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An Exploration of the Cultural Landscape Model of Zhuge Village

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Abstract: Since ancient times, China has adhered to designing human settlement based on the concept of “defending the emperor and safeguarding the ordinary”. With its spatial structure in accordance with the Chinese ancient strategist Zhuge Liang’s art of war “the Diagram of the Eight-Sided Battle Formation” and in line with the terrain of natural landscape, Zhuge Village, the settlement of Zhuge Liang’s descendants in middle Zhejiang Province, has formed a landscape model featuring cultural characteristics. Using literature research, field research, schema cognition and analysis method, this paper investigates and analyzes aspects such as the siting of settlement, spatial layout, landscape images, ritual activities, and landscape changes so as to explore the concepts from ancient art of war to spatial design as well as analyze its landscape forms and the construction of its landscape model. The paper aims to reveal how the designer of Zhuge Village transformed the spatial deployment of the battle formation in the ancient art of war into the spatial landscape model of “living and working in peace and contentment”. In addition, this paper intends to explore the cultural landscape model of the traditional settlement on the basis of Chinese traditional cultural symbol, “the Eight Trigrams”, in hope that it will provide some inspiration for urban public landscape design in China.

Keywords: cultural; landscape; Zhuge village; Zhuge Liang; Battle Formation

1. Introduction

In the *Timeless Way of Building* (1994:162), Christopher Alexander points out that, “these ‘worldwide’ models that we fashion are none other than the ideas that we create; we imagine, conceive, create, and construct the living models in the world, because we have equivalent imaginative models in our mind”. [1] “*Feng shui* (風水)” (*Feng shui*: We use Chinese Pinyin to translate traditional Chinese concepts/terms, unless there are internationally accepted translations such as “Taoism (道教)”) in Chinese architecture is a spatial model designed by combining the ancient spatial science and culture. During the Tang (唐) and Song (宋) dynasties, the Chinese cultural center moved to the south, resulting in the prevalence of *Feng shui* in the south of the Yangtze River. First, Guo Pu (郭璞), the founder of *Feng shui* (Guo Pu of the Jin Dynasty wrote in *Book of Burial* (葬書) [2]: “the Confucian classics said that, ‘Qi (Energy) is dispersed by wind and absorbed by water, so the ancients conserve it and make it continuous; that’s so called *Feng shui*.’” The theory of *Feng shui* is a comprehensive natural science consisting of varied disciplines such as geophysics, hydrogeology, cosmology, meteorology, environmental landscape, architecture, ecology and bioinformatics. It aims to observe and understand natural environment deliberately, utilize and transform nature so as to create a nice living environment.), exerted a huge influence on the construction of settlement layout. Second, Yang Yun-song (楊雲松), the *Feng shui* master, introduced *Feng shui* to Jiangxi Province and gradually created “school of *Xing Shi*” (“形勢派”) telling the fortune according to the geographical formation

of landscape. Last, “School of *Li Qi*” (理氣派) in Fujian Province was formed by combing *Feng shui* and *Taiji* (太極) (*Taiji*: It is the culture of Chinese Taoism an important concept, refers to the state of the most primitive order of the universe, including *yin* and *yang* differentiation and interdependence, including *yin* and *yang* differentiation and interdependence. First seen in “*Zhuangzi*” [3]: “*Dao* (大道), Above *Taiji* but not too high”), the Eight Trigrams (八卦) (the eight trigrams: It is from in the Book of “*Changes* [4]”, translation of sound: *the eight trigrams*, include: 乾 *qian*, 坤 *kun*, 震 *zhen*, 巽 *xun*, 坎 *kan*, 離 *li*, 艮 *gen*, 兌 *dui*, used to symbolize the nature and various personnel in the world, and deduct the relationship between them.) based on the founder of the Neo-Confucianism, and its interpretation theory. It is a mathematics-based genre, the core of which is to determine the state of the *Jiugong Feixing* “九宮飛星” (*Jiugong Feixing*: It is the core of the “*Liqi School*” of *Feng shui School*, which reflects the truth of the “*Feng shui*” round. “*Nine Stars*” are one white, two black, three blue, four green, five yellow, six white, seven red, eight white and nine purple. “*Nine Palaces*” is also called the “*Luoshu* (洛書)” arrangement, the trajectory of the meteor moving in the order of “*Luoshu*” with *Zhonggong* (中宮) as the starting point) theory. In a word, with the emphasis on the importance of the Nine Squares and the Eight Trigrams, *yin* and *yang*, the five elements (metal, wood, water, fire and earth), the movement of the emanative material forces, and the twenty four azimuths, the Neo-Confucianism and the Mind studies in the Song and Ming (明) dynasties all contributed to the development of *Feng shui* [5].

