THAMMASAT REVIEW
PRINT ISSN: 0859-5747 ONLINE ISSN: 2630-0303
Volume 24 No 1 (January-June) 2021 [Page 37-56]

A Study of Attitudes of Bangkok's Dwellers Toward the Chao Phraya Riverfront

Pattamon Selanon [a, *] and Hansa Srilertchaipanij [b]

[a] *Faculty of Architecture and Planning, Thammasat University, Thailand*
[b] *School of Architecture and Design, King Mongkut's University of Technology Thonburi, Thailand*

Received 8 October 2020; Received in revised form 3 December 2020
Accepted 18 December 2020; Available online 27 April 2021

Abstract

Water is an important natural resource necessary to all livings. Recent studies mark that spending time in nature can foster mental and physical health, which can result in increased levels of social support, social cohesion, and a sense of community, allowing cities to grow healthily. Historically, the Chao Phraya River has had a strong connection with the city of Bangkok – the capital of Thailand. Its riverfront is a paradigmatic example of a unique urban blue space. However, city expansion and rapid industrialization have substantially interrupted the engagement between Bangkok's dwellers and the river. Satisfaction of Bangkok's dwellers over the Chao Phraya's riverfront use has been dampened. By conducting a survey within the constructively selected study area, the study brings a comprehensive view on attitudes toward overall development along the Chao Phraya River.

Keywords

Attitudes of dwellers, Bangkok, The Chao Phraya River, Riverfront development, Personal preferences toward the river

* **Corresponding author**: pselanon@hotmail.com **DOI**: 10.14456/tureview.2021.3

Introduction

The qualities of water are unique. People are drawn to water wishing to reach it and feel it. Its impacts on humans are diverse, varying from the sensory experience of sight and sound of water to the physical activities and experience of the shared space of the city. Recent research has also revealed that living in close proximity to water can positively impact one's physical and mental well-being (Cutts et al., 2009). It is important for urban communities to have exposure to water resource settings for stress relief, emotional well-being, and intellectual functioning (Kellert, 2005). City dwellers should be able to engage with water resources such as rivers so that the connection between water and city residents can be fulfilled. Many cities across the world have successfully connected their waterfront areas to the public realm for their citizens by reshaping their riverfronts. Waterfronts in cities such as New York and San Francisco are some examples of urban places that provide good accessibility to water. They serve as key public spaces and draw international visitors. Like other rivers, in which Global cities originated and flourished along, the Chao Phraya River has always been the bloodline for Bangkok. However, with continuous emerging economies in the past decades, it is conceivable that Bangkok's riverfront has been laid out with buildings and infrastructure with much less regard for the river. These have transformed the organization and function of the river, altered Bangkok's riverfront, and lead to difficulties to reach the river. There has been little previous research on this topic. In order to develop long-term plans and strategies for the river and its riverfront development, it is important to learn how Bangkok's residents value the Chao Phraya River and its existing development. This article is situated within debates about riverfront dynamism and the complexities of the city of Bangkok. The primary research question is as follows;

Are Bangkok's dwellers satisfied with the development of the Chao Phraya riverfront and its current uses?

The following literature review will help to form an understanding of issues related to the study's question and gain an insight to the current debates and thoughts regarding the development of the Chao Phraya's riverfront.

Literature Review

Reflecting on the research question, this section reviews the literature on the Chao Phraya riverfront development including books, publications, and academic articles from artists' accounts, critics' accounts, art catalogues, and digital information deriving from websites. The review consists of two topics, 1) Historical background of

development of the Chao Phraya River; and 2) Regulations regarding development along the Chao Phraya River.

1. Historical Background of Development of the Chao Phraya River

It is important to look deep into the history of a city's river to know where the city has been and to learn the influences of the Chao Phraya River to the city. The river originates from the north covering most of the 19 provinces of central Thailand and serves about 13 million inhabitants (Department of Provincial Administration, 2018). The river passes through the Bangkok metropolis with an approximate length of 20 kilometers, and eventually meanders into the Gulf of Thailand (Vongvisessomjai,2005). The city of Bangkok has a strong historical link with the river. After the destruction of Ayutthaya in 1767, King Taksin[1] re-unified Siam and founded a new capital Thonburi located on the west bank of the Chao Phraya River. Thonburi was constructed in order to defend intrusion of the Burmese armies (Ministry of Culture, 2015). In 1782, King Rama I[2]officially moved the capital city to Bangkok on the east bank of the river, both to be closer to the ocean and trade routes and also to take advantage of the easy rice production that the delta provided (Royal Thai Embassy, 1993). Inspired by Ayutthaya's city planning, the Grand Palace and the Temple of the Emerald Buddha were placed on the bank of the river. Between 1782 and 1851, many canals were constructed in order to provide a more inhabitable landscape (ibid). In these old days of the city, the river was extremely crucial providing all that were required for locals to live (Figure 1). Its riverfront was thus intensely used. Traditional Thai houses were built along the river banks in linear patterns creating riverine settlements. As illustrated in Figures 2 and 3, the design of the houses responded to the people's waterfront lifestyle with its front facing the river and agricultural fields and fruit plantations to its back. The water-based communities were considered cultural manifestations of water importance. Additionally, the canals facilitated as the transportation route for people and goods with a high trade value. In these old days, water could directly be felt through their commutations. On the other hand, in terms of space along the river, past Bangkok's residents could mostly access the river through their own properties. Only a few public properties existed such as schools, floating markets, and religious buildings such as Buddhist temples. The Buddhist temples were important not only as platforms for religious traditions and education, but as community centers (Figures 6). Considering the small number of

