City, Territory and Architecture

CASE STUDY

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Towards inclusive and accessible parks in Pathum Thani Province, Thailand

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Abstract

The problem of the lack of inclusive public space in the fringes of Bangkok, Thailand, is related to multiple factors in urban development. The study-area of the Pathum Thani province offers a summary of the critical consequences of the urban development in the past decades. The partial transformation of some environmental tracks onto an urbanized system allows the creation of a nonhomogeneous privatized continuous built surface. The conditions of these urban areas suffer from vehicular traffic, car dependency, absence of differentiated mobility, limited walkability, and lack of public spaces. The research aims to bring these areas to a higher level of inclusion, accessibility and overall quality by rethinking the existent public spaces, creating the grounds for the design of inclusive and accessible park. To reach this objective, the study explores the topics of public space, park, accessibility and inclusivity for disabilities to establish some principles for future design approach for *Thaklong–Klongluang*, a study-area located in the Pathum Thani Province. Characteristics, features, weaknesses and existing parks of the study area are demonstrated in the subsequent section. The results' discussion relates all the aforementioned topics, defining the guidelines for the creation of inclusive and accessible parks in the six existent sites of the study area. Because of its premises, besides being based in a specific location, the article aims to be a valid reference for the areas which present similar features and critical points.

Keywords: Inclusivity, Accessibility, Disability, Park, Pathum Thani

Introduction

From the aftermath of the second world war, the city making process of many South East Asian cities often relied on inhomogeneous privatized urban developments and car dependency (Ouyyanont 2017). Pursuing human development and seldom equalling urbanisation to human progress, the local authorities of this world region set up mild urban regulations and controls, allowing the expansion of the old urban cores, mostly capital cities, in new lands with the patterns of the contemporary age. The occupations of the spaces in many cases were mostly related by constant privatisation and parcellation of the territories in inaccessible enclaves (Dovey 1999; Askew 2004). Individual means of transportation became the driver of the transformations themselves, introducing a new the scale for the city making which introduced with a change of the speed commute times. Both changes were translated towards the edification of soils. In the regional South East Asian context and in Bangkok specifically, urban developments followed mostly a few constant trends during the previous decades (Ratanawaraha 2013). Among them, the most relevant for the purpose of this essay are:

- A car-based approach to urban development, which shifted the attention of the planning (at different scales) more towards the infrastructural thinking (Dovey 2016) rather than on the classic city making process;
- A general indifference to the environmental layout of places, which caused imbalances of different magnitude: physical and social, mostly, but also in terms of

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resource availability, land use, soil's destination, environmental balance, deforestation, resource's management and economy (Askew 1993);
- A well-grounded diffused trust in the technological capacities of the times, which made planners and stakeholders look mostly for immediate sources of progress rather than for various forms of sustainability (Krongkaew 1996).

The tolls of the previous decades of planning decisions persist today in the hypergrowth of the historical settlements and their alteration as continuous urban areas made by different satellite territories. All these contexts are seldom incorporated in an entity defined commonly megacities (UN 2009). The world megatrends of urbanisation and the well-known overtaking of the urban population against the rural population will persist in the next decades (UN 2018), especially in Asian and African emerging urban areas (UN-Habitat 2020); for these territories, some site-specific actions within the urban status quo can be possible to be identified. This essay will take into consideration this state-of-the-art, and will localize some key points in a defined study-area located in the fringes of Bangkok in regards of the strengthening of inclusive urban green spaces.

The area of the megacity Bangkok bypasses the legal and administrative borders of its Metropolitan Authority. In this territory, built and crossed by daily relationships, different municipalities, urbanized centres and whole provinces gravitates around the main area of Bangkok. The historical starting point is the foundation of Bangkok in the year 1782, while the physical centre remained the core of the Rattanakosin island, a Chao Praya River bend, until the first opening in the surrounding territories in the King Rama V Age (1853–1910; Thai Studies, Chulalongkorn University 2018). From this time onwards, the expansion of the urban area in the surroundings became mainly an operation of conversion of the local environment: draining wetlands and paddy fields and reconverting canals into roads which are constant traits of the urban development of the area until today. During the following century these phenomena expanded semi-radially from the main central area to mostly the East bank of the river across all directions. Continuing with this semi-radial development and the massive industrialisation of the urban areas, the final modernisation of the territory happened with the first modern metropolitan Plan in the 1960, "The Greater Bangkok Plan", by Litchfield and Associates (Ministry of Interior of Thailand 1960). The plan aimed to include the various satellite centres existing in a comprehensive car-based plan; in its expansion towards the North, the strengthening of the North–South axis is, remarkably, a process still undergoing (with, for instance, the realisation of the Red Line SRT transport which represents a relevant shift towards mass mobility to connect the territories including the Don Muang Airport, which was the first airport of the Country, and regional hub, located in the border between the provinces of Bangkok and Pathum Thani). During the decades of development, the attention towards green space, inclusivity and accessibility had always been left aside by the stakeholders involved, creating a gap between the actual situation and the needs of the society and a view of a 'city for all' where no one is left behind (UN-Habitat 2020).

With the background the urban development of the Pathum Thani province, the objective of this research is to define a contemporary approach to solve the issue of the lack of inclusive and accessible green public spaces in a study area located at the fringes of Bangkok, Thaklong–Klongluang in the Pathum Thani province. This approach suggests the creation of highly accessible and inclusive green spaces where marginalized people (UN-Habitat 2020)—especially people affected by disabilities—can access and interact freely. These spaces aim to expand the general levels of accessibility and inclusivity in the given context. At this stage of the research, this study's approach is hence based on a theoretical exploration of the topics of accessibility, inclusivity, disability's inclusion and of the need of green space in the built environment. The theoretical premises of this approach expressed in the chapter 2 will address some notions for future design of green inclusive public spaces in the study area, suggest validity of the findings in comparable contexts. The following chapters will tailor the theoretical framework to the needs of the chosen study area: the 3 will present the specificalities of the chosen context (its urban form and composition, its social, economic and physical features) and its existing public spaces; chapter 4 will treat the relevant issue of the lack of public space in the study area; chapter 5 will be dedicated to the need for inclusivity and accessibility through green public spaces in the study area, pointing out some findings in terms of policies and principles to be applied in the selected sites for future interventions as operational indication to be developed in future steps of the research.

The study's methods

In this context, following the regional contemporary megatrend, free time, leisure, common activities and interactions are relegated to indoor spaces (Dobbins 2009; Dovey 2016): which include not only malls but even single homes, seldom located in residential compounds which host all facilities inside fenced perimeters. These gated communities carry with them other aspects, focusing on the contemporary view on socio-economic urban studies. The combination of a lack of public space with

the previously defined physical layout of these spaces have deep consequences in other spheres of the built environment, affecting the general accessibility, inclusivity and the liveability of these spaces. These downsides are represented by a *lack of homogeneity and cohesion, divisions, exclusions, segregation* (Florida 2017) and are intertwined among them.

