The Attitude in Urban Planning of Thai Urban Public Space: A Case Study of Bangkok Metropolitan Area, Thailand

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Abstract

Public space represents the concerning of social, economic and environmental of the country where should lead to sustain the urban development. An objective of this article is to identify zoning of public spaces by using the decision of 80 experts whose working experiences involved in urban planning disciplines. The methodology of the study was designed to incorporate, urban, creative, identity and sustainable issues which are four major criteria for signifying the public spaces in Thai context. The weighted score demonstrated importance of different key urban development policy were ranked by the experts, and integrated with geospatial analysis on Geographic Information System (GIS). Bangkok, the capital of Thailand was selected for the study area. The analyzed zoning by the expert decisions revealed that the most suitability level of area scatters all over Bangkok, covering 4.635 square kilometer or 0.3 percent of Bangkok area. Three groups identifying by locations of public spaces were clustered and their locations concentrates at the inner of Bangkok or city center, the upper part of Bangkok, and scatters sparse outside of the city center, respectively. The results of this study could help for identifying the appropriate zone of public space in Bangkok and its vicinities.

Keywords: urban public spaces, ranking method, urban development, creative, identity, sustainable

1. Introduction

Urban development has expanded rapidly and is likely to increase about 0.4 percent annually, by 2050, which the 68 percent of the world population will become urban dwellers (UN-Habitat, 2017). The development trend and growth of the city have a great benefit impact on people and cities. There are many created utilities and facilities, chance of educations and jobs, and conveniences in daily life. As same as cities, they have an opportunity to expand their economic production, trade, and services which was well managed by the high technology (Toffler, 2012; Office of Knowledge Management and Development, 2015; United Nations, 2014). However, continuing growth of urban is a challenge to urban planning for sustainable growth which has caused urban problems if lack of good planning to control the ability to cope of population number in the city. This problem has directly affected to quality of life; inadequate service of public utilities and facilities, faced with higher urban pollution caused by congested transportation, industrial production and services, including changes in the land use, urban environment both physical and aesthetic (Health Effects Institute, 2018). In addition, urban boom causes to high risk of insecurity and safety in life and property, conflicts in society caused by inequality and the variety of the people, moreover the trend of individual living. They all make people have lesser interaction to each other and low social capital (Legatum Institute, 2018). Whenever social and cultural change, the way of life and people activities has been changed accordingly (Carmona, Tiesdell, Heath & Oc, 2010; Barton, Grant & Guise, 2010). The identity of the community began to disappear when togetherness is lax, there is no sense of space, sense of belonging, and through lack of awareness of the value of social progenitor, neighborhood, and city, which are the basement structure of all urban dimensions (Rose, 1995; Myerson, 2006; Lewicka, 2008)

From above, it can be seen that the urban development brings advantages and disadvantages to all urban fabrics; social, economic, and environmental. The solution of urban problems is an issue that all sectors are intend to address, however, the former study still focuses on some dimensions, which has not linked to the sub - components together. The planning dimension is a broad picture of the city system that including policy of developing, designing, and planning. The place or neighborhood dimension correlate with context that make it striking from others, which users correlate with using and attitude, and social interactions. Public space is one of the foremost component of the urban city. It has outstanding role and available for social activity for all since in the past until now (Kaplan & Kaplan, 1987; Benn & Gaus, 1983; Blackmar, 2006). It transmits the relationship among urban planning, context of each place and interaction of user reflects the social interaction between people who share and use spaces together. Moreover, public spaces in each era pass on their role that inform the different development of cities.

In depth study on public spaces should be a key approach to enlighten the problems from the subdivisions of the urban city, the attitude and behavior of users that reflect the way of life, social, economic, and cultural, which combine to resound the characteristics of the place, praise its social identity. This is an approach to develop a sustainable society by using public space as a component of the city's prosperity as a key for urban development component that makes lively city (UN-Habitat, 2015). It also helps to define cultural patterns and characteristics of the place which reflects the identity and sense of place (Jacobs, 1961; Habermas, 1989).

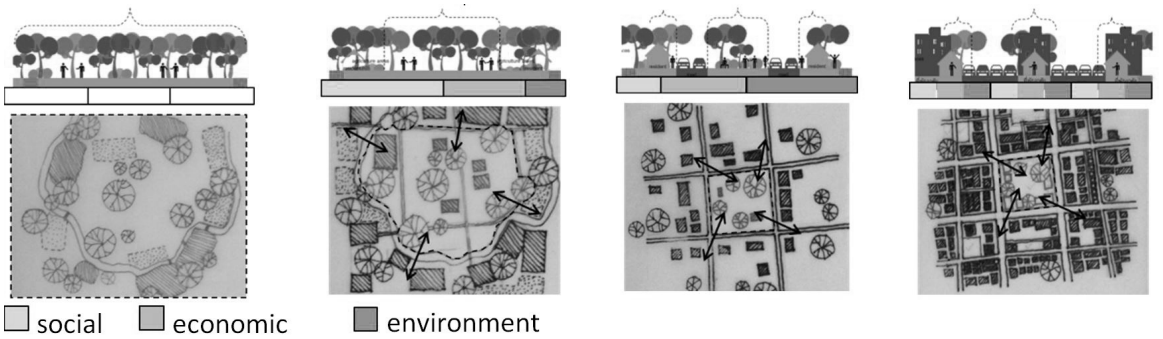
This research aimed to study on public space in all dimensions by integrating knowledge in the urban planning, architecture and design, and built environment to understand the context of Thai public spaces and to lead the suitability development for context and way of Thai life along with promoting the social identity. In terms of urban planning concern to layout planning of urban system, which contains the relationship of urban elements in different dimensions; social, economic and environment, moreover, reflects the urban structure in a big picture. This research selected Bangkok as a case study to be a representative area of Thailand. It is the city model for all provinces in every region of Thailand with metropolitan city which is rapidly developing, different social and cultural backgrounds with diversity ethnic of population who migrants from both the other domestic regions and foreign.

2. Literature review

Public space is space for all, everyone has the right to access which their utilizations also participate in ownership and management (Kaplan & Kaplan, 1987; Benn & Gaus 1983; Blackmar, 2006). There are many kinds of public space, they are roads and routing (such as sidewalks, bicycles, etc.) parks, recreation areas (such as parks, squares, etc.) green areas for recreation, etc. Within the public space, there are the various relationship of interaction between people, people and space, and space and its surrounding (Madanipour, 2010).