[1] King Taksin (1767–82) reunited Thailand, or Siam, after its defeat at the hands of the Myanmar (Burmese) in 1767 (Ministry of Culture, 2015)

[2] King Rama I (1737 – 1809) was the first monarch of the Chakri dynasty and the founder of Rattanakosin Kingdom (Encyclopedia Britannica, 2020)

Bangkok residents in the past, Chao Phraya river access may not have been an issue. In the 1900s, the relationship between the riverfront and the city was gradually interrupted due to industrial evolution and modernization of the city. Bangkok quickly rose to become Thailand's trade hub and attracted people from all around the world (Takaya, 1975). History shows the value of the Chao Phraya River and how the river became important to Bangkok residents.

Figure 1 Life along the Chao Phraya River in the past (Na Ayutthaya, 2003)

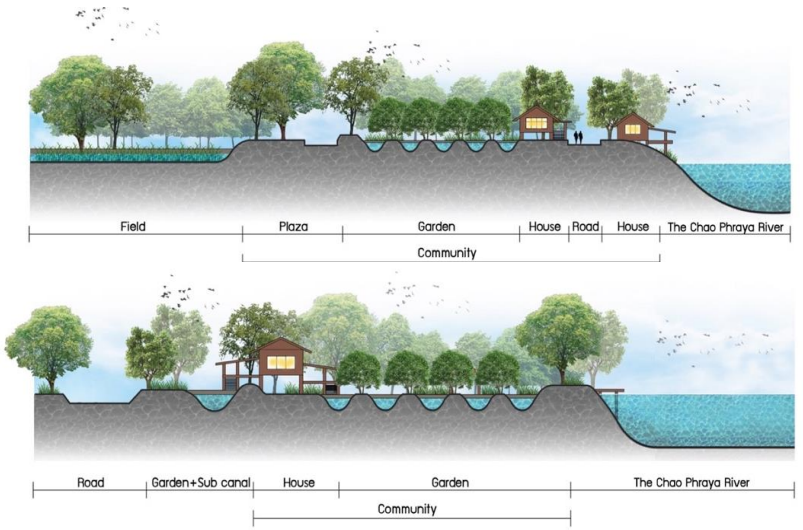

Figure 2 Cross section of life along the Chao Phraya River approximately in the 1930s (adapted from Tengkaoprasert & Sawangjaroen, 2018)

Figure 3 Limited accessibility in the past (adapted from Noomsuk, 2019)

Today the Bangkok Metropolitan is the largest urban area in the country covering 1,568 square kilometers with 16 million residences. The average density of the city is approximately 10,367 people per square kilometer (City Population, 2019). People of different nationalities and religions live together giving the city a unique character. With pressure of urbanization and population growth, the city's riverfront has been affected greatly. Such transformations are not only confined to a particular geographic region of the world, but also common to all places subject to urbanization where Bangkok is no exception. Roads have been built to provide access to the area and better transportation has been provided. Some of the water-based communities still remain, but are disorganized. Riverfront development is filled with hotels, condominiums, and civic buildings. River banks are built with blocks presenting an artificial appearance. Urbanization of the riverfront has advanced considerably along with a radical transformation of the way of life down the Chao Phraya River. Riverfront development is mostly owned and managed by private development companies. This limits the opportunity to reconnect local people to the river. Several riverfront projects have been initiated to improve the riverfront environment.