The physical limitations and parcellation of the areas offer the physical base for the creation of the socio-economic disparities. The solid and tangible barriers (i.e., the fences of the gated communities, the dense roads, the rare overpassing skywalks, etc.) creates divisions and a diffused lack of homogeneity in the built environment; non-homogeneous urban layout, not well-connected nuclei, issues of disconnections between the parts, as well as traffic issues which is key to this context with many comparable realities. The subsequent grafting of built private estates and developments in the territories rarely kept into account a public buffer or frontage which took care of urban cohesion among the parts. These constant exclusions represent the opposite of the urban concept of inclusion, and it raises the degree of complexity of the system. Whomever cannot own a private vehicle or the resource to be able to minimize expenses, is left out, marginalized, excluded. The segregation of portions of the society is hence another consequence, which can have new urban serious effects (as the tragic outburst related to the minorities in the US suburbs. This research will consider social segregations only from the point of view of the marginalized stakeholders, given the young demographics of the study area. The research's goal to expand the level of inclusivity for the context aims particularly at these marginalised stakeholders, in order to prevent future problems and to cope with the prospected natural progression of the demography; the actual inclusivity of the context can hence be considered as a value to be expanded.

The Pathum Thani province suffered of a common trait of the South East Asian urbanization, the disconnection between the modernist urban development and the city-making of previous centuries during the late phases of the so-called third urban design tradition, the modernist one (Dobbins 2009). In this tradition, the city planners eliminated the small-scale mixed use in favour of the big scale zoning planning, prioritizing car accessibility with the subsequent creation of disconnected superblocks separated by unwalkable highways uncomfortably separated among themselves. "Postwar planning has significantly influenced life between buildings. Life has literally been built out of these new areas, not as a part of a well-thought-out planning concept but as a by-product of a long series of other considerations. "(Gehl 2011, p.47). The following Table 1 demonstrates an overall review of concepts, motivations and considerations for the topics of inclusive public spaces for people affected by disabilities. Each section investigates the research's aim from the point of view of the keywords of the study, providing different integration of them in the real urban scenario at the time of writing.

From the overall review provided in Table 1, it can be seen that public spaces or parks are very important to urban living as a place for people to relax during the times; from the past to the present. the design principles and concepts have focused on the importance of people's way of life as the first priority. Yet, reference to design for people with disabilities and specific references about are scarce, and generally included in the debate only in the last three decades. Due to the importance of equality in society, city parks' theory should not be ignored the concept of space use by people with disabilities, and disabilities as a concept. Principles, concepts and examples of park design for the disabled people as a matter of inclusive design will be discussed in the following parts. The feature of the study area will be explored in the last section of the text, altogether with the definition of some key spatial characteristics to be included in future design; the article will conclude its scope providing these operational indications.

Literature review

People's livelihoods as a top priority

Accordingly to Gehl's vision, a lively city—a goal in itself—"it is also the starting point for holistic city planning" (Gehl 2010 p.63). The final degree of accessibility and inclusiveness of a public space shall hence take into account liveability, safety, sustainability, and health and set them as a requisite for future accessible and inclusive green public spaces. A lively city is a city where the density of the human interactions in a given space creates the occasion for social interactions, and not only where the necessary activities happen. It is city where the urban design features, the urban layouts, the public spaces and the exchanges happen effectively in a network of direct logical routes, small spaces and hierarchy of spaces. Edges' diversities, urban density of street activities, permeable frontages create not only liveable fronts but also safety: the presence of people and activities represents the eye on the streets and the social spontaneous bonding represent the essence of a society. However, as a broad concept, safety needs to be addressed also in terms of pedestrian safety: the inhomogeneous urban layout and patterns, the many street crossings and street sections of the study areas and of many other comparable contexts prioritizes the intervention of the safety towards a high degree of *security* of the users, especially the weak actors of the urban contexts. Gehl's notion of sustainability,

Table 1 Summary of academic concepts related to public space design. Sources: Researcher Team, 2022

Section	Description and objectives	Motivation	Considerations for persons with disabilities	Author(s)/source(s)
3.1	The design of public spaces should consider people's livelihoods as a top priority	Human dimension absents in the city-making process during the previous decades	N/A	Gehl et al. (2010, 2011); Wan et al. (2021)
3.2	Public spaces are places that are shared equally by all parties involved in the city	Lack of public spaces; general diffused lack of accessibility	N/A	American Planning Association (2006); Carmona, 2018; Gehl (2011, 2018)
3.3	Green public spaces and parks are areas for everyone;	Good practices and state-of-the-art in contemporary visions of city-making	Yes	U.S. Department of Justice, ADA Act (2010) U.S. Department of Justice, ADA Standard (2010) American Planning Association, APA (2006) European Institute for Design and Disability, EIDD (2022) Royal Thai Government, (2021); Thai Civil Rights and Investigative Journalism (2019) UN (2006) World Bank (2019) Rafizadeh (2020)
3.4	Green public spaces and parks can include Universal Design concepts for people with disabilities, who are included in the city-making by principles of social equality	Contemporary institutional Need for actual inclusiveness, to be integrated in a new series of public spaces' interventions	Yes	Istituto Nazionale di Urbanistica INU (2006); Connell et al. (1997) Oliver (1998) UN (2022a); UN (2022b); UN-Habitat (2015) UN-Habitat (2018) UN-Habitat (2020) Siqi et al. (2020)
3.5	The design of green public spaces and parks by Universal Design concept has to consider accessibility and inclusivity	Reaching a new future level of integration in the provision of urban green public spaces	Yes	Benepe (2019) Stanley (1968)

for what concerns the scope of this research, is defined into the notion of social sustainability: "to give various groups in society equal opportunities for accessing common city spaces and getting around town" (ibid. p.109). This equality can be reached with walkability, bike use, public transportation and other means in order to allow people without cars to have "the opportunity for a daily life unrestricted by poor transport options" (ibid. p.109). These two latest concepts are crucial because they affect more than others the democratic dimension of the city space and clashes with segregations, physical, socio-economic divisions. Similarly, Gehl's concept of a healthy city frames not only the necessary health assistance and social care, but also the broader ideas of healthy lifestyle, life choices, availability of healthy food, as options provided in the city space. This can include active lifestyles and healthy choices in the urban public spaces, in the daily routine, in the city life, and it affects the provision of inclusive and accessible green public spaces. It is hence pointed out how the quality of the design in these spaces and places can attract new users, creates new activities, be integrated in the public facilities' dotation in a valid and accessible way for all the citizens with no discriminations of provenience, wealth, or disabilities.