Designed on the basis of “the Eight Trigrams” and in line with the terrain of natural landscape, Zhuge Village is situated at the juncture of the “school of *Xing Shi*” and the “school of *Li Qi*” Combining the strategist Zhuge Liang’s (諸葛亮) (*Zhugue Liang* (181–234) was the ancestor of Zhuge Village, the Three Kingdoms Period of China (220–280), The Shu State, an outstanding politician and strategist. He created the “The Diagram of the Eight-Sided Battle Formation” and deducted the art of war.) art of war—“the Diagram of the Eight-Sided Battle Formation (八陣圖) (The Diagram of the Eight-sided Battle Formation was recorded first in “*Three Kingdoms, Shu Book Volume 5 Zhuge Liang Zhuan*” [6])” and the local prevalent idea of *Feng shui*, the settlement constructs the cultural model system with traditional Chinese cultural characteristics. Specifically speaking, the village lays out space according to the model of the Eight Trigrams symbolizing the universe, and extends the practical wisdom of “the Diagram of the Eight-Sided Battle Formation” in Zhuge Liang’s art of war integrating physical environments such as mountains, rivers and buildings, trying to make them correspondent to Heaven, Earth, Man, Deity and constructing an integrated world of Heaven, Earth, Man, Deity. Beyond that, in accordance with the theoretic system of the Book of Changes (“An Interpretation of the Eight Trigrams” within *Book of Change* (the version of the Zhou Dynasty) introduced the cosmology of “the Eight Trigrams”: The *qian* trigram is Heaven, the *kun* trigram is Earth, the *zhen* trigram is Thunder, the *xun* trigram is Wind, the *kan* trigram is Water, the *li* trigram is Fire, the *gen* trigram is Mountain, the *dui* trigram is Pond.) and on the basis of the connection between Heaven and Man and the law of nature [7], the whole settlement shapes the cultural landscape model in conformity with the settlers’ psychology and mind.

Starting from field research by conducting local inspections, this paper examines the settlement’s genealogy, the local chronicles, as well as previous research literature using schema cognition and content analysis. In addition, this paper tries to analyze the spiritual images of the spatial landscape model and explore the discernable spatial landscape forms as well as the landscape model system in Zhuge Village integrating the universe and spatial culture—“the Eight Trigrams” in the Book of Changes, Zhuge Liang’s art of war—“the Diagram of the Eight-Sided Battle Formation”, and the concept of *Feng shui*.

2. Literature Review

2.1. Relevant Literature on Sustainability

“*Feng shui*” is a spatial model for sustainable development that maintains nature, humanity, culture and human behavior. In the “*Feng shui* hook on—The Source of Chinese Anthropology”, Ai Dingzeng (1998) summarized the history of *Feng shui* development, the interpretation system of *Feng shui*, and the operating system of *Feng shui*. Chinese people advocate the concept of sustainability of nature and believe “wind” and “water” are inseparable. He promotes the study and inheritance of *Feng shui* culture with open thinking to achieve sustainable development of the *Feng shui* concept [8]. In “The Source of Ideal Landscape—The Significance of *Feng shui* Culture”, Yu Kongjian (1998) concludes that the ideal *Feng shui* model is derived from the cultural patterns deep in the heart of Chinese people in maintaining Chinese production, habitat mode of life, as well as performance of sustainable accumulation of farming culture experience [9]. The *Feng shui* works of Jiang Dahong in the Qing Dynasty “The Secret Water Dragon” focused on to the shape of water, showing that “water” can express landscape patterns such as flexion, retrospective, wrap, oblique flight, straight flush, rebound, come and go, and so on, thus reflecting the eternity of the water [10]. Schools of *Feng shui* in the South of Yangtze River by Zhang Jueming (2006) explained the prevalent spatial concept of “*Feng shui*” in the south of Yangtze River from the aspect of spreading “*Feng shui*” culture. That is, the landscape construction is based on “water”, reflecting the sustainability of the created environment [5].

