

# A Traditional Community in the Chao Phraya River Basin II: Influence of Water Circulation on the Traditional Living Culture according to the Settlement Pattern

Patiphol Yodsurang<sup>1</sup> & Uekita Yasufumi<sup>1</sup>

<sup>1</sup> World Cultural Heritage Studies, Graduate School of Comprehensive Human Sciences, University of Tsukuba, Japan

Correspondence: Patiphol Yodsurang, World Cultural Heritage Studies, Graduate School of Comprehensive Human Sciences, University of Tsukuba, Kasuga Praza, Kasuga 1-8-3, Tsukuba City, 305-0821 Japan. Tel: 81-29-853-7498. E-mail: d14\_yodsurang@heritage.tsukuba.ac.jp

Received: November 30, 2015    Accepted: December 10, 2015    Online Published: December 18, 2015

doi:10.5539/ach.v8n1p112

URL: <http://dx.doi.org/10.5539/ach.v8n1p112>

## Abstract

The remaining traditional waterfront community in the Chao Phraya River Basin demonstrates human adaptability towards modern conditions. Everyday practice in the traditional community complex is about living in harmony with all other aspects of the system to which it belongs. However, the intensity and speed of such changes are challenging these complex urban environments in contemporary society. With high dynamicity, this important amphibious lifestyle is gradually disappearing.

This study is based on a qualitative approach, to examine the general pattern of amphibious livelihoods from past to present, including changes and processes of adaptability to declination. Investigation was implemented by reviewing secondary data collection and oral history and collective memory by the interview method.

The results found that water circulation patterns have exerted influence on traditional daily life over several decades: river overflows in paddy villages, irrigation network of ditches in orchard villages, brackish water circulation in estuarine agricultural villages, wetland fishery in coastal fishing villages, north-south corridor river trading in riverport towns, east-west canal network trading in canal trading villages, and surface water livelihoods in the raft community.

**Keywords:** waterfront communities, cultural pattern, living culture, Chao Phraya River Basin

## 1. Introduction

Water is life, and culture is the essence of life. It has supported rich biodiversity and provided cultural services to communities. The water-based communities are considered as cultural manifestations of water importance (Papayannis & Pritchard, 2008). The waterfront settlements, with their living culture, largely remain in Southeast Asian countries. The settlements have constantly adapted to environmental and social transition from past to present cultures (UNESCO, 2011). Community vernacular architecture is always changing to suit the current socio-economic environment. New functions respond to modern activities, expressing the ability of man to take charge of shaping his environment by his great capacity for adaptation, appropriation, and creativity (Guillaud, 2014).

People have gradually adapted their living spaces to meet the needs of life and way of living. This has indeed affected original spaces, but the identity of a place still maintains (Kwansuwan, 2014). Thus, the cultural embodiment of vernacular architecture involves the requirement of users at the time of building and how these may have been adapted to suit changing needs (Oliver, 1987).

In the Chao Phraya River Basin, diversity of the agricultural landscape and cultural activities reveal the complexity of traditional waterfront communities. Everyday life in the traditional community complex is about being in harmony with all other aspects of the system to which it belongs. The deep traditional living pattern provides some useful reference, while looking towards the sustainable development of society as a whole in paying attention to its ancestors.

The remaining community demonstrates human adaptability to modern conditions. However, the intensity and speed of such changes are challenging complex urban environments in contemporary society. With high dynamicity, this important amphibious lifestyle is gradually changing due to rapid economic growth.

This study aims to provide significance to the cultural human living pattern in the Chao Phraya River Basin settlement. Based on contextual characteristics of the waterfront community complex, this study reveals the living patterns, influence, and declination through analyzing the relationship between settlement patterns, way of life, and environment.

## 2. Research Method

The methodology is based on a qualitative approach, in order to examine the general pattern of amphibious livelihoods from past to present, including changes and processes of adaptability/declination. The analysis is intended to reveal contextual characteristics and cultural patterns of the waterfront community, geographical features, agriculture and fishing production activity, and lifestyle changes as a result of modernization. The research procedure uses two investigative steps:

*2.1 Reviewing historical documents, past and present legal measures, previous research studies, and criticisms in order to find a common ground for the existence of the waterfront community complex*

*2.2 Collecting oral history and collective memory through the interview and observation method to discover various opinions, as well as trends and latest methods used in the conservation of historic wooden structures and vernacular heritage through its living culture*

Traditional waterfront communities in the Chao Phraya River Basin were selected for the case study to grasp the complexity of the indigenous daily lives of an amphibious culture. From the archives of 138 traditional waterfront communities, the traditional waterfront community in the Chao Phraya River Basin was classified into seven types of cluster based on common preferences. These consist of a paddy village, orchard village, estuarine agricultural village, coastal fishing village, riverport town, canal trading village, and raft community (Yodsurang, Miki, & Uekita, 2015). These clusters are representative of human settlements in the river basin which have been influenced by diversity of the cultural landscape and agricultural activities.

