

Central Place Theory and the Emergence of Floating Markets in the Mekong Delta of Vietnam

Thi Phuong Lan NGO¹

¹ University of Social Sciences and Humanities, Vietnam National University, Ho Chi Minh City, Vietnam

Correspondence: Thi Phuong Lan NGO, University of Social Sciences and Humanities, Vietnam National University, Ho Chi Minh City, Vietnam.

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Abstract

This research re-examines Walter Christaller (1933)'s central place theory paradigm to explain the emergence of a network of floating markets in the Mekong River Delta's dense network of rivers and canals. Because road transportation is underdeveloped, floating markets play an important role for local people. They provide access to transportation and opportunities to trade, especially for the region's diverse agricultural products. Furthermore, the floating markets support inland infrastructures. This research challenges Christaller's (1933) assumptions about population thresholds and geographical range, and Mulligan et al.'s (2012) understanding of interaction among consumer choices, company aggregation and functional hierarchy. It finds that riverine traders employ flexible transaction strategies.

Keywords: floating market, central place theory, agricultural production, marketplace, riverine traders, The Mekong Delta

1. Introduction

1.1 The Research Issues

Waterways are the environmental foundation for Mekong Delta residents' lifestyle and livelihood. Riverine trading has long been important in the Mekong Delta, which is characterized by a dense network of rivers and canals. There are more than 200 rivers with a total length of 28,000 kilometers, accounting for 70% of the country's total waterway length. This feature brings huge advantages to water transportation in the region. The waterways improve conditions for agricultural development and help the exchange of goods between residents. Riverine trading might be described as having two distinct modes—trade along the waterways and at floating markets—but these classifications seem arbitrary. Traders sell their goods in both modes, mixing the models together.

In the past, road transport was underdeveloped, and waterways played a vital role in residents' travel and goods exchange. Canal construction was intensive from the Nguyễn Dynasty (1802-1945) to the French colonial period (Brocheux, 1995) and again in the prosperous period after the Vietnam War (after 1975). Despite the significant improvement and development of road transport throughout the region, waterways maintain many of their traditional functions. However, riverine trade has also changed in the era of road transportation. For example, floating markets are now declining its scale and some of them function as tourist destinations.

This article is divided into four parts. First, I discuss various approaches to studying floating markets, including Christaller's central place theory. Second, I describe how the Mekong Delta region affords favorable conditions for floating markets. Third, I describe the floating market network and its activities in the Mekong Delta. Last, I analyze the emergence of the network of floating markets using the central place approach.

The research is to provide an overview on the socio-economic life and dynamism of the relatively large agricultural population in the Mekong region, which indirectly introduces the current status and livelihoods of agricultural communities in Southeast Asia. The research reflects how the natural environment shapes and stimulates the livelihoods of residents, and also puts forward the importance of natural interaction between the environment and the community. This research also contributes a specific case study to the overall situation of floating market life research in Asian agricultural regions.

1.2 Central Place Theory

Various researchers have used Central Place Theory (CPT) as a theoretical foundation for their research. Central Place Theory addresses the location and distribution of scattered populations of goods and services in specific market areas (Scheer, 2004). It consists of a series of assumptions and propositions that explain the hierarchical center found at certain preferred positions in the economic landscape. Retail trade and service activities tend to congregate, forming urban centers or shopping centers (Mulligan et al., 2012).

Christaller (1933) and Lösch (1940) founded CPT. According to Christaller, *population threshold* and *geographic range* is useful concepts to understand the emergence of a cascade system at a central location. In other words, there is a functional relationship between the central population and its complementary area. The key feature of Christaller's system is the emergence of a regular hierarchy, where a central location on one level provides a complete set of goods and services specific to that level, as well as all bundles specific to all lower levels. As a result, a central place at any given level serves a market area that contains many lower-level places and rural areas. Although Lösch proposed a hexagonal market area network on a near-continuum of size, all of these are concentrated in the most central position of the system, the "metropolis."

Mulligan, Partridge, and Carruthers (2012) asserted that there are three core concepts in CPT: consumer choice, enterprise agglomeration, and functional level. Companies that provide goods and services not only strive to occupy the center of their markets, but agglomerate to gain an advantage. As companies arrange themselves in space, dispersed consumers strive to minimize the total cost of purchasing goods. After various adjustments, companies choose price positioning solutions to minimize consumer travel costs. At the same time, enterprise clusters form a hierarchy that effectively provides possible commodities.

Christaller (1933) inspired researchers by explaining the conceptual practicality of the spatial network hierarchy. CPT has been used for various kinds of analysis, including urban centers (Berry & Garrison, 1958), city size distribution (Hsu, 2011) city hierarchy (Hsu et al., 2014), the spatial distribution of cities in the labor market (Abu-Hijleh 1989); corporate locations and groups the emergence of cities (Hsu, 2008); distribution of commodities related to travel distance (Scheer, 2004), and how location affects the economic outcomes of sporting events (Daniels, 2006). Beckmann (1958; 1968), Berry (1964), Rushton (1972), Eaton and Lipsey (1982), Duranton and Puga (2000), Miron (2002), and Gordon (2010) refined and extended Christaller's theory. However, CPT's applicability to practical central system analysis can be questioned.

From the early 1990s, CPT has rarely been used, and many aspects of the theory are regarded as old and inappropriate. The focus of criticism is the gap between formal theory and empirical research. People are working hard to close this gap, conducting critical methodological research on the CPT's logic. Examples include Beavon (1977) and Berry et al.'s (1988) analyses of interurban or urban systems, Dacey's one-dimensional CPT (1974), Sonis's (1994) input-output analyses of hierarchical spatial structures, Cronon's (1992) examination of inventions in the American urban system, South and Boots' (1999) study of market areas of a given hierarchy, as well as Beckmann-McPherson's (1975) CPT model. Mulligan et al. claimed that CPT was overwhelmed by the "new economic geography" (Parr, 2017, p. 152). White (1974; 1977) and Allen and Sanglier (1979) highlighted that CPT is static and unresponsive to change. Parr (2017) further noted that CPT may be defined as a commodity or service, for which demand is scattered widely and sensitive to distance. Therefore, the "location problem" becomes a "location-allocation problem" (p. 158-9).

The hierarchy of markets was discussed and modified more in detail in Vining (1955), Beckmann (1975), and Mori and Smith (2011). They identified hierarchies based on the assumption that centers should be viewed as parts of a continuum, with each market level having its own quality of goods. Both Mulligan (1984) and Hsu (2011) called this a "successively-inclusive hierarchy" and concluded that its foundations are both diverse and complex.

Researchers recently conducted CPT-oriented research in Asia found that communities of different races and regions may adopt various methods to maximize benefits, thus forming the organizational structure and social hierarchy of rural society. However, the exchange of goods and services still centers on the local market which, taking the center-periphery relationship as the axis, connects the distribution and transaction network with the same and higher-level markets.

In *Regional Analysis*, Crissman (1976) explored the interconnectedness of economic and social systems in territorial-environmental systems, specifically market towns in the Changhua region of Taiwan. According to Crissman, Changhua's structural features can be explained by the traffic principle: individual decisions about

purchases, entrepreneurial ventures, administrative structures, and bureaucratic programs have established a central places system on the Changhua Plain.

1.3 Riverine Trade in East Asia

William G. Skinner vividly described rural life in the Chengdu Basin around 1950, especially the region's rural marketing structures. His analysis of the region's market system became the basis of his spatial model of rural social structure in China. Skinner emphasized that rural market communities are the basic units of Chinese rural society, connected to larger and more inclusive units through commercial and social transactions. Skinner found that China is composed of semi-self-sufficient geographic macro-regions, roughly corresponding to major river basins. Furthermore, it is internally integrated through the hierarchical structure of urban places (Harrell & Lavelly, 2017; Skinner, 2002; 2017). This hierarchical relationship between rural, semi-urban and urban quarters of the Chengdu basin was later discussed by Zeuthen and Griffiths (2011).