Table 1. Evolution of public space comparable to universal history

Era	Prehistoric (4,000 B.C.)	Historical age (4,000 B.C. – 476 A.D.)	Middle Ages or the Dark Ages (476 A.D. - 1,453 A.D.)	Modern era or present (1,453 A.D. to Present)
Role	Source of four basic human needs	Space for activity' s group	Space for people recreation and promoting urban environment	Convenience space for supporting people' s quality of life and promoting urban environment
Usage	No possession	Agora and Forum, Colosseum, etc.	Market square, boulevard, plaza, square, and religious places	Activity center of the city, park, religious places, coffee shop, market, department stores, etc.
Feature	Public space	Public space	Public space and semi-public space	Public space and semi-public space



2.1 Evolution of public space comparable to universal history

Public space has reshaped according to the urban development. It is closely related to the physical and context of its location and people who use them. As the city changes, role of public space changes in several ways as the center of political, economic, social, cultural, and civic activities (Carmona et al., 2010; Barton et al., 2010; Tonnelat, 2010; Madanipour, 2010). Public spaces in each age inform the role that reflects the development of different era (Stearns, 2000) which can be summarized as seen in Table 1.

1) Prehistoric (4,000 B.C.): This period, humans live for survival, all area is public space that everyone can access to get the four basic human needs;

2) Historical age (4,000 B.C. – 476 A.D.): The era, people began to live together as a community, they have a faith-based society, leaders, places for group activities and goods exchange, and inform the news;

3) Middle Ages or the Dark Ages (476 A.D. - 1,453 A.D.): This age, people interested in urban renewal and used public space as an open space for urban ventilation, a center for meeting and exchanging goods, and for recreation and leisure activities. Location of public spaces in this era is related to the perspective view and physical access, axis and intersection, such as market square and boulevard;

4) Modern era or present (1,453 A.D. to Present):This era, public space in the era is flexible usage and multiple role. It plays a role in promoting the quality of life, promotes city scenery, and also create a unique and beautiful view for the city such as green area with fountains, public open space with decorated architecture, etc. This era, there are many semi-public spaces such as markets, restaurants, coffee shop, department stores, etc.

2.2 Evolution of public space comparable to Thai history

Public spaces in Thailand originates similar to others the Eastern region, where it has no strictly planning pattern of urban but widening from using occasion and concerning with social and cultural beliefs. In addition, public space in Thailand forms up with the social structure in terms of faiths, such as the city pillar, capital gate, city, and waterway (Wyatt, 2013; Baker & Phongpaichit, 2014; Institute of Academic Development [IAD], 2015; Sittipunt, 1984; Paksookcharown, 2008; McGee, 1967). The succinctness of Thai public space evolution can be summarized as seen in Table 2.

1) Sukhothai period (1780 A.D.- 1881 A.D.): Public spaces in the period is the waterfront and the temple where scattered in the community and was used for activities and festivals. Most of them are open spaces, such as the front of city gate, waterfront, and agriculture space as a meeting place of the villagers.

2) Ayutthaya period (1893 A.D.- 2310 A.D.): The waterfront and the temple area remained the main public space for the social activities. Their forms are open and the functions are promoting the cityscape and opening up the city view.

3) Rattanakosin Period in reign 1 - 4 (2325 A.D.- 2411 A.D.): The role of public space in this period is similar to the space in Ayutthaya. In addition, there are public spaces for recreational activities in the elite, and a garden inside the palace that called right and left parks. Moreover, there were located an official public open space for public.

4) Rattanakosin Period in reign 5 to Present (1868 A.D. to present): Public spaces has been developing as an infrastructure for recreational activities and promoting the people' s quality of life, and supporting the beautiful scenery of the city. From reign of King Rama V to the present, there has been many types of public spaces due to the more development of infrastructure, which results in a clearer use of the public spaces. There are parks and courtyards for recreational facilities, and also remaining used other public spaces such as temples for religious ceremonies, educational institutions for educational activities, together with business and services area such as shopping malls, coffee shops, etc. which are semi-public spaces.

3. Methods

This research session is a part of the macro level, the relationship between public space and the design planning of the city system was studied to identify the appropriate zone of public space. The geospatial analysis was adopted to screen areas by integration of Geographic Information System (GIS) and spatial multivariate analysis (Malczewski, 1999). The conducting research contains four steps throughout the research process, along with the methodologies which are presented in Figure 1.

Step-1, Data preparing: The data in this study is the secondary data, gained from organizations which vary types of aspects. Accordingly, all data were adjusted to the same basis, with values between 0 - 1 to support the analysis of common data. Positive and negative are considered which the positive factor is the closer to 1. As the factor setting, there are 4-main and 24-minor factors. The main factors are included urban, creative, identity, and sustainable. The details of each factor and calculate equation is shown in Table 3. and the details of each factor are explained as follow:

1) Urban factor: The urban factor represents to centrality of all urban aspects. There are 4 minor factors as subsets order the consideration of urban factor which consists of;

- Building density, which is an indicator of the concentration of buildings in the area. The high buildings density corresponds to high population density, high-activity of land use such as commercial, residences, it helps to be interpreted that the higher the density, the greater the concentration of buildings. It refers to community or city center.

- Floor Area Ratio [FAR] indicates building features, the higher building ratio of area to land area, the higher FAR, the more land value especially in the downtown that its land use is limited.

- Utilities and facilities density, the higher the city prosperity and refer to convenience area which ample infrastructure.

2) Creative factor: The creative, represents the mix of urban diversity, such as land usage, activity and people. It consists of 4 minor factors which are diversity of building types, land use types, travel modes, ethnic groups. They indicate variety of activities and user groups that create urban creativity.

3) Identity factor: The identity factor reflects a unique feature of each district which are identity, value, and characteristic that striking of others. It consisted of four minor factors which are the density of each type of building that indicates the district where is specific land use or activity of its, such as residential area or agricultural area. As well as the density of each user group which was considered according to the role and usage of the area, promoting its social and cultural, such as Thai-Chinese district. Another minor is the diversity of imaginative urban elements that represent the city image.