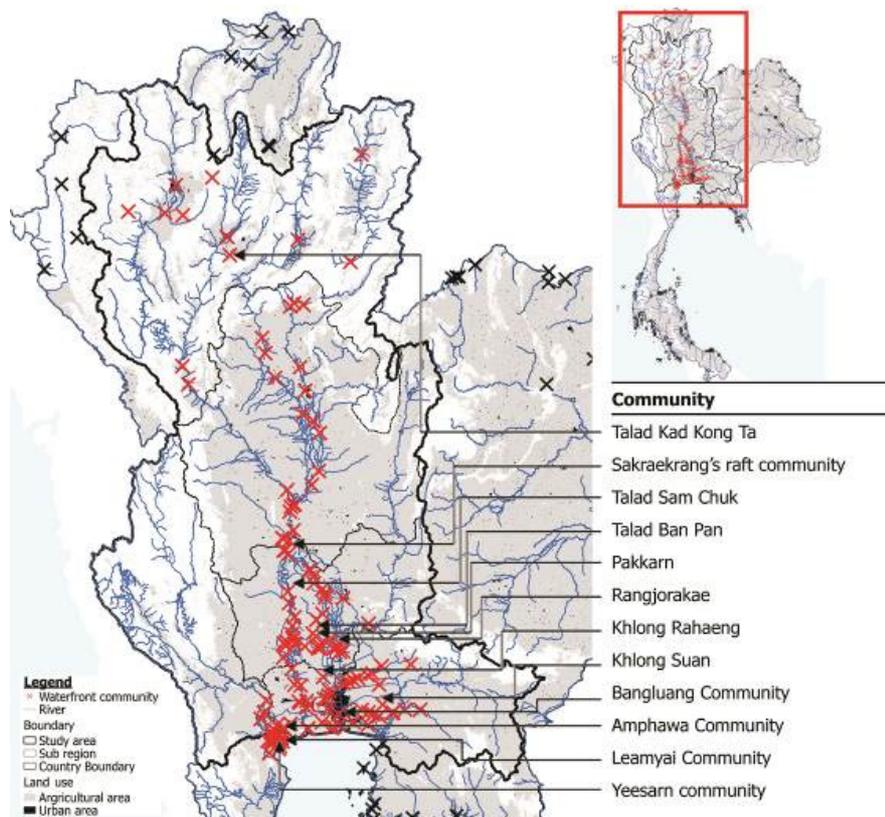


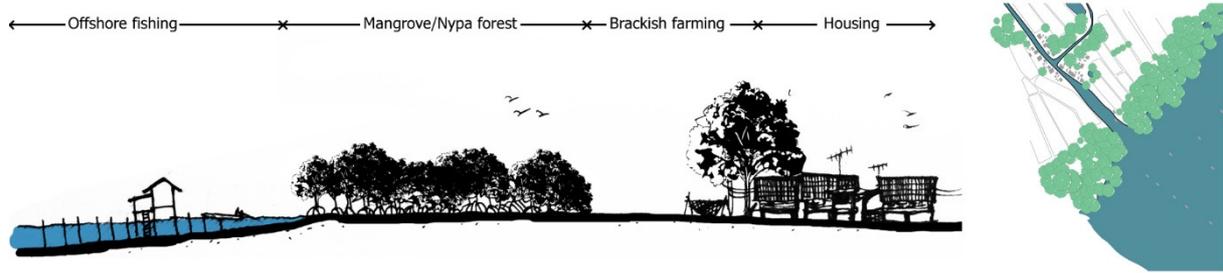
Figure 1. Location of selected case study

An in-depth field investigation survey was carried out using seven sample clusters throughout the river basin. The critical case sampling method was used for the case study selection procedure since it was likely to provide the most informative and illustrative sample. The matching case selection was based on a study by Kwansuwan (2014) which mentions the spatial configuration of a typical traditional village, revealing the association between agricultural area, village, and waterbody. The sampling selection was screened for either an actual or probable match in the traditional conditions, and twelve communities were included as a result (Figure 1, Table 1). Talad Kad Kong Ta (Lampang), Talad Ban Pan (Ayutthaya), Talad Sam Chuk (Suphanburi), Pakkarn community (Ayutthaya), Rangjorakae community (Ayutthaya), Sakaekrang River’s raft community (Uthai Thani), Rahaeng Market (Nakhon Pathom), Klong Suan Market (Samut Prakan and Chacheongsao), Yeearn community (Samut Songkhram), Bangluang (Bangkok), Amphawa (Samut Songkhram), and Leamyai (Samut Songkhram).

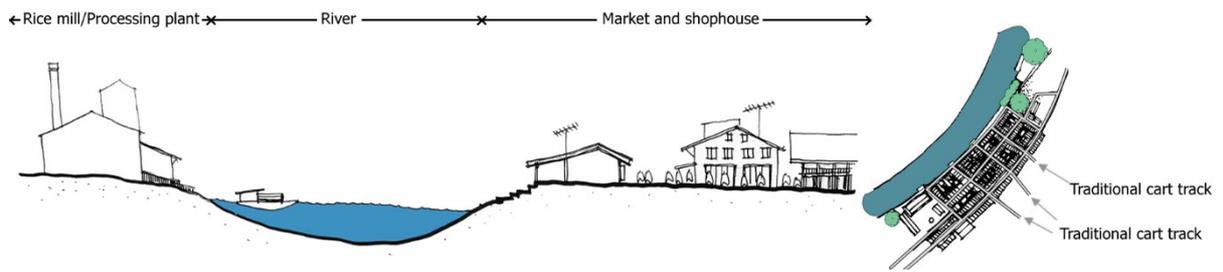
Table 1. Twelve case studies and their typical features

Cluster	n	ID	Community	Found	Current use
Paddy village	37	A-1	Pakkarn	Ayutthaya period (over 250 years)	Rice and other crop-producing community
		A-2	Rangjorakae	Ayutthaya period (over 250 years)	Rice and other crop-producing community
Orchard village	21	B-1	Amphawa community	Early Rattanakosin period (Approx 200 years)	Weekend market, tourist attraction, agricultural community
		B-2	Bangluang community	Early Rattanakosin period (Approx 200 years)	High density residential area, tourist attraction
Estuarine agricultural village	5	C-1	Yeearn community	1703	Estuarine food and mangrove product-producing community, residential area, tourist attraction