Research on other regions of Asia can be found in Liu Shao-hua's (2007) study on the Nuosu (Yi) ethnic group in Liangshan, Sichuan, China, Vajirakachorn's (2011) study of floating markets for tourists in Thailand, and Jamoliddinov and Jacinta Dsilva's (2019) case study in Uzbekistan. Moreover, Thongpanya (2017) analyzed the Damnoen Saduak floating market community in Thailand. Thongpanya found many implications, including the local agronomist's waterway roaming community, and the impact of tourism on the local way of life at the floating market. Positive effects included making floating markets known to outsiders and providing employment for community members. Negative effects included changes in people's lifestyles, such as switching from the traditional bartering system to trade. Furthermore, when the Damnoen Saduak floating market turned to the tourist market, traders stopped being generous with one another and became intensely competitive.

1.4 Floating Markets and Riverine Trading in the Mekong Delta

Some studies of the Mekong Delta have focused on wet rice cultivation (Hendry 1964; Hickey, 1964; Nguyễn Công Bình et al., 1990; Trần Xuân Kiên, 1990). Riverine trading is also a significant economic activity in the region, and allows residents of the Delta to access a variety of goods and services from many places. Using boats for trading has been essential to the livelihood of residents with little or no land. Researchers who attended to the use of boats in trade include Nguyễn Văn Huệ (1988), Phan Thị Yến Tuyết (2007), Ngô Văn Lê, Ngô Thị Phương Lan & Huỳnh Ngọc Thu (2014). Scholars have also addressed residents' use of boats for transportation, including Sơn Nam (1985), Nguyễn Công Bình et al. (1990), Phan Thị Yến Tuyết (2007), Nguyễn Thanh Lợi (2005), etc. Trần Nam Tiến (2004), Nhân Hùng (2009), Đặng Thị Hạnh (2011) analyzed floating markets as traditional cultural activities, while Nguyễn Trọng Nhân (2012) and Huỳnh Bích Trân (2011) regarded them as tourist destinations. These authors saw floating markets as embodying cultural values that should be promoted and protected.

In short, as the bases of traditional livelihood of the Mekong Delta, floating markets and riverine trading have long been studied. However, it is interesting and necessary to explore why floating markets only appear at certain places.

2. Method

I investigated 12 floating markets in the Delta. They are still operating. The data in this article comes from Cái Bè in Tiền Giang Province, Trà Ôn in Vĩnh Long Province, Cái Răng and Phong Điền in Cần Thơ Province, Ngã Bảy—Ba Ngàn in Hậu Giang Province, Ngã Năm in Sóc Trăng Province, Cái Nước in Cà Mau Province, and Long Xuyên in An Giang Province. These eight floating markets are typical one in terms of operating scale and long history.

In 2012 and 2013, the author conducted 198 in-depth interviews (Note 1) with floating merchants, inland traders, local officials, vegetable and fruit growers, and tourists. At each market, I observed the activities of commercial activities of all stakeholders from the beginning to the end of daily transactions. I talked with people during their free time to learn about the history of the floating market, trading activities, the trade network, and social and cultural practices. I followed small merchants on their pick-up routes and observe their trading activities, spending more time with floating merchants and farmers than inland people. I interviewed orchard owners, inland traders, about the history of floating markets, sales networks, and their relationships with floating merchants. I interviewed representatives of local government about the management and development direction of floating markets, and tourists about their expectations and feelings of floating markets.

3. The Mekong Delta: A Water Region and Agricultural Producer

3.1 Overview

The Mekong Delta was born as a flooded area, gradually accumulating alluvial deposits, so it has completely surfaced in the past few centuries. The canal and dam system was built to prevent floods in the 1970s and 1990s, turning these flooded areas into two large rice fields.

The Mekong Delta has many natural and manmade rivers and canals. In addition to the two main tributaries (the Tiền Giang and the Hậu Giang) and eight estuaries of the Mekong River, there are hundreds of large and small rivers connecting the it with the entire delta (Biggs & Cronon, 2010; Brocheux, 1995). Cities and towns form at the confluence of tributaries with the Mekong, where agricultural trade takes place throughout the year. Many large farms operate on the rice field-canal model or fruit garden-canal model.

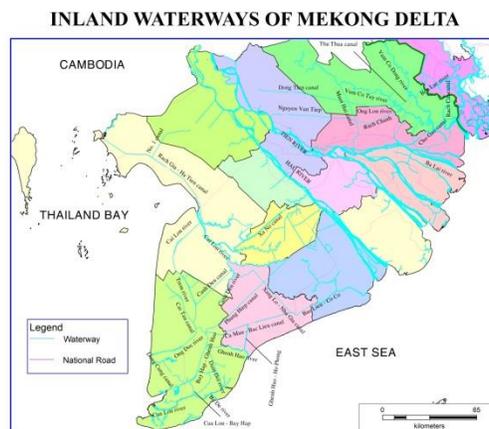


Figure 1. Main riverine transportation system in the Mekong Delta

Source: Author 2013

The entire delta area is large and fertile. In the past, the flood season brought a lot of fish and shrimp, so they became important agricultural commodities. The floods also left alluvial deposits, supporting abundant rice, fruit, and vegetable crops. The delta occupies 12% of Vietnam's land but provides 60% of its rice production, and 80% of the country's exported rice (Trần Ngọc Thêm, 2013). Therefore, agricultural products must be transported from the delta to larger markets such as Ho Chi Minh City (HCMC) (Note 2), Vietnam's largest international trading port.

There were traditionally two main methods to transport agricultural goods from the Mekong River Delta to Saigon, in order of importance: waterways and roads. Although nowadays road traffic has superseded river transport, road transportation was more restricted in the past. Before 2000, trucks and vans could drive from HCMC to the lower Mekong Delta, but had to be ferried across two tributaries of the Mekong River. It took time and cost much.

Some traders and distributors have adopted a hybrid method, using both riverway and land transportation. Vessels took produce from dealers and farmers in the delta, and transported them to the C á B ò floating market on the north bank of the Mekong River. There, the produce was sorted, packed, and transported by trucks and vans to HCMC. Hence, the C á B ò market flourished in the 19th and 20th centuries. Other markets in the lower delta were established in similar way but on a smaller scale, such as C á R ăng, Ng ă B ảy, and Long Xuy ên. Dealers bought goods there and transported them to the C á B ò market by boat, and from C á B ò to HCMC by truck. Some goods were transported by truck directly from the C á R ăng and Ng ă B ảy markets via ferry.

In summary, the Mekong Delta has favorable conditions to form floating markets where riverine traders can exchange agricultural products. The Mekong Delta has a dense network of rivers and canals for transportation; thanks to the alluvial deposits, it is also a productive agricultural region. Different localities specialize in different agricultural products, so riverine trading is needed in the region.

3.2 Typical Floating Markets and Their Trading Network in the Mekong Delta

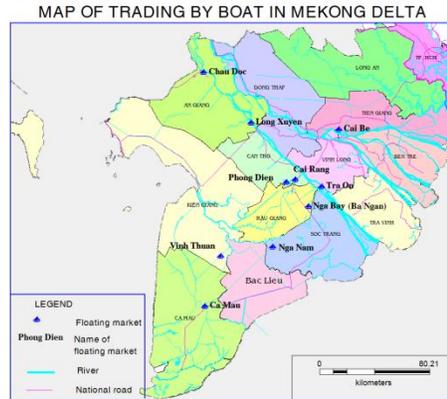


Figure 2. Location of floating markets in the Mekong Delta

Source: Author 2013

Research was conducted at all of the floating markets in the delta, eight of which are introduced below. They are C á B è, Tr à Ô n, Phong Đ iền, C á R ăng, Long Xuy ên, Phụng Hi ệp (Ng ả B ả y/ Ba Ng ầ n), Ng ả N ăm and C á N ướ c. The market sequence presented here is based on the north-south geographic principle. The number of boats and trade activities described in this section is calculated based on the average ratio throughout the year, excluding the period before T ết. In the days before T ết, the number of boats and trading activities is usually doubled or tripled, depending on the location of each market and agricultural production in the area.

