

Spatial Protection and Development of Traditional Mountain Settlements from the Perspective of Self-organization: A Case Study of Anju Ancient Town in Tongliang District, Chongqing

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Abstract Through literature research, field research and urban design analysis methods, based on the self-organization theory, the evolution characteristics of the settlement space of Anju Ancient Town with significant characteristics of traditional mountain settlements were analyzed, and then its internal and external influencing factors were summarized. Finally, appropriate protection and development strategies were proposed, such as reasonably planning functional zones, breaking through the single structure, and creating a good living cultural environment. The innovation of this study is that it integrates the self-organization theory into the cognition of traditional mountain settlement space, and discusses the connection between the mountain settlement space and the traditional regional context under the modern development concept, so as to seek the benign protection and reasonable development of traditional mountain settlement space.

Key words Traditional mountain settlements; Self-organization theory; Spatial characteristics; Protection and development; Anju Ancient Town

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Since ancient times, the meaning of "settlement" has gradually developed from villages to countryside, market towns and cities, and it is the main place for people to carry out social activities. It not only contains the material combination of common people to carry out social activities, but also implies the combination of culture and other non-material aspects, namely the collection of human, nature and society^[1]. "Traditional mountain settlements" refer to the settlements in the mountain environment that give people a unique sense of place after successive inheritance, and as the product of friendly symbiosis with the mountain form developed from bottom to top, it bears the memory of historical development^[2]. "Space" here represents the part defined by various entities (buildings, mountains, vegetation, *etc.*) in traditional mountain settlements. With the acceleration of urbanization process, many traditional mountain settlements are faced with different degrees of constructive destruction, resulting in a series of problems such as lack of features and cultural memory fault^[3]. In this paper, "traditional mountain settlement space" was as the research object, and based on the self-organization theory, Anju Ancient Town in Tongliang District, Chongqing was analyzed to understand the internal law of development and evolution of traditional mountain settlement space and then explore sustainable protection and development models.

1 Self-organization theory and self-organization characteristics of traditional mountain settlements

1.1 Self-organization theory As a concept opposite to "other organization" (see Fig. 1), the system formed by "self-organization" refers to the self-development of its structure from disorder to order, from single to rich, from rough to fine, and from low to high level due to the internal mechanism^[4]. Hence, in order to better analyze the formation and evolution of this complex system, self-organization theory comes into being. As a theoretical group, it includes dissipative structure theory, synergetic theory and mutation theory. In addition, Professor Wu Tong of Tsinghua University also systematically proposed the framework system of self-organization methodology^[5].

1.2 Self-organizing characteristics of traditional mountain settlements The evolution of the spatial form of traditional mountain settlements is a long and continuous process. After hundreds of years of material and information exchanges with the outside world, they gradually develop into a complex system. When this system has four characteristics of openness, non-balance, non-linearity and internal fluctuation, it can be judged that the evolution of these traditional mountain settlements is self-organized^[6].

With the rapid development of urbanization, traditional mountain settlements in China at present can be divided into three types according to their growth and evolution. Firstly, a purely self-organized settlement, without interference from external instructions, gradually evolves into an orderly spatial form from bottom to top in accordance with its own development law, fully demonstrating the creativity and initiative of residents and the fresh-

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ness of the spatial form of traditional mountain settlements. Secondly, a settlement with the combination of self-organization and other organization means that in the evolution process of its self-organization, other organization is involved appropriately, which can not only enrich the spatial form of traditional mountain settlements, but also promote their new round of self-organization evolution. Thirdly, a completely other-organized settlement means that the strong intervention of other organization makes the settlement

quickly reach a higher ideal state, but it is easy to cause a single economic and cultural input, and cut off the growth mechanism of traditional mountain settlements^[7]. Therefore, the self-organization characteristics of spatial evolution of Anju Ancient Town, one of the representatives of traditional mountain settlements in Bayu area will be analyzed to provide guidance for the development and protection under the intervention of other organization at present.