Table 2. Evolution of public space comparable to Thai history

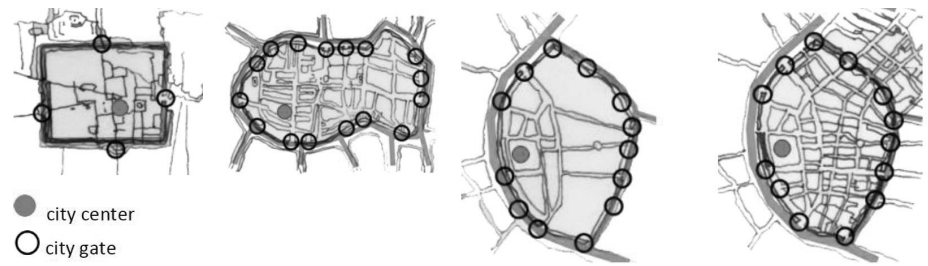
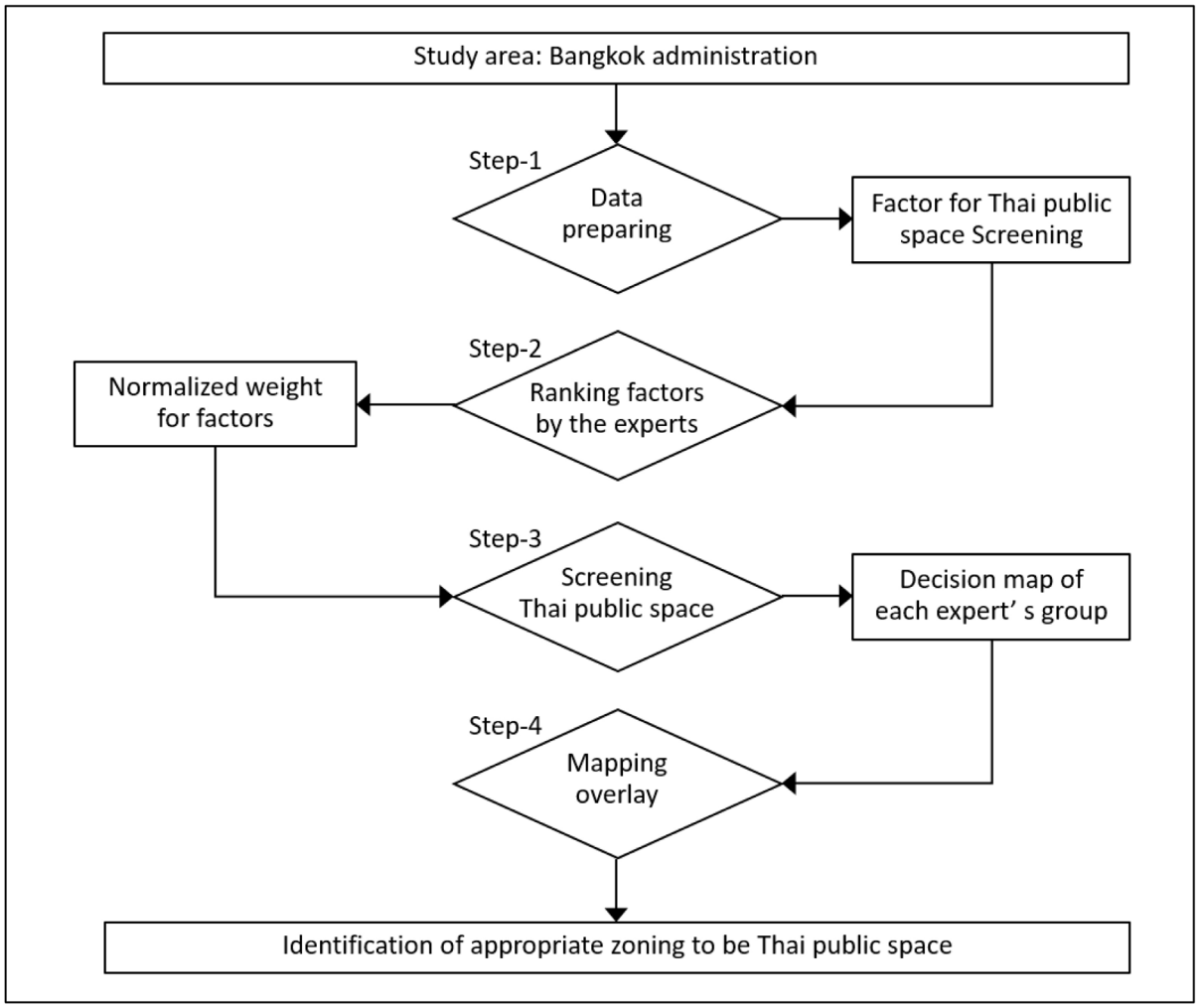
Era		Sukhothai period (1780 A.D.- 1881 A.D.)	Ayutthaya period (1893 A.D.- 2310 A.D.)	Rattanakosin Period in reign 1 - 4 (2325 A.D.- 2411 A.D.)	Rattanakosin Period in reign 5 to Present (1868 A.D. to present)
Role	Agricultural space	Open space outside the city gate	Open space outside the city gate	Agricultural area in suburb or rural	Agricultural area in suburb or rural
	Religious space	Temple area	Temple and other religious area	Temple and other religious area	Temple and other religious area
	Goods exchange space	Open space in front of the city gate and waterfront	Open space in front of the city gate and waterfront	Open space in front of the city gate and waterfront	Flea market, walking street market, market, supermarket, and shopping mall
	Political space	Open space in front of the city gate and complaining area in the palace	Open space in front of the city gate and complaining area in the palace	Open space of the city such as royal plaza and political square	Open space of the city such as royal plaza, political square, and government office
	Recreation space	waterfront	Waterfront and street	Waterfront, street, and square	Park and activity center of the city
	Convenience space	non	non	recreational space in the palace	Infrastructures of the city such as park, recreation space, activity center, etc.
	Scenery and landscape space	non	Open space for city scenery and perspective such as city axis, square, etc.	Open space for city scenery and perspective such as city axis, square, etc.	Open space for city scenery and perspective such as city axis, square, city park, monument, etc.
Feature					

Figure 1. Method of analysis



4) Sustainable factor: The sustainable factor composts of thirteen minor factors which are social, economic and environmental dimensions. In terms of social, there are six minors concerning to quality and security of life and property. As economic, there are two minors related prosperity of life and country. And for environmental factor, there are five minors regarding nature resources that effected to human existence.

Step-2, Ranking factors by experts: For solving the complex problems involving many uncertainties in urban planning problems, decision making by expert were used in this step and it contains many variables and alternatives inherently (Srivanit & Selanon, 2017). The four main factors and twenty-four minors' factors were rank ordered by the experts who expertise in urban and planning or their work concerning to architecture and design, product and material design, built environmental design, and landscape design and planning. The 80 experts were classified to four groups by their field of work, twenty persons per each group. Educator group composing of lecturers from the university in Thailand. Governor group is agent experts who work in government agency. Officer group includes workers who work in consulting firm. Creator group is freelancers or designers who work in private sector.

