

The preliminary study on the spatial characteristics and utilization of water port space of waterfront settlement in south of the five ridges

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Abstract. As the core area of south of the Five Ridges culture, Guangzhou is situated in the Pearl River Delta. The densely-distributed river network generates many waterfront settlements. The spatial patterns of the watercourse are complicated and diversified. Water port is an important element of the village. In this paper, we take water port and its surrounding space as the research object, such as Daling Village of Panyu District and Huangpu Ancient Port. Its spatial characteristics, protection and utilization are analyzed to reveal the mechanism of the external environment on the waterfront morphology and living environment of the waterfront settlements.

1. Overview of water port space in South of the five ridges

In Ming and Qing Dynasties, as the commercial trade and the shipping industry in the south of the five ridges developed, the commodities were transported to the upper market through the port of water, which promoted the construction of infrastructures in the waterfront settlement. Besides the functions of production, water port also acts as a junction terminal between land and water, and it is typically used as a commodity distributing center. Gradually, the water port has been one of the most critical components in the waterfront settlement space, which permeates the daily life of residents.

2. Main factors affecting the water port space

Natural geography and environment: The spatial pattern of waterfront settlement of South of the five ridges is firstly affected by the factors of natural geography and environment, such as channel width, tortuosity and distance to the seaway. In South of the five ridges, the rivers within waterfront settlements are narrow and changeable in shape. In order to obtain the maximum width of river and maintain routes unobstructed, design of water port is intensive. In addition to a very small number of wharfs with a floating platform, the remaining water port with single step run directly into the water and its width is only one or two people used together.

Social organization structure: The operation of clans infiltrates into all levels of settlement planning because of the long distance from the feudal ruling center [1]. It impacts on location of public buildings and the orientation of residential groups, which affects the location and form of shipping



traffic space and water port. Public ports are often built in front of a large ancestral temple while private ports are owned by the various clans and built in all adjacent bulkheads.

Folk culture and belief: People of south of the five ridges are mostly living near the water and they rely on water to live their lives. Since ancient times, the concept of sacrificial offering centered on worship of water gods has been formed. With altar or stone, public water ports often built together with a temple dedicated to water gods. In addition, based on Feng Shui [2], the location of water port is mostly in the open area with good vision.

3. Spatial distribution of water port in the waterfront settlement

As the vital junction terminal between land and water, public water ports are commonly found in front of the ancestral hall, near the village pond, Pak Tai Temple, village gate and bridge, river channel bifurcation. It is not only the principal places for commodity consumption, but also the key area for collecting and distributing goods. The pattern of waterfront settlements is considerably modified by the form of the river. Along the river streets, there is a bell-shape or "Y"-shape layout [3]. Water port space is interspersed with it, which expanding and buffering the line streets, forming settlements space texture together with the squares and streets. The street interface along the river includes shops, shrines, houses and trees such as river. Barges generally use stone, mostly large blocks of granite, some villages still retains water port with red sandstone masonry.

Private water ports usually have traffic and production functions, and are often located at the far end of each waterway or lanes of different neighborhood. In the past, water port of each family was divided strictly and some of them were specifically inscribed with stone. So there will be one thing that several private water port adjacent to each other. With a simple layout, revetment of this kind of water port often uses granite or gravel. People will plant fruit, crops, vegetables and so on next to the port. To meet the needs of villagers' daily life, the width of the street is expected to be very small, often less than 5 meters.

4. The morphological characteristics of water port space

According to morphological characteristics, the water port in the south of the five ridges waterfront can be divided into platform-type, vertical-type and parallel-type.

Platform-type: With wide width, the platform type water port is commonly located in the waterfront which near the main channel of the Pearl River. It is not only an important material conversion hub for south of the five ridges waterfront settlements, but also a place for villagers to communicate. This kind of waterfront settlement has a wider water port, more goods and boats. In order to meet the need of berth of different boats, water port mostly located in the shuikou of the village. The float of water port is related to steps, forming a large area of the waterfront trail. With a clan ancestral hall, the village square usually shares a side of shore with water port. Banyan trees are planted beside the shore paved with granite slippery underfoot, such as water port of Nanjiao village of Fangcun District, dock park of Lijiao village of Haizhu District. People plant large trees to block the summer sun effectively and to provide shelter for the water port and its surrounding space because of intense sunshine in the south of the five ridges. With the stone benches and stone tables, the villagers can stay for a long time.