In 2014 when the military regime took over the country's administration, the Chao Phraya promenade project, known as "the Chao Phraya for All," (Figures 4) was announced. According to Jansuttipan (2016), the 3.7 billion-baht project was to include a 14-kilometer-long passageway along the Bangkok's riverbank around the historic center area. Though providing great access to the river with a long linear riverfront walkway, the project totally overlooked cultural traces along the river particularly the Riverine communities. The massive Chao Phraya for All project would have affected a number of piers, riverside communities, landmarks, religious places, official agencies' offices, schools and restaurants. The project received strong opposition from various civic groups especially regarding on its feasibility study, and the project faulted the regime for failing to disclose important details to the public. In addition, the

gigantic foundations would affect the river flow, and lead to subsequent ecological changes. Eventually, the plan was banned in 2019.

2.Ministerial Regulations regarding development along the Chao Phraya River

In order to obtain a full perspective of the Chao Phraya riverfront development, ministerial regulations related to the issue should be understood. According to Bangkok Metropolitan Administration (1999), the Bangkok's Building Control Act states the following;

• Within 3-meter distance from both sides of the riverbank, construction is not allowed, except for city's facilities such as tunnels, bridges, drainage systems, fences and walls.

• Between 3 and 15 meters of both sides of the riverbank, construction of buildings cannot exceed 8 meters high. Buildings must be at least 4 meters apart.

• From 15 meters of both sides of the riverbank, construction of buildings cannot be higher than 16 meters. In addition, no theatre is allowed to be built unless it is within 500 meters from the mass rapid transit station.

Based on the above review, this study also examined factors such as the current riverfront's uses and activities, sufficiency of access to the river, and recreational facilities. As the river is rich with history, traces of cultural along the river are also investigated.

The Research Method and the Study Area

Quantitative method in questionnaire distribution is the key research method of this study. In order to efficiently collect opinions of Bangkok's residents regarding their engagement with the river, the area of the study was carefully determined. In order to optimize the chance of getting users who had participated in waterfront activities, the area needed to be a walkable distance of 500 meters from the river. According to Tröger (2015), people in society must embark on a quest for a form of dwelling that is valid for them. Based on the review, the study considered relations between utilization of riverfront space, and density of the area in contemplating the study area. Rofé et.al. (2015) noted that utilization of riverfront tend to be rare in area with low-density such as sub-urban or rural area. On the other hand, city residents who live in dense city centers typically demand open-space (ibid). Their interest in waterfront activities may not, however be high due to their busy schedules. Considering the literature review, neighborhoods in the moderate density area with distribution of riverfront activities were

chosen. Based on Bangkok's Geographic Information System (GIS) maps, most of the total 20 kilometers length of the Chao Phraya riverfront in Bangkok is designated in brown with as of built Floor Area Ratio (FAR) of 6-8 and Open Space Ratio (OSR) of 4-5. This exceeds the study's expectation. To carry on the process, the study thus distracts the area with attribution of moderate land value. Subsequently, neighborhoods in the west bank of the river (Figures 4 and 5) covering 2 districts of Bang Phat and Bangkok Noi, were purposively chosen. Even though the selected areas were on the west side of the river, they should also represent the other side of the river, as the city of Bangkok has been blended with modernization and globalization.

The targeted area is 1.1 square kilometers with approximately 4 kilometers of waterfront. Because it is located nearby Bangkok's historic center mixing with the old and new town, the connection between the history of the city and its current uses can be tested. The targeted users associated with the riverfront activities are expected to be high with a number of dynamic riverfront nodes in the selected area as shown in the Figure 5.

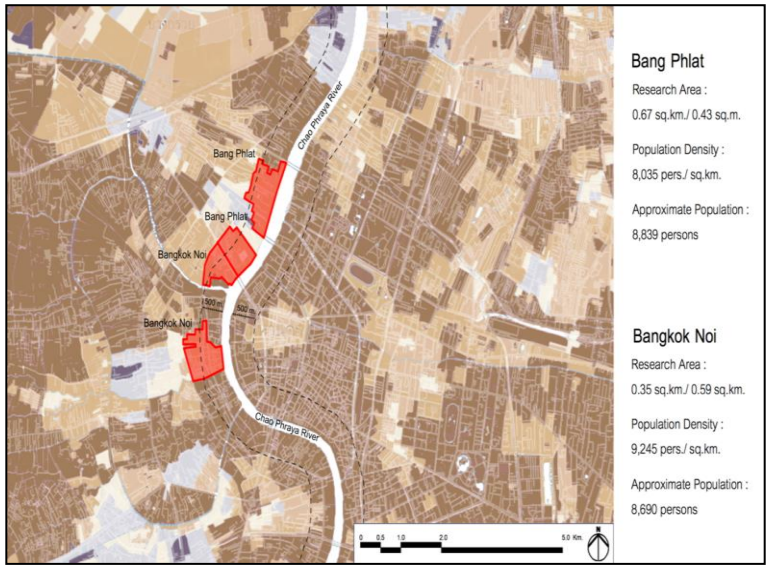

Figure 4 Limited accessibility to the river through various riverfront projects (Macro Scale)

