological design of urban park landscapes in Bangkok.

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Abstract

The appearance of ecological landscape design often causes public dissatisfaction. Precedent texts and studies, especially in the landscape perception and design fields, reiterated the affection for the ‘picturesque’ and the ‘park-like’ landscape of most Americans, resulting in their resistance to the ‘messiness’ of ecological landscapes. This research, therefore, studied how Thais perceive and respond to the look of the landscape, investigating if the ‘picturesque’ and the ‘messiness’ play a role in their perception and appreciation of ecological urban park design in the country. The questionnaires were distributed to gather respondents’ notions of beautiful, natural, and ecologically sustainable landscapes as well as opinions on the ecological landscape design of Chulalongkorn University Centenary Park—a pioneer and epitome of ecological landscape design in Bangkok. Four groups of respondents included park users, affiliates of Chulalongkorn University, Bangkok residents, and landscape professionals. The analysis of 315 responses reveals the attachment to the ‘picturesque’ ideal and the ‘park-like’ landscape, as well as the disinclination for the ‘messiness’ and poor maintenance of most Thais. Also, the ‘picturesque’ conventions, ‘cues to care’ tactic, familiarity, and knowledge about nature and ecology seemed to involve in their perception of beautiful, natural, and ecologically sustainable landscapes. Based on these findings, the research suggests strategies for designing ecological urban public parks in Bangkok in order to achieve not only ecological function, but also aesthetic expression, with the ultimate goal of achieving public positive attitude toward, and widespread support for the ecological landscape projects in the city.

Keywords

Landscape Perception, Visual Appearance, Urban Park, Ecological Landscape Design, Picturesque, Messy Landscape

Highlights

- Thais manifested attachment to the ‘picturesque’ ideal and the ‘park-like’ landscape.
- Thais expressed resistance to the ‘messiness’ and poor maintenance.
- The ‘cues to care’ tactic could be adopted for designing ecological urban parks in Bangkok.
- The ‘picturesque’ involved in the perception of beautiful, natural, and ecological landscapes.
- Familiarity enhanced the appreciation of ecological landscapes.
- Knowledge about nature and ecology affected the perception of ecological landscapes.

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Chapter 1: Introduction

1.1 Research background

In the past decades, with the recognition that urban ecosystems have become seriously degraded, a number of ecological landscape design projects have been constructed in many cities. These landscapes are created to provide benefits to urban ecosystems, which include reducing air temperature and pollution, infiltrating and treating runoff, reducing flood risks, recharging groundwater, and providing habitats for urban wildlife, for example. Unfortunately, according to Mozingo (1997, 46), “Ecological design literature has elided its aesthetic implications.” In particular, because the design of ecological landscapes primarily concentrates on ecological processes and benefits in terms of solving ecological problems and sustaining ecosystems, too little attention is paid to making attractive landscape appearance. Especially, the use of native, tolerant plant species and low maintenance procedures also makes ecological landscapes look unkempt. As a result, such ecological landscapes often fail to satisfy the public eye because they have unattractive appearance.

Literature and research precedents suggest that because people, especially the Americans, are deeply attached to the picturesque ideal of landscape beauty, they manifest dissatisfaction with the messy appearance of ecological landscape designs. The picturesque landscapes originated from the eighteenth-century English landscape aesthetics, denoting those having components and compositions that look like landscape paintings. For centuries, the picturesque theory has extensively been pursued by landscape architects and designers in both Europe and North America. Due to the fact that the visual appearance of ecological landscapes often defies the picturesque ideal which favors the naturalistic and neat appearance, people often think ecological landscapes are unsightly and unappealing. The negative public reaction to ecologically valuable designs, importantly, affects public support and protection of ecological landscape practices.

This research, therefore, aims to study public response to the ecological urban park landscapes in Bangkok. Chulalongkorn University Centenary Park serves as a case study in this research. This is because the design of the park intends to provide not only pleasant outdoor spaces for all the people, but also superb ecological benefits for the city. Since the park contains several ecologically valuable elements, including trees and plants, green roof, retention pond, constructed wetlands, rain gardens, underground water drainage system, for example, it helps reduce air temperature, detain and treat water, reduce flood risk, and so on. As a result, it is one of the prominent ecological landscape design projects in the country.

1.2 Research objective and contribution

Realizing that in the western culture, especially in the United States, ecological landscapes have often fallen short of achieving public recognition and satisfaction, this research is proposed to be a pioneering effort to examine how Thais perceive and respond to the appearance of ecological landscape design. In particular, it aims to investigate if perception of scenic beauty is associated with perceived naturalness and perceived ecological quality of the landscape. Moreover, it also aims to study if the ‘picturesque’ and the ‘messiness’ play a role in public appreciation of the appearance of landscapes in Thailand. Specifically, it intends to investigate if Thais also manifest an affection for the picturesque scenery and a resistance to the messy landscape.

The insight revealed by this research is considered crucial for landscape design education because it will enhance knowledge about landscape perception and preference of Thais. Furthermore, this insight is also necessary for landscape design profession as it will provide information for creating successful ecological landscape design projects. In other words, this research will significantly contribute to the development of country-specific ecological landscape design principles which can be used to guide landscape architects and designers in designing landscape projects in order that they not only hold ecological benefits, but also achieve satisfaction of Thais.

1.3 Research schedule

This research began in January 2019 and completed in June 2020. The time schedule of the research is presented in table 1.

Table 1: Research schedule

Research Process	2019												2020					
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Reviewing relevant literature (theories, methods, sites)	█	█	█	█	█													
Surveying the site and determining representative views			█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Taking representative pictures				█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Creating photomontage pictures					█	█	█	█	█	█	█	█	█	█	█	█	█	█
Developing the survey instrument (questionnaire)									█	█	█	█	█	█	█	█	█	█
Receiving approval from IRB										█	█	█	█	█	█	█	█	█
Collecting questionnaire data											█	█	█	█	█	█	█	█
Analyzing questionnaire data using statistical procedures													█	█	█	█	█	█
Discussing research results																█	█	█
Writing and editing a manuscript for publishing in a journal																	█	█

Chapter 2: Theoretical Frameworks

2.1 The ecological landscape design and the new type of urban park

The rising awareness of serious ecological damage instigated and increased the need for landscape designs that work in concert with the natural systems. In response, academics as well as practitioners in landscape architecture and related fields earnestly attempted to incorporate knowledge in ecological science into landscape design with the aim of minimizing possible deleterious effects on the health of both humans and ecosystems. The term ecological design emerged in the fields of architectural and landscape design and planning in the late 1960s (Kallipoliti, 2018: 2). The publication of *Design with Nature* by Ian McHarg in 1969 marked significant advance of ecological approach to land-use planning, grounding the basis of landscape design rationale ever since. Afterwards, the book *Ecological Design* by Sim Van der Ryn and Stuart Cowan, first published in 1996, substantially defined and popularized the term ecological design along with its principles.

In fact, since ecological design is described broadly as “any form of design that minimizes environmentally destructive impacts by integrating itself with living processes” (Van der Ryn & Cowan, 2007: 33), the term embraces a variety of design activities—including regional planning, landscape planning, architectural design, product design, just to name a few. For ecological landscape design, specifically, it refers to the incorporation of ecology into design in order to create a landscape that fits well with the natural systems of its site and surrounding, forming an ecologically sound and sustainable landscape. The ecological landscapes, with the use of native species, permeable pavements, and local materials, for example, value and make use of the services nature freely provide so that they require less maintenance than conventional landscapes with amounts of hardscapes, lawns, and exotic plants (Danler & Langellotto-Rhodaback, 2015: 2-3). In addition, these ecological landscapes themselves can also supply ecological services—cleaning air, infiltrating and treating stormwater, providing wildlife habitat, and so on—for cities in which they locate.

The idea of ecological design has a particular application to the design of urban parks. The study by Galen Cranz and Michael Boland reveals a new type of urban park in America¹—called the Ecological Park (2003) or the Sustainable Park (2004), which began to emerge in the late 1990s. In particular, with widespread attention to sustainable development and ecological design, the design of American urban parks shifted to focus on solving ecological problems and making cities more ecologically sustainable. The ecological or sustainable parks, according to Cranz and Boland (2003: 46), “could be anywhere—of any shape, any size. Organizing geometries may be rectilinear, curvilinear or naturalistic since it is not its look that matters so much as its biological functioning.” Three general attributes characterize these new parks, making them differ from traditional parks (Cranz & Boland, 2004: 106). These include (1) targeting self-sufficiency in terms of material resources and maintenance, (2) integrating with surrounding urban systems and solving urban ecological problems, and (3) developing new forms of landscape aesthetics which highlight dynamic processes rather than fixed, static image of the landscape. Though this new urban park model manifests the modification of park

¹ In her 1982 book, *The Politics of Park Design: A History of Urban Parks in America*, Galen Cranz classifies American urban parks into four types—the Pleasure Ground (1850–1900), the Reform Park (1900–1930), the Recreation Facility (1930–1965), and the Open Space System (1965–?). This park typology renders the history of park design in America with more concern on social than ecological issues (Cranz & Boland, 2004).

design in the United States, it seems to also reflect the global trend, given that urban parks of the kind have emerged and increased in number in many countries all over the world. The examples include Byxbee Park in California, Hunter's Point South Park in New York, Corktown Common in Canada, St. Jacques Ecological Park in France, Duisburg Nord Landscape Park in Germany, Ballast Point Park in Australia, Qunli Stormwater Wetland Park in China, Bishan-Ang Mo Kio Park in Singapore, and Chulalongkorn University Centenary Park in Thailand. Apart from these new projects, the ecologically sustainable parks also encompass the restoration of existing parks. For example, some sections of Manhattan's Central Park and Brooklyn's Prospect Park, with maintenance difficulty, were converted, especially by replacing invasive exotic species with native or non-invasive horticultural species (Cranz & Boland, 2004: 107).

2.2 The preference for the picturesque and the problem with the messiness of the ecological landscape

The appearance of the landscape tremendously affects how people interpret and appreciate the landscape, especially in terms of aesthetic and ecological qualities. Nassauer (1992: 239) explains that "the look of the land communicates" and "people make inferences about ecological quality from the look of the land." Given that, the problem regarding the appearance of the ecological landscape emerged. Previous writings and studies, especially in the landscape perception and design fields, reiterated the visual quality problems, specifically the unrecognizable and unlikable appearance, of ecological landscape designs. For example, as Mozingo (1997: 48) describes, "The West Davis Pond is a new kind of ecologically integrated project, with measurable ecological benefits that we want to increasingly infiltrate into the landscape. It teaches us many things about the science of ecological design... But however much this project has profound ecological value, unless the birds are present, it is strikingly anonymous, even dull, as a landscape experience."

Apparently, the preference for the picturesque involves in this problem. This is because people mostly apprehend and appreciate aesthetic, and also ecological, qualities of the landscape through an entrenched cultural concept of nature based on the theory of the picturesque (Howett, 1987; Nassauer, 1992, 1995, 2017). The term 'picturesque,' which literally means 'picture-like' or 'like a picture' (Carlson, 2016; Conron, 2000: 9), denotes an aesthetic theory and design practice of the eighteenth-century English culture that "advocates aesthetic appreciation in which the natural world is experienced as if divided into art-like scenes, which ideally resemble works of arts, especially landscape painting, in both subject matter and composition" (Carlson, 2016). In addition, Hunt (2002: 6) describes that "...the 'picturesque' concerns the application of painterly art to the formation of gardens and landscapes; but it was also about the understanding, presentation and augmentation of 'nature' in designed landscapes, and about their reception by all sorts of visitors, topics just as important in the annals of landscape as a debt to painting." The works of legendary English landscape design masters like William Kent, Lancelot "Capability" Brown, and Humphry Repton in the eighteenth century have been leading exemplars of the picturesque gardens and landscapes (Howett, 1987: 1). The picturesque aesthetics, albeit an English invention, had subsequently flourished in other countries in Europe (Hunt, 2002: 6).

In the nineteenth-century America, the picturesque theory had a massive influence on paintings, and also other forms of artworks such as prints and engravings, providing "the imagery, the varied spectrum of effects, and the scenic strategies for the representation of landscape in the Hudson River School and the luminists; of buildings, townscapes, and cityscapes in topographical painting; and of the human figure in genre painting" (Conron, 2000: 9). For landscape and park design, specifically, Frederick Law Olmsted, a father of American landscape architecture, invented a distinctive American picturesque landscape called a 'pastoral' landscape. With his memory of rural New England scenery in Connecticut where he spent his childhood, impression of the picturesque beauty of Birkenhead Park

outside Liverpool where he visited while travelling in England in 1850, and familiarity with books by Virgil, Izaak Walton, William Gilpin, Sir Uvedale Price, and Andrew Jackson Downing that promoted the appreciation of pastoral scenery, Olmsted developed an idea of pastoral landscape and designed many pastoral parks for many American cities, starting with Central Park in Manhattan (Howett, 1987: 1-2; Simpson, 1999: 289). These American picturesque, pastoral landscapes feature a naturalistic scenery with curving pathways, meandering waterways, expansive lawns, and clusters of trees that, according to Mozingo (2011: 10), “evokes a familiar, tranquil, and cultivated nature as a counterpoint to the city.” Eventually, this idyllic landscape has become a “quintessential emblem of a civilized, humanized natural world” and influenced “our judgments of what is beautiful or appropriate in the designed landscape” (Howett, 1987: 3). At present, the deep impression of the picturesque is incredibly affecting the appreciation of the emerging ecological landscapes.

According to Nassauer (1992: 240), “We might have problems with the appearance of ecological systems because their appearance is inconsistent with our shared social understanding of the way landscapes are supposed to look: healthy ecosystems might not match our social understanding of the desirable appearance of landscape.” In particular, due to the fact that the visual appearance of ecological landscapes does not often conform to the entrenched picturesque ideal, people often think such landscapes are unappealing. The picturesque has been for centuries an epitome of beautiful, natural landscapes, and this has formed an inaccurate picture of a healthy ecosystem. In other words, according to Nassauer (1995: 161), “Picturesque conventions seem so intrinsic to nature that they are mistaken for ecological quality.” Because we equate ecology with nature, and also nature with beauty, “we assume that healthy ecological systems are beautiful” (Nassauer, 1992: 240). Moreover, because we also identify natural beauty based on the picturesque aesthetics, we expect ecological quality to possess picturesque beauty (Nassauer, 1997: 68). These conceptions have made the picturesque imagery misleadingly signifies robust ecosystem. Notably, with neat visual quality, the picturesque landscape actually does not always support the ecological function and sometimes causes ecological degradation, especially through the modification of the land and the maintenance of its scenic beauty (Nassauer, 1995: 162, 1997: 68).

Significantly, messiness proves to be a key problematic aspect. As Nassauer (1995: 161) notes, “Ecological quality tends to look messy, and this poses problems for those who imagine and construct new landscapes to enhance ecological quality.” Messiness, by definition as well as sensation, implies dirtiness and ugliness, and also infers unsafe, unhealthy, and insanitary conditions (Nassauer, 2017: 20). The messy landscapes, in consequence, are unfavorable to people, unlikely to look beautiful or attractive. Moreover, we frequently regard them as undeveloped or neglected land parcels with poor ecological health. Additionally, that we are so averse to messy landscape is because “we know we do not understand them, and our experience of messiness gives us reason to fear what we do not know” (Nassauer, 2017: 21). The messy look, therefore, has prompted public dissatisfaction with ecological landscape design projects, especially with those in urban parks where people expect to contact with nature and experience natural beauty, in the way that congruent with their shared social understanding described above, so as to escape from their daily city environments. Based on insights revealed by many of her research projects done in the Mid-western region of the United States, Nassauer (1995) underlines the value of neat appearance as an indication of human care for the landscape and proposes the idea of ‘cues to care’ as a design tactic to create ‘orderly frames’ that make messy ecological systems look neat or tidy, and then appealing to the public eye. She explains that “Cues that indicate human intention are cultural symbols that can be used to frame more novel ecosystems in inhabited landscapes. Using cues to care in design is not a means of maintaining traditional landscape forms but rather a means of adapting cultural expectations to recognize new landscape forms that include greater biodiversity. Cues to care make the novel familiar and associate ecosystems that may look messy with unmistakable indications that the landscape is part of a larger intended pattern” (Nassauer, 1995: 167). This tactic includes, but not limited to, mowing turf, growing flowering plants, providing wildlife

feeders and houses, using bold pattern, trimming and pruning shrubs and trees, incorporating linear planting designs, installing and painting fences and other ornaments (Nassauer, 1995: 167-168). She also articulates that “This tactic can support the complexity of environmental processes that are embodied in messy ecosystems... As we increasingly live with the surprises of climate change and its social and environmental repercussions, design to host complexity is integral to resilience... In the new era of global change, ecological design should aggressively seek more places for messiness to belong” (Nassauer, 2017: 22).

Chapter 3: Research Methods

3.1 Case study

Chulalongkorn University (CU) was founded in 1917 as Thailand's first university. To celebrate its 100th anniversary, the university dedicated an approximately 11-acre parcel of land on its campus at the heart of Bangkok to the construction of a new public park, Chulalongkorn University Centenary Park. Completed and opened in 2017, this park functions not only as green outdoor space for all the people, but also as urban green infrastructure for the city. As one epitome of ecological landscape design with several, both national and international, design awards, it served as a case study in this research.