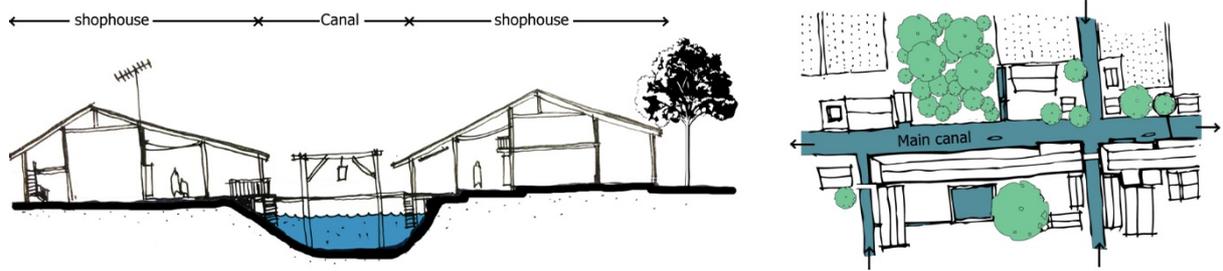
Cluster	n	ID	Community	Found	Current use
Fishing village	3	D-1	Leamyai community	80–100 years	Offshore food and mangrove product-producing community



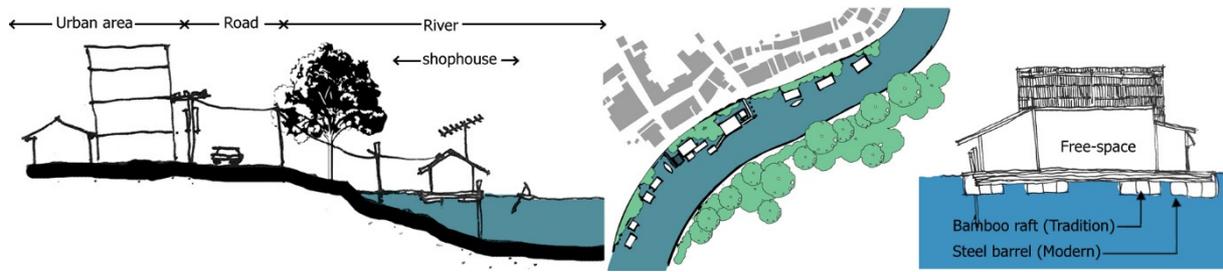
Riverport town	48	E-1	Talad Kad Kong Ta	1877	shopping street, weekend market, residential, tourist attraction
		E-2	Talad Ban Pan	before 1876	Urban market
		E-3	Talad Sam Chuk	before 1896	Local market, weekend market, tourist attraction



Canal trading village	20	F-1	Klong Suan	1868–1910	Weekend market, tourist attraction
		F-2	Klong Rahaeng	1868–1910	Weekend market, tourist attraction



Raft community	4	G-1	Sakraekrang's raft community	before 1605 (over 400 years)	Residential unit
----------------	---	-----	------------------------------	------------------------------	------------------



### 3. Traditional Environment and Livelihoods

Since agriculture dominated most parts of the river basin, agricultural communities were scattered, often connected to the irrigation network system. Adul Wichiencharoen (1993) mentioned the traditional livelihoods of Thai water-related activities in “The Environment and Culture of Thailand”:

*... The Thais lived on fertile land, and the country in the good old days was under populated. The climate was genial. The village was a social system, with at least one Buddhist monastery—a self-contained community capable of satisfying its own economic, social, and spiritual needs. The requirements for supporting life were simple and easily obtained. Rice, fish, and vegetables were plentiful. People lived amicably together. They worked and helped one another in times of need. There was plenty of time left after work for the people to enjoy their leisure life together. The village monastery was the community center for social gatherings, festivities, and ceremonial functions all year round...*

This scene depicted ideal Thai life and a cultural pattern assimilated with nature. The waterfront community along the river contains a significant influence of tradition in the daily lives of an amphibious culture. However, the diversity of a waterfront community complex goes beyond this point to something more complicated but interconnected.

A wide variety of topographical features associated with the cultural landscape exerted influence on the indigenous day-to-day living behavior. The mountainous region of the upper basin was covered by forest. A river runs through a small and narrow floodplain surrounded by mountain forest where the indigenous population made a living in the past. Following modernization, intensive forestry and remote trading has become very popular, replacing the indigenous livelihood over the past few decades.

The central plains upstream and the upper delta were dominated by the paddy field landscape. Rice cultivation and its community suited the soil fertility and natural irrigation systems. Houses and housing adapted physically and culturally with contemporary agricultural conditions over time. Associations between rice field, village, and waterbodies demonstrated how local people lived with nature and climatic transformation. However, in the lower delta region, diverse socio-economic activities were intensively clustered. The large variety of plantations, vegetation, fishing, and farming were a result of plentiful water circulation and ecosystems. Communities with traditional livelihoods were being well maintained by their living culture and remained functional.

#### 3.1 Agricultural Villages

Those cultural landscapes associated with agricultural activities were represented by agricultural villages, as testimony to the human and structural adaptation of the surrounding environment of the Chao Phraya River Basin. A unique cultural pattern illustrates the settlement characteristics.

##### 3.1.1 Paddy Village

The indigenous people of the Chao Phraya River Basin were predominantly reliant on rice cultivation, covering over half of the total land use. However, the village and associated structures were represented by modest cultural practices related to their agricultural activities. The surrounding environment exerted influence over settlements and livelihoods, not religions or beliefs (Muadthong, 2005).



Figure 2. Group of housing in Rangjorakae community



Figure 3. Traditional house in Pakkarn community

The remote Pakkarn (Figure 2) and Rangjorakae communities (Figure 3) in Ayutthaya Province provide an outstanding example of the living practices of paddy people. Communities were located on floodplains which were seasonally under water. This phenomenon created a unique characteristic where both tangible and intangible structures responded to flooding conditions. The flooding season from September to November with water depths of between 80–120 centimeters assists traditional rice growing (Sunsuwan, 2013). Water overflowed from the river through to the space underneath the house, spreading across the field. People were living in a world almost entirely submerged by water. Over these three months, life relied more on boats and fishing. The activities of daily life moved to the upper floor which was raised above the highest water level.