Table 3. Data preparing and factors

Code	Factor	Referring	Calculate equation	Source
U	Urban			
U1	Density of building (BUDen)	The concentration of buildings, fluctuated by population	BUDen=∑BC/GA	Asian Development Bank, 2001
U2	Floor Area Ratio (FAR)	building size and floors	FAR=∑(BU_{Storey}*BC)/GA	Asian Development Bank, 2001
U3	Density of building public utility (PUDen)	The concentration of public utility	PUDen=∑[(BU_{PU}/GA)/ (LU_{PU}/GA)]	Asian Development Bank, 2001
U4	Density of building public facility (PFDen)	The concentration of public facility	PFDen=∑[(BU_{PF}/GA)/ (LU_{PF}/GA)]	Asian Development Bank, 2001
C	Creative			
C1	Diversity of building use type (BUCDiv)	There are many types of building in districts.	BUDiv=∑BU_{Ctype}/GA	Asian Development Bank, 2001
C2	Diversity of land Use type (LUCDiv)	There are places which are many types of usages in districts.	LUCDiv =∑LU_{Ctype}/GA	Asian Development Bank, 2001
C3	Diversity of Transportation Mode (TMDiv)	There are many types of transportations in districts.	TmodeCDiv=∑T_{Cmode}/GA	Asian Development Bank, 2001
C4	Diversity of user (USDiv)	There are many types of users (ethnics) in districts	USDiv =∑$ReBU_{Ctype}$/GA	Asian Development Bank, 2001
I	Identity			
I1	Density of each building use type (EachBUDen)	There is high concentration of each type of activities that can be identified as a unique neighborhood	EachBUDen =-∑[(BU_IC/GA)/ (BU_{ALL}C/GA)]*LogBU_IC/GA	Asian Development Bank, 2001; Legatum institute, 2018
I2	Density of each user group (EachREDen)	There is a unique way of life that reflects the social and cultural characteristics of each district	EachUSDen =-∑[($BURE_I$C/GA)/ ($BURE_{ALL}$C/GA)]*Log$BURE_I$C/GA	Asian Development Bank, 2001; Legatum institute, 2018
I3	Density of each social and culture land use (EachLUSCDen)	A center of community where people come to use together	EachLUSCDen =-∑[(LUSCIC/GA)/($LUSC_{ALL}$C/GA)]*Log$LUSCI_C$/GA	Asian Development Bank, 2001; Legatum institute, 2018
I4	Diversity of the city image (CityImageDiv)	A landmark or point of view that create the perception of sense of place	CityImageDiv = ∑$CityImage_C$/GA	Asian Development Bank, 2001; Legatum institute, 2018; Gehl, 2001
S	Sustainable			
Economic				
S1	Prosperity of business and services (SDen)	The ability level of economic managing	SDen = ∑[(BU_{CS}/GA)/ (LU_{CS}/GA)]	UNDP, 2015; Legatum institute, 2018
S2	Land value (BUHIGH-RISEDen)	The indicator of social equality. and the ability to develop all sectors together	BUHIGH-RISEDen= ∑$BU_{HIGH-RISE}$/ GR	UNDP, 2015; Legatum institute, 2018
Social				
S3	Poverty and inequality (PIDen)	The fundamental factor in daily life pf people which is a subset of the society	PIDen=$Slum_C$/GR	UNDP, 2015; Legatum institute, 2018
S4	Food land (FLDen)	The fundamental factor in daily life pf people which is a subset of the society	FLDen= ∑LU_{FL}/GA	UNDP, 2015
S5	Mental and health (MHDen)	The indicator of the quality of life of people	MHDen=∑[(BU_{MH}/GA)/ (LU_{MH}/ GA)]	UNDP, 2015; Legatum institute, 2018
S6	Education and learning (LernDen)	The important factor of human resources development	LernDen=∑[(BU_{LEARN}/GA)/ (LU_{LEARN}/GA)]	UNDP, 2015; Legatum institute, 2018
S7	Social security	The indicator of the quality of life of people	Social security =∑[(BU_{SS}/GA)/ (LU_{SS}/GA)]	UNDP, 2015; Legatum institute, 2018
S8	Safety disaster	The indicator of the quality of life of people	Safety disaster =$FloodArea_C$/GA	UNDP, 2015; Legatum institute, 2018

Table 3. Data preparing and factors (continue)

Code	Factor	Referring	Calculate equation	Source
Environment				
S9	Green cover	The indicator that reflects the abundance of natural resources	NDVI	Asian Development Bank, 2001
S10	Water base	The indicator that reflects the abundance of natural resources	NDWI	Asian Development Bank, 2001
S11	Surface temperature (ST)	The indicator that reflects climate equilibrium and global warming	$ST=\sum(Green_{RO}+Green_{RI})_C/GA$	UNDP, 2015
S12	Pollution*	The indicator reflects air quality.	$Pollution=\sum(LU_{IN}+BU_{IN})/GA$	UNDP, 2015

Remarks:
Grid cell size is 300 meter x 300 meter
GA is grid area = 9,000 meter square
BC is the number of building (Building count)
BU_{Storey} is storey of building
BU_{PU} is the number of public utility building, LU_{PU} is the number of public utility land use
BU_{PF} is the number of public facility building, LU_{PF} is the number of public facility land use
BU_{Ctype} is the number of each type of building use
$LU_{Ctyp}e$ is the number of each type of land use
T_{Cmode} is the number of each type of transportation mode
$ReBU_{Ctype}$ is the number of each type of religious building
BU_IC is the number of i type of building, i is special type that was identified in equation
$BU_{ALL}C$ is the number of all type of building use
$BURE_IC$ is the number of i type of religious building, i is special type that was identified in equation
$BURE_{ALL}C$ is the number of all religious type of building use
$LUSC_IC$ is the number of i type of social and culture land use, i is special type that was identified in equation
$LUSC_{ALL}C$ is the number of all social and culture type of land use
$CityImage_C$ is the number of type of image of the city
BU_{CS} is the number of service building, LU_{cs} is the number of service land use
$BU_{HIGH\text{-}RISE}$ is the number of high rise building (start at 8 storey)
$Slum_c$ is the range of slum area
LU_{FL} is the number of agriculture area
BU_{MH} is the number of mental and health building, LU_{MH} is the number of mental and health land use
BU_{LEARN} is the number of education and learning building, LU_{LEARN} is the number of education and learning land use
BU_{SS} is the number of social security building, LU_{SS} is the number of social security land use
$FloodArea_C$ is the range of flood area
NDVI is normalized difference vegetation index
NDWI is normalized difference water index
$Green_{RO}$ is the range of green space on road, $Green_{RI}$ is the range of green space on river
LU_{IN} is is the number of industry land use, BU_{IN} is the number of industry building