Mark Elvin (2004) explained the roots of Chinese farming culture and environmental sustainability using the control system through water [11] from “An Environmental History of China”. Jala Makhzoumi and Gloria Pungetti (2003) in the “Ecological Landscape Design and Planning: The Mediterranean Context” investigated landscape design and planning that meets ecological and cultural requirements. On the one hand, the landscape is exacerbated by the impact of urbanization and tourism. On the other hand, it is found that traditional landscapes play a sustainable role in regional ecology [12]. In the “Spatial Behavior A Geographic Perspective”, Reginald Goletch and Robert Stinson revealed from a microscopic perspective the relationship between behavioral mechanisms, laws and spatial forms, and introducing sustainability in many aspects such as behavioral decision-making, spatial cognition and spatial activities [13].

Michael Y. Mak and S. Thomas Ng (2005) explored the ideal *Feng shui* model under the “situationalism” [14]. They (2007) explored “*Feng shui*: An Alternative Framework for Complexity in Design”. They believe that *Feng shui* is a traditional Chinese wisdom for building a sustainable harmonious relationship between the environment, architecture and people [15]. Shangyi Zhou and Weiling Xu (2018) believe that *Feng shui* is a sustainable cultural heritage [16] because it consists of a symbolic spatial pattern and a symbol of the five elements of philosophy by discussing from the perspective of geography and history. Iga Solecka, Beata Raszka, and Piotr Krajewski (2018) discussed landscape analysis for sustainable land use policy [17]. Francesca Nocca (2017) believes cultural landscapes play a sustainable role in social, economic, cultural and urban planning [18]. Bixia Chen, Chris Coggins, Jesse Minor, Yaoqi Zhang (2018) briefly report the threat of industrial pollution, urbanization and other economic forms in *Feng shui* Forest (風水林). They recommend the support of the existence of *Feng shui* Forest with an interdisciplinary view of history and culture, and promote the sustainable development strategy of rural areas [19].

2.2. Early Literature of the “Eight-Sided Battle Formation”

Since Zhuge Liang (181–234 A.D.) created the “the diagram of Eight-Sided Battle Formation”, there have been many related descriptions. For example, Emperor Taizong (唐太宗 598–649 A.D.) of the Tang dynasty and his strategist Li Jing (李靖 571–649 A.D.) mentioned many times of Zhuge Liang’s art of war. “The Diagram of the Eight-Sided Battle Formation” in Questions & Answers between Taizong and Li Jing. Du Fu (杜甫 712–770 A.D.) of Tang Dynasty wrote poetry the “the Diagram of the Eight-Sided Battle Formation”. (Du Fu once wrote a poem, “the Diagram of the Eight-Sided Battle

Formation”, describing the figure of eight formations, which was used to drill the army or fight.) It explained Zhuge Liang’s creative system “the Diagram of the Eight-Sided Battle Formation” and praised Zhuge Liang’s great achievements. Su Shi (苏轼 1037–1101 A.D.) (Su Shi of Northern Song Dynasty wrote a poem called “*the Diagram of the Eight-Sided Battle Formation*” praising the wisdom of Zhuge Liang’s “eight Array Pictures”) of Northern Song Dynasty in the Eight-Sided Battle wrote: “Since Zhuge Liang finally led the army, beat the army of all opponents. It is with the Eight-Sided Battle Formation, Kui xia (夔峡) witnessed the tragic battlefield”. Chen Shou (陳壽 1440–1522 A.D.), the historian of the Western Jin dynasty, wrote that “Zhuge Liang deduced the art of war and created the diagram of the Eight-Sided Battle Formation in “the Biography of Zhuge Liang” of Three Kingdoms (the Records of Sichuan Volume). This has been circulating until now, forming the core culture and spirit of Zhuge Village.