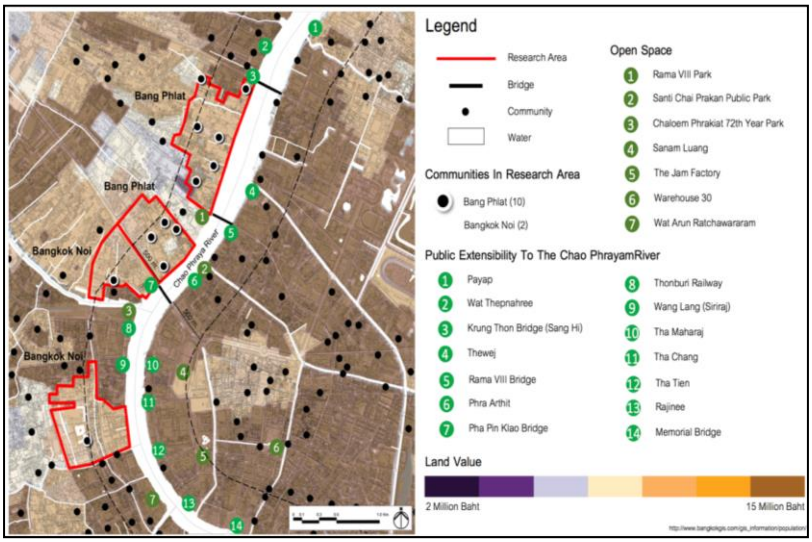

Figure 5 Limited accessibility to the river through various riverfront projects (Micro Scale)

Table 1 Area, Population, and Density of the Study Area

Location	Population (People)	Area (Square kilometer)	Density (People/Square kilometer)
Bangkok	5,676,648	1,568	3,619
Bang Phat District	91,278	11.3	8,035
Bangkok Noi District	110,417	11.9	9,245
Study Area	17,529	1.10	15,529
: Bang Phat District	8,839	0.67	13,192
: Bangkok Noi District	8,690	0.43	20,209

Source: Bangkok GIS

According to Bangkok GIS (2020), population, area, and density of the study area, which included 2 districts of Bang Phat and Bangkok Noi are as demonstrated in Table 1. The study area of Bang Phat (8,839 people) and Bangkok Noi (8,690 people) had approximatly 17,529 people. Krejcie and Morgan (1970) remarked that 384 people were sufficient to represent 100,000 people. Therefore, based on this, the sample size for the total population in the study area of 17,529 should be 67 people. However, to reach the study's saturation point, the sample size was increased to 200 people. Data collection took place between April and June 2020. Descriptive statistics of frequency count and percentage were used to organize the demographic characteristics of the respondents. Item analysis was done using mean and standard deviation.

There were two types of responses of the survey questionnaire. These included direct responses provided in the survey, and those measuring respondents' degree of satisfaction; 'Very Satisfied,' 'Satisfied,' 'Moderate,' 'Dissatisfied' and 'Very dissatisfied'. Additional suggestions and comments were incorporated in order to have valid and reliable findings. Subsequently, some of the findings were triangulated with the literature review, which functioned as a reference point for interpretation of the findings.

Findings and Discussion

The target group actively responded to the survey giving a concrete measurement. This section draws on findings of the study. Based on the structure of the questionnaire, the study's findings are divided into three sections.

Personal Background

The first section acquired demographics of the respondents, which included age, education, occupation, income, etc. According to Pasek and Krosnick (2010), the respondent's background information is generally useful in understanding factors that could have been motivations and causes of their behavior. The study can then take steps to reduce undesirable behaviors or encourage desirable behaviors. The information is also helpful in consideration of potential obstacles of the users. A results of the questionnaire are presented in Table 2.

Table 2 Descriptive statistics of socio-economic characteristics of the participants

Item(s)	Range	Frequency	Percentage (%)
Age	Less than 18	6	3.0
	19-30	23	11.5
	31-40	59	29.5
	41-50	87	49.0
	51-60	15	6.0
	More than 60	10	14.0
Education	Below High School	0	0.0
	High School	68	34.0
	College	93	46.5
	University	39	19.5
	Graduate or above	0	0.0
Occupation	Students	29	14.5
	Small business	35	17.5
	Staff of private sector	89	44.5
	Officers of Governmental Sector	33	16.5
	Medical staff	0	0.0
	School/University staff	0	0.0
	Retirement	6	3.0
	Others	8	4.0
Income (per month)	Less Than 15,000 baht	63	31.5
	15,001 - 30,000 Baht	128	64.0
	30,001 – 60,000 Baht	9	4.5
	More than 60,000 Baht	0	0.0