Shared spaces

The notion that public spaces are places that are accessible and shared equally by all citizens, requests, in the contemporary city-making process, a high level of coordination, efforts and responsibility among the different stakeholders involved (Carmona 2018). In terms of urban principles, beyond the specificities of each stakeholder, a contemporary view on accessibility pairs and intertwines with the topics of shared spaces and inclusivity in three manners. Accessibility can be an outcome, final goal of each design; a process, intended as active constant practice to set up in the places by the stakeholders; and a tool to reduce inequalities in the city space (Gehl 2018). It is hence possible to work on program and activities (ibid.) to expand the degree of accessibility, but it should

be considered also the necessary distinction between accessibility and access. While the view on accessibility is especially about "both specific ADA (Adult with Disabilities Act) and/or universal design elements" for specific citizens (ibid. p.7), access is intended in terms of easiness and immediacy of design choices that connect a public space to the surrounding urbanization (ibid. p. 30). This last point, especially, can help to consider the idea of shared spaces as a necessarily inclusive space. The American Planning Association manual, points out this in regards the connection between theespecially—green shared open spaces (APA 2006). The manual also specifies that these spaces of health, civic expression, development (Gehl 2011) are a part of the communities subject to development and management policies and that "communities with available land should concentrate on identifying and protecting park space in areas before development occurs." (APA 2006). This view of green shared urban value is, in the view of the research, a future asset to empower.

Parks

Parks have been deeply intertwined with cities for over 200 years. Parks and open spaces not only have vast inherent value in connecting urban dwellers to nature, but they also have a multitude of other benefits that make them versatile and comprehensive solutions to the diverse challenges that cities increasingly face. Values of parks for cities are diverse including fostering social interaction, providing gathering spaces, improving the economies of surrounding neighbourhoods (Benepe 2019). Subsequently, parks enrich city through the appreciating value of nearby properties, growth in tourism revenue, and the provision of free and accessible recreation (ibid). In terms of environment, parks are simply significant, from their ability to absorb storm water runoff to their ability to regulate temperatures in urban heat islands. As climate change becomes more critical, parks and more open green space will provide efficient and sustainable alternatives to impervious, heat-trapping infrastructure. Public health is also affected by the presence of parks. The built environment in which we live factors strongly in how our individual health is determined, particularly in how it can encourage or discourage active and healthy behaviours. Additionally, parks can also firmly affect the health and wellbeing of a neighbourhood (Stanley 1968), in turn reducing costs and addressing latent inequities.

Parks then are not simply pleasant amenities but serve as a foundation to the social, environmental, and mental health of communities. Many big cities and small towns around the world have realized the intrinsic value of parks and provided parks to nurturing communities through the provision of a truly public space. However, some cities still undervalue parks as key pieces of a city's social fabric. This is evidenced by how people in many big cities still lack access to a park leaving people deprived of easily accessed green space, creating a cascade of impacts on mental and physical health, and even economic opportunities for these cities. Additionally, even though the design principles and concepts have focused on the importance of people's way of life as the first priority, past design concepts have made no reference to design for people with disabilities either from lessons or design standards; this was accepted in the past few years. Because of the growing importance of equality in society, city parks should not ignore the concept of space use by people with disabilities.

Disabilities and development of design for disabilities

The latest ADA defines a person with a disability as a person who has a physical or mental impairment that substantially limits one or more major life activities (ADA 2022). Disabilities can arise in different stages of human life even including accidents, illnesses or the aging processes; many older individuals can diagnose with conditions that lead to functional or cognitive disabilities (Centers for Disease Control and Prevention 2022). Bramston and Mioche (2009) noted that individuals who do not have a disability but are regarded as having a disability are also covered. In addition to physical barriers and limitations, disabled people often have to face feelings of fear, guilt, pity or discomfort that may be consequences of some forms of disability which affects the social sphere of the individual (ibid). Individuals The United Nations has tried to develop design for disabilities so that people with disabilities receive livelihood facilities in the building and the environment. According to the Institute for Human Centered Design (2022), the evolution toward inclusive design began in the 1950s with a new attention to design for people with disabilities. In Europe and the United States, barrier-free design developed to remove obstacles in the built environment for people with physical disabilities. This was often followed various social policies which allowed the perception of people with disabilities from institutional settings to the community. Barrier-free design still tends to be segregated and perceived as special and external, especially for people with serious physical limitations as, primarily, mobility impairments. Since the 1970s, the barrier-free design idea was developed to emphasized on special solutions tailored to individuals and toward the idea of normalization and integration (ibid). Increasingly, the terminology of choice was accessible design. It was the first time that people speak for themselves argued for equality of opportunity and against paternalism and care-taking. Subsequently,

design was recognized as a condition for achieving civil rights. Its scopes were substantially expanded covering both public and private entities. All activities, services, and programs of public entities are latterly covered, including a wide range of public places and also parks. In today's society, having a disability can not only add challenge to aspects of life, but also increase the likelihood of marginalisation within society as people have reacted to disability in many ways (Bramston and Mioche 2009). Recent estimations point out the worldwide relevance of the topic: "15 per cent of the world's population lives with a disability; this figure amounts to a total of 1 billion individuals, one fifth of whom (between 110 and 190 million people) experience significant disabilities" (World Bank 2019). Moreover, recent study found that adults with disabilities report experiencing more mental distress than those without disabilities: In 2018, an estimated 17.4 million (32.9%) adults with disabilities experienced frequent mental distress (Centers for Disease Control and Prevention 2022). Frequent mental distress is associated with poor health behaviours, increased use of health services, mental disorders, chronic disease, and limitations in daily life. Therefore, it is crucial to have green public spaces that allow for health-promoting activities, such as physical activity or rest and relaxation, to take place within the existent communities. In this way, it will be possible to develop a direct relationship with the quality of life of all urban dwellers, including people affected by disability.

Parks for everyone

Providing a definition of parks and open spaces is mostly related to different local specificities or even to lack of proper definition in the land use plans (APA 2006); also, the contemporary instances of inclusivity are relatively new in the urban scenario as stated in the above section. The importance of the topic of inclusion has a wide relevance: a disability is any physical, sensory, or cognitive impairment that makes daily activities more difficult (UN 2006). The international legal framework on the disabilities, promotes officially the inclusiveness and the access to the public space:

> *"To enable persons with disabilities to live independently and participate fully in all aspects of life, States Parties shall take appropriate measures to ensure to persons with disabilities access, on an equal basis with others, to the physical environment, to transportation, to information and communications, including information and communications technologies and systems, and to other facilities and services open or provided to the public" (UN 2006).*

Each State which ratified this agreement has the task to create a National legislation on the topic: in Thailand, where about 3.7 million people or 5.5% of people require some form of assistance with their basic daily activities (Thai Civil Rights and Investigative Journalism 2019), the Ministerial Regulations demands solely that many public buildings must provide facilities for the handicapped and the elderly: these regulations do not include public spaces and parks (Royal Thai Government 2021).