The first priority of factors starts from 1 and continued order to n (1, 2, 3, …, n) when n is the number of factor. All questionnaires were calculated according to the ranking methods. There are three formats in giving scores in ranking method which includes Rank Sum, Rank Reciprocal, and Rank Exponent (Stillwell, Seaver & Edwards, 1981). It is the simplest method for assessing the importance of weights (Malczewski, 1999). In the rank sum (RS) procedure the weights, are the individual ranks normalized by dividing by the sum of the ranks. The inverse (or reciprocal) weights method (RR) uses the reciprocal of the ranks which are normalized by dividing each term by the sum of the reciprocals. The rank exponent weigh method (RE) is a generalization of the rank sum method (Stillwell et al., 1981). The formula producing the weights are the following:

$$W_i\,(RS) = \frac{n-rj+1}{\sum(n-rk+1)} \quad (1)$$

$$W_i\,(RR) = \frac{1/rj}{\sum(1/rk)} \quad (2)$$

$$W_i\,(RS) = \frac{(n-rj+1)p}{\sum(n-rk+1)p} \quad (3)$$

where r_j is the rank of the j-th criterion,
j = 1, 2, ..., n., p-parameter describing the weights.

Generally, the normalized values from Rank Exponent are the values used for analysis and comparison (Roszkowska, 2013; Iamtrakul, Srivanit & Klaylee, 2017). The results of ranked significant of the main and minor factors is demonstrated in Table 4 and geospatial factors contribute to the suitability of Thai public spaces are presented in Figure 2.