The findings demonstrated that the majority of the respondents (49%) were either 41 - 50 years old, followed by 31 - 40 years old (29.5%). Most of them had an undergraduate degree (46.5%) or a high school diploma (34%). Their occupations varied with 44.5% in staff of private sector, 17.5% working in small businesses, and 16.5% working as governmental officers. Only 14.5% were students, and 4.0% worked in other sectors Their earnings primarily ranged between 15,001 to 30,000 baht per month (64%), which could be considered as low to moderate. Only 4.5% earned between 30,001 – 60,000 Baht. It should be noted that the survey was arranged between April and June 2020 during the COVID 19 pandemic. The situation could have affected the income of the respondents. Their income may have been higher in normal time. In summary, all demographic variables investigated in this section did not show significant differences. Based on the findings, the respondents did not seem to have barriers or obstacles in terms of age, occupation or income to reach the Chao Phraya's riverfront.

2. Personal Tastes and Preferences Toward the River

The study also assumes that if the target groups had good connections with the river, they should be more involved with the river development. Therefore, the participants' personal preferences of the river also are taken into consideration. The second section of the questionnaire was set to determine the respondents' personal preferences of the river, which presumably derived from their previous use and experiences with the river. This section is divided to two parts. First, the study investigated the respondents' previous use and experiences with the river, years of residency next to the river, frequency of river visitation, purpose of riverfront use, and use frequency. Secondly, the study testified the respondents' personal preferences regarding the overall conditions and perception of the river. If the river was perceived to be in good condition, it was though that people would be happy and relaxed by their direct waterfront use. The study also examined the value of the river for Bangkok as there are various opinions on the river. Additionally, the study considered differences between the 20 kilometers of the river passing through Bangkok metropolitan and the study area of 2.67 kilometers. The questionnaire's findings are presented in Table 3, 4, and 5.

According to the survey, distances of the respondents' residences were reported diversely; within 500 meters to 1 kilometer (40.5%), between 1 and 2 kilometers (24%), and more than 2 kilometers (20.5%), and less than 500 meters from the river (16%). Though resulting variously, the majority seemed to reside relatively close to the river. The approximate years of residency spanned from 5-10 years (41.5%), more than 10 years (21.5%), less than 1 year (19%), and between 1 and 5 years (18%). Based on these findings, it was assumed that the respondents typically visited the river by foot. However, interestingly, the study reported that respondents used 4 other methods, which were car (48.5 %), public bus (29.5%), public boat (15.5%%), and motorcycle (6.5%). This finding could be because Bangkok tends to be car-oriented city.

Table 3 Relation of the Participants with the River

Item(s)	Range	Frequency	Percentage (%)
Distance from a residence to the river	Less than 500 Meters	32	16.0
	500 meters - 1 kilometer	80	40.5
	1 - 2 Kilometers	48	24.0
	More than 2 kilometers	39	20.5
Year(s) of residency	Less than 1 year	38	19.0
	1 - 5 years	36	18.0
	5 - 10 years	83	41.5
	More than 10 years	43	21.5
Familiarity of the river	Very low	0	0.0
	Low	0	0.0
	Moderate	29	14.5
	High	137	68.5
	Very high	34	17.0
Method of visitation	By walk	0	0.0
	By bike	0	0.0
	By motorcycle	13	6.5
	By car	97	48.5
	By public bus	59	29.5
	By public boat	31	15.5
	Others	0	0
Purpose of visitation	Passive recreational purpose	15	7.5
	Active recreation purpose	19	9.5
	commutation	53	26.5
	Restaurant/ Commercial purpose	72	36.0
	Festive purpose	17	8.5
	Religious purpose	18	9.0
	Others	6	3.0
Frequency of the river visitation	Less than once a month	34	17.0
	Once a month	42	21.0
	Once a week	25	12.5
	More than once a week	92	46.0
	Everyday	7	3.5

Table 4 How Participants Value the River

Item(s)	Range	Frequency	Percentage (%)
Value of the river to Bangkok	Historical aspect	78	39.0
	Eco-environmental aspect	4	2.0
	Social and festive aspect	17	8.5
	Religious aspect	62	31.0
	Commutation aspect	32	16.0
	Others	7	3.5

Table 5 The Participants' Personal Preferences Toward the River

Issues	Very Satisfied		Satisfied		Moderate/ Acceptable		Dissatisfied		Very Dissatisfied	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
• Water quality of the Chao Phraya river										
- Around Neighborhood	0	0.0	39	19.5	64	32.0	97	48.5	0	0.0
- Citywide	0	0.0	36	18.0	79	39.5	85	42.5	0	0.0
• Perception of the Chao Phraya river										
- Around Neighborhood	0	0.0	40	20.0	76	38.0	84	42.0	0	0.0
- Citywide	0	0.0	52	26.0	69	34.5	79	39.5	0	0.0

Additionally, climate may also be an important key factor as walking or biking around the city under the heat tends be unlikely for Bangkok residents. Regarding their familiarity, as many as 68.5% of respondents were accustomed to the river and 17% of them were very familiar with the river; while, only 29% were not.