In the topic of the spatial and physical design, the legislations and the practice are usually related to two frameworks of interest. The US framework is famous for its relevancy, and it is related to the main ADA Act and the 2010 ADA Standards for Accessible Design in the built environment—which has however only weak references to disabilities and public spaces. On the other hand, the European framework involves explicitly the notion of Design for All: after the 1993 establishment, the International European Institute for Design and Disability (EIDD 2022) committee carried out the Stockholm declaration of 2004 which remarks the principle of the inclusiveness through the Design for All.

Beside these two approaches, the aforementioned obstacles to information and communications, cultural attitudes (including negative stereotyping and stigmas) also contribute to the exclusion and marginalisation of persons with disabilities in urban environments. The green open spaces which should aim to the aforementioned values should consequentially be seen as central for everyone, given also the exclusive benefit connected to the biophilic features of those areas. The recent protocol by the National Recreation and Park Association prescribes general principles of inclusion for everyone in terms of design, programming—as per social, healthy and cultural open-air activities (NRPA 2021). The inclusion for everyone should then consider the demographics or the main distinction between physical or cognitive disabilities, which are usually left outside the international frameworks, but connected to case-by-case local factors. As an example, it is notable the research undertook in the US by some segment of the private sector, often in collaboration with public institutions, to realise inclusive open-space playgrounds for specific ages (Kompan 2022). These realizations of inclusive urban furniture in public areas may solve specific issues locally, while providing intrinsic limitations connected to their stand-alone nature, hardly representing comprehensive urban design strategies for the territories.

Parks and social equality

Lack of accessibility and inclusiveness contributes greatly to the disadvantaged and vulnerable situations faced by persons with disabilities, leading also to disproportionate rates of poverty, deprivation and exclusion among persons with disabilities. Developing urban infrastructures,

facilities and services that are designed and built following accessibility or inclusive universal design principles from initial stages of planning and design incurs additional costs. The returns lead to many more benefits to all service users such as fewer accidents, more diversity of society capturing persons of all talents and abilities (UN 2022a; Oliver 1998).

The principle of social equality should be addressed in reference to the positive effect that the presence of inclusive green public space can create in a world region which averages a 12.7% of global urban area allocated to streets and open public spaces, against a recommended 30% streets and an additional 10–15% of public spaces (UN 2022b). The public space often includes the coincidence on accessibility also in terms of inclusivity: "public spaces, whenever safeguards of natural or historical value allow, must be made accessible without barriers to the motorial, sensorially and intellectively challenged" (INU 2006). The UN's Sustainable Development Goal number 11 (SDG11), aims to "make cities and human settlements inclusive, safe, resilient and sustainable". It refers specifically, at point 11.7: "by 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities" (UN-Habitat 2018). This is more specified by the indicator 11.7.1 which counts the "Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities" (ibid.) The concept of sustainable urbanisation (UN-Habitat 2020) remarks how urban and environmental value can be created through green public space, and how this should be inclusive and accessible by *marginalized groups*, whose definition include people affected by disabilities. Moreover, UN-Habitat promotes safe, inclusive and accessible public space as a cornerstone of sustainable cities and communities (UN-Habitat 2015); also, the New Urban Agenda (NUA) expresses the connections between disabilities and urban space promoting the conceptual principle of "planning from the margin" and pushes for leaving no one behind, inclusiveness and green spaces to enhance "social, economic and environmental value and well-being" (UN-Habitat 2020, p.45).

These principles are tied to the practice of social inclusion, equity, green public space "using urban planning and design to deliver public space" (UN-Habitat 2015, p. 4) in terms of design features (ibid. p.26) and in terms of principles and policies (ibid. p.45). Various literature on disabilities and built environment often refers to the Design for All and to its seven points (Equitable use, Flexible use, Simple and Intuitive use, Perceptual information, Tolerance for Error, Low Physical Effort, Size and space for approach and use; Connell et al. 1997), a practical way to apply these concepts in space. But in facts, the link between Universal Design and green spaces is however limitedly explored.

Selected province and the study area

The selected study area is framed in the macro and micro scale as follows.

The selected province: Pathum Thani

The choice of Pathum Thani Province as a macro-area of study is related to different reasons. Situated on the Chao Phraya basin of central Thailand, Pathum Thani was originally a settlement for the Mon people who migrated from Myanmar over 350 years ago (Thai Studies, Chulalongkorn University 2018). Being well irrigated by the Chao Phraya and many canals, the province intensively farms with rice, various fruits, vegetables, and flowers. During the past several decades, the Thai economy has become rapidly industrialized. As shown in Fig. 1, the city of Bangkok expands extensively blurring administrative boundaries, and caused many impacts on its fringes including Pathum Thani, at diverse levels. Once relying on agricultural products, the province has shifted toward industrialisation, as a national trend. Advancement of the province comes along with a correlative development of transportation infrastructures as well as traffic activity. Roads are criss-crossing the agricultural landscape, spreading out of the city core. Development of the province has subsequently induced many changes in its environment. The selected province shows a few remarkable points, explored here with the PESTEL (Political, Economic, Social, Technological, Environmental and Legal) framework.

Politics

Pathum Thani Province is divided into administrative areas composing of 7 districts and 60 subdistricts, and 65 local government organisations divided according to the type and power of management within the locality as one provincial administrative organisation, one metropolitan administrative organisation, 10 city councils, and 18 subdistrict municipalities. The local governance authorities undertook already a few steps in the field of the research, especially in regards to urban improvements. There are, at the moment, signs of interest in committing to innovative approaches for a more comprehensive urban development (Klaylee et al. 2021).

Economic

Pathum Thani's Gross Provincial Product (GPP) was 403,797 million baht, ranked sixth in the country (Sakonnakron et al. 2021). The GPP derives from two major sectors of 95.4% from the industrial sector, and 4.6% from

Fig. 1 Macro Scale of the site study connecting to Bangkok and Pathum Thani. (Adapted from Google Map 2022)

the agricultural sector (ibid). Even with more industrialisation, Pathum Thani is home to one of the largest distribution and delivery market of agriculture products of the country (Office of the Permanent Secretary for Ministry of Agriculture and Cooperatives 2019). Furthermore, a number of higher educational institutions including four major Thai universities—Thammasat University (TU), Bangkok University, Rangsit University, and Asian Institute of Technology (AIT), are located in Pathum Thani, which also helps in terms of the province's economic growth.