2.3. Literature Related to Zhuge Village and Its Model

Now with more and more people studying Zhuge Village, research angles have become more and more unique. For example, Chen Zhihua and Li Qiuxiang, by using grounded theory, measured the buildings of the village and collected relevant literature in Vernacular Architecture of the Chinese Heritage: Zhuge Village [20]. A local scholar Zhu Lianfa sorted out the formation and development of Zhuge Village and other basic literature in The Eight-Trigram Zhuge Village [21]. A paper by Hu Xiaoli discussed the comprehensive spatial image of Zhuge Village [22]. Jing Su published “Heaven, Earth, Human: An Analysis of Landscape Structure of the Traditional Residential Settlement in The Eight-Trigram Zhuge Village” [23]. Liu Senlin conducted research on the traditional Chinese dwellings from both physical and spiritual perspectives. Western scholars have also done research on the spatial model since early times [7]. For instance, Christopher Alexander summarized the language of the construction model [1]; Christian Norberg-Schulz explored genius loci in GENIUS LOCI—Towards a Phenomenology of Architecture [24]. Martin Heidegger interpreted the systematic hierarchy and structure of cluster space in Urbanism [25].

Based on the relevant literature, we find that *Feng shui* transcends through traditional Chinese culture. It is an environmental science that has been continuously developed in China for thousands of years. It concentrates on human space and landscape to create experience and wisdom. On the one hand, *Feng shui* has continued to develop for thousands of years. The materials for creating “*Feng shui*” are mainly the “wind” and “water” that maintain a natural and sustainable cycle. *Feng shui* can integrate various factors such as nature, human, culture and human behavior to create a sustainable landscape environment. On the other hand, it can regulate the sustainable interaction between humans, space and nature through social, economic, cultural and urban planning. The environment and landscape are now exacerbated by the impact of industrialization, urbanization, and tourism. However, the traditional landscape construction concept can still play a sustainable role in the regional ecology. The unique spatial landscape pattern of Zhuge Village has been formed for over 800 years. It is a long and constantly-changing and perfectly sustainable development process. Although it has caused many researchers to question the connection between the initial establishment and the “Taiji—the eight trigrams”, the creation of Zhuge Village is a dynamic process. The village landscape undoubtedly reflects the Zhuge family’s worship of Zhuge Liang and its spiritual inheritance of the Eight Diagrams in the Art of War.

3. Method

3.1. Schema Cognition and Content Analysis

This concept “schema” was originally proposed by Immanuel Kant (1724–1804). He believes that the schema is a technique that is “hidden in the depths of the human mind”. It is human beings who use existing knowledge and experience to express specific concepts through the cognitive structure of things or events. It also refers to the pattern or form of morphology, or a computer

simulation of the schema, mode, and system. It is also related to fractal or geometry topology. In the cognitive-developmental theory of Jean Piaget (1896–1980), schema refers to an organized, repeatable pattern or structure. The use of schemas can organize and generalize complex information, making it easier to understand information. Schema can play an important role in the cognitive process. It can filter and organize information unrelated to the subject research and create a new schema to make it a holistic cognition.

In this paper, the “Diagram of the Eight-Sided Battle Formation” concept map, the settlement map and its contents will be patterned from the literature and field surveys:

- (1) Interpret the research structure and process with landscape maps to give readers a clearer insight into the effective inference of this study.
- (2) Provide certain facts based on the information obtained from the fieldwork to fill the gaps in the literature. Draw the structure pattern of the “the eight trigrams array”, the topographical map introduced by the settlement, and the settlement landscape structure pattern with the image of the “Diagram of the Eight-Sided Battle Formation” as the imagery.
- (3) Try to simulate the three-dimensional space environment and construct the spatial pattern structure of the “Diagram of the Eight-Sided Battle Formation” landscape, in order to provide a reference model for future similar landscape space creation.