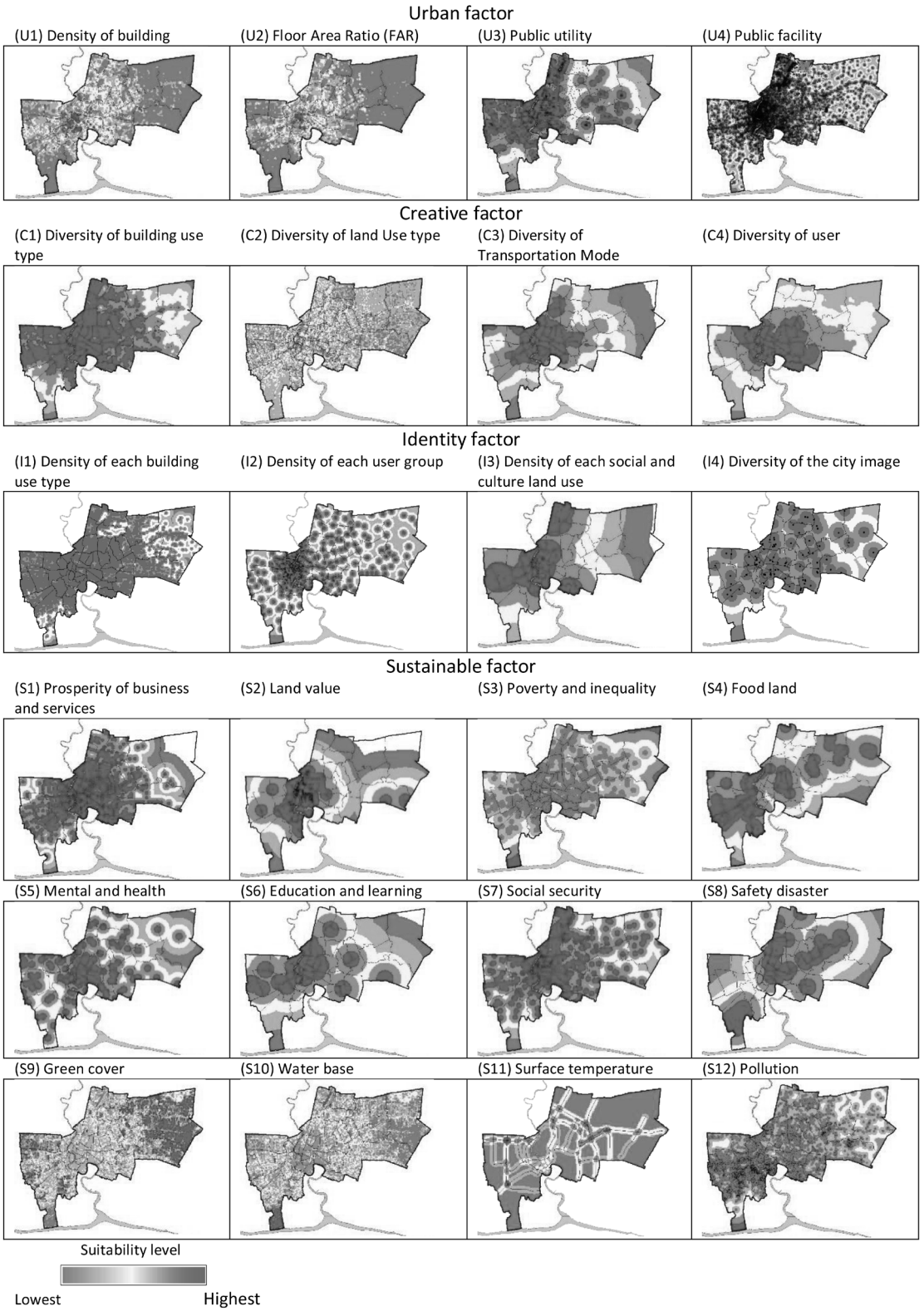


Figure 2. Geospatial factors contribute to the suitability of Thai public spaces

Table 4. Results of ranked significant of the main and minor factors

Criterion	Rank sum			Rank Reciprocal		Rank Exponent	
	Straight Rank (rj)	weight (n-rj+1)	Normalized weight	weight (1/rj)	Normalized weight	weight $(n-rj+1)^p$, p=2	Normalized weight
U	4	1	0.1429	0.250	0.188	1	0.067
C	3	2	0.286	0.333	0.250	4	0.267
I	2	3	0.4286	0.500	0.375	9	0.600
S	4	1	0.1429	0.250	0.188	1	0.067
Total		7	1.000	1.333	1.000	15	1.000
U1	4	1	0.125	0.250	0.176	1	0.056
U2	3	2	0.250	0.333	0.235	4	0.222
U3	2	3	0.375	0.500	0.353	9	0.500
U4	3	2	0.250	0.333	0.235	4	0.222
Total		8	1.000	1.417	1.000	18	1.000
C1	1	4	0.400	1.000	0.480	16	0.533
C2	4	1	0.100	0.250	0.120	1	0.033
C3	3	2	0.200	0.333	0.160	4	0.133
C4	2	3	0.300	0.500	0.240	9	0.300
Total		10	1.000	2.083	1.000	30	1.000
I1	3	2	0.222	0.333	0.211	4	0.174
I2	2	3	0.333	0.500	0.316	9	0.391
I3	4	1	0.111	0.250	0.158	1	0.043
I4	2	3	0.333	0.500	0.316	9	0.391
Total		9	1.000	1.583	1.000	23	1.000
S1	2	1	0.333	0.500	0.333	1	0.200
S2	1	2	0.667	1.000	0.667	4	0.800
S3	6	1	0.083	0.167	0.135	1	0.036
S4	6	1	0.083	0.167	0.135	1	0.036
S5	4	3	0.250	0.250	0.203	9	0.321
S6	5	2	0.167	0.200	0.162	4	0.143
S7	5	2	0.167	0.200	0.162	4	0.143
S8	4	3	0.250	0.250	0.203	9	0.321
S9	4	2	0.143	0.250	0.140	4	0.087
S10	2	4	0.286	0.500	0.280	16	0.348
S11	2	4	0.286	0.500	0.280	16	0.348
S12	3	3	0.214	0.333	0.187	9	0.196
Total		14	1.000	1.783	1.000	46	1.000

Note: U is urban factor, C is creative factor, I is identity factor, and S is sustainable factor

Step-3, Screening of Thai public space: The screening of Thai public space is spatial analysis of each expert's group by using normalized weight. After the step, decision map of each group are happened as Figure 3.

Step-4, Mapping overlay: All four decision map that gained from the third step were overlayed, and the appropriate zoning of Thai public space were indicated on the final map in vary suitability level from the lowest to highest score.

4. Results

4.1 Ranking order factor by the experts

(1) Educator: The 20 members of the group had working in field of design and planning ranged from 1-29 years. Most of them are 1-9 years of working experience (55%). The second subordinate groups are 10-19 years (35%), and 20-29 years (10%) respectively. In respect of group's perspective, urban factor is ranked to the first priority that requisite for considering the Thai public space. Its measure is 45%. The lower order are sustainable and identity factors, each of their percentage is 25%. The last order is creative factor, its ratio is 5%, respectively.

(2) Governor: The experts in this group have working period ranged from 1 year to more than 30 years. As the highest ratio is 39.1%, it is the group 10-19 years of work experience. The second is group of 20-29 years (30.4%), followed by group 1-9 years (21.6%). The last group is 30 years and more (4.3%). According to the group's attitudes, urban and sustainable topics were rated to the first priority that important to define Thai public spaces. Both factors, each ratio covers 43.5% of all main factors. The second important is creative factor, its percentage is 8.7 whereas identity factor is the third order with the left portion is 4.3%.

(3) Officers: Most of experts in the group are had working experience from 1 year to more than 30 years, mainly are group 1-10 years (57.1%). Minor group are 20-29 years (19%), 10-19 years (14.3%) and 30 years and more (9.5%), respectively. As the viewpoint of ranking factor, 38.1% of experts select sustainable factor to the first priority for specifying feature of Thai public space. The subordinate factors are identity (28.6%), urban factor (23.8%), and creative (9.5%), respectively.

(4) Creator: As the experience of work, all members of group had working experience between 1-10 years. Their work concern to creative design in urban environment and public spaces. According to opinion of the factors, sustainable is ordered to the first priority for searching the character of Thai public space, its percentage is 37.5. The lower order are urban, identity, and creative factor, and their percentages are 29.2, 20.8, and 12.5, respectively. The ranking order factor comparison of each expert group was shown in Figure 4.

As the overall, the statistical calculation result refers that every group focusing on the same way. Considering as comparison of each bar on the chart as depicted in Figure 4, both the sustainable and urban factors are the most important to specifying the feature of Thai public space, they are the highest bar in the chart whereas identity and creative factors are the lower order of the factors. At the same time, the statistical result of 80 experts put the first important priority to sustainable factor with percentage of 36.4. The urban factor is selected the second order, its ratio is 35.2. The lower order are identity and creative factor, their percentages are 19.5 and 9.1, respectively, as shown the detail in Table 1.

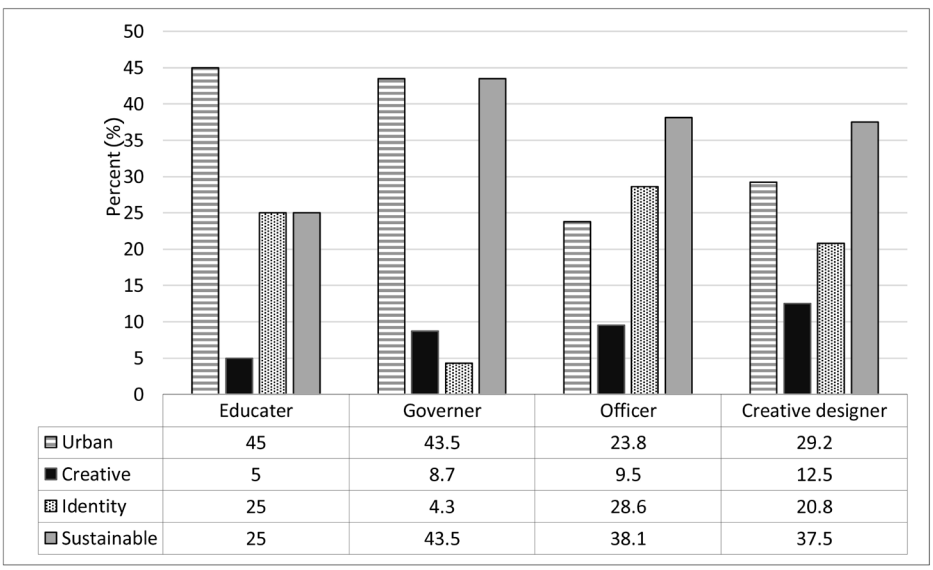
In term of minor factors, the top three of the most important factor that were voted for identifying Thai public space are density of building, public utility and public facility factor. They cover 13.2, 9.19 and 7.6 percent of all minor factors respectively. The lower other orders are shown as the bar chart in Figure 5.