Social

Established with various ethnic groups including the Mon, the Chinese and the Muslims, the province is still preserving a diffused cultural diversity. The descendants of each ethnic group still live in their own specific ways, according to the context of society including the traditions and ceremonies these people have inherited with wisdom passed on from one another transforming it to become valuable cultural heritage. Currently, the province's total population is 1.16 million people (Thai Department of Administrative Affairs 2020). However, the nation-building efforts since the past four decades led to migration of millions of workers from Cambodia, Myanmar, Laos and Vietnam. Pathum Thani's Provincial Labour Office (2022) report on Pathum Thani migration asserts that the number of non-Thai residents within the country has increased to an estimated over 300,000 people in 2020.

Technological

Pathum Thani is home to Nawanakhon city, one of the most important and innovative industrial zones in Thailand. With an area of more than 10.5 km^2, Nawanakhon contains over 200 world class new innovation companies along with commercial and residential areas. Additionally, the province also accommodates the Thailand Science Park, the first private research settlement in Thailand under the management of Ministry of Science and Technology with its main mission of creating innovation and research as well as development in the private sector including the creation of research and development of enterprises and qualified manpower.

Environmental

The spatial layout of the province is influenced by the water-management infrastructural works succeeded since the Rama V Age. With the economic and industrial progress of the country, the progressive loss of the agricultural production and of its natural ecosystem occurred in favour of the urbanisation of the soils. The urbanized

territories created from scratch a new built environment non-existent before. Contrasting and mutating landscapes exist together, but the anthropized landscape is the prevalent one. The developing path of the *modernist tradition,* in its local late adoption, "carries under its umbrella such terms as *functionalist, rationalist, technological, utilitarian, systematic,* and *efficient"* (Dobbins 2009, p.55) which compromises the remnant track of natural landscape in the area.

Legal

The Department of Public Works and Town and Country Planning (DPT) has developed a national land use plan and a number of regional and provincial land use plans. Pathum Thani's vision plan for 2018–2022 is "clean environment, safe food, tourist attractions, learning and recreation of ASEAN. The society is cool and happy." (Pathum Thani Province's Development Plan 2018–2022, 2022). The plan focuses mainly on the vision of overall development and also concentrates on economic aspects of spatial development, such as road networks and locations for industrial and commercial development, with little attention given to natural resources. While the DPT has the most wide-ranging authority, its legal and administrative authority is not extensive enough to implement the plans (Fig. 2).

The selected area: Thaklong–Klongluang

Thaklong–Klongluang is an area directly bordering the northern part of the province of Pathum Thani, and it can be considered as an interface between this province with its urban dynamics and the countryside. This area had been chosen to be representative of the whole of the provincial issues and to be the site of future design of inclusive park. Here, as per the provincial trend, the use of the soil is marked by the contrast between the agriculture, the urban privatized development and even an intense development area (as shown in Fig. 3). Thaklong–Klongluang has total population of 77,104 (Thaklong Town Municipality 2020). Total disabled people in the area are 1039 (Social Welfare Division Thaklong Municipality 2022), which is approximately 1.35% of total population. The high number of educational institutions of higher, academic and professional education, which pairs with the young demographic age of the province, is represented in the selected area by the presence of the Thammasat University Campus and of the Navanakorn Industrial area. All of these factors made this area grow with broad prosperity. However, its distance from the core area of Bangkok and the ongoing development dynamics (Fig. 4) can have negative developments in terms of its future urban assets and in its vehicular traffic load.

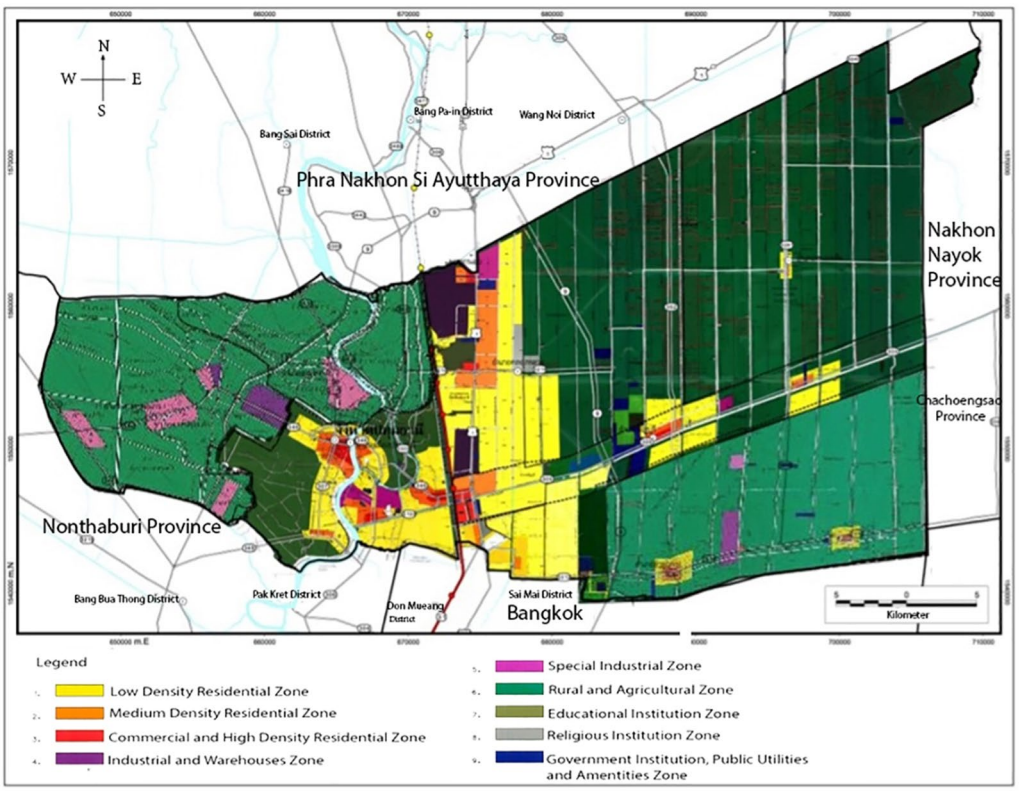

Fig. 2 The latest Comprehensive Plan of Pathum Thani Province in 2015. (Pathum Thani Province's Development Plan 2015)