With the aim of creating the park that can help the city to tackle effects of climate change, landscape architect Kotchakorn Voraakhom, founder of Landprocess—a Bangkok-based landscape architecture and urban design firm, designed various ecologically functional features, which also essentially serve public recreation use. At one end of the park sits the building with a large green roof designed to slope down toward the ground so that everyone, including wheelchair users, can walk up and enjoy the magnificent scenery of Bangkok's skyline. This green roof, with assorted kinds of vegetation on top of it, possesses the ability to capture rainwater and reduce runoff as well as the ability to insulate the building against the sun's heat, keeping the building cool and reducing the use of electricity for air conditioning system. Three underground tanks located beneath the building stores rainwater harvested from the green roof so as to use for irrigating the park during dry seasons. The slope of the green roof and the park as a whole makes good use of gravity to drain runoff through a series of landscape-based, sustainable water management facilities which effectively collect and clean runoff, minimizing the impact on the drainage system of the city. The vast green lawn at the center of the park functions as the main, multipurpose open space. With its inclined plane, this lawn offers visitors a distinctive experience for their daily recreational activities and performs as an amphitheater for up to 7,000 audiences during special events. Apart from this main lawn, there is another, smaller lawn located at the north side of the park. With steps and ramps along its sides that people can sit on and climb upon, this lawn also provides a different recreational experience and an area for special activities for almost 3,000 participants. Importantly, these two lawns particularly act as detention basins that collect and detain rainwater and runoff during and after heavy storms. The lawns, along with permeable pavement surfaces in the park, are also capable of absorbing rainwater and runoff and allowing water to infiltrate the ground, thereby increasing groundwater recharge. On each side of the park locates the constructed wetlands equipped with a series of weirs and ponds stepping down the slope of the park in order to slow down the flow of excess runoff and allow aeration process. Furthermore, a variety of native water plant species in these constructed wetlands also absorb and filter this excess runoff. Evidently, these cascade-like constructed wetlands provide a unique experience for park visitors, especially kids and teenagers, to jump and climb onto the weirs, exploring and contacting with water and nature. At the lowest point of the park, the retention pond stores rainwater and runoff cleaned by constructed wetland for future use. A range of aquatic grasses and weeds are planted at this pond for additional water treatment. The stationary bikes at the edge of the pond offer a great opportunity for visitors to ride for exercise while playing a part in aerating and treating the water. Along the edge of the park are eight outdoor spaces, each with distinctive program and design to serve as outdoor classrooms for students and recreation areas for visitors. These include herb garden, bamboo garden, meditation area, reading area, playground, and amphitheater, for example. Notably, the porous and locally-sourced materials used in these spaces certainly complement the ecological performance of

the park. In addition, with patches of water and masses of vegetation, the park is also capable of reducing urban heat island and providing urban wildlife habitat. Figure 1 illustrates the key design components of Chulalongkorn University Centenary Park.

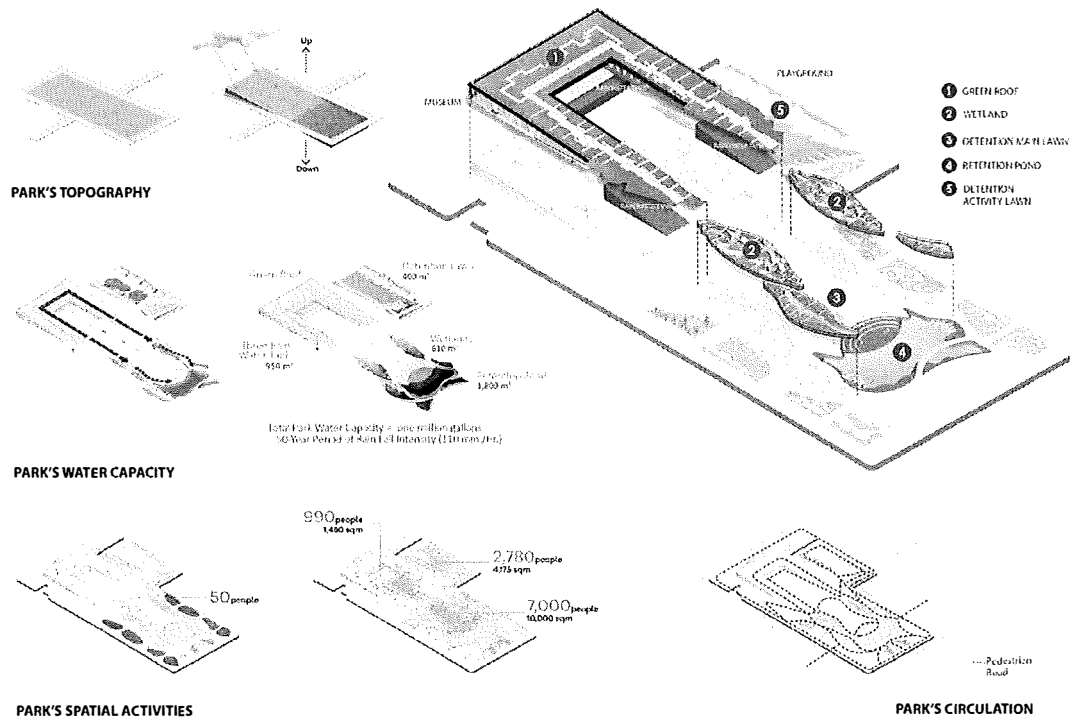


Figure 1: The key design components of Chulalongkorn University Centenary Park
(Picture by courtesy of LANDPROCESS)

Apart from creating sustainable ecological systems and enjoyable recreational spaces, the park was also designed for motivating the impression of landscape beauty. Indeed, the design of this park contains a mixture of the ‘picturesque’ and the ‘messiness’ of the landscape.

The park apparently features a number of beautiful views. At the center of the park, the main lawn appears as an impressive, extensive green open space. The open, panoramic view of green turf with the city skyline as background is very pleasurable (see picture 10 in figure 2). The sizable trees fringing the main lawn along with shady areas under their canopies perform as foreground, framing the view and creating a pleasant prospect (see picture 08 in figure 2). The curvilinear walkways with an assortment of trees and shrubs lining up along their sides provide a series of scenic views (see picture 11, 12, and 16 in figure 2). The retention pond is also a key component of the spectacle because the panoramic view of an expanse of open water is always appealing to people (see picture 17 in figure 2). Obviously, these landscape elements formulate beautiful sceneries typical to park-like landscape that people are familiar with and attached to. Nevertheless, the gradual slope of the main lawn excellently makes the sceneries also look untypical, yet unique. Most importantly, these landscape elements also compose the

picturesque landscape, an ideal of landscape beauty, for which people have a preference. Prominent among them is the view of the pond with meandering turf bank as foreground, lush vegetation as background, and curved bridge as a focal point (see picture 17 in figure 2). The lushness and diversity of vegetation, in contrast to the surroundings buildings and skyscrapers, makes the park as a whole emerges as nature amidst the city (see picture 16, 17, 26, and 27 in figure 2). This kind of naturalistic views really makes people feel fascinating as well as relaxing and refreshing. Additionally, the distinctive design of the building and other structures in the park, with modern and geometric forms, make the park look novel and memorable, as well as diverse and stimulating (see picture 10, 21, 29, and 30 in figure 2).

Besides its conventional, impressive appearance, the landscape of this park also looks unusual and unfamiliar to people of Bangkok. Because this park is such a pioneering ecological landscape design project in the city, some parts of the park possess visual characteristics which are different from the park-like landscape typical to the public parks in Bangkok that most people are familiar with, particularly Lumpini Park, Chatuchak Park, Vachirabenjatas Park, and King Rama IX Park, for example. Evidently, the use of native, tolerant plants, whether trees, shrubs, or groundcovers—which can resist extremely hot and wet seasons of Bangkok, thereby requiring low maintenance and minimal irrigation—are the key factor of this peculiar aspect. Without colorful leaves and flowers, these plants often look dull and dreary. Also, as these plants seldom look lush and green, they bring a sense of aridity and poor ecological health (see picture 23 in figure 2). Significantly, the park's weedy patches along with unclipped shrubs and untrimmed trees, although holding ecological and maintenance benefits, are often perceived as messiness, inferring the lack of care and poor maintenance (see picture 05, 12, and 25 in figure 2). Since the messy look, as mentioned above, also denotes dirty, unsafe, and insanitary conditions of the landscape, people often think these messy landscapes look ugly and unpleasant. Remarkably, the design of the park also manifests the 'cues to care' and 'orderly frames' strategy. Particularly, mowed lawns, trimmed shrubs and trees, and plants in rows are indications of human intention and care for the landscape. Moreover, the geometric forms of planters, pathways, pavement and seating areas, and other elements in the park also frame the messy vegetation and make ecological function look neat and novel, and then beautiful (see picture 05, 07, and 28 in figure 2).

3.2 Questionnaire survey

The research used a paper questionnaire as a survey instrument for collecting respondents' opinions on the appearance of the landscape. The questionnaire comprised open-ended, close-ended, and five-point rating scale questions arranged into six parts, fitting on one double-sided, A4-sized paper (see Appendix A).

The first part asked the respondents about their behaviors in relation to the site—the frequency, purposes, and time periods they used to visit Chulalongkorn University Centenary Park. The second part asked the respondents to indicate what in the landscape of the park that they like and dislike, along with how they want the park to be improved. The questions in the third part asked the respondents to rate the extent to which they think the landscape of the park as a whole is beautiful, natural, and ecological sustainable. In the fourth part, the questions asked the respondents to list places in Bangkok which, in their opinions, are beautiful, natural, and ecologically sustainable, and also to indicate, based on their opinions, how serious the environmental problem in Bangkok are. In the fifth part, the questions asked the respondents to give ratings to 30 pictures, regarding the extent to which they think the landscape in each picture is beautiful, natural, and ecological sustainable. The questions in the sixth part asked about respondents' demographic information—gender, age, hometown, occupation, and education level.



Figure 2: The representative pictures

In companion with the questionnaire, a set of 30 color pictures (2.5" x 6.5") was prepared so as to supplement questions in the fourth section. These pictures include photographs and photomontages. The photographs served as representatives of key views in the entire park, depicting typical and distinctive as well as the 'picturesque' and the 'messiness' aspects. The comprehensive study of the design concept along with site survey determined these views and a number of photographs were taken to represent them. The photomontages were produced from these photographs to illustrate the views to which the higher degrees of the 'picturesque' and the 'messiness' aspects, as well as the techniques of 'cues to care' and 'orderly frames' were applied. Specifically, mowed turf and trees with lush foliage were inserted to make the views look more picturesque; grasses and weeds as well as water plants were added to make the views look messier; geometric forms, flowering plants, clipped shrubs and groundcovers, and mowed turf were included to make the views look neat, a sign of good landscape maintenance and human care for the landscape—the 'cues to care' and 'orderly frames' tactic. With thorough deliberation, 19 photographs and 11 photomontages were selected, and organized to fit on 10 A4-sized papers, three pictures on each page (see Appendix B). Figure 2 displays the representative pictures and table 1 provides their description.

Table 2: The description of the representative pictures

#	Type	Location	Landscape aspects
01	photomontage	park's name sign	human care, neatness, flowers, mowed turf, green lawn, green foliage
02	photograph	park's name sign	low maintenance, unclipped plants, plain color, sere branches
03	photomontage	park's name sign	messiness, diversity, grasses and weeds, green foliage
04	photomontage	front entrance	orderly frames, geometric forms, neatness, flowers, mowed turf
05	photograph	front entrance	low maintenance, unclipped plants, plain color, orderly frames
06	photomontage	front entrance	messiness, diversity, grassy and weedy plants, orderly frames
07	photograph	pathway near front entrance	orderly frames, unclipped plants, plain color, curvilinear pathway
08	photograph	main lawn	park-like, picturesque, openness, prospect, mowed green turf, trees
09	photomontage	main lawn	messiness, grasses and weeds, prospect, mowed green turf, trees
10	photograph	main lawn and building	park-like, neatness, openness, prospect, mowed green lawn, building
11	photograph	pathway along main lawn	park-like, curvilinear path, trees, shade, mowed green lawn
12	photograph	pathway along main lawn	low maintenance, meandering path, unclipped plants
13	photograph	steps at side lawn	neatness, geometric forms, green lawn, trees
14	photograph	side lawn	neatness, geometric forms, openness, green lawn, trees
15	photomontage	side lawn	orderly frames, geometric forms, grasses and weeds, messiness
16	photograph	pathway near retention pond	park-like, picturesque, curvilinear path, lush plants, trees
17	photograph	retention pond	picturesque, naturalness, neatness, mowed green turf, water
18	photomontage	retention pond	picturesque, naturalness, messiness, grasses and weed, water plants
19	photomontage	bridge across retention pond	picturesque, openness, neatness, mowed green turf, water
20	photomontage	bridge across retention pond	picturesque, naturalness, messiness, grasses and weed, water plants
21	photograph	stationary water bikes	orderly frames, curvilinear path, grassy plants, water
22	photomontage	pathway on sloped green roof	human care, park-like, trees, mowed green turf, flowers
23	photograph	pathway on sloped green roof	low maintenance, unclipped plants, plain color, aridity, orderly frames
24	photomontage	pathway on sloped green roof	messiness, diversity, grasses and weeds, orderly frames
25	photograph	pathway to the bridge	low maintenance, unclipped plants, plain color, trees, curvilinear path
26	photograph	side entrance	low maintenance, unclipped plants, orderly frames,
27	photograph	side entrance	orderly frames, geometric forms, neatness, lush plants
28	photograph	constructed wetland	messiness, orderly frames, geometric forms, grasses and weeds
29	photograph	outdoor room	neatness, geometric forms, rectangular forms, enclosure
30	photograph	outdoor room	neatness, geometric forms, curved forms, enclosure

The distribution of questionnaires began in November of 2019, after the committee for research involving human subjects approved the execution of the project (see Appendix C), and ended in April of 2020. The respondents were categorized into four groups, which include 1) users and visitors of the park, representing those holding familiarity with the landscape of the park, 2) Chulalongkorn University affiliates—students, faculty, and staff, representing those possessing high acquaintance with the institution, 3) Bangkok residents, representing the general public living in the city, and 4) landscape

architects or designers, representing the professionals with expertise in landscape design. The research set the minimum number of each group at 75, for a total of at least 300. For the most part, the researcher, along with eight trained assistants who were graduate students in the Landscape Architecture program, friendly approached potential respondents to ask for voluntary participation in the survey by filling out the questionnaire in situ—in Chulalongkorn University Centenary Park, Chulalongkorn University, and various public spaces in Bangkok. Notably, as a result of the serious spread of coronavirus, during March and April of 2020 some potential respondents were contacted and asked for completing the questionnaire digitally. Finally, a total of 315 completed questionnaires were collected, counting 76, 81, 83, and 75 for each of the four groups, respectively.

Chapter 4: Analysis and Results

The statistical analysis of questionnaire data used the Statistical Package for the Social Sciences (SPSS) software. It should be noted that the research considered the rating scale data as approximately continuous so that the parametric methods were utilized to analyze them.

4.1 Respondents' demographics and behaviors toward the park

In this section, responses to questions in the first and the last parts of the questionnaire are displayed so as to provide basic ideas regarding the characteristics of the respondents, specifically their demographics and behaviors toward Chulalongkorn University Centenary Park. Table 3 displays the demographic information and table 4 displays behaviors toward the park of the respondents.

Table 3: Respondents' demographics

Demographics	All Respondents (<i>n</i> = 315)	Park Users (<i>n</i> = 76)	CU Affiliates (<i>n</i> = 81)	Bangkok Residents (<i>n</i> = 83)	Landscape Professionals (<i>n</i> = 75)
Gender					
- Male	99 (31.4%)	30 (39.5%)	27 (33.3%)	20 (24.1%)	22 (29.3%)
- Female	216 (68.6%)	46 (60.5%)	54 (66.7%)	63 (75.9%)	53 (70.7%)
Age					
- 20 or less	25 (7.9%)	15 (19.7%)	5 (6.2%)	5 (6.0%)	0
- 21 - 30	198 (62.9%)	36 (47.4%)	64 (79.0%)	39 (47.0%)	59 (78.7%)
- 31 - 40	24 (7.6%)	7 (9.2%)	5 (6.2%)	7 (8.4%)	5 (6.7%)
- 41 - 50	25 (7.9%)	6 (7.9%)	6 (7.4%)	4 (4.8%)	9 (12.0%)
- 51 - 60	22 (7.0%)	7 (9.2%)	1 (1.2%)	12 (14.5%)	2 (2.7%)
- More than 60	21 (6.7%)	5 (6.6%)	0	16 (19.3%)	0
Hometown					
- Bangkok	208 (66.0%)	38 (50.0%)	57 (70.4%)	63 (75.9%)	50 (66.7%)
- Others	107 (34.0%)	38 (50.0%)	24 (29.6%)	20 (24.1%)	25 (33.3%)
Education Level					
- Lower than bachelor degree	40 (12.7%)	28 (36.8%)	1 (1.2%)	11 (13.2%)	0
- Bachelor degree	213 (67.6%)	41 (53.9%)	61 (75.3%)	56 (67.5%)	55 (73.3%)
- Master Degree	48 (15.2%)	7 (9.2%)	11 (13.6%)	15 (18.1%)	15 (20.0%)
- Doctoral Degree	14 (4.4%)	0	8 (9.9%)	1 (1.2%)	5 (6.7%)
Occupation					
- Students	120 (38.1%)	28 (36.8%)	68 (84.0%)	13 (15.7%)	11 (14.7%)
- Academics (teachers, researchers)	27 (8.6%)	1 (1.3%)	9 (11.1%)	5 (6.0%)	12 (16.0%)
- Landscape architects, architects	47 (14.9%)	0	0	0	47 (62.7%)
- Engineers, scientists, technicians	6 (1.9%)	0	1 (1.2%)	3 (3.6%)	2 (2.7%)
- Doctors, nurses, health professionals	9 (2.9%)	1 (1.3%)	1 (1.2%)	7 (8.4%)	0
- Policemen, soldiers, lawyers	4 (1.3%)	1 (1.3%)	0	3 (3.6%)	0
- Businessmen, bankers	19 (6.0%)	3 (3.9%)	0	13 (15.7%)	2 (2.7%)
- Officers, clerks	47 (14.9%)	19 (25.0%)	1 (1.2%)	28 (33.7%)	0
- Laborers	20 (6.3%)	15 (19.7%)	1 (1.2%)	4 (4.8%)	0
- Others (retired, unemployed, freelances)	16 (5.1%)	8 (10.5%)	0	7 (8.4%)	1 (1.3%)

Overall, around two-thirds of the respondents were female. The respondents were concentrated in the age of young adults (21-30 years old) as they mostly were students. The majority of the respondents indicated Bangkok as their hometown and a bachelor degree as their educational attainment.