Harvesting started in early December after the water level had decreased and the rice burst forth into kernels. Post-harvested grain might contain a lot of moisture and dirt courts were used to dry it off. This created a large open space in between a group of houses and the rice field, and was one of the most important features of the paddy village, representing a plentiful, locally grown, healthy and lively community culture. Rice products were collected by boat and then transported and processed at market communities.

In the 1860s, agricultural reformation created a significant impact on the frontier. The Bowring Treaty forced the country to lift all barriers on rice trade, emphasizing the potential for export. The rapidly rising volume of exports was turning the traditional rice culture into a commercial production system (RRAFFA, 2007). Rice became the major export crop while expanding the land for growing rice in accordance with canal development.

A monoculture-type export structure began in the 1960s (Urrutia and Yukawa, 1988). Since the new road system has reached rural villages, the demand and supply of rice crops have significantly increased. Villages producing rice crops evolved towards intensive farming, using mostly wage labor for cultivation. Traditional methods have been replaced by new machinery and technology. However, an environmental problem caused by modern agricultural waste has gradually occurred. Pesticide and fertilizer waste enters the surface water, and rivers then become polluted, turning into undesirable areas.

Meanwhile, water requirements have increased due to rice production requirements, and new irrigation systems have been provided. Dam and water gates were constructed on existing canals/rivers to control water flow in the dry season. As a result, water was unable to flow naturally. This has created a consequent impact on fishing potential as migratory fish cannot or have difficulty in getting across the water gate; fishing folk have since found it harder to survive.

However, agriculture has been in serious trouble since the 1980s (Siamwalla, 1996). It has been demoted from an engine of growth due to the lack of labor supply which has shifted concentration towards the industrial and service sectors (Suwannarat, 2011). Massive migration has led to the abandonment of agricultural areas. The working generation moved away, leaving older people and children behind. Indeed, traditional and old vernacular houses lay in ruins since the durability of materials reached its limit due to lack of continuous care. It seems easier to build new houses than to repair broken ones which need more money and time spent on them, especially with the shortage of labor. Traditional communities have lost their adaptability towards modern requirements and threaten to disappear.

### 3.1.2 Orchard village

The unique socio-economic activities in the orchard village complex, consisting of the isolated orchard with the local-made processing plant, marketplace, floating market, and traditional housing, were completed within a canal system. Agricultural and post-processed agricultural products were usually self-marketed. The orchard villages were scattered in the lower delta, located in brackish water territory. Agriculture and water management relied extensively on natural water circulation.

An outstanding irrigation network system connected the orchard ditches to canals and the larger river system. A branching network of ditches provided the main water supply to the inner land (Palopakorn, 2010). Individual orchard ditches joined parts together. Water was able to flow into the orchard ditches using high tide and low tide water circulation. As water ebbs and flows twice a day, brackish water merges with fresh water, and therefore people managed to collect fresh water for their household and brackish water for agricultural purposes (Silapacharanan, 2007).

The Amphawa community (Figure 4) in Samut Songkhram Province retained its integrity, even though some people were faced with abandonment and uncontrolled urbanization problems. Traditional settlements and waterfront livelihoods accommodating brackish water circulation were commonly seen. Processing plants, including those for coconut and palm sugar, still play an important role in the local economy, even though they have subsequently turned into nostalgic tourist destinations.

The only example remaining in the city of Bangkok is the Bangluang community (Figure 5). It was a unique community along the old Chao Phraya River before the shortcut was created. The settlement represented a waterfront livelihood within the associated natural environment. Housing was aligned along the river strip, alternated by orchards, green spaces, and religious structures. However, since the change in socio-economic activities as a result of rapid economic growth and city expansion, orchards and green spaces have gradually decreased and turned into new development projects. The canal network system may still be seen but has been left unfunctionable. However, evidence of Bangkok's past still remains in tangible structures. The relationship between social spaces, pedestrians, vistas, social activities, and water-based environments created the fundamental city structure, making it unique (Wongtimarat, 2003).

Land transformation has consequently impacted on the water flow changes in the orchard farm land. The water distribution network used in orchards was hierarchical, resulting in the failure of a whole distribution system if any system member withdraws. While urban development gradually continued, most of the orchards and agricultural lands were replaced by road, housing estates, resorts, and even parking spaces. As a result, this increase in the impermeable water area has led to difficulty for the network of ditches flowing into the inner land. Slow or stagnant water flow has created pollution and flooding. Irrigation systems have been allowed to deteriorate, leading to subsequent abandonment.



Figure 4. Processing plant in the orchard of Amphawa



Figure 5. Remaining market of the orchard village of Bangkok, Bangluang community

### 3.1.3 Estuarine Agricultural Villages

Estuarine agricultural villages along the coastal region were influenced by seawater interpenetration, covering larger areas along the Gulf of Thailand coastline. The associated coastal vegetation of the settlement, such as mangrove forest, and *Nypa* palm, was extremely important to the indigenous environment. Mangrove forest remains important since it has an indirect impact on local livelihoods. Mangrove forest products were traditionally used for construction frameworks, while *Nypa* palm was commonly used for roof thatching and wall partitioning. In addition, mangrove charcoal and firewood remain an important source of fuel in the lower delta. The Yeesarn community (Figure 6) in Samut Songkhram Province maintains a relationship between kinship, living conditions, and the settlement (Tragoonram, 2009). The single-centric community has been built on the uplands of coastal wetlands and mangrove swamps. The settlement is clustered around the Buddhist temple, surrounded by agricultural land and mangrove forest. The areas connected communities to remote farms and forest by natural canals (Figure 7).