“Scheme” is used in Chinese traditional culture to explain the spatial orientation and the law of operation between all things. “*Taiji*” and “the eight trigrams” are typical patterns for analyzing traditional space concepts. Understanding space is a complicated process. In this process, the information just obtained and the original cognitive structure, the primary and secondary information, the way of information availability and the researcher’s expectations, motivations, and encounter situations all have an impact on spatial cognitive processes and content. This paper also uses content analysis method in addition to inducting schema. “Content analysis method” refers to a systematic and quantitative description method. This paper firstly compares and analyzes the amount of information and its changes contained in the contents of “Diagram of the Eight-Sided Battle Formation” and “Zhuge Village”. Then further dimensional analysis is carried out on the spatial pattern formed by it. The so-called dimensional analysis, also called the category of analysis, is based on the research design needs. The dimensions and categories of analysis and discussion in this paper are designed according to the research objectives. First, this paper aims to familiarize and analyze the relevant information materials, and then develop and analyze the sustainable spatial landscape pattern dimension created by the “Diagram of the Eight-Sided Battle Formation”. Then this paper tries to discuss the three dimensional characteristics of this spatial model:

- (1) Analyze and discuss the landscape image of the dimensional system shaped by the “Diagram of the Eight-Sided Battle Formation”, and deeply understand that the overall environment does not only have a single spatial image, but includes many groups of images, overlapping and interrelated, and jointly constructing sustainable landscape features.
- (2) The construction of the settlement space landscape, centering on human settlements, mainly brings security to the residents in terms of space defense and spiritual security, and is closely related to the life and behavior of the residents, and jointly constructs a sustainable place spirit;
- (3) Integrate the spirit of the “the eight trigrams” of “the *Book of Changes*”: The development and change of the universe is not only the dialectical opposition of *yin* and *yang*, but also the integration of time and space. The cultural landscape model is based on *Taiji* and *the eight trigrams* patterns, and combines different landscape elements to form a mutually reinforcing, mutual responsive, and overall harmonious spatial relationship, and to construct a sustainably changing landscape.

3.2. Research Steps and Research Framework

First, starting from the Book of Changes, the paper examines the compositional form of the myriad things in the universe by understanding the symbolic spatial meaning and the combination law of “the Eight Trigrams” in the book;

Second, the paper studies the settlement’s genealogy, the local chronicles, historical literature, and searches for the ideological basis of “Feng shui” and “art of war” in the early constructing period of Zhuge Village (Figure 1);

Thirdly, this paper uses the schema cognition and content analysis method, sorting, summarizing and describing Zhuge Liang’s “eight-figure map” and landscape layout with the integrated mountains and waters of Zhuge Village;

Finally, it analyzes and discusses the landscape pattern and its dimensional characteristics of Zhuge Village’s continuous “Diagram of the Eight-Sided Battle Formation”, which includes three aspects: landscape imagery, landscape behavior and landscape change.

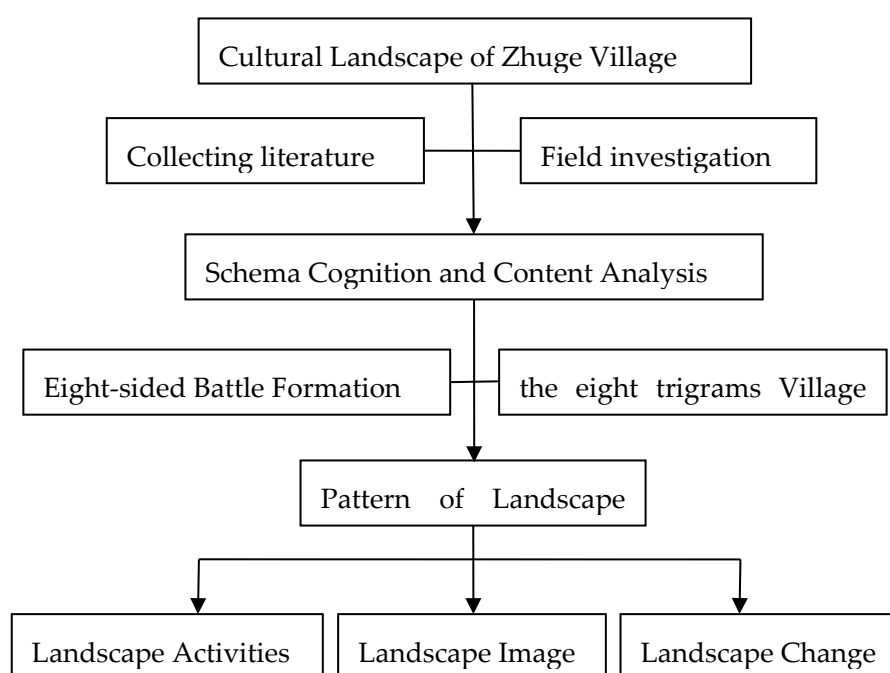


Figure 1. Research framework.