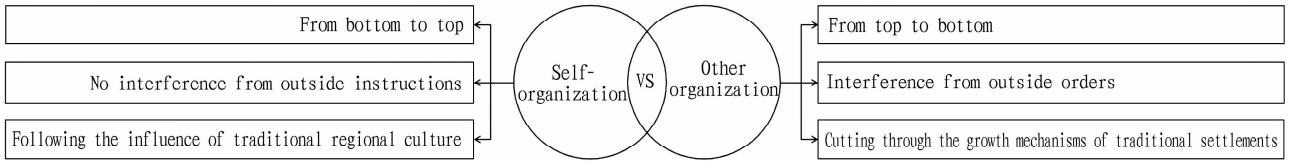


Fig.1 Comparison between self-organization and other organization

2 Evolution process and self-organization characteristics of Anju Ancient Town

2.1 General situation of Anju Ancient Town Anju Ancient Town is located in the north of Anju Town, Tongliang District, Chongqing (Fig. 2). It is 66 km away from downtown Chongqing and 17 km away from the county town of Tongliang. It has good location conditions. It is located in the central node of tourism circle line in the west of Chongqing, and extends to Dazu stone carvings in the southwest, the former residence of Yang Angong in the northwest, and Hechuan fishing city in the east, closely connecting with the surrounding scenic spots. In addition, the national highway 319 line runs across the town, and it is only 2 km away from the entrance of Yusui Expressway, so it has convenient transportation. The overall layout of the ancient town is quite in line with the feng shui principle of "fronting water and with hills on the back". It is located in a hilly area, bordering the Feifeng Mountain in the east, starting from the Hualong Mountain in the south, connecting the Qingliang Mountain rounding the Eumu River in the west, and bordering the south bank of the intersection of Qiongjiang River and Fujiang River in the north, which is the trend of Peninsula Island (Fig. 3)^[8]. The core protection

area of the ancient town settlements totals 2.5 km². With the evolution of history, the settlements in Anju Ancient Town first developed Taiping Street, West Street and Cross Street along the Qiongjiang River, Fujiang River and Wumu Stream, and then major streets such as Dananmen Street, Huoshenmiao Street, Huilong Street and Shuncheng Street along the Feifeng Mountain and Hualong Mountain. Its spatial system spontaneously developed in a more complex, orderly, exquisite and advanced direction. Thus, the settlements in Anju Ancient Town are purely self-organized traditional mountain settlements.

2.2 Evolution process of the spatial pattern of Anju Ancient Town Anju Ancient Town, which was built in 504 AD, had gathered merchants and enjoyed economic prosperity in the Qing Dynasty due to easy access to the waterway. Without the interference of external instructions, the ancient town was built according to the mountain and along the river. After more than 1,500 years of self-organization evolution, the traditional mountain settlements with great characteristics have finally been formed, and their spatial pattern system tends to be perfect. Through the study of county annals and related data, the evolution process can be divided into the following three stages.



Fig.2 Location analysis

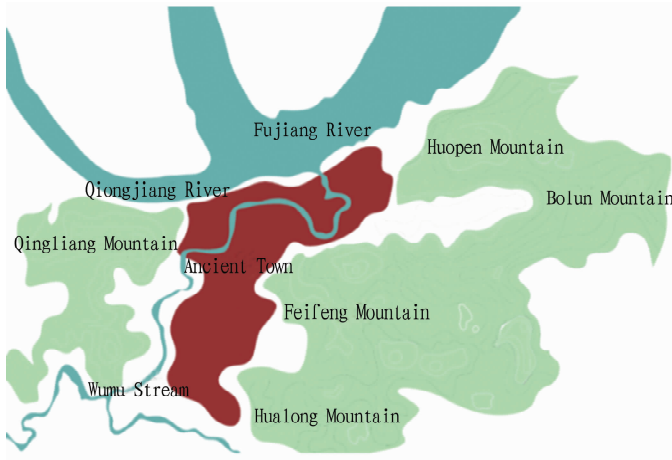


Fig. 3 Overall layout



2.2.1 Initial construction period (before the Ming Dynasty). As early as 20 000 years ago in the Paleolithic period, there have been traces of human existence here. During the Spring and Autumn Period and the Warring States Period, it belonged to Ba and Qin State successively. A settlement was formed here in the Han Dynasty. In the Sui and Tang Dynasty, it became the waterway in the lower reaches of the Fujiang River, and Bolun Temple, Dafo Temple and other Buddhist temple buildings were built here. It was set as a market town in the Southern Dynasty, a town in the Kaiyuan period of the Tang Dynasty, and a county in the Sui, Song and Ming Dynasty.

