Traditional Coastal Settlements of Chaoshan Area Adapted to The Sand Ridge Landform

Ying Pan¹, Jiayu Bai², Ying Shi^{1*}

¹ ²School of Architecture, South China University of Technology, Guangzhou, Guangdong Province, 510000, China

Abstract. Sand ridge landform is a kind of typical coastal natural landform in Chaoshan area. Through data review, historical satellite image collection, field interviews, archives search and other methods, the relevant data of the sand ridge landform area were collected, and comparative research methods were used to analyze the influence of such terrain on the Traditional settlement mode. A types of settlement patterns is summarized: the evolutionary pattern of settlements which are built on high ground and spread out to sea and that are adapted to the development of sand ridges landform. Through this case study, we hope to have a better understanding of the characteristics of the Chaoshan traditional settlements.

1 Sand ridge landform in ChaoShan area

The Chaoshan area is an important part of Guangdong province. Since the Tang and Song Dynasties, Fujian immigrants have moved to Chaoshan area, reclaiming wasteland and establishing villages and towns. During the Ming and Qing Dynasties, due to the rapid population growth puts enormous pressure on land development. In the process of expanding the living space, the fertile soil areas of alluvial plains were first occupied by the ancestor (of Chaoshan). Newer immigrants were compelled to the south to exploit coastal saline-alkali land [1]. In the estuary of the Han River, the largest river in the Chaoshan Plain, a sand ridge landform formed under a special natural environment has been developed, this area is around 370km², and 11.5% of the Chaoshan Plain. A number of tall and wide sandbanks straddle the earth in parallel. In order to adapt the local environment, the ancestors of ChaoShan made settlements and cultivation by using unique method. They formed a unique type of sand ridge settlement, which is a typical settlement pattern formed by the Chaoshan people during the historical development of the past millennium.

Sand ridge is the name for the sandbank in the Chaoshan area [2]. After leaving the estuary, the sediment piled up in parallel with the size of the particles under the wave action, moved to the shallows along the coast and final formed a underwater sand bank. The result of sediment movement widen and heighten the existing sandbank, so that it will continue to rise and emerge from the water surface, gradually becoming integrated with the rear continent. At the same time, the new sandbank is developing in the front, and the coastline keep propelling to the sea [3]. Series of sand

ridges were arranged parallel to the coastline, forming a special type of coastal landform.

2 Settlement adapted to the sand ridge landform

2.1 The counterpoint relationship is obvious between settlements and sand ridges

The development of sand ridge - lagoon plain has a great influence on the settlement pattern in the traditional period. First, massive areas of Chaozhou have been developed after the Tang and Song dynasties in the process of immigration. When the immigrants arrived at lower reaches of the Hanjiang Delta, they built the settlement exactly on the sand ridge. We overlay the elevation information map (figure 1.) and 1964 satellite map which still retain the traditional settlement pattern and mark village location (figure 2.). Obviously, in the area of Dongxi-Waishahe-Xinjinhe-Meixi in Chenghai District, about 17 villages belts have been formed, which are located on the 2-5m height sand ridges. There are several villages on the same sand ridge, which are kept at a certain distance from each other, and the village belts on different sand ridges are arranged in parallel. In addition, due to the different widths of the sand ridges developed in different periods, it also affects the spatial scale of the village settlements. For example, the width of the sand ridges developed in the Han Dynasty can reach 2 kilometers. The corresponding villages in Longhu District, Guating Village and Waisha Town Pengzhong Village are relatively large in size, and the lateral width reaches 200-400m. The sand ridges developed during the Tang and Song Dynasties were only 100-200m wide, and the corresponding widths of Liuhe Village and Bahe Village in Xinxi Town were only

*Corresponding author's e-mail: 246834@qq.com

150 m.

Figure 1. Elevation information map

Figure 2. The counterpoint relation between settlement and sand ridge

2.2 The formation of settlements conforms to the development of sand ridge

The resettlement and migration process of immigrants on this land can be reflected by information such as the name of the village, the age of the village and the source of the immigrants. The Waisha and Xinxi towns sandwiched between the Xinjin River and the Waisha River are typical areas for the development of the Sand ridge-Lagoon plain. Most of the villages were built on the sand ridges. There are 7 village belts in the order from the inland to the seashore in the Xinxi Town. The names of these villages are arranged in order from “First He”, “Third He” and “Forth He” to “Eleventh He” (“He” is what the local villagers call the settlement group),

from which the development process of the village system can be seen [4].