(1) C á B è Floating Market

C á B è described in the 19th century as a bustling fruit trading center (Tr ần Ng ọc Th ầ n, 2013) is considered the first of the floating markets. It is located on Đ ồng H ồ a Hi ệp Island in the middle of the Front Tributary, where it is separated from the neighboring V inh Long and B ến Tr ề provinces. The region is a center of both fruit production and trade between the lower Mekong and upper central Vietnam. According to traders at C á B è Floating Market, trading was discouraged during the period of the command economy (1976-1986) (Note 3). Therefore, traders at the floating market operated in secret.

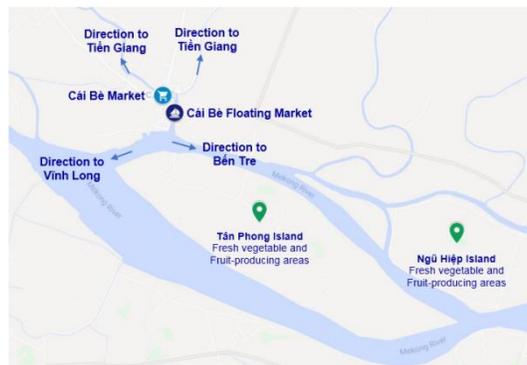


Figure 3. Location of C á B è Floating Market

Source: Credit to Google My Maps. Illustration: Nguyễn Mạnh Tiên, 2020

Before 2000, when the Mỹ Thuận Bridge was completed, there were hundreds of boats buying and selling agricultural products every day. In the days before the T ết holidays, there might have been thousands of boats.

Traders came from many different provinces, especially those located near the waterway network. In addition to the dealer's boats, there were many farmers in nearby areas who used sampans to transport fruits and agricultural products for sale on the river.

Due to the development of road transportation, especially the Mỹ Thuận and Cần Thơ bridges, floating markets have suffered. Ms. N.T.T.H. (58 years old, formerly a small-scale dealer) reported, "Before 2000, the warehouse, transshipment and packaging services, and transportation system of C á B ò Floating Market were very complete. Mỹ Thuận Bridge changed everything" (in-depth interview, November 2012). The accounts of the people living near C á B ò Floating Market were very similar.

According to the author's observations and interviews conducted in 2012, people at C á B ò Floating Market often exchange fruits (provided daily by farmers in the Tân Phong and Ngũ Hiệp Islands in the region), and flowers and potted plants (provided by locals for Lunar New Year celebrations). Watermelons come from neighboring Long An province, root vegetables and pumpkins from the central highlands. Manioc, yams, and pineapples are provided by locals, or are imported from Sóc Trăng or Kiên Giang provinces.

Based on observations at C á B ò Floating Market, we know that distributors usually sell products in bulk lots of one ton or more. After they sell their goods, they journey to buy from producers in other provinces or from other floating markets. They classify goods into four grades, with the first being the best quality. Usually, traders at the floating market sell their best goods to the inland market. This is so because inland traders will transport them to big cities by roads. Grades two through four are sold in the floating markets.

At the time of my observation, around 200 boats gather at the C á B ò Floating Market. According to locals, this number tripled during the Lunar New Year. The busiest time in the market is 5 :00-10:00 a.m. Boats come from all over the delta and surrounding areas such as HCMC, Đồng Nai and Bình Dương provinces to buy and sell goods. After the hottest trading hours, those dealers who have not yet sold their goods anchor in the floating market to wait for customers. Therefore, there are fewer boats in the afternoon than in the morning.

Trading on the floating market by boat is not limited to the network of traders and customers in a particular province, but encompasses the entire region. The market is related to the infrastructure of inland trade, including the district market (C á B ò market). There are parking lots and storage areas where merchants can obtain vegetables from the distant central highlands and redistribute them to smaller floating merchants.

(2) Trà Ôn Floating Market

The Trà Ôn Floating Market serves as an intermediate stop because it is situated between C á B ò and C á R ăng. It is located on the lower Hậu Giang river of Lục Sĩ Thành commune. From Trà Ôn, people can take the waterway to Trà Vinh, Đồng Tháp and Sóc Trăng. Lục Sĩ Thành, and surrounding areas such as Phú Thành, are famous for tropical fruits such as durian, rambutan, grapefruit, and mangosteen. It has a close connection with the inland Trà Ôn market, where traders and farmers in Trà Ôn Floating Market can ship their high quality fruit. From there, the fruit is transported to major cities like HCMC and Hanoi.

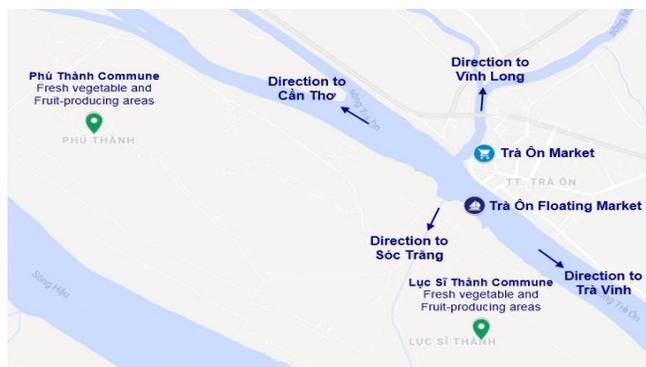


Figure 4. Location of Trà Ôn Floating Market

Source: Credit to Google My Maps. Illustration: Nguyễn Mạnh Tiến, 2020

Like C ấ B ề Floating Market, Tr ầ Ôn Floating Market has a long history. However, people do not remember the exact date of its establishment. Some people say it began in the 1960s (BVB, male trader, interviewed February 22, 2013) or 1970s (LVS, male trader, interviewed February 23, 2013). In the 1990s, after a period of command economy that discouraged trading (THD, male gardener, interviewed February 21, 2014), it resumed its bustling operations. Tr ầ Ôn was a natural market. First, some boats came. Gradually, more boats come to exchange goods (BVB, male trader, interviewed on February 22, 2013). Its peak time was the 1990s and early 2000s. Since 2000, when National Road 54, C ầ Thơ Bridge and Tr ầ Ôn Bridge were completed and roads were upgraded, land transportation has superseded water transportation. Spontaneous market combining waterways and highways has reduced the existence of floating markets.

The Tr ầ Ôn Floating Market is closely linked with the Tr ầ Ôn Inland Market where riverine traders can upload their cargo bought from floating or inland markets. Currently, about 60% of the trading boats are from Vĩnh Long Province (HPM, male trader, interviewed February 21, 2013), but there are even traders from Cambodia. The trade in agricultural products begins at 2:00 a.m. and peaks from 4:00 to 5:00 a.m. People from remote areas and plantations follow the trend and ship their products to floating markets. People rely on the daily high tide to go to and return from the floating market.

At the time of my observation, about 20 to 30 boats are still operating at Tr ầ Ôn Floating Market. To survive in a competitive environment, traders usually have two boats: one to go to the fields and plantations to buy, and the other docked at the floating market to maintain a relationship with regular customers.