The spatial pattern in this period is shown in Fig. 4a. The original settlements in the ancient town were scattered along the Qiongjiang River, Fujiang River and Wumu Stream, and were all in the gentle areas with sparse contour lines. The road space had not yet formed a system, and the connection between buildings was weak. Due to the influence of religious culture, the early Anju Ancient Town was mostly composed of independent Buddhist temple buildings, which fully reflected its natural settlement space form.

2.2.2 Development period (from the Qing Dynasty to Republic of China). In the first year of Kangxi's reign in the Qing Dynasty (1662 AD), Anju County was withdrawn and merged into Hezhou. Tongliang County was set up in the 60th of Kangxi's reign in the Qing Dynasty (AD 1721), and was under the jurisdiction of

Chongqing government. In the sixth year of Yongzheng's reign in the Qing Dynasty (AD 1728), it was merged into Tongliang County. It was changed into a county in the 41st year of Qianlong's reign (AD 1776).

The spatial pattern in this period is shown in Fig. 4b. On the basis of retaining the architectural achievements of the initial construction period, the settlements in Anju Ancient Town first developed Taiping Street, West Street and Cross Street along the Qiongjiang River, Fujiang River and Wumu Stream, and then major streets such as Dananmen Street, Huoshenmiao Street, Huilong Street and Shuncheng Street along the Feifeng Mountain and Hualong Mountain. The settlement space spontaneously and orderly expanded on both sides of the streets. The architectural pattern has begun to take shape, and the relationship is relatively close, reflecting the spatial form characteristics of traditional mountain settlements.

2.2.3 Steady period (since 1912). Anju Ancient Town was changed into a township in the eighth year of the Republic of China. It set up a sub-county office in 1949 and a town in 1961. It was under the jurisdiction of Chongqing City in 1983. Anju Town was established in 1994. In 2002, it was positioned as the first batch of municipal "historical and cultural famous towns" in Chongqing. In 2008, it was established as the fourth batch of Chinese historical and cultural famous towns.



Note: a. Initial construction period (before the Ming Dynasty); b. Development period (from the Qing Dynasty to Republic of China); c. Steady period (since 1912).

Fig. 4 Evolution process of the settlement space system of Anju Ancient Town

The spatial pattern in this period is shown in Fig. 4c. After the development period, the scale of the settlements has been continuously developed and refined, and their overall pattern has also tended to be perfect, showing clear street veins and orderly spatial structure. Under the organic organization of points and lines, the ancient town is sandwiched between mountains and rivers, and has a typical group of traditional mountain settlements, showing its unique plane and texture.

2.3 Analysis of self-organization characteristics of Anju Ancient Town Anju Ancient Town, which has having purely self-organized settlements in the mountain environment, has the following characteristics according to the theory of dissipative structure: openness, non-balance, non-linearity and internal fluctuation.

2.3.1 Openness. Since its birth, Anju Ancient Town has been constantly exchanging material, energy, information, energy and capital with the outside world, so it is a typical open system. In the early Ming Dynasty, thanks to the convenience of waterways, Anju became a material distribution center of Tongliang, Dazu, Tongnan, Hechuan and other places. By the Qing Dynasty, merchants gathered in the ancient town, and the economy was prosperous. Merchants and immigrants from all over the world built guild halls here^[9]. Today, Anju Ancient Town, with its rich historical and cultural relics and beautiful scenery surrounded by the two rivers, presents a unique style to tourists from all over the world. From the point of view of self-organization theory, Anju Ancient Town introduces elements from the outside of the system and filter them effectively, so as to maintain the balance of its own evolution and achieve sustainable development.

2.3.2 Non-balance. The economic development level, cultural level, uneven resource distribution and population distribution of Anju Ancient Town promote the flow of labor, resources, transportation, culture and funds between it and the outside world. The competition within and between settlements and surrounding settlements leads the evolution direction of their spatial form, and the overall pattern changes accordingly.

2.3.3 Non-linearity. The self-organizing system of settlements in Anju Ancient Town is an open and complex dynamic system composed of different subsystems (Table 1). Each component element interacts with each other, and jointly guides the development of settlement space. For example, with the evolution of history, residents' way of life has changed, and the shape of settlement streets has become more perfect; the spatial scale has gradually expanded. When such changes reach a certain extent, they will react to the residents' way of life. Specifically, the streets that were originally used for living have been endowed with more extensive functions of commerce and traffic. Therefore, the evolution of ancient town settlements under the action of nonlinear characteristics has diversity and uncertainty.