The brackish water agricultural activities including shrimp, fish, and coconut farms, as well as salt paddy, played an important role in supporting the local economy. However, intensive farming has produced both direct and indirect impacts on mangrove and other coastal ecosystems. In many cases, mangrove forests have been destroyed in exchange for pond spaces (Plathong & Plathong, 2004). The remaining residents were the older generation and the community faced depopulation issues. Older people were reliant on traditional fishing and vegetation at a moderate level with sufficient capital and labor. Besides, most of the old houses were left abandoned and remained in a ruinous condition due to lack of maintenance.



Figure 6. Yeesarn community

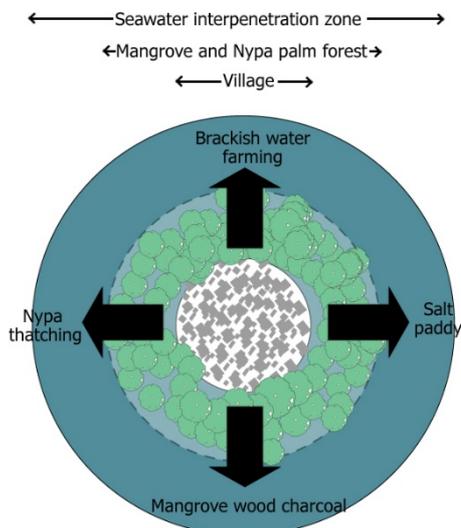


Figure 7. Conceptual diagram showing association between village, agricultural land and forest in the estuarine agricultural village

### 3.1.4 Coastal Fishing Village

The coastal fishing village demonstrated an outstanding culture-based fishery in the related offshore area. The village, with its offshore fishing shelter (Figure 8) was a prominent tangible structure representing a plentiful sea resource. Indigenous people relied on fishing and fish processing, which were important cultural modes of living in the wetlands. Since wetland resources are very sensitive to changes in the global environment, the lifestyles of the indigenous people were under threat and vulnerable to fluctuations in traditional socio-economic activities.

The Leamyai community (Figure 9) in Samut Songkhram Province was a small fishing village located on the estuarine of the Meaklong River. Vernacular architecture and its associated environment was a result of interaction between man and nature. Natural resources from mangrove products were commonly used as building construction materials. Mangrove wood was used as a construction framework, covered by Nypa shingles for roofing and partitioning. Offshore fishing was the traditional and primary economic resource of the local dweller, while coconut farming and other brackish water farming provided supplementary living. However, as with the other villages, the working generation moved towards the industrial sector for economic reasons. However, the socio-cultural conditions of the Leamyai community did not change that much, and ecological, social, and cultural resources still remain in good condition (Usupharat, 2013).



Figure 8. Krateng, offshore fishing shelter



Figure 9. Leamyai community

In the waterfront and water-related communities, fishing for a living was mandatory. Traditional methods and instruments are still being used today. However, overfishing and illegal fishing practices using modern lighted nets and fishing traps has caused indiscriminate trapping of non-targeted fish and young animals. Since the EU issued a “yellow card” warning on Thailand’s illegal fishing activities, the Thai junta has promulgated article 44 of the interim charter, which legalized the junta’s hard order, to deal with illegal fishing (Ganjanakhundee, 2015). However, rigid law enforcement on the fishing industry opposes traditional fishing methods and faces a predicament because traditional fishing traps (subsistence fishing) is also prohibited. The banned traditional fishing traps are the “Ai Ngo” trap, “Sai Nang” trap, and “Pong Pang” stow nets because of their use of the lighted net trap and overfishing which creates an environmental hazard (“Knowing Pong Pang”, 2015).

### 3.2 The Market Communities

Chinese immigrants have contributed much to the development of market communities, since the indigenous people were not proficient in trading and traveling up and down the river. The market communities helped to connect agricultural villages to the river network system by their economic activities. Traditional market communities emerged on the transportation route junction; both on land to water and water to water trading routes.

The waterfront market and water trading were first mentioned in the Ayutthaya period (Pongsripean, 2007) and became popular in the early Rattanakosin (Jiwakul, 1982) until reaching their peak after 1855 during agricultural transformation, particularly in the Central Region (Natsupa, 2002). They contributed much to the promotion and distribution of agricultural products from the Chao Phraya River Basin, such as rice, forestry products, tropical fruits, spices, etc.

However, there is a classic threat to the historical area from new urban areas which have grown along the modern communication axis. In commercial communities, the new towns, along with their infrastructure and modern facilities, have attracted new activities to the historical area. A number of roadside communities have formed to provide somewhere for people to shop. Roadside markets and convenience stores have been established, coming into direct competition with the old riverfront markets. The riverfront centers soon became obsolete due to their distance from the roadside markets (Sriwichien, Keeratiboorana, and Soungsaweng, 2015) and have been gradually abandoned and remain unfunctionable.

As a consequence of economic center shifting, declination has led to the closure of shops and people have had to look for work elsewhere. Besides, the problems of poor housing conditions and inadequate infrastructure made the communities uncompetitive in local markets. The units were fundamentally rental shophouses, thus it was not easy to be able to customize, remodel, or even change the layout. Accordingly, the existing structures and open spaces were difficult to adapt to the modern trade and market activities.

#### 3.2.1 Riverport Town

The riverport town was an urban commercial distribution/collection center for the agricultural products of the neighboring village. The settlement was scattered along the main river running north-south of the basin, commonly found at the point of convergence where the traditional cart track meets the river (Figure 6). Thus, there were both land and waterfront markets.



Figure 10. Kongta community



Figure 11. Banpan market



Figure 12. Samchuck market

The historical Kad Kong Ta community (Figure 10) in the Northern Region of the Lampang Province was located in the middle of the Lampang Basin, surrounded by mountain forest. Kad Kong Ta (aka Chinese market) literally means river road market, and was one of the most important port towns of the Northern Region. In the past, cargo from Bangkok and the Central Region was unloaded here before being shipped to the neighboring and mountainous areas.