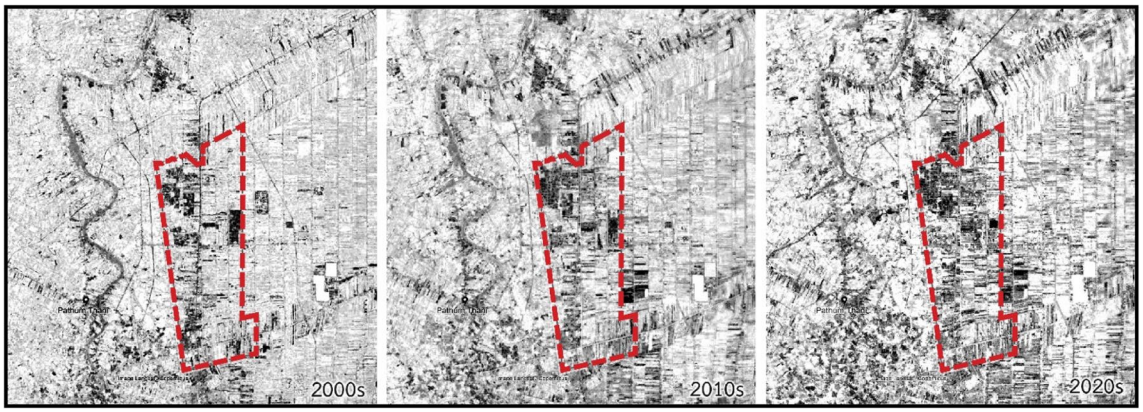

Fig. 3 Expansion of the Thaklong–Klongluang City Councils in 2002, 2010s, and 2020s. (Adapted from Google Map 2022)

The following sections show the major negative and positive aspects of the local contemporary urban development. The key points established are used as a starting point for the development of the scope of the research.

The lack of public space in the selected area

Specific attention should be given to the lack of public spaces in the study area, which is extremely minimal. The urban growth which happened with the accumulation of private developments never had a specific legal tool dedicated to the development and the interaction of the public spaces. In the framed area, the public spaces mainly comprise of composed of six green public spaces, consisting of the few parks represented in Fig. 5—which represent almost exclusively the whole provincial dotation of public spaces.

The dotation of public spaces, in the Western tradition, is scarce in Pathum Thani for a few reasons. Historically, Thai people have typically gathered in the waterfront and the temple, which were scattered in the community and was used for activities and festivals. Most of the public spaces are open spaces, such as the front of a city gate, waterfronts, and agricultural space as a meeting place of the villagers. Green public spaces are often provided, but scarcely used due to them being generally poorly designed. Public planners in the city have not prioritized parks and historically, private developers have built malls to shelter people from the outdoors, rather than to embrace it: the temperatures in Bangkok can be stifling, and the weather thunderous. Malls and commercial spaces, especially, represent the heterotopies where collective life takes place. People in Pathum Thani spend a day moving from one shopping centre to the next, breathing solely with conditioned air. In the framed area, the most remarkable presence is the provincial landmark of Future Park Rangsit, a multipurpose commercial and entertainment complex which includes a local transportation hub.

Beyond the local traditions' customs and these built common spaces, it is widely argued that the lack of spaces of pedestrian traffic, informal gathering and expression which carry fully public value and a broad degree of accessibility have negative effects on the daily quality of life and on the routine of the necessary activities of the citizen (Gehl 2011). These relational lacks make hard to establish the social base of a living city, the so-defined *life between buildings*, considered as "more essential and more relevant than the spaces and buildings themselves" (Gehl 2011, p.29). With the absence of this base, the identification of green inclusive public spaces for people affected by disabilities appears to be even more challenging. The following section illustrates the need for inclusivity and accessibility in the site area, in reference to the existent green spaces and to their possible improvement in this regard.

The need for inclusivity and accessibility through park in the study area

The below Table 2 demonstrates total existing green space in the study area as 669,702 m^2.

As stated in Sect. 2.2, total population of the study area are 77,104 (Thaklong Town Municipality 2020). Total disabled people in the area are 1039 (Social Welfare Division Thaklong Municipality 2022), which is approximately 1.35% of total population. Therefore, the green spaces per capita of the study area is 8.68 m^2, which almost reach the often indicated international standard of 9 square meters per capita. However, these areas are still not convenient to be used in real life due to the lack of connection with the context and physical separations with fencing from the public road. All areas lack in a safe exercise area for all, especially people with disabilities. In