2.3.4 Internal fluctuation. In traditional mountain settlements, fluctuation is the result of the interaction of many subsystems, which can be manifested as the interference or intrusion of space. For a certain limit of "fluctuation", ancient town settlements can be digested through self-adaptation, self-adjustment, and self-rehabilitation. For instance, with the traffic needs of residents' life

and business exchanges in the ancient town, some secondary space attached to the main street space grows in the form of "丁". When "fluctuating", the spatial structure of the ancient town settlement system is faced with instability, which is manifested as collapse and disintegration or evolution into a new organizational structure. For example, in ancient times, the ancient town was prosperous by water transportation, but with the improvement of land transportation system, water transportation also declined. It can be seen that the moderate "fluctuation" has objectively promoted the evolution of traditional mountain settlements.

Table 1 Self-organizing system and components of spatial form of traditional mountain settlements

Subsystem	Constituent element
Nature	Terrain, landform, water system, geology, <i>etc.</i>
Culture	Folk customs, patriarchal concept, Fengshui concept, technology, <i>etc.</i>
Economy	Agriculture, commerce, industry, forestry, fishery, animal husbandry, <i>etc.</i>

3 Current situation and thinking of self-organization protection and development of settlement space in Anju Ancient Town

The process of development and protection of Anju Ancient Town is a process of coordination between self-organization and other organization. The intervention of other organization is the inevitable requirement of social development, but it will inevitably lead to a series of problems if it breaks away from the evolution law of self-organization. Therefore, under the premise of fully following traditional regional culture, on the one hand, settlement space should be rationally developed to improve the level of local material space; on the other hand, the layout of traditional mountain settlements should be effectively protected to continue the context of historical development.

3.1 Influence of external factors on the ancient town

3.1.1 Promotion of the status of the ancient town. In 2002, Anju Ancient Town was named by Chongqing Municipal People's Government as one of the first batch of municipal "historical and cultural famous towns" in Chongqing City, and in 2008 it was approved as one of the fourth batch of "Chinese historical and cultural famous towns". It is a national 4A scenic spot with a long history and great cultural diversity. As early as 1984, the government made a master plan for Anju Ancient Town, and the opinions of local residents were fully respected during the development and construction. At present, the Bolun Temple area has basically maintained its original state, and Danan Street and the Huoshen Street have been maintained, while Mazu Temple, Xiaziyun Palace and other palace buildings have been repaired. With the increase of the attention paid to the protection and development of Anju Ancient Town, the local government has invested heavily in the construction of Liangjiang Square, Quanxi Bridge, the reconstruction of Wumu Bridge, and the preparation of Anju Sewage Treatment Plant. At the same time, under the attraction of rich historical relics and unique natural landscape, many tourists are pouring in,

which drives the rapid development of local tourism.

3.1.2 Pattern of the ancient town under planning. Anju Ancient Town has a typical group of traditional mountain settlements. Through the planning intervention of other organization, Anju Ancient Town presents a structure of "two axes" (the commercial axis along the river formed by Taiping Street – West Street – Shizi Street, and the palace temple and hall axis formed by Huilong Street – Huoshenmiao Street – Dananmen Street), and "three centers" (the political power center (the political power represents the ancient county government), the operation center (Beimen Pier in front of Xiaziyun Palace), and the public center (the intersection square between Huilong Street and Huilong Street)). On the whole, Anju Ancient Town stretches along the river in the plane layout, and in the longitudinal space, it twists up with the mountain, showing a "T"-shaped spatial pattern (Fig. 5). The streets in the ancient town are different from the straight and intersecting roads in the north, extending in the shape of snakes, and

the roads cross in the shape of "丁" at various angles. The streets grow along the landscape interface, and the node space is varied, forming complicated traditional mountain settlement space (Fig. 6).

The total length of streets in the ancient town can reach more than 1 000 m. Among them, Banlao Street (now Binjiang Road), Xiaonan Street and Houhe Street are traditional residential areas. Banlao Street is close to Wumu Stream, and is full of stilted houses along the river, having characteristics of water towns. Along Taiping Street, Shizi Street and Huilong Street, there are many shops, chambers of commerce, guilds and so on. Huoshenmiao Street is full of old houses, shops, palaces, halls, academies, etc. The overall pattern not only conforms to the self-organizing evolution of traditional mountain settlements, but also meets the needs of traffic, business activities and daily communication of residents. It perfectly integrates natural landscape and cultural landscape, creating a coordinated settlement spatial pattern of "mountain, water and city" (Fig. 7 – Fig. 9).