4. From the Arrangement of Battle Formation in the Art of War to the Construction of Home

4.1. Introduction of the Eight-Trigram Village

Zhuge Village is located in the hilly area of the middle Zhejiang province (Figure 2). Around 10 miles north of Zhuge Village, there are Tianchi Mountain and Daci Rock (大慈岩); on the west, Xian Mountain winds around 4 miles; on the east of the village, a few small hills run north-south; and on the south of the village, there is “Jingtanghou Hill”. These mountains form a unique geographical environment for Zhuge Village. The village lies at the bottom of a “pot”, with higher ground all over the village. Because of this, rivers are not able to run through the village. Thus, many ponds and wells were dug throughout the village. The altitude of these hilly mountains are between 68 to 92 m. From the overview, the whole village face southeast, with its back facing northwest [26].

Because of the Chinese tradition of maintaining the cultural ties and worshiping ancestors, the village was originally called “Gaolong Village”, which implied the experience of their ancestor—the ancient strategist Zhuge Liang once “staying in Longzhong”. It was a metaphor for “the talented

person from Longzhong". Later on, with the development of the Zhuge family, the name of the village has been changed into Zhuge Village [21]. The cultural landscape model of Zhuge Village integrates Zhuge Liang's art of war—"the Diagram of the Eight-Sided Battle Formation" with the Chinese traditional *Feng shui*. The Caution Hall of Zhuge Village collected the Genealogy of the Zhuge Family (1947) [27]. It was recorded that "the Eight-Sided Battle Formation was so useful and applicable in the warfare that the essence of it has been written in the 'the Diagram of the Eight-Sided Battle Formation'". "Doing research on *Feng shui*, the twentieth-generation from Zhuge Liang looked for a fortunate settlement. Finally they settled down in Gaolong". The association between Zhuge Village and the Diagram of the Eight-Sided Battle Formation can also be traced. According to Genealogy of the Zhuge Family (1947), on 31 March 1134, Emperor Gaozong wrote a letter to Zhuge Hui, descendant of Zhuge Liang, "I heard there is an original copy of the Eight-Sided Battle Formation by Zhuge Liang. Can you bring it for me to take a look?"

The Chinese Confucianism and Taoism view nature, society and life with an integrated cosmology. The early settlers, depending on their model, built up a system closely related to it [28]. "The Diagram of the Eight-Sided Battle Formation" is a spatial battle formation referring to the eight-trigram idea of containing astrology and geography and representing everything in the universe in Book of Changes [4]. So the cultural landscape model of Zhuge Village constitutes the traditional Chinese cosmology, patriarchy and etiquette, the ecology of *Feng shui*, and reflects the spiritual pursuit of the traditional Chinese human settlement, that is to "defend the emperor and safeguarding the ordinary".