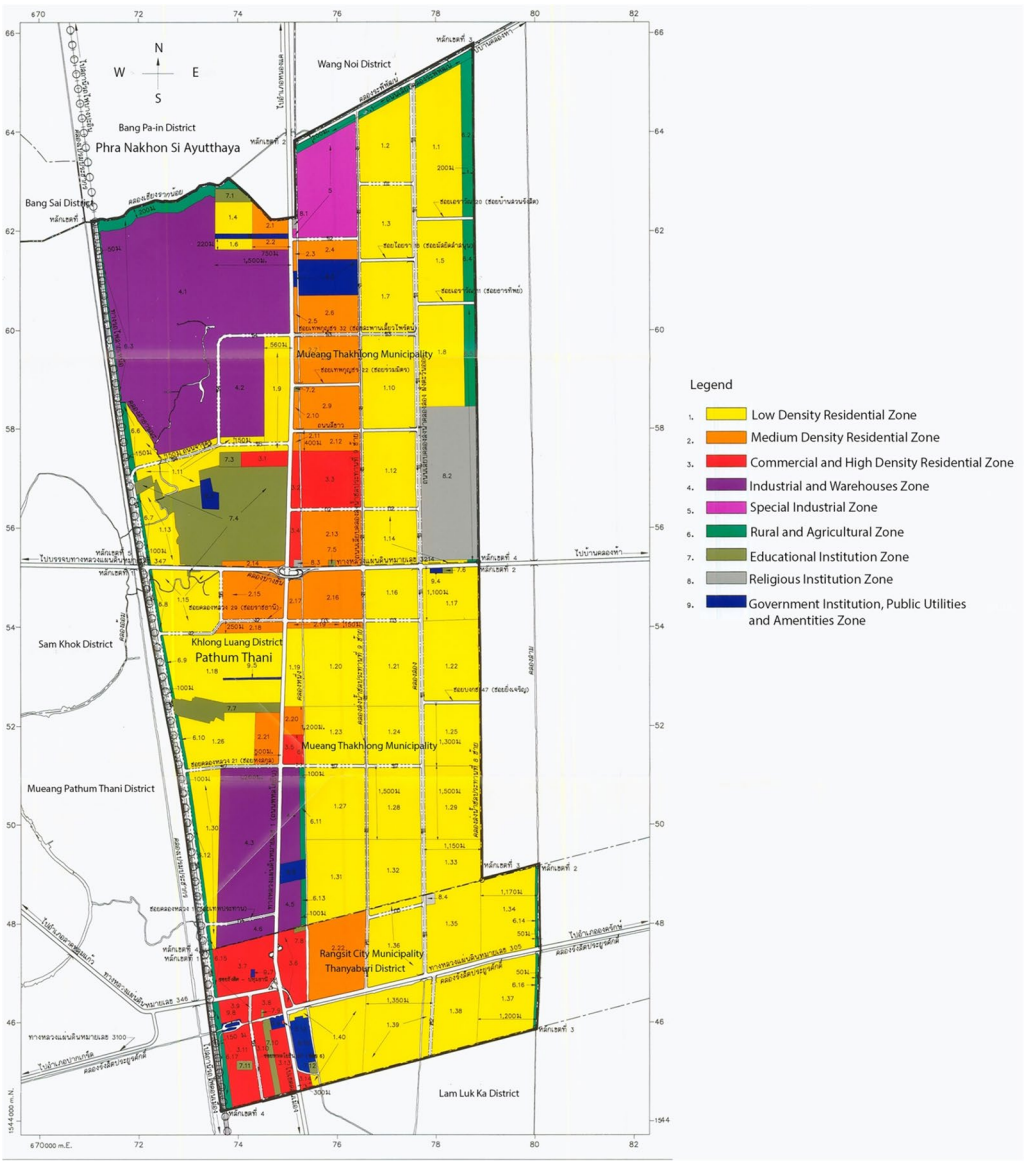

Fig. 4 The latest Comprehensive Plan of Thaklong–Klongluang in 2012 (Thailand Property Online 2012)

a context which state-of-the-art suggests also a rethinking of the so-called necessary activities, a deep intervention on the existing built environment to provide brand new green and accessible spaces would be invasive and unactionable, with the request of deeper and complicated transformation of the territory. To comply with the real possibilities and to introduce an actual practicable view of inclusion, this research proposes the empowerment of green public spaces in some specific selected portions of the study area; each of them can act as a green device capable of practically implementing the quantity of welfare and wellness of the area.

The main feature of these parks's transformation should be aimed to enhance the quality of the life of whoever remains left behind by the contemporary city developments and by its lack of public spaces. The main feature of these ideal parks should be the total inclusiveness and its high level of accessibility which will allow people with different disabilities to access and enjoy freely without needs of additional help. More specifically, it is possible to identify some principles to guide future design interventions to pursue the research's scope. So, given the context's specificities, each prospected design will have to:

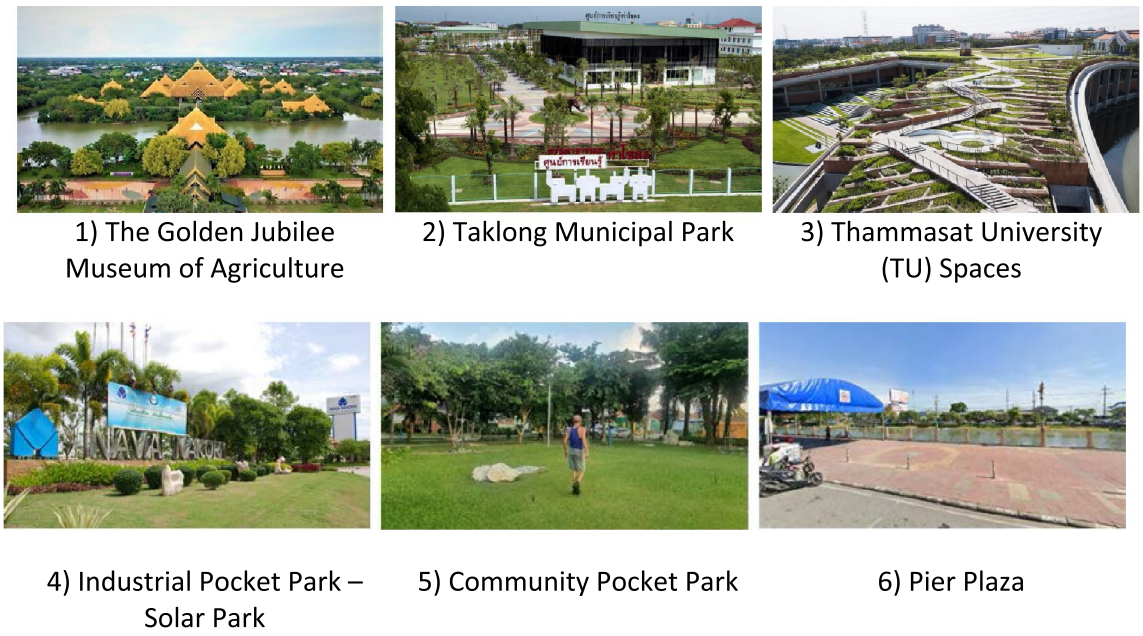

Fig. 5 Images of existing parks (Researcher Team 2022)

Table 2 Considerations of the existing parks. Sources: Researcher Team, 2022

Area	Identification	Description, surface	Positive factors	Negative factors
1	The Golden Jubilee Museum of Agriculture	Located in an existent Museum, freely accessible; 480,000 m^2	Already well known; well connected	Related to an agricultural field—a space of production in activity, not of leisure
2	Taklong Municipal Park	Public garden connected to the main collector road; 63,740 m^2	Accessible; popular choice	Not well integrated with the surroundings
3	TU Spaces (Solar Park, Suey Park for People, and Thammasat Active Park)	Different spaces located in a University Campus; 147,200 m^2	Spaces integrated in the campus, and connected to the TU management	Public access, but limited accessibility—spaces are located in a gated university campus, following the academic seasonality
4	Industrial Pocket Park—Solar Park	Green space located in an industrial estate of new development; 4000 m^2	Limited connections with the surroundings;	These areas are located in a development area which counts as industrial estate
5	Community Pocket Park (Challerm Prakiet Park 1, 2 and 3)	Three interventions in marginal sites 2306 m^2	Separated among themselves	Limited range of engagement for the other users of the area
6	Pier Plaza	Linear park located alongside the canal; 2456 m^2	Close to the Future Rangsit urban pole and to the strategic connection node	Potential to be developed and well connected to the urban context

- Be integrated in the international framework of inclusiveness and green spaces, regardless the absence of a national defined framework;
- Include the public sector and local agencies in roles which are, so far, new for this context. These roles may vary in the different phases of the design process (i.e., supporting private initiatives, designing new policies for the green spaces' development and integrations, promoting daily fruition and healthy inclusive activities, etc.), and may include the institution of new practices and policies also within the existent frameworks (i.e., providing space standards and requisites for future expansions);