Note: a. Point; b. Plane line; c. General plane.

Fig.5 Plane composition of the settlements

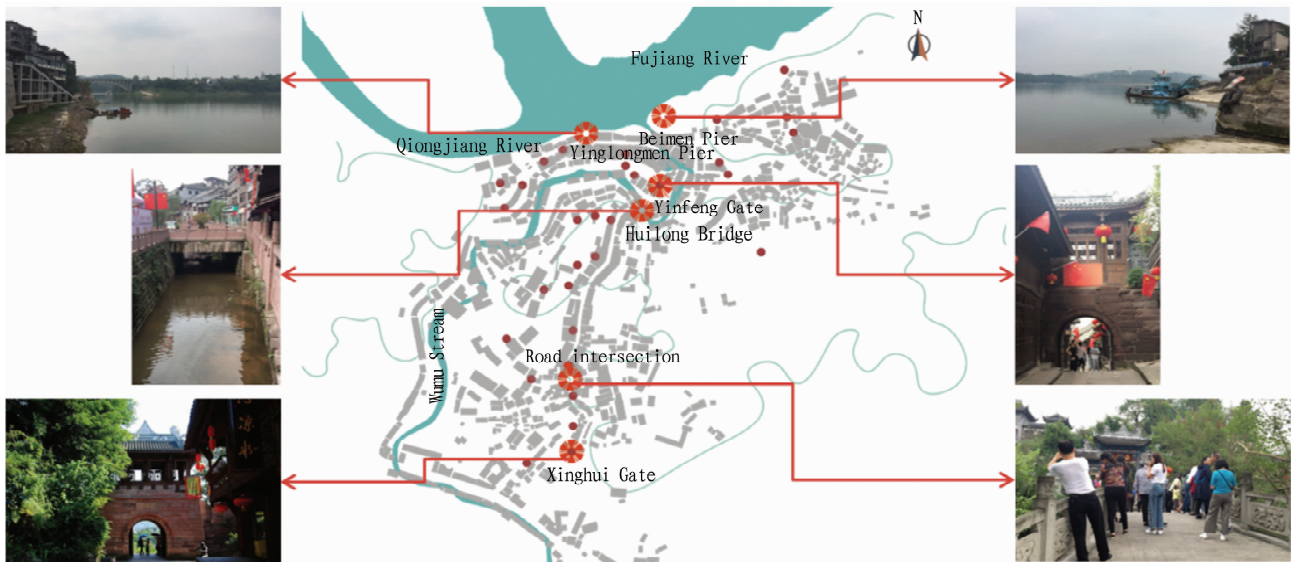


Fig.6 Node space

3.2 Influence of internal factors on the ancient town

3.2.1 Industry situation of the ancient town. Under the promo-

tion of good location and transportation conditions, Anju Ancient Town has made great efforts to develop tourism economy by relying



Fig.7 Figure bottom relationship



Fig.8 Spatial structure

on the cultural resources mainly dominated by historical relics and the natural resources mainly dominated by mountains and rivers (Fig. 10), thus promoting the protection of traditional mountain settlements. A series of business activities based on tourism promote the renewal of street space and the change of architectural style in the ancient town. West Street, Huilong Street and Shizi Street, as the main streets of the ancient town, are all about 1.5 – 3.0 m in width, but under the influence of the difference between the advance and retreat of compact land and buildings, their width fluctuates by 1 – 2 m. Meanwhile, the height of the buildings on both sides of the streets is about 3 – 8 m, and the width ratio of the streets is about 1 – 2. According to the *Aesthetics of Streets* written by Yoshinobu Ashihara, the street space under this scale is comfortable and pleasant, and will not produce a sense of oppression. The buildings on both sides of the streets retain the pattern of "front shop and back house, upper house and lower shop"^[10] (Fig. 11), and are mostly reconstructed from two-story ancient

buildings and traditional dwellings.