Vertical-type: The vertical water port is the most common type of water port in the south of the five ridges' watercourse, which is vertical to the river and parallel to the coastline on both sides. It is approximately 1-2 meters long and usually reaches the surface of the water with 6-10 steps. The width is different, width of common vertical port which is near the bridge usually up to 3-4 meters. In this case, ship is apt to steer in shore and evacuate the people in time, such as water port at both ends of Longjin bridge of Daling village of Panyu District. The private water ports in the junctions or tributaries of the river are narrow and less than 2 meters. This kind of port is generally not far from the owner's residence. Coast often has land with fruit and vegetables. Villagers irrigate their land through the water port, conveniently and quickly.

Parallel-type: Parallel water port is mostly seen in new or renovated waterfront settlements in the south of the five ridges. The steps are parallel to the river shore. With a width of 1 meter, parallel water port takes up small channel space and can be made into single side or two single to the river depending on different terrain. This type of water port is not as convenient as vertical water port to steer a boat in shore, and it is commonly used for taking water by land residents nearby river, such as Sanshan village in Panyu District.

5. Significance of the water port space

Practical significance: Although there are various forms of water port in the south of the five ridges, the ultimate goal is to facilitate production activities of villagers. In fact, its practicality can be divided into three aspects: production, living and transportation. As a bridge between land and water, the villagers accomplish various daily activities through the water port and its surrounding space, such as washing, fishing, trading, leisure, communication and other activities. In the Dragon Boat Festival, people row dragon boat to the other villages. As guests, villagers share lunch through water port. The water port is regarded as the living room of the village [4].

Psychological significance: Water port space is not only an important public node of the village waterway but also a good place for residents to pay tribute to the god of water. There is usually the Pak Tai Temple or arch nearby the water port. People come to worship especially in holiday. At the same time, street next to the water port is placed as node space of the street. Tables and chairs in the street can be used for playing chess and chatting. It is significant for increasing village cohesion and promoting residents' identity.

Ornamental significance: As a man-made structure on the watercourse, water port combines the beauty of nature and the beauty of Architecture. It connects the dynamic water flow with the static land, breaking the continuity of shore. It adds a lot of scenic embellishment to gorgeous revetment. In addition, with different forms of water port, revetment space can be combined with furniture, green plants and other layout of distinctive waterfront space.

6. The protection and utilization of water port space

In recent years, due to the increase in the size of the ship, demand for mooring is changing. Some traditional public water ports have been diverted to other purposes while some of them become tourist spots. Others become the waterfront footpaths. A part of the small private water ports are still reserved. There are many waterfront settlements in the south of the five ridges. This article only takes the Daling village of Panyu District and the Huangpu ancient port as an example to explore the protection and utilization of water port space.

Daling village of Panyu District: According to historical records, Daling village was built-in the first year of the Northern Song Dynasty (in 1119) and it has 900 years of history. Located in northwestern Panyu District, the village has Yudai River runs through, which is only 1 kilometers away from the main channel of the Pearl River. It travels 30 kilometers along the waterway to reach the estuary of the Pearl River. Because of development of fishery along the river channel, all kinds of water ports are distributed along the river to facilitate villagers' access. Along the main river existing 6 water ports, two of them located in both ends of Longjin bridge, next to ficus. There is a square of the ancestral temple and two parallel-type water ports beside the bridge. In new masonry railing, revetment beside wide streets is divided into two layers. The lower layer is provided with a hydrophilic footpath, now become a place for after-meal entertainment.

Huangpu Ancient port: Since the Song Dynasty, Huangpu Ancient port has played an important role in overseas trade for a long time. The ancient port witnessed the prosperity of the "Maritime Silk Route" in the south of the five ridges. In the Southern Song Dynasty, this village was a ship's distributing center. After Ming and Qing Dynasties, Huangpu Ancient port has gradually become South of the five ridges' trade center for foreigner. But now it has peaceful reunification and become a new tourist spot in the south of the five ridges. The largest port in the port is still operating. There are daily ferries to move the villagers and tourists across the river. This vertical-type water port has

waiting seats and the whole port is spacious and comfortable with mahogany paved floor. Besides, there are a lot of small water ports, some of which are private water ports for use of villagers. Others are public water port for tourists viewing and most of them located in the harbor area of Huangpu Ancient Port. With the sunset and lobular banyan, it is a comfortable place.

7. Conclusion

As a common architectural element of rural settlement in the south of the five ridges, water port is influenced by factors such as the natural geographical environment, social organization structure and folk culture and beliefs. With flexible and diverse forms, it has practical value and aesthetic value. It is not only an important node for villagers to participate in the rustic waterfront life, but also a window for image of settlement. Understanding the spatial characteristics, functional mechanism of water port and its surrounding area is significant for maintaining and repairing waterfront settlements even the urban waterfront space.

References

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