(3) C ấ R ẫ Floating Market

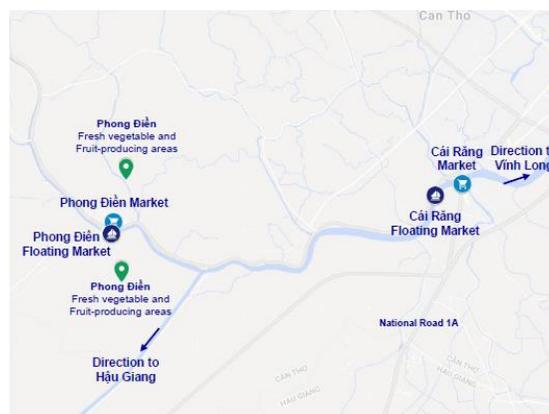


Figure 5. Location of C ấ R ẫ Floating Market

Source: Credit to Google My Maps. Illustration: Nguyễn Mạnh Tiến, 2020

C ấ R ẫ Floating Market on the C ấ R ẫ River emerged in the early 20th century, when goods were shipped from Saigon and southeast Vietnam and vice versa. Like the C ấ B ề and Tr ầ Ôn markets, C ấ R ẫ Floating Market is closely related to the inland C ấ R ẫ market, where merchants from the floating market can buy and sell commodities. The C ấ R ẫ inland market is open all day, from 6:00 a.m. to 9:00 p.m., whereas trading begins at the C ấ R ẫ Floating Market at 3:00 a.m. and peaks from 5:00 a.m. to 9:00 a.m. This is the case because like other floating market, C ấ R ẫ floating market mainly specialized in vegetable and fruit. Therefore, these agricultural products should be transported before sunlight comes otherwise, they will be damaged and withered.

The C ấ R ẫ Floating Market hosts many boats from other provinces, such as C ầ Mau, Sóc Trăng, Tiền Giang, Long An, and Kiên Giang. Every day there are about 300 boats, of which 250 are docked on the market, while the other 50 anchor in other places in 2013. The boats vary in capacity. It ranges from 4 tons to 20 tons.

Commodities exchanged include fruits such as oranges, grapes, mangoes, guavas, longan, watermelons, durian, rambutan, pineapple, and limes; green vegetables like cabbage, green onions, and chives; gourds like chayote and pumpkins; and root vegetables such as potatoes, carrots, yams, taro, and sweet potatoes. The market usually takes up an area of 1,000m. At the Lunar New Year, the floating market expands to a few kilometers and sells flowers and potted plants in addition to daily necessities.

The merchants of C á B è Floating Market mainly serve HCMC, Vietnam's largest economic center, while the merchants of C á R ăng Floating Market mainly serve the downstream areas of the Mekong Delta (C à Mau and Ki ên Giang province). C á R ăng Floating Market has become a tourist destination due to its proximity to C ần Thơ, the central city of the Mekong Delta. Therefore, there are boats specializing in food and beverages for the tourist market.

(4) Phong Điền Floating Market

Phong Điền Floating Market is located in the center of Phong Điền District at a “T” intersection: one goes to C á R ăng Floating Market, the second to Hậu Giang Province, and the third to Ki ên Giang Province via Hậu Giang province. It is also convenient to the Phong Điền inland market. This location makes Phong Điền an inter-district floating market and a tributary of C á R ăng Floating Market, which is about 10 kilometers away.



Figure 6. Location of Phong Điền Floating Market

Source: Credit to Google My Maps. Illustration: Nguyễn Mạnh Tiên, 2020

This floating market was formed after V ạn X ảng Canal was dug by the French. Like other floating markets, before 1986, operations at Phong Điền Floating Market were restricted due to wars and economic policies. Its golden age was the second half of the 1980s. Since the 2000s, its operation has been declining. A trader recalled:

In the past, we did not have enough time to eat because there were many people who came to buy things. Sometimes I wanted them to stop so I could have time for breakfast or lunch. I have a stomachache now. The floating market is shrinking. In the past, it was very good. People [...] were buying, selling, transferring, paying, and very busy.

(T.T.H., born in 1950, a male floating trader, 5 March 2013)

In addition to decline due to the development of road transport like the case of above-mentioned floating market, the Phong Điền Floating Market has been affected by the irrigation design of the area. In the past, Phong Điền's merchants could easily travel to C à Mau and Ki ên Giang Provinces by the Xã No Canal. However, in 2001-2002, the new KH8 canal in Ô M ôn District drained the water from Xã No Canal, according to local authorities. In addition, a new bridge on the canal hinders boat travel during high tide. Therefore, Phong Điền is no longer as convenient as C á R ăng Floating Market for water transportation. There were only from 10 to 20 boats doing transactions at the floating market in 2013.

The decline of fruit supply in Phong Điền also contribute to the decrease of Phong Điền floating market. In the past, Phong Điền was a fruit-growing center. Traders from other provinces, such as Sóc Trăng, Bạc Liêu, and C à Mau, went there to buy fruits. Phong Điền was famous for citrus fruits in the early 20th century. When the French dug canals in the area, the horticultural economy developed. Because such fruits are susceptible to diseases, they must be periodically replaced. Today, merchants from Phong Điền must go to C á B è to buy fruit to redistribute to the lower delta. Due to lower fruit yields, the Phong Điền floating market lost its central role in riverine transportation, as recalled by a farmer:

Since Phong Điền Floating Market provides agricultural products wholesale to various customers, there is a classification in terms of quality. The best quality commodities go to large floating markets like C á B è, C á R ăng, C à Mau, and Ng ả Năm. C á B è is an entrep ôt with access to the largest market in HCMC. Inferior goods are transported along small canals or markets. The network of traders of Phong Điền Floating Market is as follows: "I

often moor my boat for sale here, mainly for merchants from Cambodia, Long Xuyên (close to the border with Cambodia), and C á B è When I have sold out my goods, I will go to Mỹ Tho to buy another shipment of goods" (C.H.M., born in 1955, a trader at the floating market, interviewed 7 March 2013).

(5) Ng ấ Bảy (Phụng Hiệp/ Ba Ng ầ) Floating Market

The Ng ấ Bảy Floating Market is located in Hậu Giang province, famous for growing rice, vegetables, and fruit. The market was formerly located at the Phụng Hiệp intersection of seven canals (namely C á C ồ n, B ứ n T ầ u, Mang C á L ấ Hi ể u, X ể o M ồ n, X ể o D ồ ng, and S ố c Tr ắ ng). Therefore, this floating market was called Ng ấ Bảy (seven directions) or Phụng Hiệp. Traders exchanged and sold their goods and then went in different directions to supply goods to customers. The area is connected to the upper sub-region (C ầ n Th ờ, Ti ề n Gi ầ ng, and V ồ n h L ồ ng) and the lower sub-region (Tr ầ Vinh, B ắ c Li ầ u, S ố c Tr ắ ng, C ầ Mau, and K ầ n Gi ầ ng).

My informants said that Ng ấ Bảy Floating Market appeared 10 years after the French dug canals to form this intersection in seven directions. Due to its activities and scale, Ng ấ Bảy Floating Market became the most attractive tourist destination in the Delta. Its peak time was from 1990 to 2002. According to many local informants, during that period, there were thousands of small and large boats operating at the market.

Ng ấ Bảy Floating Market was located in a place with convenient waterway and road transportation. Unfortunately, its convenient location caused unsafe conditions for transportation. Due to the high density of merchant boats, traffic jams and accidents were obvious problems. Therefore, local authorities transferred the market to the Ba Ng ầ "T" intersection, three kilometers away in 2002. Since then, activity at the market has decreased. Traders claim that the new location is less spacious and there is no road transport. Therefore, at present (at the time of my observation in 2013), there are only 10-50 boats operating at Ng ấ Bảy or Ba Ng ầ Floating Market. The market is open from 5:00 to 9:00 in the morning.

Ng ấ Bảy Floating Market offers two categories of products. One consists of household products like cloth, large earthenware pots, and porcelain. The second category includes agricultural products such as vegetables, roots, fish, and fruit from the Mekong Delta.