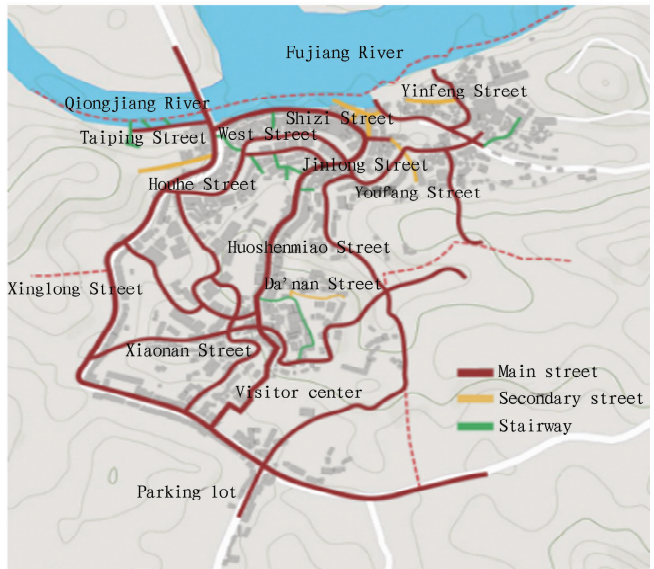
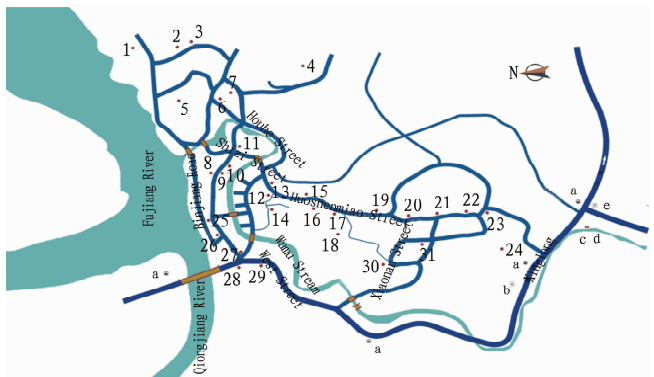


Fig.9 Plane layout of streets

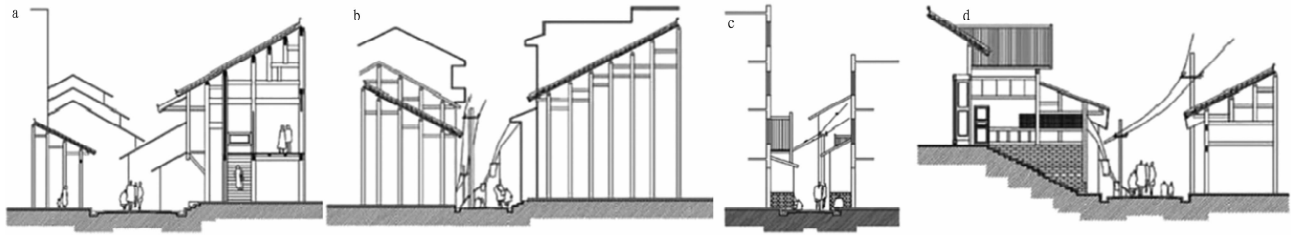


Note: 1. White Pagoda; 2. Anju National Wetland Park; 3. Huangjiaba Camping Base; 4. Bolun Temple; 5. Xiaziyun Palace; 6. Liangjiang Square; 7. Zeng's Ancestral Hall; 8. Liu Bocheng's secret residence site; 9. Fan Family Noodle Restaurant; 10. Liu Xue'an Art Center; 11. Yinfeng Gate; 12. Wu Hanlin Academy; 13. Book Shop; 14. Wang Hanlin Academy; 15. Kejia Lane; 16. Huoshen Temple; 17. Military Museum; 18. Wen Temple; 19. Wu Hungen Exhibition Hall; 20. Qi'an Public Office; 21. Huguang Guild Hall; 22. Tianhou Palace; 23. Xinghui Gate; 24. Visitor Center; 25. Observation Deck; 26. Yinglong Gate; 27. Chenghuangmiao Square; 28. Yuan Tian Palace; 29. National Academy of Sciences; 30. Wanshou Palace; 31. County government. a. Anju Ancient Town Bus Station; b. Anju Center Health Center; c. People's Government of Anju Town; d. Anju Ancient Town Scenic Area Management Committee; e. Ecological Parking Lot, Tourist Through Train Station.

Fig.10 Distribution of tourist routes and main scenic spots in Anju Ancient Town

There are commercial activities about a variety of traditional food in the streets, and the traditional handmade food culture is well restored through the display process of handmade food (such as grinding, playing ciba, painting sugar figures, steamed rice cakes and a series of on-site production). This form of tourism economy not only provides more living income for local residents,

but also is the inheritance mechanism of intangible culture in the ancient town.