Approximately one-fourth of the respondents never visited Chulalongkorn University Centenary Park, while one-third rarely visited and one-fifth occasionally visited; only one-fifth visited the park on a routine basis. Approximately one-third of the park users reported that they weekly visited the park. More than half of Bangkok residents never visited the park and almost half of the landscape professionals rarely visited the park. Most of the respondents who ever visited the park indicated relaxing as the key purpose of visit, and closely followed by passing by or walking through the park. Considering the park users, they also visited the park for relaxing, yet followed by exercising. The respondents in the other three groups mostly passed by the park and visited the park for relaxing. Notably, more than one-fourth of the respondents also went to the park for meeting and talking with their friends. Few respondents went to the park for picnicking and eating. Other purposes of visiting the park included taking pictures, joining events, and parking cars. Obviously, most of the respondents visited the park in the evening.

Table 4: Respondents' behaviors toward the park

Behaviors toward the park	All Respondents	Park Users	CU Affiliates	Bangkok Residents	Landscape Professionals
Frequency of visit	(n = 315)	(n = 76)	(n = 81)	(n = 83)	(n = 75)
- Never	74 (23.5%)	0	9 (11.1%)	49 (59.0%)	16 (21.3%)
- Daily	7 (2.2%)	6 (7.9%)	1 (1.2%)	0	0
- Almost daily	21 (6.7%)	16 (21.1%)	2 (2.5%)	2 (2.4%)	1 (1.3%)
- Weekly	40 (12.7%)	24 (31.6%)	8 (9.9%)	0	8 (10.7%)
- Occasionally (only for special events)	62 (19.7%)	15 (19.7%)	20 (24.7%)	10 (12.0%)	17 (22.7%)
- Rarely	111 (35.2%)	15 (19.7%)	41 (50.6%)	22 (26.5%)	33 (44.0%)
Purpose of visit (can choose >1 option)	(n = 241)	(n = 76)	(n = 72)	(n = 34)	(n = 59)
- Relaxing, walking, sitting	129 (53.5%)	50 (65.8%)	34 (47.2%)	12 (35.3%)	33 (55.9%)
- Exercising, jogging	70 (29.0%)	35 (46.1%)	11 (15.3%)	9 (26.5%)	15 (25.4%)
- Picnicking, eating	14 (5.8%)	7 (9.2%)	3 (4.2%)	0	4 (6.8%)
- Passing by, walking through	124 (51.5%)	26 (34.2%)	47 (65.3%)	14 (41.2%)	37 (62.7%)
- Meeting, talking with friends	65 (27.0%)	20 (26.3%)	21 (29.2%)	8 (23.5%)	16 (27.1%)
- Others (taking pictures, joining events, parking cars)	25 (10.4%)	4 (5.3%)	4 (5.6%)	2 (5.9%)	15 (25.4%)
Time period of visit	(n = 241)	(n = 76)	(n = 72)	(n = 34)	(n = 59)
- Morning	6 (2.5%)	3 (3.9%)	1 (1.4%)	1 (2.9%)	1 (1.7%)
- Late morning	1 (0.4%)	0	0	0	1 (1.7%)
- Noon	7 (2.9%)	1 (1.3%)	2 (2.8%)	3 (8.8%)	1 (1.7%)
- Afternoon	13 (5.4%)	3 (3.9%)	2 (2.8%)	3 (8.8%)	5 (8.5%)
- Evening	144 (59.8%)	50 (65.8%)	43 (59.7%)	20 (58.8%)	31 (52.5%)
- Night	8 (3.3%)	3 (3.9%)	4 (5.6%)	0	1 (1.7%)
- Several time periods	62 (25.7%)	16 (21.0%)	20 (27.8%)	7 (20.6%)	19 (32.2%)

4.2 Respondents' opinions on the landscape of the park

The open-ended questions in the second part of the questionnaire asked the respondents who ever visited the park to list their liked and disliked aspects in the landscape of the park, along with their suggestions for park improvement. It is noted that, for each query, while some respondents listed nothing, many gave several entries. The total numbers of respondents who answered each question along with their answers, after being sorted out into groups, are displays in table 5.

In view of these responses, it is found that various principal aspects of the 'picturesque' and 'park-like' landscapes were indicated by the respondents as what they liked in the park. In particular, trees and lush vegetation were most mentioned, followed by extensive green lawn, then naturalness, scenic views, and the pond. The building along with its sloped green roof was also appreciated by around one-fifth of the university affiliates and almost one-fifth of the landscape professionals. Remarkably, almost one-fifth of the landscape professionals also valued the water management and ecological function of

the park. The dilapidation, messiness, and aridity were the top three disliked aspects. These could indeed imply poor maintenance and lack of care. Notably, some respondents also did not prefer sloped pathways. Considering the improvement suggestions, more trees, shades, and lushness were most mentioned; hence, the affection for natural and park-like appearance of the landscape seemed to play an influential role in respondents' preferable landscapes. In addition, 'cues to care' seemed to take part in respondents' landscape ideals as well. This is because many respondents requested for good maintenance and care for both vegetation and structures in the park. Furthermore, colorful flowers along with neatness, cleanliness, and safety were also cited by several respondents as improvement suggestions. It is worth pointing out that no landscape professional suggested the use of colorful flowers. This might be because they know about the high maintenance these plants require. Also, some respondents asked for additional facilities, especially toilets, trash cans, lighting, for their convenience and safety, as well as additional features and activities, such as exercise equipment, exhibitions, and fountains, for their joyfulness and for the liveliness of the park.

Table 5: Respondents' opinions on the landscape of the park

Opinions on the landscape of the park	All Respondents	Park Users	CU Affiliates	Bangkok Residents	Landscape Professionals
Liking (can indicate >1 entry)	(n = 237)	(n = 75)	(n = 69)	(n = 34)	(n = 59)
- Water management, ecological functions	21 (8.9%)	2 (2.7%)	6 (8.7%)	2 (5.9%)	11 (18.6%)
- Pond, water expanse	29 (12.2%)	9 (12.0%)	9 (13.0%)	2 (5.9%)	9 (15.3%)
- Lawn, green open space	63 (26.6%)	19 (25.3%)	23 (33.3%)	9 (26.5%)	12 (20.3%)
- Trees, plants, shades, lushness	71 (30.0%)	26 (34.7%)	11 (15.9%)	17 (50.0%)	17 (28.8%)
- Peaceful and relaxing ambiance, fresh air	7 (6.3%)	7 (9.3%)	3 (4.3%)	2 (5.9%)	3 (5.1%)
- Naturalness	43 (18.1%)	23 (30.7%)	9 (13.0%)	8 (23.5%)	3 (5.1%)
- Beautiful scenery	33 (13.9%)	13 (17.3%)	7 (10.1%)	5 (14.7%)	8 (13.6%)
- Building, slope, green roof	28 (11.8%)	2 (2.7%)	15 (21.7%)	0	11 (18.6%)
- Walkways, curved pathways	18 (7.6%)	2 (2.7%)	8 (11.6%)	2 (5.9%)	6 (10.2%)
- Location, easy to access, car parks	3 (1.3%)	2 (2.7%)	1 (1.4%)	0	0
- Others (safety, modernity)	10 (4.2%)	6 (8.0%)	0	1 (2.9%)	3 (5.1%)
Dislike (can indicate >1 entry)	(n = 147)	(n = 32)	(n = 53)	(n = 20)	(n = 42)
- Few trees, few shades, aridity	38 (25.9%)	6 (18.8%)	15 (28.3%)	5 (25.0%)	12 (28.6%)
- Messy vegetation	30 (20.4%)	3 (9.4%)	13 (24.5%)	6 (30.0%)	8 (19.0%)
- Dilapidated hardscapes and structures	39 (26.5%)	8 (25.0%)	13 (24.5%)	2 (10.0%)	16 (38.1%)
- Insufficient exercise equipment	1 (0.7%)	0	1 (1.9%)	0	0
- Insufficient toilets, trash cans, lighting	12 (8.2%)	4 (12.5%)	3 (5.7%)	2 (10.0%)	3 (7.1%)
- Lack of naturalness	2 (1.4%)	0	2 (3.8%)	0	0
- Small and divided outdoor spaces	9 (6.1%)	2 (6.3%)	1 (1.9%)	2 (10.0%)	4 (9.5%)
- Underuse of indoor spaces	1 (0.7%)	0	1 (1.9%)	0	0
- Slope, sloped pathways	24 (16.3%)	8 (25.0%)	8 (15.1%)	3 (15.0%)	5 (11.9%)
- Location, far from public transportation	5 (3.4%)	0	1 (1.9%)	2 (10.0%)	2 (4.8%)
- Others (dogs, mosquitoes, Cigarettes)	10 (6.8%)	6 (18.8%)	3 (5.7%)	1 (5.0%)	0
Improvement (can indicate >1 entry)	(n = 159)	(n = 42)	(n = 50)	(n = 24)	(n = 43)
- Colorful flowers, flowering plants	16 (10.1%)	9 (21.4%)	2 (4.0%)	5 (20.8%)	0
- More trees, shades, and lushness	76 (47.8%)	15 (35.7%)	26 (52.0%)	12 (50.0%)	23 (53.5%)
- Maintenance of vegetation and structures	34 (21.4%)	5 (11.9%)	14 (28.0%)	3 (12.5%)	12 (27.9%)
- Provision of exercise equipment	8 (5.0%)	3 (7.1%)	1 (2.0%)	2 (8.3%)	2 (4.7%)
- Provision of toilets, trash cans, lighting	19 (11.9%)	10 (23.8%)	1 (2.0%)	5 (20.8%)	3 (7.0%)
- More fountains and cascades for liveliness	5 (3.1%)	1 (2.4%)	2 (4.0%)	1 (4.2%)	1 (2.3%)
- Bigger, undivided, flexible outdoor spaces	5 (3.1%)	0	2 (4.0%)	0	3 (7.0%)
- Provision of indoor activities, exhibitions	9 (5.7%)	1 (2.4%)	3 (6.0%)	0	5 (11.6%)
- Smooth, connected pathways	2 (1.3%)	0	2 (4.0%)	0	0
- Neatness, cleanliness, safety	6 (3.8%)	1 (2.4%)	2 (4.0%)	0	3 (7.0%)
- Others (pest control, urban agriculture, extended opening hours)	9 (5.7%)	3 (7.1%)	2 (4.0%)	3 (12.5%)	1 (2.3%)

The third part of the questionnaire asked the respondents who ever visited the park to indicate, based on their own experiences, how the landscape of the park as a whole is beautiful, natural, and ecologically sustainable, using a 5-point attitude scale, given that 1 means the least and 5 means the most. The significant Pearson correlation coefficients indicate the linear relationships among these three ratings. In particular, the ‘beautiful’ rating is positively correlated with the ‘natural’ rating, $r(72) = .68$, $p = .00$, and the ‘ecologically sustainable’ rating, $r(72) = .61$, $p = .00$, and the ‘natural’ rating is also positively correlated with the ‘ecologically sustainable’ rating, $r(72) = .54$, $p = .00$. This implies the relative influence of the perceived beauty, perceived naturalness, and perceived ecological sustainability on each other, making the respondents giving a high rating on one aspect were likely to also give a high rating on the others, and vice versa. Importantly, this perhaps manifests the effect of the affection for picturesque beauty on the perception of natural and ecologically sustainable landscapes—the misinterpretation that the beautiful landscapes are natural and ecologically healthy.

In consideration of the rating means, it appears that the landscape of the park received all positive ratings; as displayed in table 6, all of rating means are above 3.00. This suggests that the respondents generally appreciated these three aspects of the park, especially the park users, since their ratings are all higher than those of the other groups. The ANOVA analyzes these differences and reveals that the respondents in different groups rated the beautiful aspect of the park indifferently ($F = .91$, $p = .44$), yet rated the natural and ecologically sustainable aspects differently ($F = 8.11$, $p = .00$, and $F = 3.01$, $p = .03$, respectively), see table 6. The post-hoc analysis (Bonferroni) demonstrates statistically significant differences at the group of park users. Specifically, park users gave significantly higher ratings to the natural aspect than CU affiliates ($p = .00$) and landscape design professionals ($p = .00$), and also gave significantly higher ratings to the ecologically sustainable aspect than CU affiliates ($p = .02$). This might be because of the high familiarity with the landscape that made the park users more appreciative of the park, as well as the recreational activities that made them less sensitive to the natural and ecologically sustainable aspects, compared to the respondents in the other groups.

Table 6: Means and mean differences between the ratings by different groups of respondents

Ratings	All Respondents		Park Users		CU Affiliates		Bangkok Residents		Landscape Professionals		Mean Differences	
	<i>n</i>	<i>M</i>	<i>n</i>	<i>M</i>	<i>n</i>	<i>M</i>	<i>n</i>	<i>M</i>	<i>n</i>	<i>M</i>	<i>F</i>	<i>p</i>
	- Beautiful	239	4.02	74	4.11	69	3.91	35	4.00	61	4.05	.91
- Natural	243	3.80	75	4.17	72	3.61	35	3.86	61	3.54	8.11	.00*
- Ecologically sustainable	240	3.65	74	3.88	71	3.45	35	3.69	60	3.60	3.01	.03*

* $p < 0.05$; *F* is significant at the 0.05 level.

Table 7: Mean difference between the ratings for landscape aspects

Paired Ratings	All Respondents		Park Users		CU Affiliates		Bangkok Residents		Landscape Professionals	
	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
	- Beautiful x Natural	4.30	.00*	-.71	.48	2.87	.01*	1.15	.26	5.04
- Beautiful x Ecologically sustainable	6.67	.00*	2.70	.01*	4.50	.00*	2.15	.04*	3.68	.00*
- Natural x Ecologically sustainable	2.80	.01*	2.98	.00*	1.84	.07	1.36	.18	-.63	.53

* $p < 0.05$; *t* is significant at the 0.05 level (2-tailed).

In addition, it is found that, among the three ratings, the beautiful aspect was generally rated the highest, followed by the natural aspect and then the ecologically sustainable aspect. The paired sample *t*-tests reveal all significant differences between the ratings by the whole respondents—the ‘beautiful’ mean is significantly higher than the ‘natural’ mean ($t = 4.30$, $p = .00$) and the ‘ecologically sustainable’ mean ($t = 6.67$, $p = .00$), and the ‘natural’ mean is also significantly higher than the ‘ecologically sustainable’ mean ($t = 2.80$, $p = .01$), see table 7. It is noted, however, that while some groups of

respondents produced insignificant differences between the ‘beautiful’ and the ‘natural’ ratings, and between the ‘natural’ and the ‘ecologically sustainable’ ratings, every group gave significantly higher ratings to the beautiful aspect than the ecologically sustainable aspect of the park. Perhaps not surprisingly given the entrenched affection for parks and green open spaces, the respondents easily perceived and highly appreciated the beauty of the park’s landscape. In the same way, the tenet that parks and green open spaces represent nature in the city could be a factor influencing the respondents to simply consider the park as a natural landscape, contrasting with its surrounding urban landscape. Unlike the normative, perceptible ‘beautiful’ and ‘natural’ qualities, “Ecological function is not readily recognizable to those who are not educated to look for it... Even to an educated eye, ecological function is sometimes invisible” (Nassauer 1995: 161). Accordingly, it is not easy for the respondents to notice and value the ecological function of the landscape, resulting in the lower ratings for ‘ecologically sustainable,’ compared to the other two ratings.

4.3 Respondents’ notions of beautiful, natural, and ecologically sustainable landscapes and environmental problems in Bangkok

In order to explore the notions of beautiful, natural, and ecologically sustainable landscapes within the city, the fourth part of the questionnaire asked the respondents to list places in Bangkok serving as exemplars of these three landscape attributes. Almost nine-tenths of the respondents wrote down at least one beautiful place and at least one natural place, while around three-fourths specified at least one ecologically sustainable place.

Table 8: Frequency of the respondents mentioning each place as a beautiful landscape in Bangkok

Beautiful Landscape (can specify >1 place)	All Respondents (n = 276)	Park Users (n = 66)	CU Affiliates (n = 71)	Bangkok Residents (n = 75)	Landscape Professionals (n = 64)
Park-like appearance					
- Chulalongkorn University	14 (5.1%)	2 (3.0%)	6 (8.5%)	1 (1.3%)	5 (7.8%)
- Chulalongkorn University Centenary Park	25 (9.1%)	16 (24.2%)	6 (8.5%)	1 (1.3%)	2 (3.1%)
- Lumpini Park	60 (21.7%)	20 (30.3%)	12 (16.9%)	12 (16.0%)	16 (25.0%)
- Chatuchak Park	9 (3.3%)	1 (1.5%)	4 (5.6%)	3 (4.0%)	1 (1.6%)
- Vachirabenjatas Park (Rot Fai Park)	33 (12.0%)	6 (9.1%)	5 (7.0%)	9 (12.0%)	13 (20.3%)
- King Rama IX Park	38 (13.8%)	9 (13.6%)	6 (8.5%)	17 (22.7%)	6 (9.4%)
- Queen Sirikit Park	11 (4.0%)	4 (6.1%)	2 (2.8%)	3 (4.0%)	2 (3.1%)
- Benchasiri Park	7 (2.5%)	1 (1.5%)	2 (2.8%)	1 (1.3%)	3 (4.7%)
- Benchakitti Park	6 (2.2%)	0	2 (2.8%)	4 (5.3%)	0
- Other parks	5 (1.8%)	2 (3.0%)	0	2 (2.7%)	1 (1.6%)
- Parks in general	8 (2.9%)	2 (3.0%)	4 (5.6%)	0	2 (3.1%)
Urban appearance					
- Skyscrapers, iconic buildings and bridges	20 (7.2%)	2 (3.0%)	4 (5.6%)	9 (12.0%)	5 (7.8%)
- Rattanakosin Island (historic area)	45 (16.3%)	7 (10.6%)	10 (14.1%)	15 (20.0%)	13 (20.3%)
Natural appearance					
- Chao Phraya River	31 (11.2%)	4 (6.1%)	12 (16.9%)	4 (5.3%)	11 (17.2%)
- Bang Kachao	12 (4.3%)	1 (1.5%)	6 (8.5%)	1 (1.3%)	4 (6.3%)
- Nong Bon Retention Pond	0	0	0	0	0
- Bang Khun Thian, Bang Pu	2 (0.7%)	0	2 (2.8%)	0	0
- Metro Forest	22 (8.0%)	3 (4.5%)	3 (4.2%)	6 (8.0%)	10 (15.6%)
Others					
- Agricultural lands, orchards	3 (1.1%)	0	1 (1.4%)	0	2 (3.1%)
- Environmental centers, zoos, temples, flower gardens	3 (1.1%)	1 (1.5%)	1 (1.4%)	1 (1.3%)	0

Overall, it is very intriguing that the answers of these inquiries do not demonstrate a great deal of variety across these three attributes. Around 30 places were repeatedly mentioned and the majority of these places can be categorized into three appearance types—park-like, urban, and natural. Table 7, 8, and 9 display the frequency distributions of the answers given by the respondents; specifically, the number of the respondents nominated each place as an exemplary case for each landscape attribute. In figure 3 are photographs depicting key landscape features of these exemplary places.