Besides, during the nineteenth century Kad Kong Ta was very well-known as a teakwood trading center, which made a substantial contribution to Lampang's economic development, and attracted people from near and far, including Burmese, Tai Yai, Chinese, and British. As a result, the settlement turned into a multicultural community (Buranaart, 2014) with its remaining structures being represented by their ethnic origin, prosperity, and creativity.

However, the age of declination started during World War II, particularly in the commercial market. Besides local market stagnation, the war affected immigrants who had previously contributed to commercial development. This is especially true in Kad Kong Ta, where the enemy residents, including British, American, and Dutch were forced to evacuate and their concessions in properties such as forestry businesses were cancelled and taken over by the government for a short period during the war. However, the Chinese and Burmese were not treated as enemies, and thus they were able to stay and operate their businesses as usual (Uthongsap, 2012).

The consequences of the war have brought about several changes to society. Subsequently, even though previous enemy properties were returned to private ownership, they were not attractive enough to bring the business back. However, in these unrivalled conditions, Chinese businesses flourished and were more active and vibrant than before.

The Ban Pan Market (Figure 11) in Ayutthaya Province sat on the plentiful rice cultivation area of the Chao Phraya River Basin. The community was surrounded by numerous paddy villages, making it an important rice trading center for the Central Region. Rice and saw mills were the key to economic growth and drew people to the area.

The earlier Ban Pan Market was located at a mooring dock for Chinese trading raft. Until its peak, the river was crowded with raft and boat houses, resulting in more people relocating onto land and permanently settling in shophouses. As a consequence, the market complex of shophouses was clustered close to the river, gradually expanding outwards. However, with the advent of modern trade and transportation, characteristic of raft houses, shophouses, and way of life changed. On the other hand, the architecture and transformation of the community were reflected in a consistent adjustment of the way of life (Klaichom & Pinijworasin, 2013).

Sam Chuk Market (Figure 12) in the Suphan Buri Province was a wooden shophouse market cluster, and was previously the trading center on the bank of the Tha Chin River. The settlement evolved over time, from a local market into an important, more dynamic, commercial community (Jampanil, 2007).

The settlement emerged as a local market and hawker center as it formed the junction between land trading routes to the Tha Chin River. In the beginning, Chinese people helped the community to achieve urbanization. Rental shophouses were built in response to the growth in trading activities of the newcomer population. The community reached its peak during modernization in the 1960s. The arrival of modern rice and sugar mills generated local trading/financing activities and created a local bursting economy. This made Sam Chuk Market a prosperous and successful community in the Central Region.

However, during the great urban expansion and development of infrastructure in the 1980s, roads became a crucial mode of transportation and watersides were left unused. The local economy was dominated by modern trade and culture. New town centers moved to the road axis. Traditional shophouses and market places were left abandoned and unfunctionable. As a result, this period created stagnation in the Sam Chuk Market and minor changes to socio-livelihoods. However, the market has since regained its popularity due to the boom in nostalgia tourism after the 2000s. Historic shophouses, local products, and traditional livelihoods fulfilled the requirements for a new tourism approach. Thus, the local economy is bursting once again, while retaining its traditional structure.

### 3.2.2 Canal Trading Village

The canal trading village was a smaller trading center in the peri-urban area on the east-west canal network of the lower delta. During and after agricultural reformation as a result of the Bowring Treaty, the man-made canals developed substantially and expanded towards the agricultural frontier from Bangkok to neighboring regions. New canals reached remote areas, providing off season farming possibilities. As a result, new developed land, particularly rice fields, became prosperous as the new breadbasket of the Central Region, creating an easier connection to Bangkok and other urban areas. The trading center settlement was located at the point where several canals crossed. New water transportation and irrigation systems have helped much in achieving global development.



Figure 13. Klongsuan market



Figure 14. Rahaeng market

Klong Suan Market (Figure 13) was located in the Samut Prakan and Chachoengsao Provinces, along a man-made canal on the east canal network, where there was a strategic canal during the Thai-Vietnam war in the 1840s. The canal was extended once again to the Bang Pakong River in the 1880s and the Chinese coolie was employed as the main labor force. The new waterside was claimed for agriculture and housing development by aristocrats. Soon after and during the new canal construction, Thai, Chinese, Muslim, Mon, and Khmer people settled along the way and made a living (Preecha, 2008). Thus, they began trading and turning the area into a commercial hub for the agricultural and agro-industrial products of the canal network. A combination of Thai-Chinese culture created a unique architecture, coinciding with the cultural landscape.

Another important canal trading village located on the west canal network was Rahaeng Market (Figure 14) in the Nakhon Pathom Province. The Chinese settlement was built as wooden shophouses along both sides of the canal. Both water and rail transportation contributed to Rahaeng's prosperous past. During this period, the canal network provided the mode of transportation, while rail travel attracted a mass of people to Rahaeng as the last stop on the Bangkok-Bangbuathong line (Visitthakul & Hawcharoen, 2013). However, following the development of new urbanizations, road transportation has increased accordingly, and water and rail have become less important. The market has been depressed since 1952, when the railway service permanently ceased.

### 3.3 Raft Community

Due to their practical adaptability to seasonal flooding and tidal waves, raft and boat houses were very popular in the early settlements and could essentially respond to water-based trading and land-free housing units for multiracial immigrants (Jansuebsri, 2009). Raft and boat houses could also be efficiently transported throughout the river and were able to settle wherever the seasonal trade and economic activities shifted to. The raft community usually clustered together with the riverport town, which was actively supported and stimulated as a front market.