Note: a. Danan Street; b. Huoshenmiao Street; c. Huilong Street; d. Shizi Street.

Fig.11 diagrams of typical sections of streets in Anju Ancient Town

3.2.2 Problems in the ancient town. Under the intervention of tourism development, the development of Anju Ancient Town has many problems. Firstly, the industrial structure of the ancient town is too simple. For most of the tourists who have been to Anju Ancient Town, several commercial streets with food culture are the most profound, and the supporting tourism facilities and cultural and creative industries closely related to the ancient town itself are lacking. Secondly, the long history gives rise to the rich historical and cultural relics of Anju Ancient Town. For the most famous "Jiugongshibamiao", due to the erosion of wind and rain, some ancient buildings are badly damaged and lack maintenance. Local residents have weak awareness of protection and lack publicity and education. Thirdly, with the loss of indigenous peoples, some intangible cultural heritages are facing the dilemma of vanishing, while the rising tourism industry fails to highlight regional cultural characteristics. Fourthly, unreasonable development has caused the destruction of the natural ecological environment in the ancient town, and a large number of tourists have entered the town, threatening the cultural landscape environment of the ancient town. At present, there are some problems of prominent contradiction and severe relationship between man and land in the development of Anju Ancient Town.

3.2.3 Thinking about the status quo of Anju Ancient Town under the joint action of external environment and internal mechanism. By summarizing the research status of Anju Ancient Town, the dynamic mechanism of the self-organized development and protection of Anju Ancient Town is concluded (Table 2). It is also found that its tourism industry has developed rapidly but lacks cultural characteristics, and the value of traditional mountain settlements has not been well developed. In addition, for a historical and cultural town in China, protection is always the only way to achieve sustainable development, and groups at all levels such as indigenous people, tourists and planners should respect the settlement pattern formed by self-organization for thousands of years. Therefore, based on the research on the self-organized development of Anju Ancient Town, the following strategies can be proposed for the protection and development of traditional mountain settlement space.

4 Strategies of protection and development of Anju Ancient Town based on self-organization theory

4.1 Reasonably planning functional zones to protect the cultural heritage of old streets^[11] Presently, Anju Ancient Town

covers two main areas: traditional old streets and Houxihe New Street. The old streets are a collection of traditional settlements in the initial period of construction, having the most ancient historical and cultural essence. Therefore, in order to prevent excessive commercial atmosphere from damaging the style of the old streets, the old and new streets should have different functional positioning in the planning. Tourism, traditional commerce and service industries should become the key industries of the old streets. As the core areas showing the cultural heritage of the ancient town, Huilong Street, Huoshenmiao Street and Nanda Street need to improve their own infrastructure and add public space. Besides, they should be transformed into commercial pedestrian streets with traditional characteristics, and should be equipped with residential handicraft workshops, local specialty food shops, historical architecture exhibitions, *etc.* On the premise of not destroying the original style, new vitality should be injected into decaying old streets^[12]. Tourist Center, street along the Houxi River and Fujian Pier are new streets, and need to focus on the development of tourism services and modern catering to share the flow of people for the old streets. In addition, a series of leisure activities such as fishing, boating, and water shows can be introduced into the area along the river to enrich the tourism connotation of the ancient town.

4.2 Breaking through the single structure to form a multi-dimensional cultural industry chain^[13] Rich historical and cultural heritage is an opportunity for multi-brand shaping. For instance, souvenir design, handicraft production, traditional clothing design and characteristic catering service can be organically combined with tourism brands to build a relatively complete industrial chain, which can not only create economic value, but also carry forward characteristic culture, so that every tourist's impression of Anju is full and wonderful, and every resident's feelings of the ancient town is real and satisfied.

4.3 Creating a good living cultural environment^[14] Tourism development needs to pay attention to tourists' perception and experience, and the rich cultural activities of Anju Ancient Town provide an excellent environment for them (Table 3). People can participate and experience Chenghuang Meeting, Guanyin Meeting, and Qianren Banquet, and enjoy dragon boat rowing, iron water playing, Sichuan opera performance. Bamboo weaving, carving, embroidery and other folk crafts have been spread. These intangible cultural activities can also be combined with traditional architectural space^[15] and held regularly to not only inherit and pro-

tect intangible culture but also be as a characteristic form of ancient town development (Fig. 12).