The statistics reveal an interesting, surprising result that, parks were mentioned most frequently whether with regard to beautiful, natural, or ecologically sustainable landscapes. Moreover, based on all respondents' opinions, Lumpini Park—Thailand's first urban public park—holds the highest rank for all the lists, thereby epitomizing the landscape with beautiful, natural, and ecologically sustainable qualities in Bangkok.

It is fascinating that the historic area of Bangkok—Rattanakosin Island and the iconic, ancient places including the Grand Palace, Sanam Luang or the royal crematorium ground, and Wat Arun Ratchawararam or the Temple of Dawn—was mentioned the second most frequent in the list of beautiful places, yet not surprising that the area was rarely considered as a natural landscape and not at all as an ecologically sustainable place. The other runners-up in the list of beautiful places include King Rama IX Park, Vachirabenjatas Park, and Chao Phraya River, respectively. Chulalongkorn University Centenary Park comes the sixth, followed by Metro Forest, which is an almost 5-acre man-made forest built on an abandoned garbage dumping site in the eastern part of Bangkok in order to be a natural learning center. Skyscrapers along with some modern buildings and iconic bridges in Bangkok, especially Baiyoke, MahaNakorn, and ICONSIAM—the top three tallest buildings in Bangkok, also looked beautiful to many respondents.

Table 9: Frequency of the respondents mentioning each place as a natural landscape in Bangkok

Natural Landscape (can specify >1 place)	All Respondents (n = 279)	Park Users (n = 65)	CU Affiliates (n = 72)	Bangkok Residents (n = 78)	Landscape Professionals (n = 64)
Park-like appearance					
- Chulalongkorn University	7 (2.5%)	1 (1.5%)	4 (5.6%)	0	2 (3.1%)
- Chulalongkorn University Centenary Park	21 (7.5%)	15 (23.1%)	2 (2.8%)	1 (1.3%)	3 (4.7%)
- Lumpini Park	90 (32.3%)	25 (38.5%)	22 (30.6%)	23 (29.5%)	20 (31.3%)
- Chatuchak Park	23 (8.2%)	5 (7.7%)	4 (5.6%)	8 (10.3%)	6 (9.4%)
- Vachirabenjatas Park (Rot Fai Park)	68 (24.4%)	11 (16.9%)	12 (16.7%)	29 (37.2%)	16 (25.0%)
- King Rama IX Park	26 (9.3%)	4 (6.2%)	4 (5.6%)	11 (14.1%)	7 (10.9%)
- Queen Sirikit Park	6 (2.2%)	0	1 (1.4%)	2 (2.6%)	3 (4.7%)
- Benchasiri Park	3 (1.1%)	0	1 (1.4%)	2 (2.6%)	0
- Benchakitti Park	3 (1.1%)	1 (1.5%)	0	2 (2.6%)	0
- Other parks	7 (2.5%)	1 (1.5%)	1 (1.4%)	3 (3.8%)	2 (3.1%)
- Parks in general	16 (5.7%)	3 (4.6%)	3 (4.2%)	6 (7.7%)	4 (6.3%)
Urban appearance					
- Skyscrapers, iconic buildings and bridges	0	0	0	0	0
- Rattanakosin Island (historic area)	2 (0.7%)	0	0	0	2 (3.1%)
Natural appearance					
- Chao Phraya River	4 (1.4%)	0	2 (2.8%)	1 (1.3%)	1 (1.6%)
- Bang Kachao	29 (10.4%)	4 (6.2%)	16 (22.2%)	0	9 (14.1%)
- Nong Bon Retention Pond	3 (1.1%)	0	2 (2.8%)	0	1 (1.6%)
- Bang Khun Thian, Bang Pu	4 (1.4%)	1 (1.5%)	0	1 (1.3%)	2 (3.1%)
- Metro Forest	24 (8.6%)	4 (6.2%)	7 (9.7%)	3 (3.8%)	10 (15.6%)
Others					
- Agricultural lands, orchards	7 (2.5%)	0	2 (2.8%)	0	5 (7.8%)
- Environmental centers, zoos, temples, flower gardens	5 (1.8%)	0	3 (4.2%)	1 (1.3%)	1 (1.6%)

Table 10: Frequency of the respondents mentioning each place as an ecologically sustainable landscape in Bangkok

Ecologically Sustainable Landscape (can specify >1 place)	All Respondents (n = 230)	Park Users (n = 51)	CU Affiliates (n = 60)	Bangkok Residents (n = 66)	Landscape Professionals (n = 53)
<i>Park-like appearance</i>					
- Chulalongkorn University	5 (2.2%)	0	2 (3.3%)	0	3 (5.7%)
- Chulalongkorn University Centenary Park	31 (13.5%)	15 (29.4%)	9 (15.0%)	1 (1.5%)	6 (11.3%)
- Lumpini Park	51 (22.2%)	14 (27.5%)	12 (20.0%)	17 (25.8%)	8 (15.1%)
- Chatuchak Park	16 (7.0%)	1 (2.0%)	6 (10.0%)	6 (9.1%)	3 (5.7%)
- Vachirabenjatas Park (Rot Fai Park)	31 (13.5%)	5 (9.8%)	4 (6.7%)	15 (22.7%)	7 (13.2%)
- King Rama IX Park	19 (8.3%)	4 (7.8%)	3 (5.0%)	8 (12.1%)	4 (7.5%)
- Queen Sirikit Park	4 (1.7%)	0	1 (1.7%)	2 (3.0%)	1 (1.9%)
- Benchasiri Park	0	0	0	0	0
- Benchakitti Park	0	0	0	0	0
- Other parks	5 (2.2%)	2 (3.9%)	1 (1.7%)	2 (3.0%)	0
- Parks in general	2 (0.9%)	0	1 (1.7%)	1 (1.5%)	0
<i>Urban appearance</i>					
- Skyscrapers, iconic buildings and bridges	0	0	0	0	0
- Rattanakosin Island (historic area)	0	0	0	0	0
<i>Natural appearance</i>					
- Chao Phraya River	5 (2.2%)	0	1 (1.7%)	3 (4.5%)	1 (1.9%)
- Bang Kachao	41 (17.8%)	5 (9.8%)	17 (28.3%)	6 (9.1%)	13 (24.5%)
- Nong Bon Retention Pond	2 (0.9%)	0	1 (1.7%)	0	1 (1.9%)
- Bang Khun Thian, Bang Pu	3 (1.3%)	0	1 (1.7%)	0	2 (3.8%)
- Metro Forest	32 (13.9%)	9 (17.6%)	2 (3.3%)	9 (13.6%)	12 (22.6%)
<i>Others</i>					
- Agricultural lands, orchards	5 (2.2%)	0	2 (3.3%)	0	3 (5.7%)
- Environmental centers, zoos, temples, flower gardens	3 (1.3%)	0	2 (3.3%)	1 (1.5%)	0

Vachirabenjatas Park appears to be the second place in the list of exemplary natural landscapes, defeating Bang Kachao which comes the third. It is incredible that Chao Phraya River, the major river and the key natural feature of the city, was rarely regarded as a natural or an ecologically sustainable landscape. This might be because most part of the river flowing through Bangkok has already been built-up. Instead, Bang Kachao—a green area formed by a bend in the Chao Phraya River which is mostly preserved for agricultural and recreational purposes and often referred to as the ‘green lung’ as well as the ‘green oasis’ of Bangkok—was appreciated by many respondents as a natural and ecologically sustainable place, although substantially fewer respondents considered Bang Kachao as a beautiful place. King Rama IX Park claims the fourth rank, followed by Metro Forest, Chatuchak Park, Chulalongkorn University Centenary Park, and then parks in general. It is noteworthy that these public parks, with more or less park-like appearance, also defeated Chao Phraya River with regard to the natural look. For the ecologically sustainable attribute, Bang Kachao holds the second rank, while Metro Forest takes the third rank, with Chulalongkorn University Centenary Park and Vachirabenjatas Park sharing the fourth rank. King Rama IX Park and Chatuchak Park were also perceived as ecologically sustainable places by several respondents.

Delightfully, Chulalongkorn University Centenary Park was included in these lists—placed sixth for its beautiful appearance, seventh for perceived natural look, and fourth for perceived ecologically sustainable aspect. In addition, Chulalongkorn University, with its eminent planning and buildings along with its verdant landscapes amidst the city, was also one of the entries. Queen Sirikit Park, Benchasiri Park, and Benchakitti Park along with other renowned parks especially Saranrom Palace Park, Rommaninat Park, and Santi Chai Prakan Park were also mentioned by some respondents. Bang Khun Thian and Bang Pu, which are seashores and mangrove forests located nearby the city, were listed as well. Other places also entered to the lists are Nong Bon Retention Pond, Bang Sue Environmental

Education and Conservation Center (EECC), agricultural lands, orchards, zoos, temples, and flower gardens.

In view of the results described above, given that the three lists, along with the ranking of places in each of them, are not much different, it seems plausible that there exist some shared attributes among the beautiful, the natural, and the ecologically sustainable landscapes. Furthermore, the park-like appearance, with more or less picturesque scenery, seemed to involve in the respondents' notions of these three landscape attributes as well, since several public parks were among the top ranks of these lists.

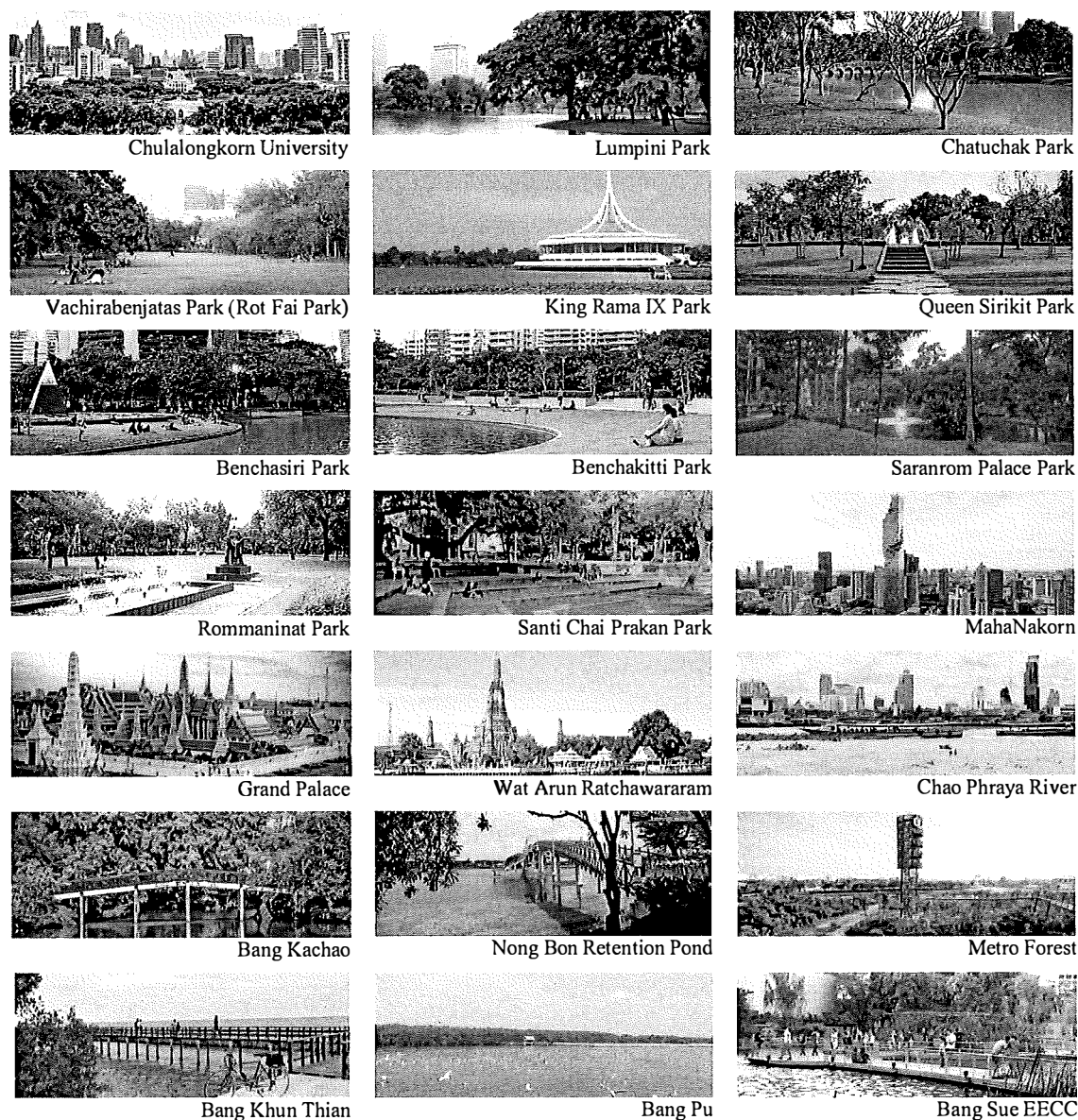


Figure 3: Exemplary places in Bangkok and its vicinity

It should be noted that in most cases the answers given by different groups of respondents look rather corresponding with the overall results, whether in terms of frequency distributions or ranking positions, implying that these respondent groups had some shared notions of beautiful, natural, and ecologically sustainable landscapes, see table 8, 9, and 10. This, nonetheless, might be related to the fact that the four respondent groups were somewhat dependent, given that the respondents were mostly Bangkok residents, and many of them were also the affiliates of Chulalongkorn University.

Yet some exceptions can also be noticed, attesting the differences among the respondent groups, see also table 8, 9, and 10. The most prominent instance is that the majority of the respondents mentioning Chulalongkorn University Centenary Park, whether as a beautiful, a natural, or an ecologically sustainable landscape, were park users. This emphasizes the idea that familiarity can increase landscape preference (Kaplan R, 1977; Kaplan R. & Kaplan S., 1989; Nieman, 1980; Wellman & Buhyoff, 1980). Chulalongkorn University was also mentioned mostly by its affiliates, including the landscape professionals who, for the most part, were professors, graduates, and students of the university. This manifests not only the relationship between familiarity and preference, but also the effect of a sense of place on landscape appreciation. Specifically, the connection and attachment to the place significantly contributes to a meaningful memory, a sense of belonging, and also a sense of pride, making people highly value that place (Lynch, 1972; Tuan, 1974, 1977).

Other interesting cases worth mentioning are as follows. Lumpini Park comes the third in the list of beautiful places by Bangkok residents, after King Rama IX Park and Rattanakosin Island, while it tops the rank of all other groups. Vachirabenjatas Park beats Lumpini Park in the list of natural places by Bangkok residents. The majority of those nominating Bang Kachao, whether for its beautiful, natural, or ecologically sustainable quality, were Chulalongkorn University affiliates. Bang Kachao defeats Lumpini Park in the list of ecologically sustainable places by Chulalongkorn University affiliates as well as by landscape professionals.

4.4 Respondents' opinions on environmental problems in Bangkok

The fourth part of the questionnaire also asked the respondents to assess, based on their own opinions, the degree of seriousness of six specific environmental problems in Bangkok, using a 5-point attitude scale, given that 1 means the least and 5 means the most. The rating means reveal that air pollution claims the first rank, see table 11. This is not surprising given that there was a serious problem regarding fine particulate air pollution, so called PM2.5, in Bangkok during the time of data collection. However, it is unexpected that flooding problem takes the last position in the rank because there occur flood events very often in Bangkok. It is interesting that the orders of the runners-up in the rankings of the whole respondents, park users, and affiliates of Chulalongkorn University are the same—high temperature comes the second, followed by waste and garbage problem, water pollution, and visual pollution, respectively. Water pollution defeats waste and garbage problem in the ranking of Bangkok residents, but shared the same means in the ranking of landscape professionals. The ANOVA tests compares the means of the four respondent groups and found that only the means of waste and garbage problem are not significantly different. The post-hoc tests reveal that the significant differences are at park users and landscape professionals. Specifically, park users rated the seriousness of air pollution and high temperature significantly lower than affiliates of Chulalongkorn University. For landscape professionals, they rated water pollution significantly higher than park users, rated flooding problem significantly higher than park users and Bangkok residents, and rated visual pollution significantly higher than all other three groups.

Table 11: Means and mean differences between the ratings for seriousness of environmental problems in Bangkok

Environmental problems	All Respondents		Park Users		CU Affiliates		Bangkok Residents		Landscape Professionals		Mean Differences	
	<i>n</i>	<i>M</i>	<i>n</i>	<i>M</i>	<i>n</i>	<i>M</i>	<i>n</i>	<i>M</i>	<i>n</i>	<i>M</i>	F	<i>p</i>
	- Air pollution	309	4.59	76	4.41	79	4.75	80	4.53	74	4.68	3.54 ⁺
- High temperature	314	4.39	76	4.21	81	4.56	82	4.29	75	4.48	3.54 ⁺	.02*
- Water pollution	312	4.09	76	3.83	81	4.17	80	4.11	75	4.24	2.80	.04*
- Flood	314	3.53	76	3.37	81	3.53	82	3.39	75	3.85	3.24	.02*
- Visual pollution	312	3.73	74	3.47	81	3.78	82	3.45	75	4.24	10.11 ⁺	.00*
- Waste and garbage	314	4.11	76	3.89	81	4.20	82	4.04	75	4.32	2.60 ⁺	.05

* $p < 0.05$; F is significant at the 0.05 level, ⁺ equal variance not assumed

4.5 Ratings for beautiful, natural, and ecologically sustainable attributes of the representative pictures

The fifth part of the questionnaire asked the respondents to rate 30 pictures regarding the extent to which the landscape in each picture is beautiful, natural, and ecologically sustainable, using a 5-point attitude scale, given that 1 means the least and 5 means the most.