The Taoist natural generative theory of the universe holds that the myriad things start from "Tao". Through the development from the Qin (秦) Dynasty to the Jin (晋) Dynasty, symbolic system of the Chinese cosmology was built—"Taiji" (It's written in *The Works of Chuang Tzu* that "Tao is above the zenith but does not seem high; it is beneath the nadir but does not seem low; it came into existence before the heaven and the earth but does not seem long ago; it was there before time immemorial but does not seem old". "An Exposition of the Diagram of *Taiji* (the Great Ultimate)" develops from the "Taiji" philosophy and combines the ideals of Confucianism and Taoism.) standing for *yin* and *yang*, "the Five Elements" (The Five Element series (also called "the Five Elements) refers to that the ancient Chinese divided everything in the universe into five categories as Wood, Fire, Earth, Metal, Water, and described their movement and transformation. The earliest record was from *Book of History*: "The five elements are water, fire, wood, metal, and earth".) on the basis of metal, wood, water, fire and earth, as well as "the Eight Trigrams" [10]. Therefore, with "Taiji"-shaped Zhong Pond in the center symbolizing the beginning of the myriad things, Zhuge Village (Table 1) integrates the traditional culture with natural geographic features. The village creates its inner-outer layout corresponding to Zhuge Liang's military thought and the geographic elements of mountains and rivers, which presents the cultural landscape model of the human settlement based on "the Diagram of the Eight-Sided Battle Formation". The geographic elevation map shows the settlement hidden in the pot-like terrain (low and level in the middle) and surrounded by eight small hills. Many artificially created ponds are evenly distributed in the settlement space. Settlement includes landscape elements such as houses, ponds, mountains, roads, halls, pavilions and temples. The village forms an extraordinary layout of "the Eight Trigrams" with the inner and outer spatial structures relating to each other.

To summarize, not only the arrangement of battle formation in Zhuge Liang's art of war but also the construction of Zhuge Village always abide by the spirit of the Chinese traditional cosmological symbols such as *Taiji*, *yin* and *yang*, the five elements, the eight trigrams and so on, which is revealed by the teachings of the original designer of the village Zhuge Dashi (the twentieth generation from Zhuge Liang). "I have devoted all my life to doing research on *Feng shui* and constructing the settlement according to it; in the future, if there is any misfortune in the village, undoubtedly, it will have nothing to do with the *Feng shui* there". [27]. This shows that Zhuge Village has integrated Chinese traditional space culture, and its ancestors spent a lifetime of energy to create it. It is hoped that the village will continue to develop even if it encounters disaster.

Table 1. The historical origin of Zhuge Village.

settlement	Zhugue Village
origin	moving in in 1018 A.D. (the Song Dynasty)
family name	Zhugue
constructor	Zhugue Dashi, the twentieth-generation descendant of Zhugue Liang
the construction concept	Referring to “the Nine Squares and the Eight Trigrams” to memorize Zhugue Liang
the landscape order in the village	“Zhong Pond” in the center, surrounded by eight extending lanes in eight directions; all the buildings are placed in the positions of <i>kan, gen, zhen, xun, li, kun, dui, qian</i> .
the landscape layout outside the village	eight surrounding small mountains outside the village form the outer Eight Trigrams
the way of living	medicine, commerce
the spiritual ideal	If they do not become good government officials, they will be good doctors.
preservation	Zhugue Village boasts eight halls, eight ponds and eighteen wells. Now there are more than two hundred well-preserved dwelling houses and halls of the Ming and Qing Dynasties.

**Figure 2.** Zhugue Village location in China.

4.2. The Diagram of the “Eight-Sided Battle Formation”

It was recorded in the Genealogy of the Zhugue Family that some poetries were written to accolade the various implications and applications of the Eight-Sided Battle Formation and the eight trigrams. That clearly shows Zhugue descendants in the village worshiped the art of war by Zhugue Liang. The core of diagrams of the Eight-Sided Battle Formation in the art of war is its moving formation, mostly reflecting the intangible formation change. This paper, however, focuses on the spatial layout of the landscape of Zhugue village. The diagram of the Eight-Sided Battle Formation in fact can be used to study spatial arrangement of landscape. For example, in Questions and Answers by Lijing, it said, “Small formations constitute big formations; small battle fields add up to big battle fields. Things and locations are interconnected. They complement each other”. The battle formations are actually location oriented. The eight battle formations and the eight trigrams were closely related to the Six Yao (爻) in the Book of Changes. The 64 different formations in Bagua are correspondent to the Hexagram in the Book of Changes [29].

The Diagram of the Eight-Sided Battle Formation was a battle array based on Taichi and Bagua Image. The earliest Taichi Bagua Image was created by Fuxi (伏羲), a cultural hero in Chinese legend and mythology, to explore nature. According to the Book of Changes, “in the system of Change, there is the Great Ultimate. It generates the Two Modes (*yin* and *yang*). The Two Modes generate the Four Forms (major and minor, *yin* and *yang*). The Form Forms generate the Eight Trigrams”. Later, based on the Diagram of the Eight-Sided Battle Formation from Bagua Images, the Taoists assigned meanings to the eight images. “Qian refers to a horse; Kun, a cow; Zhen, a dragon; Xun, a chicken; Kan, a pig; Li, a pheasant; Gen, a dog; Dui, a sheep”.