After statistics on the establishment age of some villages in these two towns (Figure. 3, Table 1), it can be clearly found that from the inland to the seashore, the village is getting closer and closer in establishment age. Daya Village, Xinxi Town, located at the delta top river bifurcation, was moved from the Lan surname ancestor in Zhangpu, Fujian Province in the late Southern Song Dynasty. It is one of the earliest villages in this district. Southward toward sea, most of the villages in the Waisha town (1-13) were built in the Ming Dynasty. Moreover, a large part of the immigrants were Fujian immigrants. Further to the southern Xinxi Town (14-36), all the villages were built in the Qing Dynasty, and the source of

immigration was the northern Waisha town and the local village of Xinxi Town.

Figure 3. Village numbering map

Table 1. village information table

Serial number	Village name	Village establishment age	Source of immigration	Serial number	Village name	Village establishment age	Source of immigration
1	DAYA	1200s	ZHANGPU, FUJIAN Prov.	19	XINTIANWEN	1905	LAOTIANWEN
2	FUSHA	Late 1300s	ZHAOAN, FUJIAN Prov.	20	UPPER 1 ST HE	About 1870	WAISHA TOWN
3	DONGXI	1573	PUTIAN, FUJIAN Prov.	21	MIDDLE 1 ST HE	About 1870	WAISHA TOWN
4	NANSHE	1200s	QUANZHOU, FUJIAN Prov.	22	LOEWR 1 ST HE	About 1870	WAISHA TOWN
5	JINZHOU	Late 1300s	ZHAOAN, FUJIAN Prov.	23	UPPER 3 RD HE	About 1870	WAISHA TOWN
6	FENGJIAO	About 1410	PUTIAN, FUJIAN Prov.	24	MIDDLE 3 RD HE	About 1870	WAISHA TOWN
7	NEILONG	About 1550	PUTIAN, FUJIAN Prov.	25	LOEWR 3 RD HE	About 1870	WAISHA TOWN
8	LICUO	1200s	PUTIAN, FUJIAN Prov.	26	NEW HE	About 1860	-
9	PENGZHONG	About 1300	PUTIAN, FUJIAN Prov.	27	6 TH HE	About 1870	WAISHA TOWN
10	XIACAI	1566	CAICUO, SHANGHUA	28	7 TH HE	About 1830	-
11	LONGTOU	About 1550	PUTIAN, FUJIAN Prov.	29	UPPER 9 TH HE	About 1870	WAISHA TOWN
12	HUAFU	About 1410	PUTIAN, FUJIAN Prov.	30	DA 10 TH HE	About 1870	WAISHA TOWN
13	FENGMEI	About 1650	PUTIAN, FUJIAN Prov.	31	GONGWEN	1836	PENGZHONG, WAISHA TOWN
14	HUAXIN	1887	HUAFU, WAISHA TOWN	32	LIUFENG	Late 1800s	WAISHA TOWN
15	RENHELI	1870	WANGCUO, WAISHA TOWN	33	LOWER 10 TH HE	1855	OUTING TOWN, SHANTOU
16	WUXAINGXI	1870	WANGCUO, WAISHA TOWN	34	11 ST HE	About 1790	-
17	SHIBAHU	About 1840	PENGZHONG, WAISHA TOWN	35	BAWEI	1866	-
18	LAOTIANWEN	1787	PENGZHONG, WAISHA TOWN	36	SIWEI	1930	WAISHA TOWN

In addition, comparing the geological age of sand ridges with the age of village settlements on the sand ridges, it is not hard to find that the later the sand ridges are formed, the shorter the time interval is. It reflects the increasing speed of population migration to the coastal area. For example, Daya Village on Delta Head built in the late Song Dynasty, and it was landed in the Spring and Autumn Period (about 500 BC), the interval time is about 1800 years; the Gongwen village on the tail of the delta was built in the 16th year of Qing Dynasty's Emperor Daoguang, the formation time of the sand ridge in a lower position was about the beginning of the Ming Dynasty, and the time interval was about 400 years. The shortening of the time interval and the compression of the spatial distance reflected the contradiction between the people and the land in Chenghai.

The sequence of natural spaces in which these sand ridges are arranged in parallel is in line with the growing population of the region. The village settlements occupy these sand ridges in the order of immigration time, forming the traditional social settlement form of perfect integration of spatial order and time sequence. Among the reasons for the village forming, the characteristics of the migration from the other province to the local villages can be regarded as the reflection of social phenomena in the history of Chaoshan area with increasing contradictions between people and land in the settlement space.