According to the findings, respondents seemed to visit the riverfront for various reasons. The majority of them accessed the river for commutation (31%). It could be that traffic congestion is quite an issue for Bangkok residents. This may have increased the demand for river boats and ferries in Bangkok. The consecutive reasons of the river visitation were for restaurant/commercial purposes (31%). From the researcher's observation, dining at a Chao Phraya riverfront restaurant has become fashionable for Bangkok residents. The results seem to match well with the researcher's observation. Other purposes include active recreational purposes (67%) religious purposes (12%), festive purposes (8%), passive recreational purposes (4%), and others (6%). It is noticeable that the percentage of people going for passive or active purposes is relatively low (1% to 2%). It is possible that the number of riverfront recreational places is quite low in the study area. These findings matched the existing land use around the study area provided in Figures 5 and 6. If more riverfront facilities were provided, it is possible that the percentage of uses in the particular type of the facilities could be higher. Regarding frequency of use, 61% of respondents used a waterfront area almost every day and 32% used a waterfront area 1–3 times per week. This meant that about 60% used a waterfront area one or more times per week and 20% used such areas only a couple of times per year. Looking at the findings, even though the river was mostly used for commutation, other results implied that the respondents may have had good connections with the river.

Subsequently, personal preferences toward the river were explored. When asked which facet of the river they most valued, many respondents (78%) mentioned the historical significance of the area. This finding confirms a strong historical link between the Chao Phraya river and the city. Others valued the river for its religious (31%), commutation (16%) and social and festive aspect (8.5%). According to City Population (2019), approximately 94% of Thailand's population is Buddhist. Buddhism is the most important religion among Thais. There are several river-based Buddhist activities that can be done on a regular basis such as releasing fish. This might be a reason for the high percentage of respondents that associated religion with the waterfront area even though there are not many prominent Buddhist temples around the study area.

In terms of water quality, Pollution Control Department (2017) demonstrated that the lower Chao Phraya river is in a fair quality condition and gradually improving.

The report conforms to the results of this study with 48% and 42.5% of people being dissatisfied with the the river's water quality as well as 42% and 39.5% of people having a negative perception of the river. Similar to many big cities in Asia, the major causes of deteriorating water quality in Bangkok are overpopulation, economical, agricultural, and industrial expansion. Whilst positive views with water quality were 32% and 39.5% of moderation and 19.5% and 18% of satisfaction and the approval of river's perception with 38% and 34.5% of moderation and 20% and 26% of satisfaction. This result of the study may provide a reference for future research on the water quality of the Chao Phraya River.

In summary, even though views of water quality and perception of the river were not positive, respondents did seem to have a good relationship with the riverfront. Therefore, the study's results toward riverfront uses in the following section can be reliable.

3. Attitudes toward Present Riverfront Uses along the River

The last section of the questionnaire was devoted to questions regarding attitudes toward the uses along the river including accessibility, activities, and the degree of their involvement with the river. The study examined the coherences of the historical buildings and new buildings along the river. Same as the previous section, the set of attributes was investigated in two contexts. Opinions regarding the riverfront management such as proper riverfront guidelines, and communications between riverfront communities and stakeholders were also explored. At the end of this section, the study inquired as to how the riverfront should be improved.

Table 6 Attitudes toward Present Riverfront Uses along the River

Issues	Very Satisfied		Satisfied		Moderate		Dissatisfied		Very Dissatisfied	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
· Number of accesses to the river										
- Around Neighborhood	0	0.0	0	0.0	79	39.5	121	60.5	0.	0.0
- Citywide	0	0.0	0	0.0	61	30.5	132	66.0	0	0.0
· Number of Recreational facilities										
- Around Neighborhood	0	0.0	35	17.5	76	38.0	89	44.5	3	1.5
- Citywide	0	0.0	36	18.0	73	36.5	91	45.5	4	2.0
· Activity along the Chao Phraya river										
- Around Neighborhood	0	0.0	58	29.0	63	31.5	79	39.5	6	3.0
- Citywide	0	0.0	61	30.5	57	28.5	82	41.0	0	0.0
· Development along the Chao Phraya river										
- Around Neighborhood	0	0.0	52	26.0	45	22.5	91	45.5	12	0.0
- Citywide	0	0.0	44	22.0	53	26.5	94	47.0	9	0.0
· Coherences between the old and the new development										
- Around Neighborhood	0	0.0	45	22.5	76	38.0	66	33.0	13	14.0
- Citywide	0	0.0	63	31.5	71	35.5	64	32.0	2	2.5
· Management of riverfront area	0	0.0	34	17.0	60	30.9	79	39.5	27	0.0
· Riverfront development guidelines	0	0.0	32	16.0	75	37.5	93	46.5	0	0.0