4.2 Spatial map analysis

The mapping overlay of expert decisions brought about the zoning identification of suitable areas for public spaces in Bangkok area in urban scale. The more suitability level of public space, the smaller area and higher level of urban as shown on Figure 6. Five suitability levels are highest, high, medium, low, and lowest. The lowest suitability level covers almost of Bangkok area or 48 percent, followed by low, medium, high, and highest suitability level area, they respectively cover 34, 12, 4, and 2 percent of Bangkok area.

The lowest suitability level public space located in edge of Bangkok, especially east Bangkok, north Thonburi, and south Thonburi area, which are agriculture land use with lightly residence. The low suitability level public space located next to the lowest suitability level public space to the city radius and vegetated with the main road in suburb area of Bangkok. The next is the medium suitability level public space, it based in the center of community in suburb, main road, and in the city. The highest and high suitability level public space appeared in the Bangkok city center and the center of suburb, covered by commercial and service land use, and crowded with people and structures. The highest suitability level public space can be divided into three groups by location, they are inner Bangkok area or city center of Bangkok, upper part of Bangkok and outside of the city center. The details of each

Figure 3. The decision map of each group of expert



	Educater	Governer	Officer	Creative designer
Urban	45	43.5	23.8	29.2
Creative	5	8.7	9.5	12.5
Identity	25	4.3	28.6	20.8
Sustainable	25	43.5	38.1	37.5

Remark: Number in the table chart represent the percentage of each main factor by considering of each expert group

Figure 4. Ranking order factor comparison of each expert group

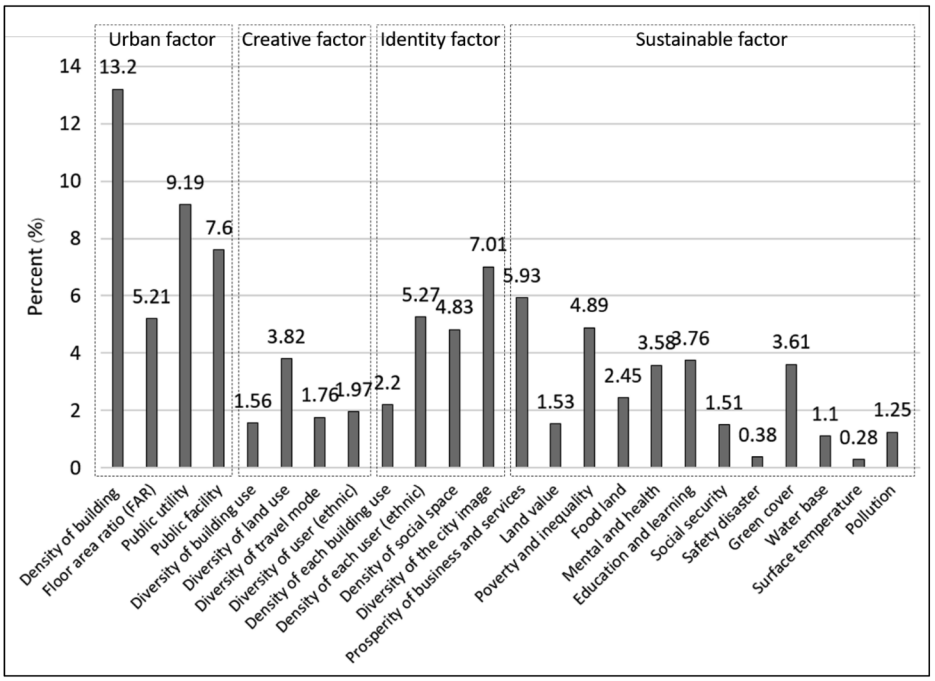


Figure 5. The overall perspective of the minor factors

Remark: Number in the table chart represent the percentage of each minor factor by considering of each expert group

group are explained as follow:

1) Public space in Bangkok city center: The public spaces in this part are concentrated in the central part of Bangkok, especially the spaces on Chao Phraya River basin where is the initial settlement of Bangkok. This zoning covers on 173 grids, 33.6 percent of all the most suitability area. The physical character of them are commercial area and old town district which represents high density of building and population, diversity of activities and facilities.

2) Public space in the upper part of Bangkok: The public spaces in the zone are concentrated in the north part of Bangkok which is a center of the North metropolitan region, connected to Nonthaburi and Pathum Thani. This part covers on 244 grid, 47.4 percent of all the most suitability level area. Its physical character is the suburb center, connected transportation area between the city center and rural, in addition between Bangkok and the other regions of Thailand.

3) Public space in the outside of the city center: The public spaces in this zone scattered locates in the other parts of Bangkok which are sub-center of communities, covering on 98 grid, 19 percent of all the most suitability level area. The physical character of this group is small patches, located in the heart of communities or districts. Their roles depend on their features and land use which they located such as a small pocket park for elderly people in a residential area or a big open space between temple and school that its roles are more than for using by people only but also it is a greenbelt area of places which they are different function of usage.

All potential areas which derived from the preliminary analysis of planning level indicates the character of the Thai public spaces. They are areas that have been using for community activities as public spaces in the past, since the Sukhothai era. The forming of public areas were originated by pattern of utilization which concerned daily life of their users, such as a public space at waterfront. It was used for waiting area for water transportation that represented typical places which people usually come