#### 3.3.1 Raft Community

The unique and still existing Sakaekrang River raft community (Figure 15) in Uthai Thani Province is an outstanding raft community of the basin. Over three generations of raft people have settled here and made their living by mixing trading, agriculture, and fishery (Kritsanapan, 2012). Traditional skills relating to water and water circulation have continually passed from generation to generation. Floating farms and net cage fishing attached to the raft house were a result of that. Yet, most of the inhabitants have adapted modern equipment and machinery to traditional living methods in response to market capitalization.

However, due to the temporary nature of raft houses, both tangible and intangible structures have simply changed over time. Traditional socio-economic activities were replaced by modern lifestyles. The free interior spaces responded to day-to-day living behavior and represent the flexibility and adaptability of raft culture. New functions and materials have been added to raft structures to meet convenience and hygienic standard requirements without any incompatibility or substantial changes to their cultural practices.

Daily life activities of the raft community such as agriculture, fishing, washing, and transportation are closely related to water and, importantly, the people still work in the agricultural sector. Thus, they treat the water and environmental resources carefully (Denpaiboon, Tohiguchi, Matsuda, & Hashimoto, 2000).



Figure 15. Sakeakrang River's raft community (left) and its traditional floating agricultural activities (right)

Daily life was threatened by the eviction of communities along the river. Since the 1960s, raft and waterfront housing have been considered as pollutants, going against the water management policy for a healthy city. The dwellers on the river, importantly raft communities, were offered resettlement onto land (Prakard kong kanapratiwat chabub tee 44, 1959). Since then, most of the raft communities have been relocated away from the river. However, only four authentic raft communities still remain in the Chao Phraya River Basin, faced with impending threatening conditions.

#### 4. Conclusions

The remaining culture of traditional livelihoods proves that the cultural landscape associated with agricultural activities is lively and living well in contemporary conditions, even though there is some threat of disappearance. The diversity of the waterfront community complex illustrates that water circulation patterns exert influence on the traditions of daily life: river overflows in the paddy village, irrigation network of ditches in the orchard village, brackish water circulation in the estuarine agricultural village, wetland fishery in the coastal fishing village, north-south corridor river trading in the riverport town, east-west canal network trading in the canal trading village, and surface water livelihoods in the raft community.

However, change and adaptability are part of the phenomenon of the living culture in traditional communities. Since the waterfront communities were first mentioned in the Ayutthaya period, they have continually developed to respond to the requirements of particular periods in time. When water transportation became critically important, waterfront communities grew substantially and reached their peak during the nineteenth century. However, it is fascinating how the vernacular culture has come to terms with the fact that modernity is now an integral part of life and chose to adapt rather than be eliminated.

#### References

- Buranaart, I. (2014, Dcember). The Study of Value and Potency Analysis and Guidelines for Nomination of Additional Cultural Heritage as the World Heritage. *Paper presented at the ICOMOS Thailand national Conference 2014*, Bangkok, Thailand.
- Darling, F. C. (1960). Marshal Sarit and Absolutist Rule in Thailand. *Pacific Affairs*, 33(4), 347-360. <http://dx.doi.org/10.2307/2753394>
- Denpaiboon, C., Tohiguchi, M., Matsuda, H., & Hashimoto, S. (2000). Typology and life style analysis of the raft house (ruan pae) in riverine settlements in Thailand. *Journal of Architecture Planning and Environmental Engineering*, 8, 173-180.
- Foundation of Reclaiming Rural Agriculture and Food Sovereignty Action (RRAFA). (2007). *Endangered: Small Rice Farmers-The Impact of the Agreement on Agriculture on Small Rice Farmers in Thailand*. Pesticide Action Network Asia and the Pacific: Penang, Malaysia. Retrieved from [http://www.panap.net/sites/default/files/endangered\\_smallricefarmers-thailand.pdf](http://www.panap.net/sites/default/files/endangered_smallricefarmers-thailand.pdf)