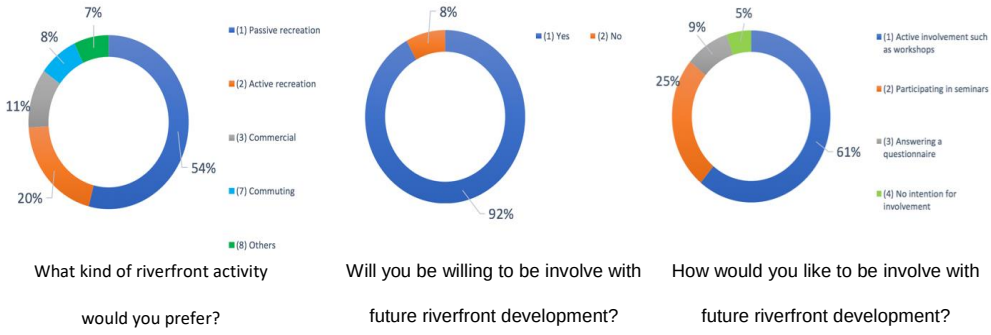

Figure 6 Results of the questionnaire

With a number of riverfront activities in the study area and 1-5 kilometer distance from Bangkok's historic center (Figures 4 and 5), positive feedback was expected. However, the results as demonstrated in Table 6 were negative in most surveyed factors of both concerned scales including number of accesses to the river (60.5% and 66.0%), number of recreational facilities (44.5% and 45.5%), activities (39.5% and 41.0%), and development along the river (45.5% and 47.0%). A better outcome was found in coherency between the old and the new development with 38.0% and 35.0% of moderation and 22.5% and 31.5% satisfaction. Only 33.0% and 32.0% were reported with dissatisfaction. For management and guidelines, the results showed disagreement with 39.5% and 46.5% correspondingly. Generally speaking, riverfront residents were not happy. It is clear that the Chao Phraya riverfront requires improvement.

The survey also explored preferred riverfront development. As shown in Figure 6, the survey respondents reported a variety of riverfront development including passive recreation (64.0%), active recreation (20.0%), commercial (12%), commutation (4%) and others (2%). Although the preferred developments are not new, results demonstrated the demand for development. Additionally, the study asked if residents wanted to be involved with the future development of the riverfront. As many as 92% of respondents were willing to be involved. Forms of involvement included active activities such as workshops (62%), seminars (25%), answering survey questionnaires (9%), and other activities (5%).

Conclusion

By testing a number of variables and attributes, this study has brought a holistic view on attitudes toward the overall development along the Chao Phraya River. Interestingly, the outcomes of the two scales of concerns were utterly coherent. It is possible that land use patterns and characters of the focused area are not strikingly

different from other parts of the river. The importance of the Chao Phraya river for Bangkok's residents was confirmed. Nevertheless, the residents' disapproval with the overall development along the Chao Phraya River was substantial. With this displeasure, the riverfront cannot effectively benefit Bangkok's residents. Potential ideas of new riverfront development were highlighted in the study. Recognizing the river's significance to Bangkok's history and enhancing the contextual coherence of the new and the old development is thus strongly recommended.

Since the Chao Phraya for All project in 2014, there have been several organizations such as Friends of Chao Phraya and others that have organized to help protect the river. However, based on the study's findings, the Chao Phraya riverfront still needs improvement. The pressure is on decision makers and local authorities to consider a long-term strategy to create alternative models of development and management that enable a viable Chao Phraya riverfront. They must recognize the vital role of coordination between various stakeholders in order to ensure success of future riverfront development. Further research is also needed to identify factors and processes that facilitate implementation of the riverfront improvement plan. The Chao Phraya riverfront can then fully provide Bangkok's residents recreational activity opportunities, which can enhance their physical and mental well-being.