Like other floating markets, the Ng ấ Bảy Floating Market is related to an inland market (Ng ấ Bảy Market), and its merchants also trade along the waterways. A female merchant illustrated this practice:

After buying sweet potatoes at this market, I transport them to the lower part further to the sea (about 300 kilometers). It takes about a week. Not because of the distance, but I stop in some places to sell them first, and the rest are usually sold at the final destination of the inland market (C ầ Mau province). When the sweet potato transportation is completed, I buy charcoal from C ầ Mau. The area is famous for mangroves that produce large amounts of charcoal. Then, I transport the charcoal back to this floating market and sell it to regular customers.

(C.B., a female trader, 52 years old, 20 March 2013)



Figure 7. Location of Ng ấ Bảy Floating Market

Source: Credit to Google My Maps. Illustration: Nguyễn Mạnh Tiến, 2020

(6) Ng ã Năm Floating Market

Ng ã Năm Floating Market is located in Sóc Trăng, a province in the lower Mekong River. Local people stated that this floating market appeared in the 1950s. During the war, they mainly did business at night. This market is located at the intersection of five directions. From here, people can reach Hậu Giang Province (50 kilometers), Bạc Liêu (100 kilometers), and the other two districts of Sóc Trăng Province. Like other floating markets, its existence is closely related to the Ng ã Năm inland market. The inland market sells vegetables, fish, fermented fish, groceries, other food items, and beverages, while the floating market only sells fish and vegetables, from about 40 to 50 boats at the time of my observation in 2013.



Figure 8. Location of Ng ã Năm Floating Market

Source: Credit to Google Map. Illustration: Nguyễn Mạnh Tiến, 2020

According to Ms. B. L. (67 years old), in 1954, the activities of Ng ã Năm Floating Market was already busy. Around 1990, there were so many boats that people could walk from one side of the canal to the other (P.V.M., male, local authority in Ng ã Năm district, Sóc Trăng Province, interviewed 22 March 2014). As with other floating markets in the region, the development of road transportation led to decreased trading volume. People prefer to go to the inland market rather than the floating market. Furthermore, suppliers can serve customers in areas which used to be accessible only by boat (P.V.M., male, local authority in Ng ã Năm district, interviewed 22 March 2014).

In addition, the Ng ã Năm Bus and Truck Station is also actively involved in the distribution of agricultural products and consumer goods from HCMC. Trucks are also used to ship temperate-zone vegetables and roots from neighboring provinces, such as Tiền Giang, Cần Thơ and Đà Lạt (600 kilometers northeast of Sóc Trăng). Truck transport from Tiền Giang to Ng ã Năm takes only three to four hours. The same trip takes up to 12 hours by waterway. Similarly, it takes only one hour to move from Ng ã Năm to Cà Mau province by truck, but seven hours by boat (CVG, male, 41, owner of the Ng ã Năm floating gas station, hamlet 6, Ng ã Năm town, interviewed March 23, 2014). Tiền Giang and Cà Mau are two common destinations for traders at the Ng ã Năm floating market. Road transport is cheaper than shipping by boat because it saves time and fuel. Since the upgrade of Quảng Lộ—Ng ã Bảy Road, the number of boats in Ng ã Năm Floating Market has been reduced by half.

Today, thanks to new roads, customers have various options to meet their needs. If they live along the river or canal, they can buy goods from the boats; if they live near the floating market, they can buy goods from the supplier. If they are far from the floating market, they can buy goods from motorcycle-based dealers or choose one of the three. Therefore, they do not necessarily need to go to the floating market.

Like other floating markets, Ng ã Năm is also a center for trading of local agricultural products. Because of extensive interactions with regions in the lower delta, agricultural products at this floating market are diverse. People from other provinces come to Ng ã Năm Floating Market to do business, so product from in and outside the province is available. Mangoes from Hà Ti ên (Ki ên Giang Province); sawos, grapes, jackfruit, durian, and guavas from Ng ã Bảy (Hậu Giang) and Kê Sách (Sóc Trăng); manioc from Tr ã Ôn (Vĩnh Long); and bananas, papayas, rambutans, yams, taro, sweet potatoes, and tamarinds from C ã Rãng and Phong Điền (Cần Thơ) can all be found at Ng ã Năm. So can temperate zone produce like tomatoes, potatoes, onions, roses, carrots, and cabbages from C ã Bê (Tiền Giang).

These products are then carried to other places such as Hậu Giang, Bạc Liêu (Phước Long), Kiên Giang, and Cà Mau (Gành Hào, Gi á Rai, Hộ Ph òng).

Vessels with a capacity of seven to 15 tons purchase goods from other floating markets or fields and plantations within or outside the province, and only gather here for wholesale. Other boats transport the wholesale goods to various places. They can be sold in large quantities to smaller markets (e.g. Vĩnh Bi ên Market just 5 km away from the market; Ngan Dừa Market in Bạc Liêu province) or in small quantities to smaller boats for sale in remote areas where roads are difficult to reach.

Thanks to inland infrastructure and waterways, some vessels specialize in rice trading, buying it for redistribution elsewhere. For example, N.T.H. (40 years old, female, Hamlet 3, Ng ã Năm Town, interviewed 24 March, 2013) has been trading rice for 22 years. She owns a boat with a capacity of 1.5 tons. Usually, it takes one or two days to sell out. She stores about 40-50 tons of husk rice in a warehouse. Whenever she sells out, she removes the rice and sells it on the floating market. In addition, she has a small motorboat to deliver rice to her return partner, who supplies restaurants and noodle shops in town.

(7) Long Xuyên Floating Market

This floating market is located on the Hậu Giang River (one of the two main tributaries of the Mekong River) in Mỹ Phước ward, Long Xuyên city, An Giang province. The area houses hundreds of boats moored close to each other on the river, where people live and trade all year round. Unlike other floating markets in the Mekong Delta, Long Xuyên Floating Market occupies a large, separate area of the Mekong River. People can reach this market by boat or canoe. Long Xuyên Floating Market sells produce like melons, tomatoes, cabbage, pumpkins, potatoes. The products are different from the rich fruit-rich C á B è, C á R ăng and Phụng Hiệp floating markets. Like other floating markets, visitors to Long Xuyên Floating Market can also enjoy breakfast on a canoe, including vegetables, cakes, coffee, and sweet congee served by local women.

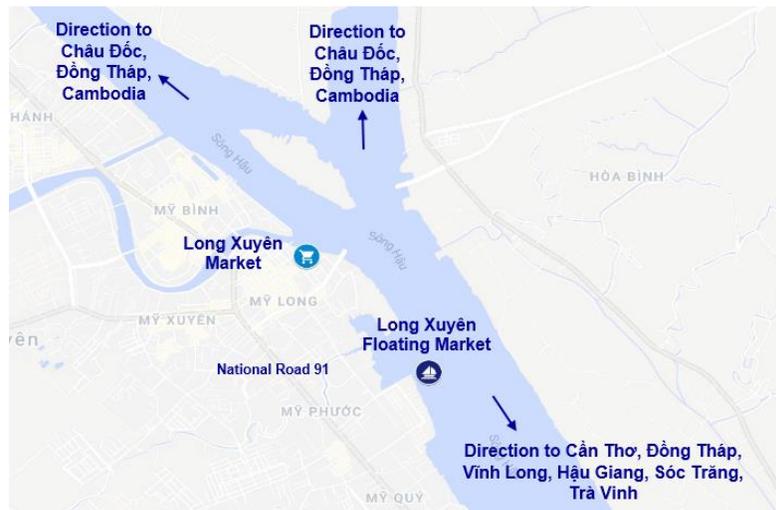


Figure 9. The location of Long Xuyên Floating Market

Source: Credit to Google Map. Illustration: Nguyễn Mạnh Tiến, 2020

Long Xuyên Floating Market functions as an important water transportation hub, connecting Cambodia, Long Xuyên, and the lower Mekong Delta. Thus, Long Xuyên Floating Market plays a cross-regional and cross-border role, attracting merchants from many provinces to live and trade. Together with C á R ăng, Long Xuyên Floating Market is currently the largest floating market in the Mekong Delta. An informant noted, “In the past, the biggest floating markets in the Mekong Delta were C á B è and Tr à Ô n, but now Long Xuyên and C á R ăng have replaced them” (V.V.L., male, 54 year old fruit seller at Long Xuyên Floating Market, interviewed 2 April 2013.)