- Ganjanakhundee, S. (2015, April 29). *Fishery problems too complicated, chronic for Article 44. The Nation*. Retrieved from <http://www.nationmultimedia.com/politics/Fishery-problems-too-complicated-chronic-for-Artic-30258977.html>
- Guillaud, H. (2014). Cultural values of earthen architecture for sustainable development. In M. Correia, G. Carlos, & S. Sousa (Eds.), *Vernacular Heritage and Earthen Architecture: Contribution to Sustainable Development*. Proceedings of CIAV 2013 (pp. 9-13). London, UK: CRC Press.
- Jampanil, A. (2007). *History of Samchuk Market community: Suphanburi Province* (Unpublished master's thesis) Silpakorn University. Bangkok, Thailand.
- Jansuebsri, S. (2009). *Reunpea lea salathanam* (Raft house and riverside pavillion). (Lecture note). Retrieved from <http://suebpong.rmutl.ac.th/Vernweb/index.htm>
- Jiwakul, K. (1982). *Talad nai krungtep maha nakhon* (Markets in Bangkok). Pimluek: Bangkok, Thailand.
- Klaichom, S., & Piniworasin, W. (2013). Existence of the traditional shophouses in Ban Pan Market Amphur Sena, Phranakorn Sri Ayutthaya Province. *Veridian E-Journal*, 6(3), 671-683. Retrieved from <https://www.tci-thaijo.org/index.php/Veridian-E-Journal/article/view/31515>
- Knowing, P. P., Sai, N., & Ai, N. (2015, October 8). *Thai PBS News*. Retrieved from <https://www.youtube.com/watch?v=OzMqqniq8AQ>
- Kritsanapan, O. (2012). Vernacular architecture in the dynamic context of cultural landscape: The raft-house community case study. *Sagae-krang River*. 11(1), 1-13. Retrieved from <http://arch.kku.ac.th/journal/?cat=12>
- Kwansuwan, P. (2014). Adaptation and spatial resilience of amphibious settlements in the flood plain of Thailand. In V. Duong (Ed.), *Traditional Dwelling and Settlement: Working Paper Series Vol. 268* (pp. 43-64). Berkeley, CA: University of California.
- Muadthong, A. (2005). *Cultural ecology concerning landscape and vernacular architecture of Klongrangjarakea Phra Nakhon Si Ayutthaya community* (Unpublished master's thesis). Silpakorn University, Bangkok, Thailand. Retrieved from [http://www.thapra.lib.su.ac.th/objects/thesis/fulltext/thapra/Amarit\\_Muadthong/Fulltext.pdf](http://www.thapra.lib.su.ac.th/objects/thesis/fulltext/thapra/Amarit_Muadthong/Fulltext.pdf)
- Natsupa, C. (2002). *Prawatsatr Sestakit Thai (History of Thailand economy)*. Chulalongkorn University, Bangkok, Thailand.
- Oliver, P. (1987). *Dwelling: the houses across the world*. The University of Texas Press, Austin.
- Silapacharanan, S. (2007). Amphawa and Its Cultural Heritage. *Nakara: Journal of Environmental Design and Planning*, 3(1), 11-20. Retrieved from <http://www.arch.chula.ac.th/nakhara/>
- Palopakorn, Y. (2010). Landscape ecological structure and ecosystem service case study: the irrigation ditches and orchard's ditches in a canal network, omm-nont canal, bang-yai, Nonthaburi. *Paper presented at the 2010 Climate Thailand conference, Bangkok, Thailand*. Retrieved from <http://www.conference.tgo.or.th/download/ppt/TechnicalConference/200810/IA6.pdf>
- Papayannis, T., & Pritchard, D. (2008). *Culture and Wetlands—Ramsar Guidance Document*. Gland: Ramsar. Retrieved from [http://www.ramsar.org/sites/default/files/documents/library/cop10\\_culture\\_group\\_e.pdf](http://www.ramsar.org/sites/default/files/documents/library/cop10_culture_group_e.pdf)
- Plathong, S., & Plathong, J., (2004). *Past and Present Threats on Mangrove Ecosystem in Peninsular Thailand*. Coastal Biodiversity in Mangrove Ecosystems: UNU-INWEH-UNESCO International Training Course. Centre of Advanced Studies, Annamalai University.
- Pongsripean, V. (2007). *Pannana Phum Satan Phra Nakhon Si Ayutthaya (Historical data on geography, prominent sites, and social and economic conditions of ancient Phra Nakhon Si Ayutthaya)*. Usakane: Bangkok, Thailand.
- Prakard kong kanapratiwat chabub tee 44 (Decree of revolutionary council). (1959). *Royal Thai Government Gazette*, 76(Section 6), 1/11. January 1959. Retrieved from <http://app-thca.krisdika.go.th/Naturesig/CheckSig?whichLaw=law3&folderName=%bb%717&lawPath=%bb%717-20-2502-a0001>
- Preecha, S. (2008). *The study of component and management process of cultural landscape for planning development in Klongsuan community* (Unpublished master's thesis). Silpakorn University, Bangkok, Thailand.
- Siamwalla, A. (1996). Thai Agriculture: From Engine of Growth to Sunset Status. *TDRI Quarterly Review*, 11(4), December, 3-10.

- Sriwichien, K., Keeratibooran, Y., & Soungsaweng, W. (2015). The Decline of Local Riverside Markets in Suphanburi Province, Thailand. *Asian Culture and History*, 7(1), 49–52. <http://dx.doi.org/10.5539/ach.v7n1p49>
- Sunsuwan, W. (2013). *Rice*. Retrieved from <http://www.natres.psu.ac.th/Department/PlantScience/510-211/lecturenote/document/rice.doc>
- Suwannarat, P. (2012). Agricultural Productivity and Poverty Reduction in Thailand. *Paper presented at the Thailand Economic Conference 2012*. Bangkok, Thailand. Retrieved from [https://www.bot.or.th/Thai/Segmentation/Student/setthatat/Doclib\\_Settha\\_BE\\_2554/B\\_Doc\\_Solace2\\_2554.pdf](https://www.bot.or.th/Thai/Segmentation/Student/setthatat/Doclib_Settha_BE_2554/B_Doc_Solace2_2554.pdf)
- Tragoonram, L. (2009). *Living conditions and kinship in Yeesarn community* (Unpublished master's thesis). Chulalongkorn University, Bangkok, Thailand.
- UNESCO. (2011). *Recommendation on the historic urban landscape*. Retrieved from <http://unesdoc.unesco.org/images/0021/002110/211094e.pdf>
- Urrutia, M., & Yukawa, S. (1988). *Economic Development Policies in Resource-rich Countries*. United Nations University Press: Tokyo, Japan.
- Usupharat, P., Buasuang, A., Pornsiripong, A., & Tejasen, B. (2013). *Leamyai: The Recovery of the Community Culture for Resources Management*. Amarin printing: Bangkok, Thailand.
- Uthongsap, K. (2012). *The economic roles of the Sino-Thai community in the northern region of Thailand from 1900 to 1960: a case study of Lampang Province* (Unpublished Doctoral thesis). Waseda University. Tokyo, Japan.
- Visitthakul, P., & Hawchareon, K. (2013). Factors affecting the emergence of and change in Rahaeng market. *Arch journal*, 16(1), 74-88. <http://tci-thaijo.org/index.php/archkmitl/article/view/18517>
- Wongtimarat, K. (2003). *Conservation guideline for Bankoko Yai canal and its communities* (Unpublished master's thesis). Chulalongkorn University, Bangkok, Thailand.
- Yodsurang, P., Miki, H., & Uekita, Y. (2015). A Traditional Community in the Chao Phraya River Basin: Classification and Characteristics of a Waterfront Community Complex. *Asian Culture and History*, 8(1), 57-68. <http://dx.doi.org/10.5539/ach.v8n1p57>

### Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/3.0/>).