Table 2 Dynamic mechanism of the self-organized development and protection of Anju Ancient Town

Driving force	Factor	Current situation	Analysis and thinking
External driving force	Status of the ancient town	Chinese famous historical and cultural town	It has a long history and is well known for its "Anjubajing" and "Jiugongshibamiao"
		National 4A scenic spot	Landscape resources and architectural features are well preserved
		National key small town	The state attaches great importance to economic development
	Government and business investment	The government invests funds and manpower to renovate and repair it, and enterprises introduce more business activities	The ancient town has been protected and developed, and residents' quality of life has been improved
		Chengdu – Chongqing economic circle	Under the attraction and radiation of Chengdu and Chongqing, the tourism of the ancient town has developed by leaps and bounds
	Tourists' cognition	Tourists are pouring in	Promoting the development of local tourism and new service industries
Internal driving force	Residents' life	Functional transformation of traditional street space	The development of service industry has transformed the function of the main streets from living function to traffic function
		Lack of living facilities	Current facilities cannot meet the needs of residents, tourists, etc.
		Increase of spiritual needs	Residents are eager for more activities to enrich their spiritual world
	Infrastructure	Medium hydroelectric power plant	Abundant water and electric power resources have promoted economic development
	Ecological environment	Deteriorating water quality of Wumu Stream	Silt accumulates in the channel, and there is some floating garbage
		Loss of indigenous people and the disappearance of traditional life styles	Nearly 60% of population in the ancient town are migrant workers who engage in commercial activities
	Industry situation	More traditional handmade food culture	On both sides of the main streets, traditional food exhibition activities such as grinding, steamed rice cakes, and glutinous rice cakes were distributed
		Folk activity	Bridal chair experience, viewing stage, archery and other activities are distributed at the important nodes
		Gradually emerging of modern service industry	New restaurants, homestays and so on are gradually developing to meet the needs of residents and tourists

Table 3 Classification of intangible cultural heritage in Anju Ancient Town

Category	Content
Folk literature	Biyuzan ancient love story
Performing arts	Dahuolong, dragon dance, Sichuan opera, Jinqianban storytelling
Arts and crafts	Tonglianglong color binding process, wood carving, stone carving, bamboo weaving and other handicrafts
Folklore and ancient life scenes	Ancient county patrol scene, Chenghuang patrol scene, samurai changing guard, Bolun Temple folk customs and ancient burning incense, making rice dumplings during the Dragon Boat Festival, dragon boat rowing, flower boat performance, Mazu festival life scene sacrifices, people marriage customs, as well as Spring Festival, Mid-Autumn Festival and other festivals, Mid-July Days and other folk customs



Fig. 12 Featured cultural activities

4.4 Improving infrastructure and comprehensively improving the ecological environment^[16] With the development of social economy, the infrastructure in the town can no longer meet the needs of residents. The water environment of Wumu Stream, the "blood" of the ancient town, is also deteriorating. As a basic element of the traditional mountain settlement, some aborigines moved out because of dissatisfaction with the current situation. With the loss of these populations, some traditional cultural elements also faded. Hence, in the development of the ancient town, on the one hand, infrastructure should be improved to enhance residents' quality of life^[17]; on the other hand, the polluted Wumu Stream and other ecological environments should be comprehensively remediated and protected to retain residents, so as to ensure the sustainable development of the ancient town.

5 Conclusions

Based on the self-organization theory, the evolution characteristics of the settlement space of Anju Ancient Town was analyzed, and its self-organization characteristics was clarified. The influence mechanism of self-organization on traditional mountain settlements was specifically revealed, and the suitable protection and development strategies of traditional mountain settlements with other organization nature based on self-organization were summarized finally. In the era of rapid urbanization, self-organization and other organization jointly promote the sustainable development of traditional mountain settlements.

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establish a professional technical and talent system, and improve the educational effectiveness, management level, and service quality of nature education bases.

4.4 Strengthening the publicity and promotion of nature education Industry regulatory authorities should promote and report the significance and effectiveness of nature education through various channels, regularly organize nature education recommendation activities, and enhance people's awareness and demand for nature education. At the same time, all kinds of nature education bases should also promote their own advantages and characteristics through new media technologies such as Tiktok and Kwai, so as to enhance their nature education brand awareness and market competitiveness. It should pay attention to collaborating with schools, research institutes, and study tour institutions to carry out diverse and rich nature education activities, and

enhance the influence and attention of nature education bases.

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