2.3 The form of residence reflects the land development process

The two towns sandwiched by Waisha River and Xinjin River are Waisha and Xinxi. The Waisha Town located in the upper reaches of the river, in which the villages were formed earlier. In contrast, the Xinxi Town is located in the lower reaches of the river, in which the land formation time was later. It was gradually developed by the ancestors of the Waisha Town in the late Qing Dynasty. The reclamation is conducive to meeting the growing population demand of the Waisha Town, but the farmland here is far away from the home in Waisha, and daily farming has many inconveniences. Therefore, the ancestors of the Waisha Town began to build some triangular conical grass rafts with bamboo rafts in the field for the storage of agricultural tools and temporary rest. These grass rafts are shaped like the sitting Avalokitesvara Bodhisattva, also known as "Guanyin Liao". During the reign of Emperor Kangxi in Qing Dynasty, the people in Waisha Town escaped from the disaster, and took the family to escape to the Guanyin Liao in Xinxi Town for temporarily escape. When the officers came to search, they hid in crops or wild grasses. Over time, people were accustomed to the convenience of living here. The Guanyin Liao was demolished and converted into a thatched cottage to form a permanent settlement and gradually developed into a village. Most of the villages in Xinxi Town were formed after then [5].

Due to lack of resources and economic backwardness, the residences in Xinxi Town retain the original thatched cottage until the 1980s. It has poor ventilation and

lighting conditions and is easily damaged by typhoons. In the past 30 or 40 years, the village has carried out a unified plan, replacing the original thatched cottages with the unified brick and tile houses. The settlement pattern has also changed into a checkerboard layout, and the original village pattern has been completely destroyed. In comparison, the residential buildings in the Waisha Town developed earlier are more sturdy and refined. The villages in Waisha Town have all been replaced by brick and tile houses in the late Qing Dynasty. There are still thousands of houses in the late Qing Dynasty. In addition to small houses such as Xiashanhu, Sidianjin and Shuangpeijian, there are many places. Large-scale residential houses such as Simatuoche, the building is various in form and the status quo is basically intact [6]. The area where the old buildings in the village are concentrated also basically retains the original village structure organized by the longitudinal alleys, and the new buildings are concentrated in the periphery of the old village.

The history and current situation of the construction of residential houses in the two towns reflects the sequence of land development and the resulting differences in social and economic conditions. It is a historical imprint of the traditional villages gradually moving towards the seashore.

3 Conclusion

The site selection of settlements in the sand ridge landform area is adapted to the expansion of the village population. Limited by the influence of the width of the sand ridge on the size of a single village, the increasing population can only choose to move out of the old village. The new village conforms to the development of the sand ridge. The site selection has a clear alignment with the sand ridge highland, and it continues to advance to the seashore. There are significant temporal distribution characteristics. The form of dwellings also reflects the changes in people's living patterns in different periods of land development.

The form of settlement on this coastal sand ridge landform reflects the adaptability of the Chaoshan people in the land development process of the past millennium. It is an important case showing the wisdom of the ancestors living and the harmonious relationship between people and the land.

Acknowledgement

Fund Item: The National Nature Science Foundation of China-- Research on Characteristics, Regionalization and Mechanism of Lingnan Han Ethnic Rural Settlement' Landscape Based on Cultural Geography (No. 51978275);

Guangzhou Dadian and Guangzhou History and Culture Research Subsidy Project "Comparative Study of Traditional Village Settlements Landscape in Guangdong Based on Ethnic Differences" (Project Approval No. 2019GZB07)

References

1. Situ, S. (2001) Lingnan History and Human Geography--A Comparative Study of Guangfu, Hakka and Fulao Clans. Sun Yat-sen University Press, Guangzhou. 121.
2. Ji, Z. (2013) Chronicle of Longhu District, Shantou City (1979-2003). Huacheng Press, Guangzhou. 129.
3. Li, P. (1987) Hanjiang Delta. Ocean Press, Beijing. 152-163.
4. Guangdong Province, Shantou Municipal Chronicle Compilation Committee. (1999) Shantou Municipal Chronicle Volume 4. Xinhua Press, Beijing. 284.
5. Zhang, X. (1992) Chenghai County Chronicle. Guangdong People's Press, Guangzhou. 289.
6. Pan, Y. (2013) Chaoshan Residence. South China University of Technology Press, Guangzhou. 41.