Table 12: Pearson correlation coefficients of the paired ratings of 30 representative pictures (bxn, bxe, and nxe stand for the correlations between the paired ratings—beautiful and natural, beautiful and ecologically sustainable, and natural and ecologically sustainable, respectively)

Pictures	All Respondents			Park Users			CU Affiliates			Bangkok Residents			Landscape Professionals		
	bxn	bxe	nxe	bxn	bxe	nxe	bxn	bxe	nxe	bxn	bxe	nxe	bxn	bxe	nxe
	- 01 (park's name sign)	.70	.64	.79	.61	.62	.84	.66	.58	.69	.57	.40	.63	.72	.64
- 02 (park's name sign)	.40	.32	.58	.50	.47	.55	.27	.22 [#]	.53	.24	.08 [#]	.58	.57	.55	.65
- 03 (park's name sign)	.39	.33	.61	.48	.49	.62	.39	.27	.56	.26	.15 [#]	.57	.41	.39	.70
- 04 (front entrance)	.59	.57	.80	.52	.61	.83	.66	.55	.78	.50	.51	.72	.45	.47	.77
- 05 (front entrance)	.49	.40	.63	.56	.56	.69	.44	.44	.59	.41	.34	.58	.52	.26	.63
- 06 (front entrance)	.43	.34	.62	.38	.24	.34	.52	.41	.66	.46	.34	.65	.38	.36	.75
- 07 (pathway, entrance)	.44	.37	.67	.54	.43	.62	.32	.36	.66	.45	.41	.73	.43	.26	.63
- 08 (main lawn)	.54	.49	.72	.49	.44	.39	.58	.60	.77	.47	.36	.72	.43	.35	.78
- 09 (main lawn)	.53	.39	.62	.43	.28	.38	.57	.44	.73	.47	.28	.60	.63	.51	.66
- 10 (lawn, building)	.50	.22	.33	.39	.34	.70	.56	.24	.29	.60	.31	.62	.43	.38	.73
- 11 (pathway, lawn)	.21	.15	.64	.04 [#]	-.05 [#]	.56	.62	.58	.74	.57	.30	.48	.36	.43	.69
- 12 (pathway, shrub)	.51	.37	.61	.72	.36	.51	.45	.52	.68	.48	.18 [#]	.53	.43	.42	.71
- 13 (steps at side lawn)	.38	.53	.51	.61	.63	.69	.17 [#]	.46	.27	.58	.43	.74	.54	.52	.82
- 14 (side lawn)	.50	.50	.75	.31	.41	.65	.62	.56	.79	.33	.26	.68	.59	.56	.75
- 15 (side lawn)	.49	.48	.66	.44	.42	.48	.41	.45	.70	.44	.40	.67	.56	.53	.72
- 16 (pathway, pond)	.65	.61	.74	.60	.68	.63	.69	.55	.68	.67	.61	.81	.58	.55	.78
- 17 (retention pond)	.49	.40	.63	.64	.65	.69	.53	.45	.69	.35	.19 [#]	.58	.39	.19 [#]	.50
- 18 (retention pond)	.11 [#]	.35	.21	.52	.47	.69	.11 [#]	.45	.20 [#]	.15 [#]	.22	.43	.31	.29	.30
- 19 (bridge, pond)	.65	.53	.76	.69	.54	.72	.65	.57	.84	.65	.46	.68	.54	.47	.76
- 20 (bridge, pond)	.52	.48	.62	.62	.66	.58	.67	.55	.67	.20 [#]	.10 [#]	.59	.47	.46	.64
- 21 (water bikes)	.60	.48	.66	.69	.58	.66	.55	.51	.67	.48	.32	.56	.69	.46	.73
- 22 (green roof)	.72	.66	.81	.67	.46	.71	.78	.76	.88	.56	.54	.76	.66	.63	.73
- 23 (green roof)	.65	.60	.72	.60	.74	.70	.68	.64	.78	.55	.29	.63	.61	.55	.66
- 24 (green roof)	.54	.42	.70	.66	.55	.76	.59	.49	.69	.34	.21 [#]	.65	.47	.37	.67
- 25 (pathway, bridge)	.45	.39	.65	.54	.37	.63	.38	.41	.58	.43	.42	.68	.31	.23 [#]	.61
- 26 (side entrance)	.58	.62	.71	.51	.56	.59	.59	.59	.76	.54	.59	.69	.61	.66	.69
- 27 (side entrance)	.61	.53	.66	.55	.37	.57	.68	.63	.76	.56	.65	.64	.59	.41	.58
- 28 (wetland)	.48	.45	.65	.43	.40	.78	.67	.57	.77	.22 [#]	.21 [#]	.37	.55	.56	.54
- 29 (outdoor room)	.58	.54	.70	.57	.59	.63	.65	.54	.80	.39	.34	.51	.56	.53	.63
- 30 (outdoor room)	.61	.57	.77	.71	.54	.75	.56	.62	.80	.57	.59	.72	.52	.46	.76

[#] *r* is not significant at the 0.05 level

The Pearson correlation coefficients, see table 12, manifest the majority of significant positive linear relationships between the paired ratings of each picture. Only the ratings the group of park users gave to the beautiful and ecologically sustainable aspects of picture 11 are negatively correlated, yet not statistically significant, $r(73) = -.05, p = .70$. These prove both the appreciation of natural scenery and the belief that what looks natural is ecologically healthy, as Howett (1987) and Nassauer (1992, 1995, 1997) explicate, making the respondents giving a high rating to the beautiful aspect of a picture tend to also give a high rating to the other aspects of the same picture, and vice versa. The messy look and the sign of low human care for the landscape seemed to complicate the ratings for beautiful and ecologically sustainable aspects of Bangkok residents, as almost one fourth of the correlations are not statistically significant and all of which (picture 02, 03, 12, 17, 20, 24, and 28) depict weedy plants and low maintenance landscapes.

Table 13: Means and mean differences of the ratings for beautiful quality

Pictures	All Respondents		Park Users		CU Affiliates		Bangkok Residents		Landscape Professionals		Mean Differences	
	<i>n</i>	<i>M</i>	<i>n</i>	<i>M</i>	<i>n</i>	<i>M</i>	<i>n</i>	<i>M</i>	<i>n</i>	<i>M</i>	F	<i>p</i>
	- 01 (park's name sign)	315	3.37	76	3.89	81	3.31	83	3.71	75	2.55	23.79
- 02 (park's name sign)	315	3.47	76	3.63	81	3.40	83	3.33	75	3.56	2.12	.10
- 03 (park's name sign)	315	3.84	76	3.86	81	3.68	83	3.98	75	3.85	1.66	.18
- 04 (front entrance)	314	3.45	76	3.89	81	3.27	83	3.61	74	3.00	10.03 ⁺	.00*
- 05 (front entrance)	315	3.34	76	3.53	81	3.23	83	3.27	75	3.33	1.60	.20
- 06 (front entrance)	314	3.60	75	3.61	81	3.69	83	3.53	75	3.56	.45	.72
- 07 (pathway, entrance)	314	3.65	76	3.79	81	3.53	82	3.52	75	3.76	1.90	.13
- 08 (main lawn)	314	3.76	76	4.08	81	3.72	83	3.87	74	3.38	8.41	.00*
- 09 (main lawn)	315	3.67	76	3.75	81	3.69	83	3.70	75	3.53	.83	.48
- 10 (lawn, building)	312	4.07	73	4.30	81	4.07	83	3.99	75	3.95	2.48	.06
- 11 (pathway, lawn)	315	3.68	76	3.95	81	3.52	83	3.65	75	3.63	.74	.53
- 12 (pathway, shrub)	315	3.52	76	3.63	81	3.44	83	3.54	75	3.45	.68	.57
- 13 (steps at side lawn)	315	3.62	76	3.82	81	3.37	83	3.83	75	3.47	4.34	.01*
- 14 (side lawn)	315	3.64	76	3.92	81	3.35	83	3.78	75	3.52	6.53 ⁺	.00*
- 15 (side lawn)	315	3.57	76	3.80	81	3.28	83	3.72	75	3.49	4.39	.01*
- 16 (pathway, pond)	315	3.40	76	3.75	81	3.16	83	3.42	75	3.29	5.01	.00*
- 17 (retention pond)	315	3.56	76	3.66	81	3.56	83	3.43	75	3.61	.91 ⁺	.44
- 18 (retention pond)	315	3.90	76	3.97	81	3.78	83	3.69	75	4.20	4.12	.01*
- 19 (bridge, pond)	315	3.70	76	4.00	81	3.62	83	3.67	75	3.53	3.45	.02*
- 20 (bridge, pond)	315	3.79	76	3.82	81	3.73	83	3.73	75	3.89	.57	.64
- 21 (water bikes)	315	3.84	76	3.89	81	3.67	83	3.89	75	3.92	1.26	.29
- 22 (green roof)	314	3.63	76	4.13	80	3.51	83	3.82	75	3.05	15.61	.00*
- 23 (green roof)	315	3.50	76	3.92	81	3.26	83	3.66	75	3.17	11.04	.00*
- 24 (green roof)	314	3.51	76	3.50	81	3.30	82	3.65	75	3.61	2.07	.10
- 25 (pathway, bridge)	315	3.47	76	3.74	81	3.23	83	3.59	75	3.32	4.52	.00*
- 26 (side entrance)	315	3.76	76	4.03	81	3.54	83	3.87	75	3.59	4.99	.00*
- 27 (side entrance)	315	3.61	76	3.83	81	3.44	83	3.75	75	3.40	3.36	.02*
- 28 (wetland)	315	3.41	76	3.59	81	3.33	83	3.40	75	3.32	1.02	.39
- 29 (outdoor room)	315	3.87	76	4.11	81	3.74	83	4.02	75	3.59	5.15	.00*
- 30 (outdoor room)	315	3.52	76	3.83	81	3.52	83	3.73	75	3.40	2.64	.05

* $p < 0.05$; F is significant at the 0.05 level, ⁺ equal variance not assumed

The analysis of the rating for beautiful attribute reveals a satisfactory result, see table 13. All means of the entire respondents, along with park users, affiliates of the university, and Bangkok residents, reach above 3.00. For landscape professionals, only the mean of picture 01 falls below 3.00, while the others are all above. It is also worth mentioning that although landscape experts usually give a relatively lower rating with regard to the landscape beauty as they mostly are very subtle to the perception and assessment of this landscape quality, in this case they rated the beauty of these pictures quite high. This seems because they appreciated this site as a novel, exemplary urban park landscape. Accordingly, these representative pictures, whether the photographs depicting existing landscape or the

photomontages exaggerating the ‘picturesque’ and the ‘messiness’ aspects, looked rather beautiful to the respondents. Picture 10 tops the rank of the entire respondents, as well as park users and affiliates of the university, confirming the preference for neatness and park-like appearance. The runners-up are picture 03, 18, 21, and 29, which interestingly embracing both a neat, park-like appearance and a messy look. Picture 29 also takes the first place in Bangkok residents’ ranking, while picture 08, 19, 22, 26, 29 are runners-up in park users’ ranking, reiterating the importance of neatness and orderly patterns to perceived beauty of the landscape. The affiliates of the university and Bangkok residents seemed to oppose to the messiness of the landscape, compared to the other two groups since they rated several pictures with weedy plants or unclipped shrubs lower. Landscape professionals rated picture 18 the highest, followed by picture 10, picture 21, and then picture 20. Also, it is noticeable that while these professionals rated picture 10 very high, they rated pictures with the presence of neat, mowed lawns, clipped hedges, colorful flowers, and distinguishing geometric forms lower than other pictures, and also lower than other respondent groups. These results suggest that the landscape expertise perhaps enhance their predilection for ecological look of the landscape, and ‘orderly frames’ or ‘cues to care’ could be a sign of too much human manipulation and high maintenance. Remarkably, the ANOVA tests reveal an impressive number of significant differences among the means of the four groups. The post-hoc tests manifest that most of these significant differences are at landscape professionals—their means are mostly significantly lower than the means of park users and the means of Bangkok residents, yet rarely significantly different from the means of the affiliates of the university. It is noteworthy to mention that while the means of park users are mostly the highest among the four groups, there is no significant mean difference at all between park users and Bangkok residents. Plausibly, these happen because the majority of the park users were also Bangkok residents and the majority of the landscape professionals were the affiliate of the university.

For the perceived natural look, picture 18 achieves the highest position—the only picture that the mean of every respondent group reaches above 4.00, see table 14. Indeed, this picture depicts the combination of the picturesque and the messiness—the expanse of water, the lushness of vegetation, and the variety of grass and plant species—signifying fertility and biodiversity, and forming an ideal natural landscape in which most people are entrenched. The runners-up in the rankings of the different groups are pretty much corresponding, including picture 03, 09, 12, 20, and 25, all with the presence of weedy grasses and unclipped plants—a messy look, and some also with a park-like appearance. Although both the messy and park-like aspects are detected in these pictures, it is suspected that ‘greenness’ would rather be the key attribute making them highly perceived as exemplary natural landscapes. As Kaplan R. (1982: 186-187) states, ‘green’ often stands for ‘nature.’ The neat landscape, predictably, did not look natural. As a result, picture 01 and 04 hold the two lowest positions. Also, picture 13 and 30, with the presence of a vast pavement and geometric forms hold very low means in this regard. In most cases park users rated the pictures the highest, followed by Bangkok residents, then the affiliates of the university. Even though landscape experts usually rated the pictures the lowest, they rated picture 20 the highest among the four groups, and rated pictures 03, 07, 21, and 24 higher than some other groups; observably, all these high rated pictures portray a diversity of grass species. This seems because of their deeper knowledge about nature and ecology that made them able to draw a distinction between the biodiversity in the natural landscape and the messiness. These experts, therefore, produced a quite extreme set of means—the pictures suggesting a lack of fertility and biodiversity (including the neat landscape) were rated awfully low, while some with sound biodiversity (even though possessing a messy look) were rated very high. The ANOVA tests compares these means and found that almost all differences are statistically significant. The post-hoc tests also reveal that these are mostly the cases that landscape professionals rated the pictures significantly lower than park users and Bangkok residents. Moreover, these tests also show that almost all mean differences between park users and Bangkok residents are not statistically significant, so do the cases of landscape professionals and the affiliate of the university.

Table 14: Means and mean differences of the ratings for natural quality

Pictures	All Respondents		Park Users		CU Affiliates		Bangkok Residents		Landscape Professionals		Mean Differences	
	<i>n</i>	<i>M</i>	<i>n</i>	<i>M</i>	<i>n</i>	<i>M</i>	<i>n</i>	<i>M</i>	<i>n</i>	<i>M</i>	F	<i>p</i>
	- 01 (park's name sign)	315	2.95	76	3.58	81	2.64	83	3.37	75	2.17	28.72 ⁺
- 02 (park's name sign)	315	3.54	76	3.74	81	3.33	83	3.64	75	3.47	3.28	.02*
- 03 (park's name sign)	315	3.97	76	4.09	81	3.80	83	4.14	75	3.85	2.83	.04*
- 04 (front entrance)	313	2.93	76	3.45	80	2.68	83	3.24	74	2.34	19.64	.00*
- 05 (front entrance)	315	3.59	76	3.83	81	3.46	83	3.66	75	3.43	3.38	.02*
- 06 (front entrance)	314	3.77	75	3.99	81	3.77	83	3.76	75	3.57	2.14	.09
- 07 (pathway, entrance)	315	3.70	76	4.03	81	3.52	83	3.58	75	3.72	5.16	.00*
- 08 (main lawn)	315	3.48	76	3.95	81	3.28	83	3.70	75	2.97	15.58	.00*
- 09 (main lawn)	315	3.84	76	4.05	81	3.80	83	3.80	75	3.72	1.89 ⁺	.13
- 10 (lawn, building)	312	3.33	74	3.68	80	3.05	83	3.52	75	3.08	7.57	.00*
- 11 (pathway, lawn)	315	3.48	76	3.76	81	3.35	83	3.63	75	3.16	7.24	.00*
- 12 (pathway, shrub)	315	3.89	76	3.93	81	3.99	83	3.90	75	3.72	1.29	.28
- 13 (steps at side lawn)	315	3.07	76	3.45	81	2.93	83	3.24	75	2.65	4.10	.01*
- 14 (side lawn)	315	3.23	76	3.61	81	3.04	83	3.48	75	2.79	12.56	.00*
- 15 (side lawn)	315	3.65	76	3.88	81	3.36	83	3.88	75	3.47	6.66 ⁺	.00*
- 16 (pathway, pond)	314	3.35	76	3.84	81	3.11	82	3.43	75	3.03	11.48	.00*
- 17 (retention pond)	315	3.78	76	3.79	81	3.80	83	3.86	75	3.65	.86 ⁺	.46
- 18 (retention pond)	314	4.48	76	4.13	81	4.94	82	4.34	75	4.51	1.14	.33
- 19 (bridge, pond)	315	3.36	76	3.67	81	3.14	83	3.52	75	3.12	6.72	.00*
- 20 (bridge, pond)	314	3.99	76	3.92	80	3.88	83	4.06	75	4.11	1.42 ⁺	.24
- 21 (water bikes)	315	3.79	76	3.92	81	3.62	83	3.82	75	3.83	1.45 ⁺	.23
- 22 (green roof)	315	3.49	76	3.99	81	3.25	83	3.81	75	2.89	20.66 ⁺	.00*
- 23 (green roof)	315	3.27	76	3.67	81	3.04	83	3.40	75	2.99	9.62	.00*
- 24 (green roof)	314	3.64	76	3.67	81	3.44	82	3.74	75	3.69	1.49	.22
- 25 (pathway, bridge)	315	3.84	76	4.14	81	3.62	83	4.02	75	3.56	9.81 ⁺	.00*
- 26 (side entrance)	315	3.62	76	3.89	81	3.40	83	3.80	75	3.37	7.52 ⁺	.00*
- 27 (side entrance)	315	3.43	76	3.78	81	3.23	83	3.58	75	3.11	7.38	.00*
- 28 (wetland)	313	3.80	76	4.00	81	3.60	82	3.96	74	3.62	4.96 ⁺	.00*
- 29 (outdoor room)	315	3.47	76	3.83	81	3.19	83	3.66	75	3.21	9.57 ⁺	.00*
- 30 (outdoor room)	315	3.02	76	3.37	81	2.84	83	3.31	75	2.55	10.63	.00*

* $p < 0.05$; F is significant at the 0.05 level, ⁺ equal variance not assumed

Considering the means for perceived ecologically sustainable quality, it is found that they resemble those for perceived natural look, see table 15. Specifically, picture 18, the only one with all means above 4.00, reaches the highest place, while picture 01 and 04, again, hold the last two places. The results of ANOVA and post-hoc tests also look similar to those of the natural attribute. This seems predicable since people mostly relate nature to healthy ecosystems, especially through the notion of the picturesque (Howett, 1987; Nassauer 1992, 1995, 1997). Although these two set of means are comparable, it seems that in most cases the ecologically sustainable means are somewhat lower. The explanation for this is that the ecological function and advantage of the landscape is not visible and not easily recognizable (Nassauer, 1995), compared to the beautiful and perceived natural attributes.