I conducted two surveys in May 2013, counting about 200 to 220 boats anchored in the area, while other boats were engaged in long distance trade. Like other markets, the busiest time of Long Xuyên Floating Market is from 5:00 a.m.

to 8:00 a.m., dwindling in the afternoon. Mr. V.V.L. added: “The market is crowded only in May and June. The rest of the time, half of the people go home somewhere or engage in long distance trade. At its peak time in the past there were around 700 to 800 boats. It is declining now”. The decline of Long Xuyên Floating Market is mainly attributable to the growth of road traffic. Mr. N.H.P. said:

Now, trading on the river is more disadvantageous than trading on the road. To buy goods here, people must take a boat, canoe, or sampan. In the inland market, goods can be delivered to homes, and traders do not have to waste energy and money to travel. In the past, there were so many boats, canoes, and sampans in this market, and now you see it, very few.

(N.H.P., 52 year old grapefruit seller, Long Xuyên Floating Market, 2 April 2013)

Long Xuyên Floating Market has a wide variety of commodities, such as sugar cane, dried coconut, fresh coconut, sweet potatoes, pumpkins, cassava root, watermelons, pineapple, bananas, grapefruit, plums, and lemons. The products are ranked according to quality, with the best being sold to Hanoi and HCMC, as well as Chinese and Cambodian markets. A trader explained, “This market delivers goods to Cambodia. We deliver them here. This is the center. Customers in Ch âu Đ ộc also come here to purchase our goods (to sell at the border)” (VVH, male, 47 year old merchant, Long Xuyên, 3 May 2013). Other commodities are sold mainly in the Mekong Delta area.

(8) C ấ Nước Floating Market

C ấ Nước is situated in the center of the five districts of C à Mau Province, namely Trần Văn Thời and Phú Tân (northeast), Đ ầm Dơi (east), and Năm Căn and Ngọc Hiển (south). It is located on National Road 1A, 35 kilometers away from C à Mau city center and 15 kilometers away from Năm Căn town. In the C ấ Nước Floating Market area, in addition to National Road 1A, rivers and canals also allow 15 to 20 tons of cargo boats to reach all areas.

C ấ Nước, Đ ầm Dơi, Phú Tân, Năm Căn, Ngọc Hiển, and other areas of C à Mau Province have undergone a profound economic restructuring since 2000. The government has provided support and encouragement for farmers to convert rice fields into ponds for raising shrimp, crabs, and fish. With the changing economic structure, rural communities have tended toward cash crop specialization. As a result, farmers produce a higher volume of commodities for sale, meeting the needs of C à Mau residents and supplying hundreds of seafood processing facilities inside and outside the province.

However, the shift to aquaculture has made it difficult to grow rice, fruit and vegetables in C à Mau. As a result, most households are no longer self-sufficient as they were in the past, when they grew their own food. With economic growth, households in the region have created a new market for fresh produce. At the same time, new farming methods have made U Minh and Trần Văn Thời regions vegetable and fruit producers. As a result, over the past 10 years, C ấ Nước has gradually become the largest floating market in C à Mau.

C ấ Nước Floating Market is the center of three commodity flows by water and road. By water, large cargo boats from the Mekong region and Ho Chi Minh City sail along the Cửa Lớn River and Ông Trạng River to C ấ Nước. Boats on the provincial canals can also carry cargo from Vĩnh Thuận, Phụng Hiệp, C ấ Răng (the upper part) to C ấ Nước. On the road, large-tonnage vehicles transport goods from the Mekong River and other provinces to C ấ Nước along National Road 1A. Produce from U Minh and Trần Văn Thời is also transported to C ấ Nước via the canals.

In C à Mau province, road conditions are not as convenient as rivers and canals, and village shops and groceries have limited offerings. Commodities brought by floating merchants, in contrast, are fresh every day. Locals like to eat fresh fruits and vegetables, so they buy goods from C ấ Nước Floating Market delivered daily by boat or canoe. According to information from floating merchants, at the time of my observation there was about 1,000 boats and canoes distributing goods from C ấ Nước to all corners of the southeastern part of C à Mau Province. Demand is high, so the volume of transactions and the number of traders’ boats in the floating market is at maximum capacity. In addition to boats that supply or buy and fresh fruits and vegetables, there are about 12 to 15 grocery boats on the floating market, mainly operated by merchants from other provinces.

C ấ Nước Floating Market is very busy from 1 a.m. to 4 a.m., and then distributors ship the goods to different areas for sale. From 11 a.m. to 3 p.m., the market is busy again, but not as crowded as the morning. Goods from U Minh and Trần Văn Thời arrive in two shifts, in the early morning and afternoon.

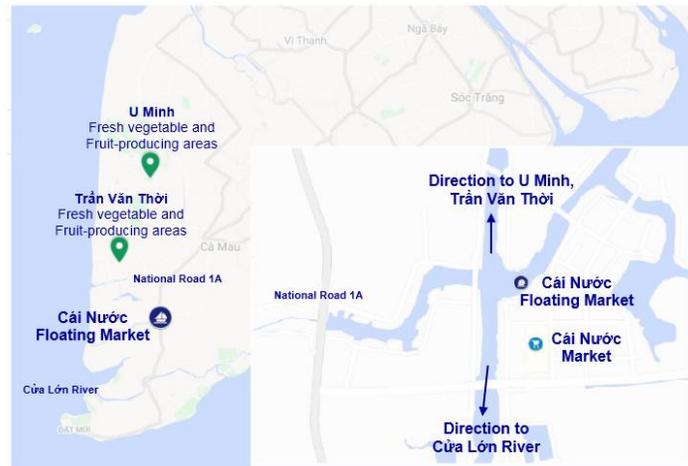


Figure 10. The location of C ấ Nước Floating Market

Source: Credit to Google Map. Illustration: Nguyễn Mạnh Tiến, 2020

4. Discussion

4.1 Conditions to Form Marketplaces

The description of the current floating markets in Vietnam's Mekong Delta indicates that floating markets form in places with appropriate geographic and economic conditions. These conditions include:

- (1). *Infrastructure for riverine trading.* The Mekong Delta is dense with networks of long rivers and canals, interconnecting provinces, regions, and small villages. In the past, row boats were the main form of transportation in the region. Nowadays, road transportation plays a vital role. However, motorboats still help people to travel and trade, especially in remote areas.
- (2). *The moderate confluence of rivers and canals.* Rivers and canals meet to form T-shaped, five-direction, or seven-direction intersections where riverine traders can gather to do business. People can easily travel to the upper or lower part of the Mekong Delta from these confluences. The waterways must have a moderate water flow and be neither too deep nor shallow. These conditions ensure a safe environment for transactions on the water; furthermore, they allow traders to anchor their boats when they need to go ashore. Therefore, floating markets form in tributaries, not in the Mekong River itself.
- (3). *Abundant agricultural production.* Floating markets mainly offer fresh produce. The Mekong Delta is the cradle of agriculture in Vietnam. It produces agricultural products year round. Each region specializes in certain agricultural products, and farmers have excess produce to sell. Residents also want produce from other regions, creating demand. Floating markets offer a location to buy *and* sell agricultural goods.
- (4). *Inland infrastructure.* This study shows that floating markets need the support of onshore services such as electricity, clean water, parking, and storage. Inland markets help to supply floating markets with agricultural goods that are more profitable when transported by truck.