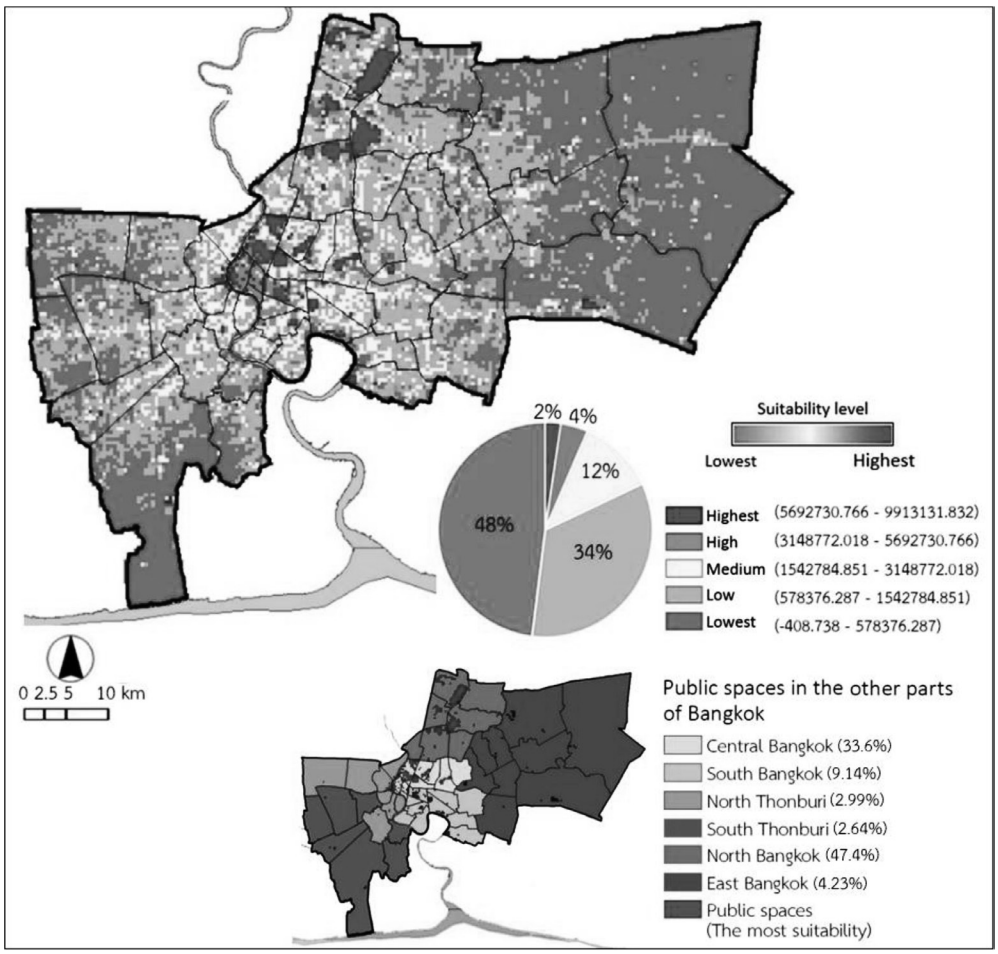


Figure 6. The potential zoning of Thai public space of Bangkok and its vicinity

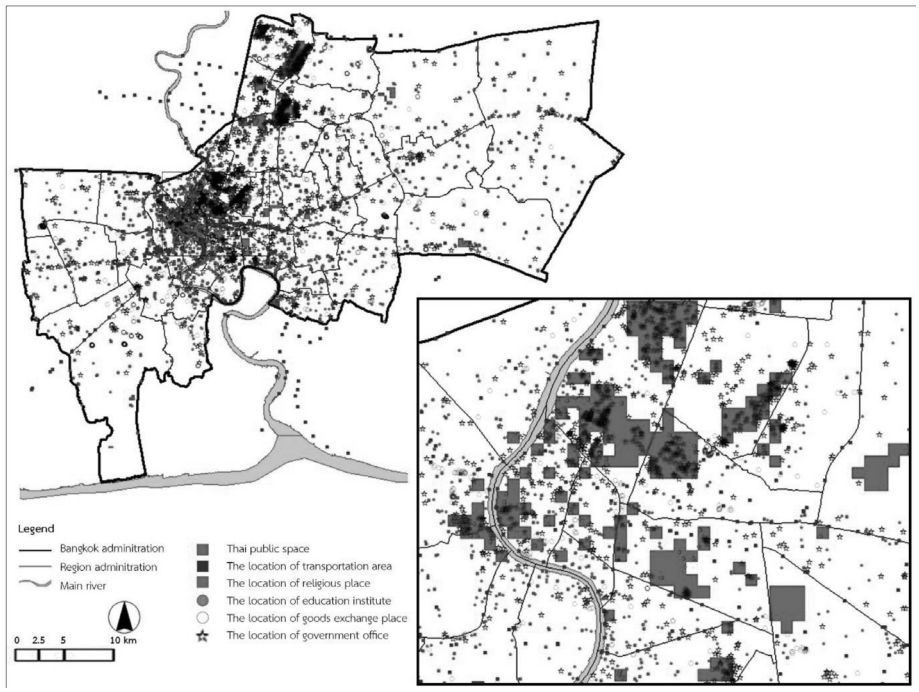


Figure 7. The spatial implication of Thai public space and other used places

and stay together some times. This behavior of utilization affects to social interaction and social activities. Thus, there are public spaces located adjacent to the rivers, some were parts of religious places or institution, goods exchange, and turning points of transportation in the present. The concerning of public spaces and the functions of usage were shown in Figure 7.

5. Conclusions and next step

The provided Thai public spaces by the expert decisions are consistent with the former Thai public spaces which are formed by the actual usage pattern. It reflected to the people lifestyle, historical background and value of the areas are the character of Thai public spaces. Their forming are similar to the forming of public spaces in the Eastern region which have no strictly pattern (Paksookcharown, 2008; McGee, 1967). Although the public spaces of Thailand are different from the public spaces where they located in the Western region with clearly in planning level. Thailand's public spaces also play their roles on behalf of the definition of universal public spaces, they are spaces for all people come to visit and share their activities together (Carmona et al., 2010; Barton et al.). In term of the public spaces in the case study, most of the highest suitability level public spaces appeared in the Bangkok city center because it has been the main central business district of Bangkok since Rattanakosin period. In the other hand, some of the highest suitability level public spaces allocated in the north of Bangkok where is the secondary city center of Bangkok as an urban sub center, and community center of suburbs. This finding reflects an expanding of urban areas in the present.

Moreover, the public spaces are encouraging people to own and social interaction (Tonnelat, 2010; Madanipour, 2010). This study only focuses on the identification the potential of public space areas and observes the trend of types of public spaces in Thailand in Macro level. For the next step, all 515 zoning where represent the most suitability area for Thai public spaces considering in Urban, Creative, Identity, and Sustainable factors will be clustered by using their physical characteristics of each grid, five hundred radius meter, as the factor for grouping the areas, preparing for in depth study in Meso and Micro levels. This study could spark a greater understanding of the genuine public spaces. Especially, understanding could be done and differentiated by the stakeholder groups whom realized in different discipline of the knowledge and guidelines could be initiated for the development of public spaces could be initiated. The results of analysis from multidisciplinary experts grouping leads to a recommendation for comprehensive approach to the explication of public spaces in all dimensions.

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