The *t*-tests compare the means of pictures which are grouped into seven sets. The pictures in each set depict the same scenery, yet illustrate different degrees of the picturesque and the messiness, and also neatness and human care. Considering the case of beautiful quality, see table 16, the statistics reveal an intriguing result that, in some settings, the means of the pictures with a messy appearance as well as a low maintenance aspect of the existing landscape are significantly higher than those with a neat, park-like appearance with a high degree of human care. These include particularly the views from outside the park (set 1 and 2). However, some respondents, especially Bangkok residents and park users, also thought that the neat landscape with flowering plants is more beautiful than the plain, green appearance of the existing landscape. In view of these results, it is suspected that it was the colorful planting in the pictures that these respondents appreciated, as revealed in section 4.2 that many

respondents requested for colorful flowers. In addition, because these are the entrance settings of the park, the respondents perhaps expected to see a rather bright and striking landscape. For the views of the pond (set 5 and 6), the messy landscapes are also mostly more beautiful than the neat landscape, although some are statistically significant but some are not. This seems because messiness could enhance the natural quality of the landscape of which people are in favor. The mean comparisons of the lawn settings (set 3 and 4) reveal that the sceneries with only neat turf is more beautiful than those with some additional weedy plants. Nonetheless, most of these comparisons are not statistically significant. This seems because lawn is usually a preferred landscape, especially through its greenness and openness, yet the messy planting diminishes these qualities. However, the mean comparisons prove that if the amount of additional messy grasses does not blemish the green, open, and orderly qualities of the lawn, the ratings for beautiful quality of the lawn with and without weedy planting are not significantly different. The comparisons of the green roof pictures (set 7) are very interesting because it is obvious that landscape professionals thought differently from the others. Specifically, while they thought that the picture of messy grasses is most beautiful, the others thought the opposite—the picture of mowed turf and flowering plants is most beautiful. However, it is suspected that trees are the key factor making the other groups of respondents thought that picture 22 is more beautiful than the other two pictures in the set. Yet, for landscape professionals, trees seemed unable to defeat grass and low maintenance species because the ecological benefits of these plants made them look beautiful to the eye of these professionals.

Table 15: Means and mean differences of the ratings for ecologically sustainable quality

Pictures	All Respondents		Park Users		CU Affiliates		Bangkok Residents		Landscape Professionals		Mean Differences	
	<i>n</i>	<i>M</i>	<i>n</i>	<i>M</i>	<i>n</i>	<i>M</i>	<i>n</i>	<i>M</i>	<i>n</i>	<i>M</i>	<i>F</i>	<i>p</i>
	- 01 (park's name sign)	315	2.79	76	3.24	81	2.63	83	3.18	75	2.07	20.87
- 02 (park's name sign)	313	3.38	75	3.60	80	3.26	83	3.52	75	3.13	4.85	.00*
- 03 (park's name sign)	315	3.77	76	4.00	81	3.65	83	3.87	75	3.57	3.23	.02*
- 04 (front entrance)	311	2.84	74	3.31	80	2.68	83	3.01	74	2.36	10.99	.00*
- 05 (front entrance)	315	3.42	76	3.62	81	3.32	83	3.52	75	3.20	3.63	.01*
- 06 (front entrance)	313	3.65	74	3.81	81	3.59	83	3.65	75	3.56	.976	.40
- 07 (pathway, entrance)	314	3.66	76	3.96	81	3.54	83	3.59	75	3.57	3.85	.01*
- 08 (main lawn)	315	3.32	76	3.78	81	3.12	83	3.49	75	2.88	13.39	.00*
- 09 (main lawn)	315	3.72	76	3.96	81	3.58	83	3.72	75	3.64	2.51	.06
- 10 (lawn, building)	315	3.27	76	3.45	81	3.47	83	3.25	75	2.91	.82	.49
- 11 (pathway, lawn)	314	3.36	75	3.73	81	3.12	83	3.42	75	3.16	7.45	.00*
- 12 (pathway, shrub)	315	3.85	76	3.92	81	3.74	83	3.92	75	3.83	.76	.52
- 13 (steps at side lawn)	315	3.07	76	3.59	81	2.79	83	3.17	75	2.73	12.56	.00*
- 14 (side lawn)	315	3.24	76	3.61	81	2.98	83	3.51	75	2.88	11.59	.00*
- 15 (side lawn)	315	3.59	76	3.83	81	3.33	83	3.75	75	3.44	5.33	.00*
- 16 (pathway, pond)	314	3.32	76	3.70	81	3.12	82	3.39	75	3.07	7.42	.00*
- 17 (retention pond)	315	3.73	76	3.80	81	3.68	83	3.80	75	3.65	.73 ⁺	.54
- 18 (retention pond)	315	4.29	76	4.13	81	4.27	83	4.39	75	4.36	1.527	.21
- 19 (bridge, pond)	315	3.32	76	3.63	81	3.21	83	3.35	75	3.08	4.66	.00*
- 20 (bridge, pond)	315	3.95	76	3.92	81	3.88	83	3.90	75	4.12	1.23 ⁺	.30
- 21 (water bikes)	315	3.92	76	4.04	81	3.68	83	4.08	75	3.89	3.08	.03*
- 22 (green roof)	315	3.35	76	3.83	81	3.17	83	3.51	75	2.87	13.05 ⁺	.00*
- 23 (green roof)	315	3.20	76	3.66	81	2.96	83	3.22	75	2.97	9.28	.00*
- 24 (green roof)	314	3.60	76	3.64	81	3.42	82	3.63	75	3.69	1.12	.34
- 25 (pathway, bridge)	315	3.70	76	3.97	81	3.51	83	3.87	75	3.47	6.75 ⁺	.00*
- 26 (side entrance)	315	3.54	76	3.91	81	3.35	83	3.61	75	3.31	6.71	.00*
- 27 (side entrance)	314	3.49	76	3.75	81	3.28	82	3.57	75	3.35	3.39	.02*
- 28 (wetland)	314	3.78	76	3.97	81	3.52	83	3.83	74	3.81	3.10 ⁺	.03*
- 29 (outdoor room)	315	3.37	76	3.78	81	3.14	83	3.53	75	3.05	9.96 ⁺	.00*
- 30 (outdoor room)	314	3.04	76	3.34	81	2.89	82	3.22	75	2.68	6.04 ⁺	.00*

* $p < 0.05$; F is significant at the 0.05 level, ⁺ equal variance not assumed

Table 16: The t statistics testing mean differences between the ratings for beautiful quality

Paired Ratings	All Respondents		Park Users		CU Affiliates		Bangkok Residents		Landscape Professionals	
	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
1) park's name sign										
- picture 01 x picture 02	-1.36	.17	1.98	.05	-.67	.51	3.29	.00*	-6.86	.00*
- picture 01 x picture 03	-5.98	.00*	.24	.81	-2.41	.02*	-2.10	.04*	-9.04	.00*
- picture 02 x picture 03	-5.73	.00*	-1.71	.09	-2.24	.03*	-5.45	.00*	-2.17	.03*
2) front entrance										
- picture 04 x picture 05	1.49	.14	2.76	.01*	.27	.79	2.74	.01*	-2.40	.02*
- picture 04 x picture 06	-1.85	.07	1.74	.09	-2.69	.01*	.52	.60	-3.54	.00*
- picture 05 x picture 06	-4.20	.00*	-.72	.48	-3.83	.00*	-2.33	.02*	-1.61	.11
3) main lawn										
- picture 08 x picture 09	1.40	.16	2.43	.02*	.20	.84	1.54	.13	-1.27	.21
4) side lawn										
- picture 14 x picture 15	1.15	.25	1.07	.29	.50	.62	.50	.62	.25	.80
5) retention pond										
- picture 17 x picture 18	-5.67	.00*	-2.38	.02*	-1.98	.05	-1.99	.05	-5.83	.00*
6) bridge across retention pond										
- picture 19 x picture 20	-1.40	.16	1.54	.13	-.85	.40	-.52	.60	-3.05	.00*
7) pathway on sloped green roof										
- picture 22 x picture 23	2.10	.04*	1.84	.07	2.00	.05*	1.33	.19	-.95	.34
- picture 22 x picture 24	1.58	.12	4.43	.00*	1.48	.14	1.25	.21	-3.60	.00*
- picture 23 x picture 24	-.11	.91	3.84	.00*	-.35	.73	.23	.82	-3.41	.00*

* $p < 0.05$; *t* is significant at the 0.05 level (2-tailed).

Table 17: The t statistics testing mean differences between the ratings for natural quality

Paired Ratings	All Respondents		Park Users		CU Affiliates		Bangkok Residents		Landscape Professionals	
	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
1) park's name sign										
- picture 01 x picture 02	-9.58	.00*	-1.20	.22	-6.25	.00*	-2.36	.02*	-12.93	.00*
- picture 01 x picture 03	-13.83	.00*	-3.11	.00*	-7.93	.00*	-6.47	.00*	-12.89	.00*
- picture 02 x picture 03	-6.97	.00*	-2.94	.00*	-3.39	.00*	-4.83	.00*	-2.94	.00*
2) front entrance										
- picture 04 x picture 05	-11.12	.00*	-3.15	.00*	-6.46	.00*	-3.75	.00*	-10.31	.00*
- picture 04 x picture 06	-11.41	.00*	-3.56	.00*	-8.45	.00*	-3.80	.00*	-7.83	.00*
- picture 05 x picture 06	-2.94	.00*	-1.23	.00*	-2.55	.01*	-.93	.36	-1.11	.27
3) main lawn										
- picture 08 x picture 09	-5.66	.00*	-.79	.43	-4.44	.00*	-.94	.35	-5.07	.00*
4) side lawn										
- picture 14 x picture 15	-8.30	.00*	-2.23	.03*	-3.46	.00*	-4.74	.00*	-7.14	.00*
5) retention pond										
- picture 17 x picture 18	-4.38	.00*	-2.98	.00*	-1.88	.06	-5.71	.00*	-10.69	.00*
6) bridge across retention pond										
- picture 19 x picture 20	-11.94	.00*	-2.25	.03*	-6.84	.00*	-3.17	.00*	-10.10	.00*
7) pathway on sloped green roof										
- picture 22 x picture 23	3.63	.00*	2.66	.01*	1.90	.06	3.73	.00*	-.71	.48
- picture 22 x picture 24	-1.99	.05*	2.48	.02*	-1.35	.18	.44	.67	-5.04	.00*
- picture 23 x picture 24	-7.00	.00*	.00	1.00	-4.57	.00*	-3.77	.00*	-6.94	.00*

* $p < 0.05$; *t* is significant at the 0.05 level (2-tailed).

For the case of natural quality, the statistics really resemble those of ecologically sustainable quality, see table 17 and 18. In each of the first six sets of pictures, it is obvious that the messy landscape holds the highest mean, while the neat, picturesque landscape holds the lowest mean and the low maintenance landscape takes the in-between position. Interestingly, most of these mean

comparisons are also statistically significant. Indeed, this is not surprising that the messy look implies the higher degree of natural and ecologically sustainable qualities of the landscape, whereas neatness suggests the opposite. For the seventh set of pictures, all respondent groups except the landscape professional rated the neat landscape, with the presence of mowed turf and flowering plants of picture 22 higher than the existing, low maintenance landscape of picture 23, although some comparisons are not statistically significant. Again, it is suspected that trees are the key feature making picture 22 look more natural and ecologically sustainable than picture 23. However, trees still could not delude the eye of the professionals since the ratings they gave to picture 22, both for natural quality and ecologically sustainable quality, were lower than the other two pictures.

Table 18: The t statistics testing mean differences between the ratings for ecologically sustainable quality

Paired Ratings	All Respondents		Park Users		CU Affiliates		Bangkok Residents		Landscape Professionals	
	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>	<i>t</i>	<i>p</i>
1) park's name sign										
- picture 01 x picture 02	-9.71	.00*	-2.85	.01*	-5.16	.00*	-2.89	.01*	-10.38	.00*
- picture 01 x picture 03	-13.41	.00*	-4.50	.00*	-7.41	.00*	-5.46	.00*	-10.76	.00*
- picture 02 x picture 03	-6.54	.00*	-3.19	.00*	-3.01	.00*	-3.21	.00*	-3.70	.00*
2) front entrance										
- picture 04 x picture 05	-9.80	.00*	-2.84	.01*	-5.38	.00*	-4.54	.00*	-6.99	.00*
- picture 04 x picture 06	-10.27	.00*	-2.97	.00*	-6.56	.00*	-4.37	.00*	-7.11	.00*
- picture 05 x picture 06	-4.35	.00*	-1.78	.08	-2.54	.01*	-1.31	.19	-3.00	.00*
3) main lawn										
- picture 08 x picture 09	-7.03	.00*	-1.62	.11	-4.16	.00*	-2.35	.02*	-5.85	.00*
4) side lawn										
- picture 14 x picture 15	-6.92	.00*	-2.09	.04*	-3.43	.00*	-2.73	.01*	-5.99	.00*
5) retention pond										
- picture 17 x picture 18	-11.58	.00*	-2.73	.01*	-6.18	.00*	-7.69	.00*	-8.37	.00*
6) bridge across retention pond										
- picture 19 x picture 20	-11.08	.00*	-2.58	.01*	-5.60	.00*	-5.30	.00*	-9.62	.00*
7) pathway on sloped green roof										
- picture 22 x picture 23	2.68	.01*	1.78	.08	2.31	.02*	2.79	.01*	.77	.45
- picture 22 x picture 24	-3.34	.00*	1.37	.18	-1.74	.09	-.90	.37	-5.12	.00*
- picture 23 x picture 24	-7.39	.00*	.11	.92	-4.27	.00*	-4.69	.00*	-7.99	.00*

* $p < 0.05$; *t* is significant at the 0.05 level (2-tailed).

Chapter 5: Conclusion

5.1 Research findings

The issue of landscape preference has long interested researchers and designers. Over the last fifty years, research especially in psychology, sociology, geography, and landscape design has made enormous contributions to the understanding of landscape perception and scenic beauty. Indeed, the prominent among them include the reiteration of the ‘picturesque’ as a principal ideal of landscape beauty and a prototype of public park landscape or park-like landscape affected by most Americans, and recently, the opposition to the ‘messiness’ of the ecological landscape.

This research provides empirical evidences for better understanding about landscape perception and preference in Thailand, advancing knowledge valuable for education and research in the field of landscape architecture in the country. In particular, by examining the notions of beautiful, natural, and ecologically sustainable landscapes as well as opinions on the ecological landscape design of Chulalongkorn University Centenary Park, the research reveals that Thais, Bangkokians specifically, also manifest the affection for the picturesque or park-like landscape and the disinclination for the messy landscape. Moreover, they also generally cherish the same cultural construct, the shared social understanding, as the Americans—regarding what look beautiful, natural, and ecologically sustainable based on the ‘picturesque’ ideal, and, hence, perceiving these three landscape qualities in correlation with each other. Accordingly, it is explicable that why Lumpini Park was perceived as the epitome of beautiful, natural, and ecologically sustainable landscape in Bangkok.

Most importantly, the research substantially provides information and insight useful for landscape design profession to innovate ecological urban landscapes. Specifically, it attests the importance of the appearance or visual quality of the landscape to the perception and appreciation of people, and, subsequently, to the success of ecological urban design projects. According to Mazingo (1997: 48), “Ecological spaces, especially those in close proximity to urbanized areas where most people live, should be appealing aesthetic experiences. If we expect the public to enthusiastically recognize its environmental preferences, the ecological landscapes themselves should engage public interest and motivate support for their expansion and replication. This is central to the promotion and acceptance of ecological design.”

5.2 Guidelines for ecological urban public park design

Based on its findings, the research suggests five key guidelines for designing ecological urban public parks in Bangkok in order to achieve not only ecological function, but also aesthetic expression, with the ultimate goal of achieving public positive attitude toward, and widespread support for the ecological landscape projects in the city.

First, *understand the power of the ‘picturesque’ ideal*. Realizing that people are attached to the cultural concept of the ‘picturesque’ when they think of beautiful, natural, and ecologically sustainable landscapes, the design of ecological urban parks should draw upon this ideal, whether in terms of components and compositions, in order to gain their appreciation. Indeed, an extensive green lawn and an expanse of water are major attractive features, figuring main open spaces and scenic, panoramic

views in the park. In addition, curvilinear paths provide a great variety of viewpoints while the lushness and diversity of vegetation enhances a sense of greenness and naturalness.