4.2 The Floating Market as Central Place

As mentioned above, each floating market is central to its commodity distribution network. Each market also forms a hierarchy within the network. The seller buys goods from the supplier on the farms or at the floating market. In turn, these sellers redistribute these goods to smaller traders, and the smaller traders redistribute them to other inland retailers or directly to customers. The central position of the floating market is dependent on both its location and the specialized agricultural production of the area. For example, C ấ B ề Floating Market is the central place for Tiền Giang Province because traders can reach it by the canals to buy agricultural products. Meanwhile, traders who buy from other floating markets (C ấ R ẫng, Ng ấ B ảy, and Ng ấ N ăm) gather at C ấ B ề to produce to redistribute in their hierarchical network.

The floating markets are also closely linked to each other. Merchants can buy commodities from one floating market and trade in another. For example, C ấ R ẫng supplies merchants at other floating markets such as Ng ấ B ảy and Ng ấ

Năm. C á R ăng is, itself, supplied by merchants from Phong Đ i ền and C á B ề floating markets and farmers from the lower and upper regions of the delta. Each network of merchants and agricultural specializations enables trade at a certain market or along a route. Traders from C à Mau, the farthest province in the delta, can go up to Long Xuy ên (about 180 km), C á B ề (over 200 km), C á R ăng (150 km), Phong Đ i ền (140km), Ng ả Năm (85 km), or Ng ả B ảy (120km) floating markets. This is so because traders either trade on floating markets or sell along their waterways. They can buy commodities from farms, fields, or floating markets, and then sell them to other floating markets at another location or along the waterway. When they sell their goods, so long as they can make a profit, they will load another cargo from another floating market.

Observations indicate that the more the floating market is connected, the more diverse its commodities are. For example, the Phong Đ i ền and C á B ề floating markets mainly focus on fruit due to their availability in the surrounding region. C á N ớc Floating Market specializes in fresh fruits and vegetables because people lack these types of products in the saltwater shrimp and crab farming areas. The floating markets of Ng ả Năm, Ng ả B ảy, C á R ăng, and Long Xuy ên offer all kinds of commodities.

Christaller's (1944) Central Place Theory is only partially applicable to the situation of floating markets. The key feature of the Christaller system is the emergence of a regular hierarchy, where a central location on one level provides a complete set of goods and services specific to that level, as well as all bundles specific to all lower levels. As a result, a central place at any given level serves a market area that contains many lower-level places and rural areas. In the Mekong Delta, each floating market was central to its locality *provided the aforementioned favorable conditions*. The modernization of rural areas in the Mekong Delta enabled linkages among the floating markets. Thanks to new roads, concrete bridges, motorboats and mobile phones, riverine traders can extend beyond their familiar trading network. Floating markets in the delta operate within a wide distribution system and assume a commercial role according to actual local and intermediate needs. A floating market serves as a central place for the local trading network and a place where riverine traders from elsewhere can bring their goods for sale.

The Phong Đ i ền and C á R ăng floating markets exemplify this dual function. Although Phong Đ i ền is very close to C á R ăng, they are still separate. Each one has its own network and the floating markets are the centers of their networks. Even riverine traders from Phong Đ i ền transfer their goods to C á R ăng for easier sale. However, Phong Đ i ền is connected to provinces up and down the river, making it a convenient entrep ôt. These routes are shorter than going via C á R ăng Floating Market. Traders from Phong Đ i ền market can buy agricultural products from C á R ăng or C á B ề market to ship via its own network.

5. Conclusion

The floating market is the center of the cargo distribution network in the waterways of the Mekong Delta in Vietnam. In accordance with Christaller's (1944) Central Place Theory, the floating market does offer a range of commodities specific to its location. Floating markets also serve subordinate floating markets and rural areas. From the perspective of Christaller, population threshold and geographic range provide a top-down explanation for the emergence of a cascade system at a central place. As far as the interaction between consumer choice, firm agglomeration and functional hierarchy is concerned, Mulligan, Partridge, and Carruthers (2012) proposed that centrality determined by price positioning and consumers' travel costs. Simultaneously, the clustering of firms leads to the formation of a hierarchy that effectively provides all possible commodities. For the floating markets in Vietnam's Mekong Delta, however, these factors are not important. Their location depends on moderate water conditions and accessibility, the requirements of trading by boat, agricultural surplus, and inland infrastructure. Unlike other approaches to CPT, my study of the floating market in asserts that this network does not clearly form a hierarchical network although they are the central place. A floating market can occupy a central position in its own network, but occupy a subordinate position in another floating market's network. Each floating market has its own hierarchical network. And these networks interplay with each other and this formulate the network of floating markets in the Mekong Delta. This is the case because of the merchants' flexible trading strategies.

References

- Agust, L. (1940). *The economics of location*. New Haven, Yale University Press.
- Allen, P. M., & Sanglier, M. (1979). A dynamic model of urban growth in a Central Place System. *Geographical Analysis*, 11(3), 256-272.
- Beavon, K. S. O. (1977). *Central place theory: A reinterpretation*. Longman, London.
- Beckmann, M. J. (1958). City hierarchies and the distribution of city size. *Economic Development and Cultural Change*, 6(3), 243-248.

- Beckmann, M. J. (1968). *Location theory*. NY.: Random House.
- Beckmann, M. J. (1975). On the economic structure of strictly hierarchical central place systems. *Environment and Planning A*, 7(7), 815-820.
- Berry, B. J. L. (1964). Cities as systems within systems of cities. *Papers of the Regional Science Association*, 13(1), 147-163.
- Berry, B. J. L., Parr, J. B., Epstein, B., Ghosh, A., & Smith, R. H. T. (1988). *Market centers and retail location: theory and application*. Englewood Cliffs, NJ.: Prentice Hall.
- Biggs, A. D., & Cronon, W. (2010). *Quagmire nation-building and nature in the Mekong Delta*. Seattle: University of Washington Press.
- Cannon, H. G. (1964). *Village in Vietnam*. New Haven, Connecticut: Yale University Press.
- Carol, S. A. (1976). *Regional analysis*. NY.: Academic Press.
- Communist Party of Phong Điền District. (2007). *History of Phong Điền – Cần Thơ*. Cần Thơ City.
- Cronon, W. (1991). *Nature's metropolis: Chicago and the Great West*. New York: W.W. Norton.
- Dacey, M. F., et al.. (1974). *One-dimensional Central Place Theory*. Northwestern University Press.
- Định, L. Q. (1806/2005). *Unified History of Imperial Vietnam*. Phan Đăng translated, annotated and introduced. Huế: Thuận Hóa Publisher.
- Durant, G., & Puga, D. (2000). Diversity and specialisation in cities: why, where and when does it matter?. *Urban Studies*, 37(3), 533-555.
- Eaton, B. C., & Lipsey, R. G. (1982). An economic theory of central places. *Economic Journal*, 92(365), 56-72.
- Fakriyor, J., & Dsilva, J. (2019). Investigating the Central Place Theory: A case study on Uzbekistan. *International Journal of Management Entrepreneurship Social Sciences and Humanities*, 2(1), 12-21.
- Gordon, I. (2010). Entropy, variety, economics, and spatial interaction. *Geographic Analysis*, 42(4), 446-471.
- Hạnh, Đ. T. (2011). Floating Markets in the Mekong Delta: a Perspective from cultural studies. *Master Thesis*, University of Social Sciences and Humanities, Vietnam National University – HCMC.
- Hùng, N. (2009). *Mekong Delta floating markets*. HCMC: Youth Publishing House.
- James, H. B. (1964). *The Small World of Khanh Hau*. Chicago: Aldine Publishing Company.
- Jesper, Z. W., & Michael, G. B. (2011). The end of urban-rural differentiation in China? Hukou and resettlement in Chengdu's urban-rural integration. In B. Alpermann (Ed.), *Politics and markets in rural China: politics and markets in rural China* (pp. 218-232). Taylor & Francis Group.
- John, P. B. (2017). Central Place Theory: an evaluation. *Review of Urban and Regional Development Studies*, 29(3), 151-164.
- Lawrence, C. W. (1976). Chapter 6 - Specific Central-Place models for an evolving system of market towns on the Changhua Plain, Taiwan. In C. A. Smith (Ed.), *Regional analysis* (pp. 183-218). NY.: Academic Press.
- Liu, S.-H. (2007). Emerging modernity in a periodic marketplace of Southwest China. *Taiwan Journal of Anthropology*, 5(2), 11-30.
- Luong, V. H. (1994). The Marxist state and the dialogic restructuring of culture in rural Vietnam. In H. V. David Elliot, L. B. Kiernan, & T. Mahoney (Eds.), *Indochina: cultural and social change* (pp. 79-113). Claremont: Claremont-McKenna College.
- Luong, V. H. (2007). The restructuring of Vietnamese nationalism, 1954-2006. *Pacific Affairs*, 80(3), 439-453.
- Mahmoud, A.-H. Y. (1989). Central place model: a case study on southwest Iowa. *Retrospective Theses and Dissertations*.
- Margaret, D. J. (2006). Central place theory and sport tourism impacts. *Annals of Tourism Research*, 34(2), 332-347.
- Michael, S. (2005). Central Place Theory after Christaller and Losch: Some further explorations. *This paper is prepared for the presentation at 45th Congress of the Regional Science Association* (pp. 23-27). August 2005, Vrije Universiteit Amsterdam.