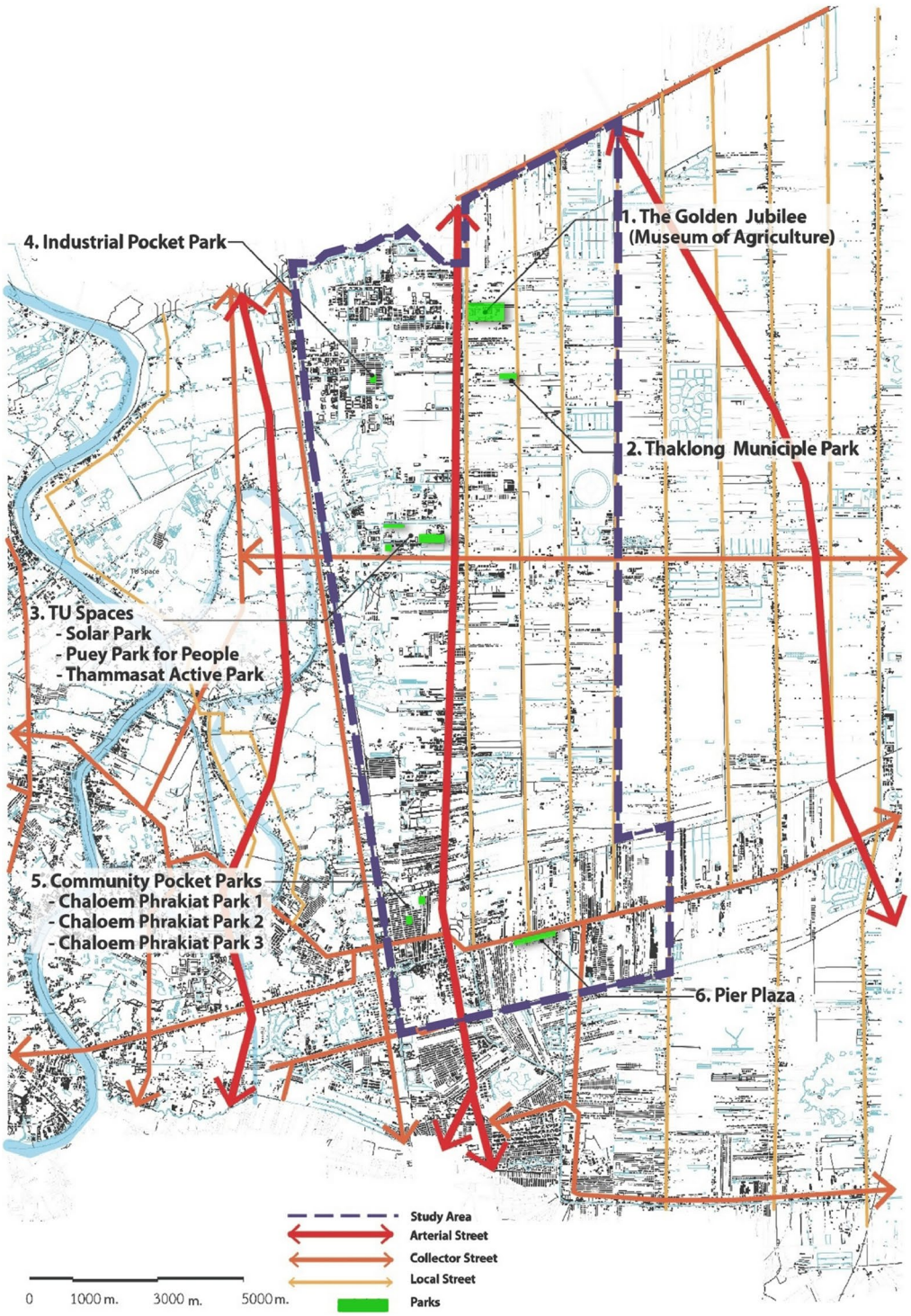

Fig. 6 Mapping of existing parks in Thaklong–Klongluang. (Adapted from Google Map 2022)

– Be a result of collaborative efforts among the managing stakeholders in charge to guarantee access and absence of segregation;

– Improve the level of accessibility of the whole park's area, making the new interventions interact with the surroundings and the site's specific needs;

- Consider inclusivity as a key foundational necessary feature of these new spaces, putting it at the center of the urban policies and making it a driver of urban wellness in accordance with the UN's different prescriptions;
- Provide to the disabled and marginalized users the chances to have free spaces for the autonomous fruition the spaces in order to have a fully developed and independent common social life;
- Differentiate the spaces of uses for all users, with dedicated spaces for a wide range of demographics;
- Integrate harmoniously the designed spaces in the context, providing safe, green, walkable, cyclopedestrian connections with the surroundings and complying to the international excellence standards of access—including passive and active accessibility navigation support for people affected by disabilities;
- Balance, within each new intervention, active and passive dotation of urban furniture designed with the principle of inclusivity and design for all.

All these points should be integrated among themselves and should be tailored to the actual conditions of the study area's sites, in order to give the city an inclusive yet integrated, safe, livable green public space able to improve the quality of life. As per the research's context, it is auspicated these policies may have a hypothetical successful application in the areas shortlisted in the "Selected province and the study area" section. These spaces' synthetic introduction is then provided in Table 2, (see Fig. 6).

The identification of the spaces and their surfaces provide a first quantitative operational introduction to the sites. The positive and negative aspects of each park are presented to the reader as a brief summary of indications, obstacles and potential developing key points to suggest possible implementation of the defined policies and principles. Next steps in the undergoing research will furtherly define these aspects and define the applications of the principles to the sites, altogether with more detailed analysis and definition.

Conclusions

The defined approach towards inclusivity, accessibility and public value suggests a change of paradigm in the process of city making. The principle of putting the social aspects at the centre of the planning, within the reality of the neoliberalist contemporary urban development, is a necessary challenge that all rapidly urbanising territories will have to face. This challenge will have to unavoidably include, among other factors, the inclusion of different marginalized users and a clear and underlying strategic stance by the public sector to make the public and civic principles of inclusivity a tangible spatial realization. This strategic stance will practically aim, in the given study area to enhance accessibility and inclusivity in the existing green areas to define new ways of inclusion for people affected by disabilities in the physical and social urban contexts of peripherical urbanized territories.

The choice to empower the existent areas is connected to the physical and social characteristics of the context, and with the local conception of the public space. The identification of guidelines, while allowing comparisons and discussions with other peer contexts in Thailand and in Asia, will create a ground-setting approach valid for this little explored perspective of urban development; nonetheless, comparable interventions can be explored and evaluated. Finally, the spatial site-specific indications provided at the actual state of the research will constitute the base for future steps of the research, which will include more detailed definition of both principles and areas, with the final goal to open up future scenarios for potential practical realisation of the theories so far discussed.

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Author contributions
The authors read and approved the final manuscript.

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Declarations

Ethics approval and consent to participate
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