Second, *adopt the 'cues to care' tactic*. Evidently, people feel upset when they see messiness or damages in the landscape because these imply poor maintenance. Particularly in urban public parks, people expect to see a neat, clean, and beautiful landscape, which also signify a healthy and safe environment amidst the city. Therefore, it is recommended that the tactic of 'cues to care'—particularly mowed lawn, trimmed shrubs, plants in rows, flowering plants, and also bold form and clear edge of spaces and pathways—be adopted in the design of ecological urban parks to create 'orderly frames' for messy ecosystems and enhance landscape beauty and appreciation.

Third, *engage active public use*. As familiarity also plays a role in landscape appreciation, it is important that the ecological urban parks be designed as part of everyday urban life, providing spaces for daily activities in order that people can visit and use them frequently. This certainly increases opportunities for people to see and interact with ecological landscapes, and then become more familiar with them. In consequence, people would develop the affection for such landscapes, and also value and cherish them. The design of Chulalongkorn University Centenary Park is a good example because it integrates ecological features into dynamic, scenic public spaces.

Fourth, *manifest the ecological function*. It is not easy for people, especially those living in cities, to recognize the ecological function of the landscape. For that reason, the design of ecological urban parks should consider to make ecological processes visible in order that people can notice them, and then value the landscape not only for its attractive appearance, but also for its ecological function. The display of ecological processes in an artful way, especially through the design of eye-catching, emotion-arousing, or thought-provoking elements, is highly recommended. One exemplar in this regard is the cascading wetlands that exhibit the water treatment and management processes at Chulalongkorn University Centenary Park.

Finally, *boost environmental knowledge*. Literature and research, including this one, reiterate that knowledge about nature and ecology could enhance aesthetic appreciation of ecological landscapes (e.g. Carlson, 1995, 2016; Carroll, 1993; Matthews, 2002; Rolston, 1995). In addition, scholars also support the use of urban ecological landscapes for advancing environmental education (e.g. Orr, 2002; Pennypacker & Echols, 2008). The design of ecological urban parks, therefore, should offer learning opportunities. The provision of interpretive signs is the simplest way to supply essential knowledge to people. The use of advanced technology like digital screens and multimedia displays, and the arrangement for guided or self-guided tour programs are also recommended.

5.3 Recommendations for future research

It should be emphasized that this research concentrated on the urban park landscape in Bangkok, yet the findings and recommendations are likely applicable to different locations and contexts as well. Nonetheless, further research on landscape preference of people in other cities and countries with different cultural backgrounds as well as attitudes of people toward other landscape types such as residential property, agricultural land, countryside, forest, and wilderness would be very necessary. This could significantly supply more information and specific insight, contributing to better understanding and advancing knowledge relevant to the perception of ecological landscapes, which is certainly crucial to the education and profession of landscape architecture and environmental planning in order to build a better and more sustainable future.

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Appendixes

- A: The survey instrument (questionnaire)
- B: The representative pictures
- C: Certificate of research approval



แบบสอบถามความคิดเห็นต่อทิวทัศน์ของอุทยาน 100 ปี จุฬาลงกรณ์มหาวิทยาลัย

แบบสอบถามนี้เป็นส่วนหนึ่งของโครงการศึกษาความคิดเห็นต่อทิวทัศน์ของอุทยาน 100 ปี จุฬาลงกรณ์มหาวิทยาลัย โดยขอความร่วมมือให้ท่านตอบคำถามในแบบสอบถามนี้ด้วยความสมัครใจ ข้อมูลที่เก็บรวบรวมทั้งหมดจะถูกเก็บรักษาเป็นความลับและใช้เพื่อการศึกษาในโครงการนี้เท่านั้น

- 1.1 ท่านไป/มาที่อุทยาน 100 ปี จุฬาลงกรณ์มหาวิทยาลัย บ่อยเพียงใด
 ไม่เคยไป ทุกวัน เกือบทุกวัน ทุกสัปดาห์ เฉพาะช่วงที่มีกิจกรรมพิเศษ แทบไม่ค่อยไป
- 1.2 ท่านไป/มาที่อุทยาน 100 ปี จุฬาลงกรณ์มหาวิทยาลัย เพื่อทำกิจกรรมใดบ้าง (ตอบได้มากกว่า 1 ข้อ)
 พักผ่อน, เดินเล่น, นั่งเล่น ออกกำลังกาย, วิ่ง ปิกนิก, รับประทานอาหาร
 เดินผ่าน, แวะพัก นัดเจอเพื่อน, พบปะพูดคุย อื่นๆ (ระบุ)
- 1.3 ท่านมักไป/มาที่อุทยาน 100 ปี จุฬาลงกรณ์มหาวิทยาลัย ในช่วงเวลาใด (ตอบได้มากกว่า 1 ข้อ)
 ช่วงเช้า ช่วงสาย ช่วงกลางวัน ช่วงบ่าย ช่วงเย็น ช่วงกลางคืน
- 1.4 ท่านชื่นชอบอะไร/สิ่งใดในทิวทัศน์อุทยาน 100 ปี จุฬาลงกรณ์มหาวิทยาลัย
- 1.5 ท่านไม่ชื่นชอบอะไร/สิ่งใดในทิวทัศน์อุทยาน 100 ปี จุฬาลงกรณ์มหาวิทยาลัย
- 1.6 ท่านอยากให้ปรับปรุงทิวทัศน์อุทยาน 100 ปี จุฬาลงกรณ์มหาวิทยาลัยอย่างไร/ให้เป็นอย่างไร
- 2.1 ท่านมีความเห็นอย่างไรต่อทิวทัศน์ของอุทยาน 100 ปี จุฬาลงกรณ์มหาวิทยาลัย ในประเด็นดังต่อไปนี้
 ขอให้ท่านเลือกให้คะแนนตามลำดับ จาก 1 ถึง 5 (1 = น้อยที่สุด, 2 = น้อย, 3 = ปานกลาง, 4 = มาก, 5 = มากที่สุด)
- | | | | | | |
|-------------------------------------|---|---|---|---|---|
| - ทิวทัศน์มีความสวยงาม | 1 | 2 | 3 | 4 | 5 |
| - ทิวทัศน์มีความเป็นธรรมชาติ | 1 | 2 | 3 | 4 | 5 |
| - ทิวทัศน์มีความยั่งยืนของระบบนิเวศ | 1 | 2 | 3 | 4 | 5 |
- 2.2 ท่านคิดว่าสถานที่ใดบ้างในกรุงเทพมหานครที่ทิวทัศน์มีความสวยงาม
- 2.3 ท่านคิดว่าสถานที่ใดบ้างในกรุงเทพมหานครที่ทิวทัศน์มีความเป็นธรรมชาติ
- 2.4 ท่านคิดว่าสถานที่ใดบ้างในกรุงเทพมหานครที่ทิวทัศน์มีความยั่งยืนของระบบนิเวศ
- 3.1 ปัญหาสิ่งแวดล้อมของกรุงเทพมหานครต่อไปนี้ มีระดับความรุนแรงมากน้อยเพียงใด
 ขอให้ท่านเลือกให้คะแนนตามลำดับ จาก 1 ถึง 5 (1 = น้อยที่สุด, 2 = น้อย, 3 = ปานกลาง, 4 = มาก, 5 = มากที่สุด)
- | | | | | | |
|-----------------------------------|---|---|---|---|---|
| - อากาศเป็นพิษ | 1 | 2 | 3 | 4 | 5 |
| - อากาศร้อน, อุณหภูมิเพิ่มสูงขึ้น | 1 | 2 | 3 | 4 | 5 |
| - น้ำเน่าเสีย | 1 | 2 | 3 | 4 | 5 |
| - น้ำท่วม | 1 | 2 | 3 | 4 | 5 |
| - มลพิษ, ทัศนอุจาด | 1 | 2 | 3 | 4 | 5 |
| - ชยะมูลฝอยและสิ่งปฏิกูล | 1 | 2 | 3 | 4 | 5 |
| - อื่นๆ โปรดระบุ | 1 | 2 | 3 | 4 | 5 |

4.1 ท่านมีความเห็นอย่างไรต่อทิวทัศน์ในแต่ละภาพต่อไปนี้ ในประเด็นด้านความสวยงาม ความเป็นธรรมชาติ และความยั่งยืนของระบบนิเวศ ขอให้ท่านเลือกให้คะแนนตามลำดับ จาก 1 ถึง 5 (1 = น้อยที่สุด, 2 = น้อย, 3 = ปานกลาง, 4 = มาก, 5 = มากที่สุด)

	มีความสวยงาม					มีความเป็นธรรมชาติ					มีความยั่งยืนของระบบนิเวศ				
- ภาพทิวทัศน์ 01	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 02	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 03	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 04	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 05	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 06	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 07	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 08	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 09	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 10	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 11	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 12	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 13	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 14	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 15	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 16	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 17	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 18	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 19	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 20	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 21	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 22	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 23	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 24	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 25	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 26	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 27	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 28	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 29	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
- ภาพทิวทัศน์ 30	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5

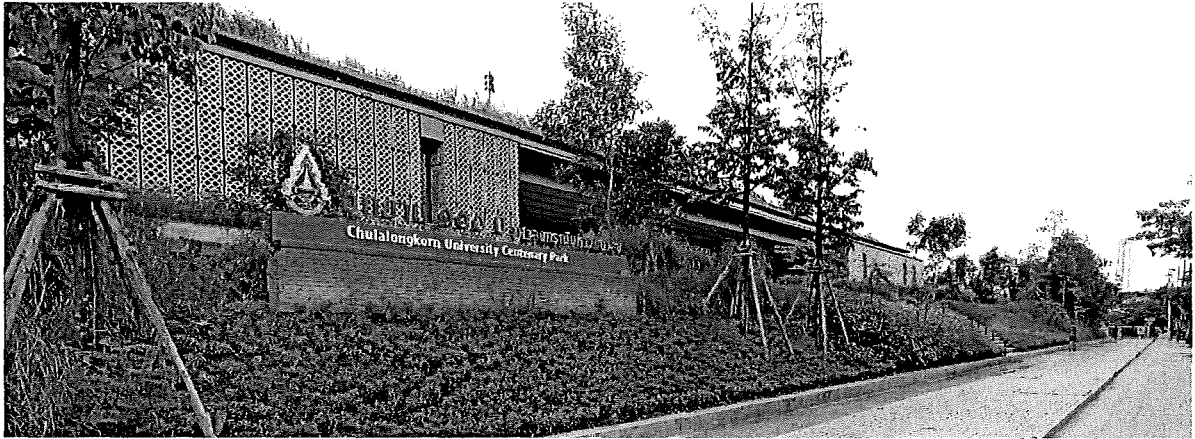
- 5.1 เพศ ชาย หญิง
- 5.2 อายุ 20 ปีหรือต่ำกว่า 21-29 ปี 31-39 ปี 41-49 ปี 51-59 ปี 60 ปีขึ้นไป
- 5.3 ภูมิลำเนา กรุงเทพมหานคร จังหวัดอื่น โปรดระบุ
- 5.4 อาชีพ โปรดระบุ
- 5.5 ระดับการศึกษา มัธยมศึกษาหรือต่ำกว่า ปริญญาตรี ปริญญาโท สูงกว่าปริญญาโท
- 5.6 สาขาการศึกษา โปรดระบุ