References

Ahamed-Broadhurst & Kathleen E. (2017). *Understanding Canals in Bangkok Using Historic Maps and GIS*. Master of Liberal Arts in Extension Studies, Harvard University. Retrieved from http://nrs.harvard.edu/urn-3:HUL.InstRepos:37736775

Baania. (2020). *Land Value*. Retrieved from https://www.baania.com/th/project/ àÈÃÉ° ÊÔÃÔ-¨ÃÑ-Ï»Ôè¹à¡ÅéÒ-2-5e79bf5e944232001a5d4bc3

Bangkok GIS website. (2020). GIS Data. Retrieved from http://www.bangkokgis.com/modules.php?m=download_shapefile

Bangkok GIS website. (2020).*Population Density*. Retrieved from http://www.bangkokgis.com/gis_information/population/

Bangkok Metropolitan Administration. (1999). *Bangkok's Building Control Act*. Retrieved from https://www.dpt.go.th/wan/lawdpt/data/02/116_58_050742_19.pdf

City Population. (2019). *Bangkok metropolitan city population. City population Online.* Retrieved from https://www.citypopulation.de/php/thailand-prov-admin.php?adm1id=B

Cutts, B. B., Darby, K. J., Boone, C. G. & Brewis, A. (2009). City structure, obesity, and environmental justice: an integrated analysis of physical and social barriers to walkable streets and park access. *Social Science Medical Journal*, *69*(9). Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/19751959

Department of Provincial Administration. (2018). *Statistic Service*. Retrieved from https://www.dopa.go.th/public_service/service1

Department Pollution Control, Ministry of Natural Resources and Environment. (n.d.). State of Water Pollution 2003. *Thailand State of Pollution Report.* Retrieved from http://www.pcd.go.th

Encyclopedia Britannica. (2020). *Rama I*. Chicaco, IL: Author. Retrieved from https://www.britannica.com/biography/Rama-I

Garvin, A. G. (2000). *Parks, recreation, and open space: a twenty- first century agenda.* Chicago: IL: American Planning Association.

Jansuttipan, M. (2016). *Why time is running out on the fight for the Chao Phraya's future? Bangkok Asia City Online.* Retrieved from https://bk.asia-city.com/city-living/news/time-running-out-chao-phraya-river

Kellert, S. (2005). *Building for Life: Designing and Understanding the Human-Nature Connection.* Washington, DC: Island Press.

Krejcie, R. V. & Morgan, D. W. (1970). Determining Sample Size for Research Activities. *Educational and Psychological Measurement,* 30(3), 607-610.

Ministry of Culture. (2015). *King Taksin Day.* Retrieved from https://www.m-culture.go.th/en/article_view.php?nid=30

Na Ayutthaya, K. (2003). *Portraits of Bangkok 220 Years*. Bangkok, Thailand: Department of City Planning, Bangkok Metropolitan Administration.

Noomsook, W. (2019). Primary Messages System and Cultural Landscape: Bangkok Noi Mosque Community. *Landscape Architecture Journal, 1*(1), 65-86.

Pasek, J. & Krosnick, J. A. (2010). *Optimizing Survey Questionnaire Design in Political Science: Insights from Psychology.* Retrieved from https://calgara.github.io/Pol157_Spring2019/Pasek%20&%20Krosnick%202010.pdf

Pollution Control Department. (2017). *Thailand State of Pollution Report 2017*. Retrieved from http://www.oic.go.th/FILEWEB/CABINFOCENTER3/DRAWER056/GENERAL/DATA0001/00001279.PDF.

Rofé, Y., Feierstein, G. & Zarchin, I. (2012). *Quantity and quality of public open spaces in Israel.* September 2012 Urban Design and Planning 165(DP3):177. DOI: 10.1680/udap.11.00021.

Royal Thai Embassy. (2020). *231st Anniversary of Rattanakosin Period*. Retrieved from https://www.thaiembassy.sg/press_media/news-highlights/231st-anniversary-of-the-rattanakosin-period

Takaya, Y. (1975). An Ecological Interpretation of Thai History. *Journal of Southeast Asian Studies, 6*(2), 190-195.

Tengkaoprasert, R. & Sawangjaroen, C. (2018). Living with Water – Decoding the Local Ways of Living in the Central Region Basin of Thailand. *Journal of Architectural/Planning Research and Studies*, *15*(2), 91-106. Retrieved from https://so02.tci-thaijo.org/index.php/jars/article/view/167934

Tröger, E. (2015). *Density and Atmosphere On Factors relating to Building Density in the European City.* Retrieved from https://www.degruyter.com/view/title/305209

Vongvisessomjai, S. (2005). Chao Phraya Delta: Paddy Field Irrigation Area in Tidal Deposit. *Proceedings of the 56th International Executive Council of ICID, 105-120.* Retrieved from https://dsignsomething.com/2017/11/05/8