- Miron, J. R. (2002). Loschian spatial competition in an emerging retail industry. *Geographical Analysis*, 34(1), 34-61.
- Mori, T., & Smith, T. E. (2011). An industrial agglomeration approach to Central Place and city size regularities. *Journal of Regional Science*, 51(4), 694-731.
- Mulligan, G. F. (1984). Agglomeration and central place theory: A review of the literature. *International Regional Science Review*, 9(1), 1-42.
- Mulligan, G. F., Mark, P. D., & John, C. I. (2012). Central place theory and its reemergence in regional science. *The Annals of Regional Science*, 48, 405-431.
- Ngô V. L., Ngô T. P. L., & Huỳnh, N. T. (2014). *Floating traders' activities in the Mekong Delta: tradition and change*. Project of National Foundation for Science and Technology Development (NAFOSTED) in 2012.
- Nguyễn, C. B., Lê X. D., & Mạc, Đ. (1990). *Mekong Delta culture and people*. HCMC: Social Sciences Publishing House.
- Nguyễn, T. B. B. (2014). Orientation to develop technological infrastructure of the Mekong Delta's tourism. *Science Journal of HCMC University of Education*, 63, 91-102.
- Nguyễn, T. L. (2005). Boats and sampans in Southern Vietnam. *Journal of Folklore*, 2, 49-58.
- Nguyễn, T. N. (2012). The need to restore Ngã Bảy floating market and the issue of tourism exploitation. *Journal of Research and Development*, 2(91), 96-192.
- Nguyễn, V. H. (1988). Boat-based trading activities in Cần Đước. In *Cần Đước: land and people*. Tân An: Department of Culture and Information of Long An Province.
- Phan, T. Y. T. (2007). Overview of Chinese boats and waterways trade in southern Vietnam in the 19th century. In *Southern vietnam: land and people* (Vol. 5, pp. 320-326). HCMC: Association of Historical Sciences and Youth Publishing House.
- Pierre, B. (1995). *The Mekong Delta: ecology, economy and evolution, 1860-1960*. University of Wisconsin-Madison.
- Robert, S., & Barry, B. (1999). Relaxing the nearest centre assumption in central place theory. *Papers Regional Science*, 78, 155-177.
- Rushton, G. (1972). Map transformations of point pattern: central place patterns in areas of variable population density. *Regional Science Association Papers*, 28(1), 111-129.
- Stevan, H., & William, L. (2017). Preface. In S. Harrell, & W. Lavelly (Eds.), *Rural China on the eve of revolution: Sichuan fieldnotes, 1949-1950* (pp. 7-10). Seattle: University of Washington Press.
- Teerapon, T. (2017). Damnoen saduak floating market: the construction of floating market community identity from agricultural society to tourism community. *Kasetsart Journal of Social Sciences*, 2017, 1-8. <https://doi.org/10.1016/j.kjss.2017.06.005>
- Thanathorn, V. (2011). Determinants of success for Community-based Tourism: the case of floating markets in Thailand. *Ph.D. Dissertation*. Texas A&M University.
- Till, S. (2004). Applicability of the Theory of Central Places in the Automobile Industry in Germany. *Dissertation in Business and Entrepreneurship*. Nova Southeastern University.
- Tram, H. B. (2011). The Cái Răng floating market, Vietnam: towards pro-poor tourism. *Master Thesis*, Tourism Studies. Auckland University of Technology.
- Trần, N. T. (2004). Floating market - the beauty of cultural culture of rivers and canals in Cần Thơ. In *Southern Vietnam: Land and People* (Vol. 5, pp. 403-410). HCMC: Association of Historical Sciences and Youth Publishing House.
- Trần, N. T. (2013). *Viet culture in the Mekong Delta*. HCMC Publishing House.
- Trần, X. K. (1992). *Agriculture in Southern Vietnam*. Hanoi: Social Sciences Publishing House.
- Trịnh, H. Đ. (1820/1972). *Gazetteer of Gia Định Citadel* (Vol. 2). Saigon: Nha văn hóa.
- Vietnam Institute of History. (2007). *Lê Quý Đôn: the miscellaneous notes on domestic counties*. Hanoi: Văn hóa -Thông tin Publishing House.

- Vining, R. (1955). A description of certain spatial aspects of an economic system. *Economic Development and Cultural Change*, 3(2), 147-195.
- Walter, C. (1933). *Central places in southern Germany*. Englewood Cliffs, N.J.: Prentice-Hall.
- Wen-Tai, H. (2011). Central place theory and city size distribution. *The Economic Journal*, 122(563), 903-932. <http://doi.org/10.1111/j.1468-0297.2012.02518.x>
- Wen-Tai, H., Thomas, H. J., & Frank, M. (2014). Optimal city hierarchy: a dynamic programming approach to central place theory. *Journal of Economic Theory*, 154, 245-273.
- White, R. W. (1974). Sketches of a dynamic Central Place Theory. *Economic Geography*, 50(3), 219-227.
- White, R. W. (1977). Dynamic Central Place Theory: results of a simulation approach. *Geographical Analysis*, 9(3), 226-243.
- William, S. G. (2002). Marketing and social structure in rural China. *Études Rurales*, 161-162. <https://doi.org/10.4000/etudesrurales.7952>
- William, S. G. (2017). *Rural China on the eve of revolution: Sichuan fieldnotes, 1949-1950*. Seattle: University of Washington Press.

Notes

Note 1. Including 140 floating merchants (in which 95 wholesale riverine traders and 45 retail ones), 17 local officials, 22 inland traders, 14 vegetable and fruit growers, and 5 tourists.

Note 2. Known as Saigon prior to 1975.

Note 3. After the Vietnam War (1975), the Vietnamese government centralized almost all economic activities; farmers had to join state-run cooperatives. Spontaneous markets, such as the floating markets in the Mekong Delta, were banned. The 1986 Reform Policy (applied in 1991), encouraged non-state economic sectors so long as activities are legal and do not harm national interests (Luong 1994, 79-113; 2007, 439-53).

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