ขอขอบคุณเป็นอย่างสูง

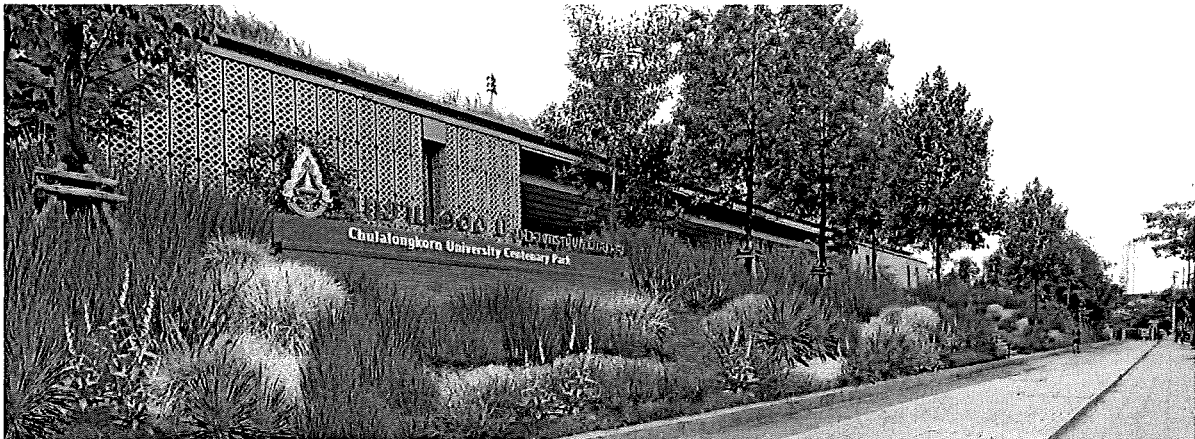
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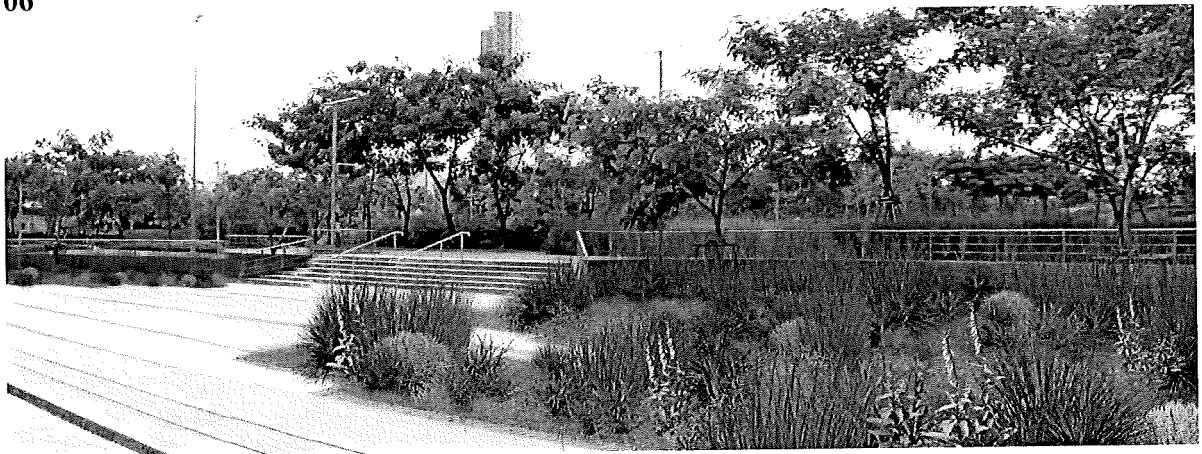
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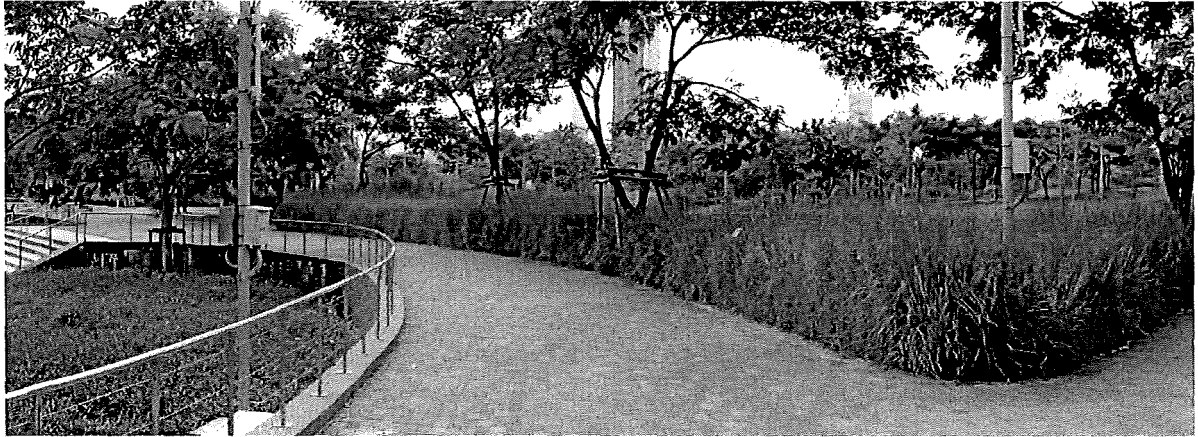
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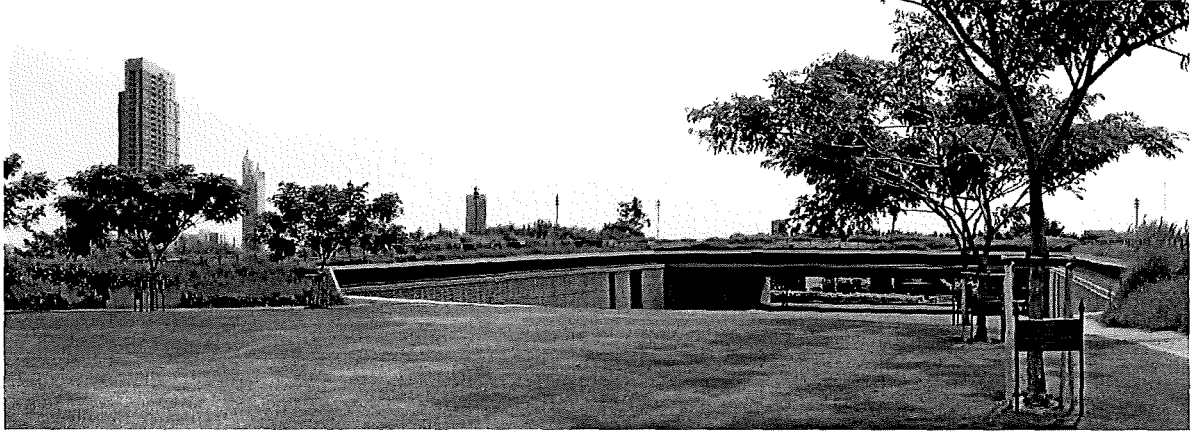
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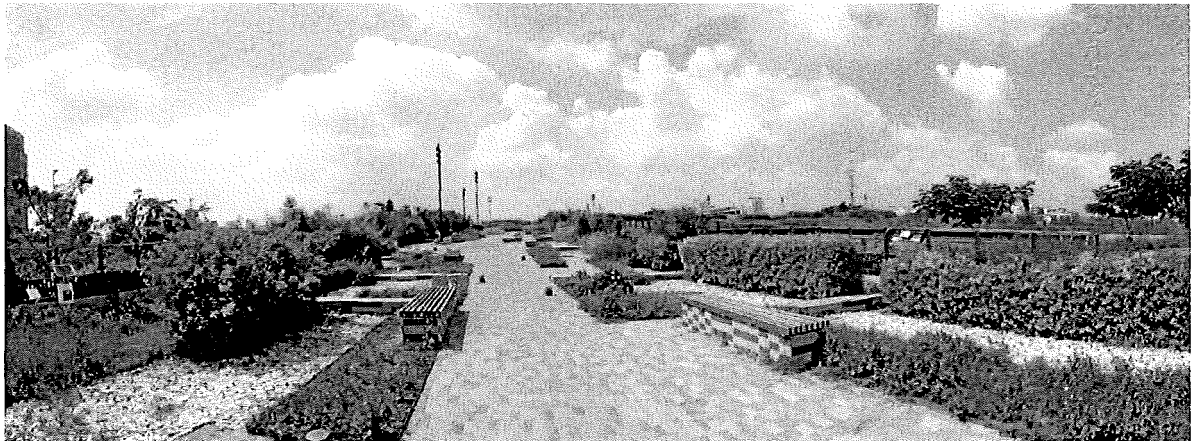
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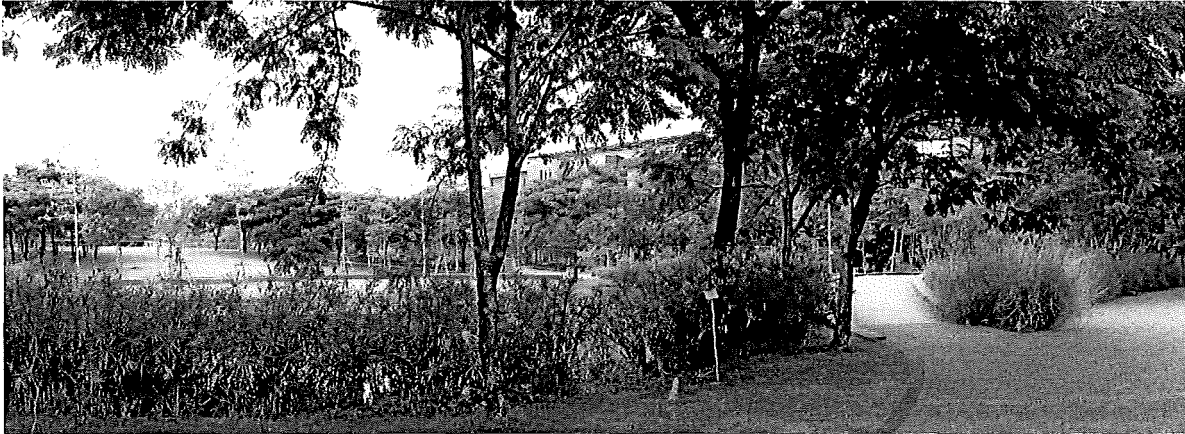
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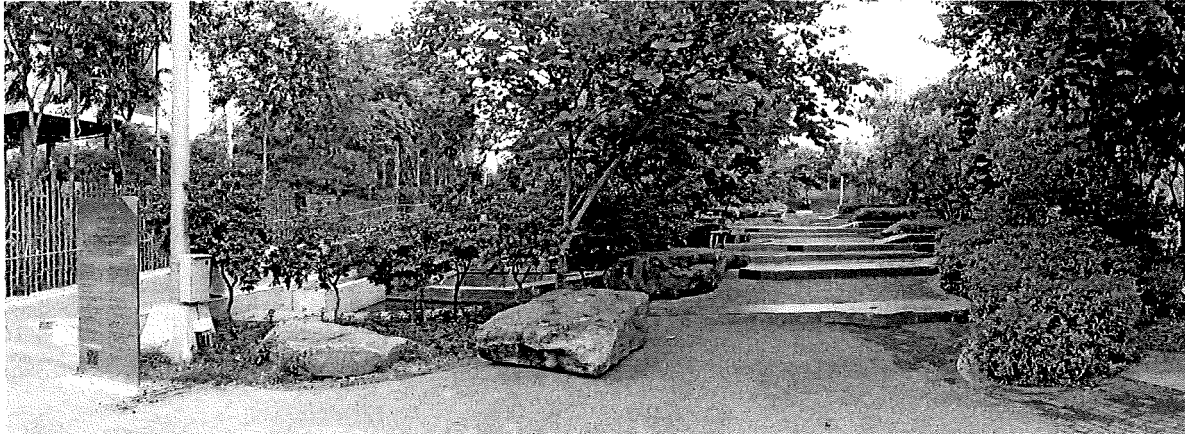
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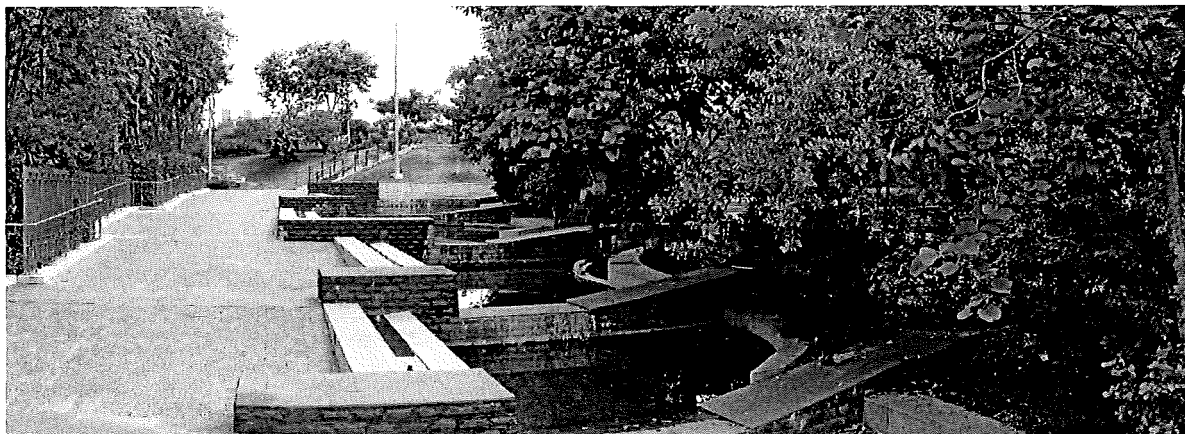
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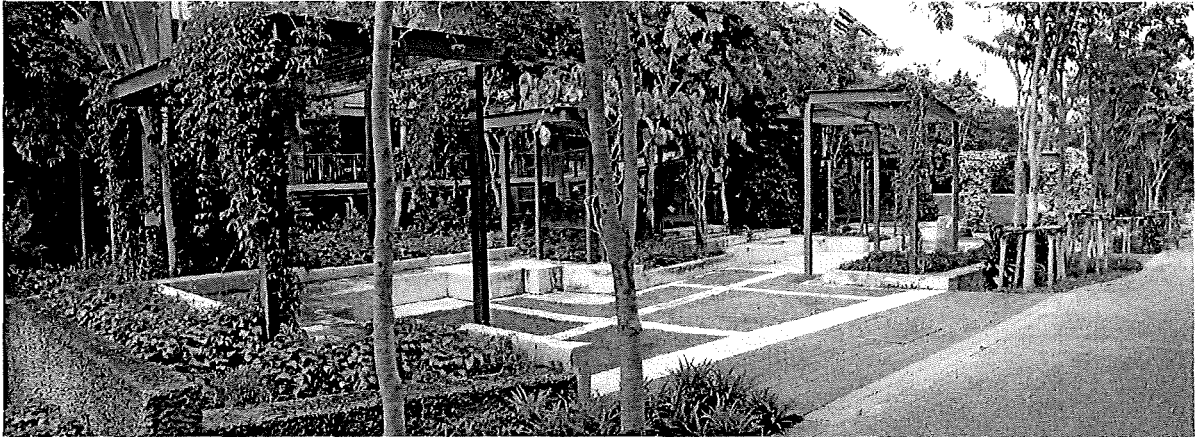
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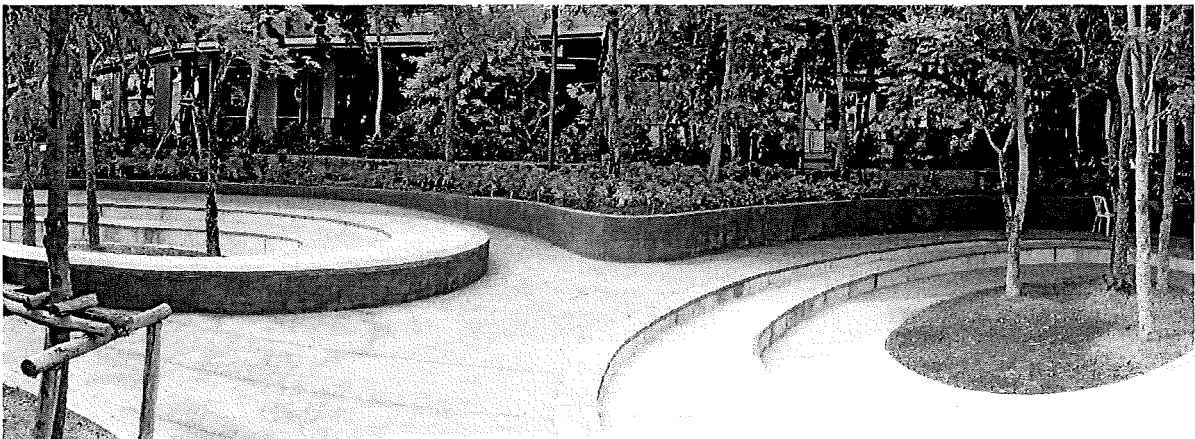
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Office of the Research Ethics Review Committee for Research Involving Human Subjects:
The Second Allied Academic Group in Social Sciences, Humanities and Fine and Applied Arts
Chamchuri 1 Building, Room 114, Phayathai Road, Wang Mai Sub-district,
Pathum Wan District, Bangkok 10330
Telephone number 0 2218 3210-11 E-mail curec2.chl@chula.ac.th

COA No. 092/2562

Certificate of Research Approval

Research Project Number 131/62 PUBLIC RESPONSE TO THE VISUAL QUALITY OF ECOLOGICAL LANDSCAPE DESIGN: A CASE STUDY OF CHULALONGKORN UNIVERSITY CENTENARY PARK

Principal Researcher Dr. Wilasinee Suksawang

Office Faculty of Architecture, Chulalongkorn University

The Research Ethics Review Committee for Research Involving Human Subjects: The Second Allied Academic Group in Social Sciences, Humanities and Fine and Applied Arts at Chulalongkorn University, based on Declaration of Helsinki, the Belmont report, CIOMS guidelines and the Principle of the international conference on harmonization – Good clinical practice (ICH-GCP) has approved the execution of the aforementioned research project.

Signature: *Theraphan Luangthongkum*
(Emeritus Prof. Theraphan Luangthongkum, PhD.)

Chairman

Signature: *ว.น. นงหทัย*
(Asst. Prof. Nunghatai Rangponsumrit, PhD.)

Secretary

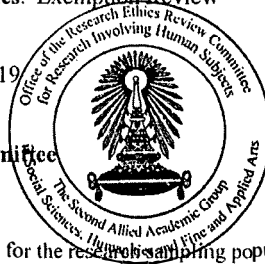
Research Project Review Categories: Exemption Review

Date of approval: 11 November 2019

Expiry date: 10 November 2020

Documents approved by the Committee

1. The research proposal
2. The researcher CV
3. Document providing information for the research sampling population/participants
4. Questionnaire



Protocol No.....	131/62
Date of Approval.....	11 NOV 2019
Approval Expiry Date.....	10 NOV 2020

Conditions

1. The researcher has acknowledged that it is unethical if he/she collects information for the research before the application for an ethics review has been approved by the Research Ethics Review Committee.
2. If the certificate of the research project expires, the research execution must come to a halt. If the researcher wishes to reapply for approval, he/she has to submit an application for a new certificate at least one month in advance, together with a research progress report.
3. The researcher must conduct the research strictly in accordance with what is specified in the research project.
4. The researcher must only use documents that provide information for the research sampling population/participants, their letters of consent and the letters inviting them to take part in the research (if any) that have been endorsed with the seal of the Committee.
5. If any seriously untoward incident happens to the place where the research information, which has requested the approval of the Committee, is kept, the researcher must report this to the Committee within five working days.
6. If there is any change in the research procedure, the researcher must submit the change for review by the Committee before he/she can continue with his/her research.
7. For a research project of less than one year the researcher must submit a report of research termination (AF 03-13) and an abstract of the research outcome within thirty days of the research being completed. For a research project which is a thesis, the researcher must submit an abstract of the research outcome within thirty days of the research being completed. This is to be used as evidence of the termination of the project
8. A research project which has passed the Exemption Review, must observe only the conditions in 1, 6 and 7.



คณะกรรมการพิจารณาจริยธรรมการวิจัยในคน กลุ่มสหสถาบัน ชุดที่ 2
 สังคมศาสตร์ มนุษยศาสตร์ และศิลปกรรมศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
 อาคารจามจุรี 1 ชั้น 1 ห้อง 114 ถนนพญาไท แขวงวังใหม่ เขตปทุมวัน กรุงเทพมหานคร 10330
 โทรศัพท์ : 0 2218 3210-11 E-mail: curec2.ch1@chula.ac.th

COA No. 092/2562

ใบรับรองโครงการวิจัย

โครงการวิจัยที่ 131/62 การตอบสนองของสาธารณชนต่อทัศนคุณภาพของงานออกแบบภูมิสถาปัตยกรรมเชิงนิเวศ: กรณีศึกษาอุทยาน 100 ปี จุฬาลงกรณ์มหาวิทยาลัย

ผู้วิจัยหลัก อาจารย์ ดร.วิลาสินี สุขสว่าง

หน่วยงาน คณะสถาปัตยกรรมศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

คณะกรรมการพิจารณาจริยธรรมการวิจัยในคน กลุ่มสหสถาบัน ชุดที่ 2 สังคมศาสตร์ มนุษยศาสตร์ และศิลปกรรมศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย พิจารณาจริยธรรมการวิจัยโดยยึดหลัก ของ Declaration of Helsinki, the Belmont report, CIOMS guidelines และ The international conference on harmonization – Good clinical practice (ICH-GCP) อนุมัติให้ดำเนินการศึกษาวิจัยเรื่องดังกล่าวได้

ลงนาม *วิลาสินี สุขสว่าง*

(ศาสตราจารย์กิตติคุณ ดร.ธีระพันธ์ เหลืองทองคำ)
 ประธานคณะกรรมการ

ลงนาม *พร นฤมล*

(ผู้ช่วยศาสตราจารย์ ดร.หนึ่งทชัย แรงผลสัมฤทธิ์)
 กรรมการและเลขานุการ

รูปแบบการพิจารณาขออนุมัติ: แบบกรณียกเว้น

วันที่รับรอง: 11 พฤศจิกายน 2562



วันหมดอายุ: 10 พฤศจิกายน 2563

เอกสารที่คณะกรรมการรับรอง

1. ข้อเสนอโครงการวิจัย
2. ประวัติและผลงานของผู้วิจัย
3. เอกสารข้อมูลสำหรับกลุ่มตัวอย่าง/ผู้มีส่วนร่วมในการวิจัย
4. แบบสอบถาม

เลขที่โครงการ.....	131/62
วันที่รับรอง.....	11 พ.ย. 2562
วันหมดอายุ.....	10 พ.ย. 2563

เงื่อนไข

1. ผู้วิจัยรับทราบว่าเป็นการผิดจริยธรรม หากดำเนินการเก็บข้อมูลการวิจัยก่อนได้รับการอนุมัติจากคณะกรรมการพิจารณาจริยธรรมการวิจัย
2. หากใบรับรองโครงการวิจัยหมดอายุ การดำเนินการวิจัยต้องยุติ เมื่อต้องการต่ออายุต้องขออนุมัติใหม่ล่วงหน้าไม่ต่ำกว่า 1 เดือน พร้อมส่งรายงานความก้าวหน้าการวิจัย
3. ต้องดำเนินการวิจัยตามที่ระบุไว้ในโครงการวิจัยอย่างเคร่งครัด
4. ใช้เอกสารข้อมูลสำหรับกลุ่มตัวอย่าง/ผู้มีส่วนร่วมในการวิจัย ไปยื่นขอของกลุ่มตัวอย่างหรือผู้มีส่วนร่วมในการวิจัย และเอกสารเชิญเข้าร่วมวิจัย (ถ้ามี) เฉพาะที่ประทับตราคณะกรรมการเท่านั้น
5. หากเกิดเหตุการณ์ไม่พึงประสงค์ร้ายแรงในสถานที่เก็บข้อมูลที่ขออนุมัติจากคณะกรรมการ ต้องรายงานคณะกรรมการภายใน 5 วันทำการ
6. หากมีการเปลี่ยนแปลงการดำเนินการวิจัย ให้ส่งคณะกรรมการพิจารณาจริยธรรมการวิจัยก่อนดำเนินการ
7. โครงการวิจัยไม่เกิน 1 ปี ส่งแบบรายงานสิ้นสุดโครงการวิจัย (AF 03-13) และบทคัดย่อผลการวิจัยภายใน 30 วัน เมื่อโครงการวิจัยเสร็จสิ้น สำหรับโครงการวิจัยที่เป็นวิทยานิพนธ์ให้ส่งบทคัดย่อผลการวิจัย ภายใน 30 วัน เมื่อโครงการวิจัยเสร็จสิ้น ทั้งนี้เพื่อเป็นหลักฐานในการปิดโครงการ
8. โครงการวิจัยที่ได้รับการอนุมัติโครงการโดยการพิจารณาขออนุมัติแบบกรณียกเว้น (Exemption review) ปฏิบัติตามเงื่อนไข ข้อ 1.6 และ 7 เท่านั้น



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