Just as Luo Guanzhong wrote in Chapter 84 of Romance of the Three Kingdoms [30] that, Zhuge Liang arranged the eight-trigram battle formation, consisting of leisure, life, injury, du (hiding), jing (good luck), death, panic, opportunity, in the sixty-four formations as a whole, which, plus another twenty-four mobile troops of cavalry, scared away hundreds of thousands of elite soldiers from the Kingdom of Eastern Wu. Zhuge Liang held that the military “formation (陣)” and “Shi (勢) position)” depended not only on weather condition (天時), but on human deliberation (人謀). Taking in the arrangement of “the Square-Field” and “the Eight Trigrams”, “the Diagram of the Eight-Sided Battle Formation” (The arrangement of the eight battle formations is actually “the Diagram of the Wenwang Eight Trigrams” or “the Azimuth Diagram of the Eight Trigrams”). Each formation is composed of six smaller formations, referring to the six lines in the eight trigrams (where the solid line represents positive and the broken line represents negative) of *Book of Change (the version of the Zhou dynasty)*. There are sixty-four smaller battle formations (eight battle formations plus middle troops), corresponding to the sixty-four hexagrams in *Book of Changes (the version of the Zhou dynasty)* constructed the spatial relationship among Heaven, Earth, and Human [31]. The Figure 3 below shows a remake of Diagram of the Eight-Sided Battle Formation based on the verbal descriptions in the Romance of Three Kingdoms. Table 2 presents and interprets the whole arrangements based on “Eight Diagrams and Nine Palaces”. The arrangement of the Eight-Sided Battle Formation and “the Diagram of the Wenwang Eight Trigrams (文王八卦方位)” are positioned according to “the Eight Trigrams” and shaped in line with “the Square-Field (井地)”, which are displayed in Figure 3 and Table 2: The formation of Heaven—the qian (乾) trigram (the symbol of heaven) in the northwest; the formation of Turtle and Snake—the kan (坎) trigram (the symbol of water) in the back, belonging to water (水) within the five elements (五行); the formation of Cloud—the gen (艮) trigram (the symbol of mountain) in the northeast, with clouds coming out of the mountain; the formation of Green Dragon—the zhen (震) trigram (the symbol of thunder) on the left, belonging to wood (木) within the five elements; the formation of White Tiger—the dui (兌) trigram (the symbol of pond) on the right, belonging to metal (金) within the five elements; the formation of Earth—the kun (坤) trigram (the symbol of earth) in the southwest; the formation of Rosefinch—the li (離) trigram (the symbol of fire) in the front, belonging to fire (火) within the five elements; the formation of Wind—the xun (巽) trigram (the symbol of wind) in the southeast; the main formation and the nucleus of the Eight-Sided Battle Formation —middle troops (中軍) with a commander in the center, belonging to soil (土) within the five elements and governing the Eight-Sided Battle Formation, surrounded by the formation of 24 mobile troops of cavalry. Together with the 24 mobile troops of cavalry, the Eight-Sided Battle Formation has formed a complementary spatial system which combines motion and stillness, integrates order and change.

Table 2. Bagua Jiugong to explain the major Layouts of the Diagram of the Eight-Sided Battle Formation in Figure 3.

4. the <i>xun</i> trigram: southeast, the formation of Wind coming out of the mountain, the formation of Cloud	9. the <i>li</i> trigram: front, fire, the formation of Rosefinch	2. the <i>kun</i> trigram: southwest, the formation of Earth
3. the <i>zhen</i> trigram: left, wood, the formation of Green Dragon	5. middle troops with a commander in the center, belonging to wood within the five elements and governing the eight trigrams	7. the <i>dui</i> trigram: back, metal, the formation of White Tiger
8. the <i>gen</i> trigram(the symbol of mountain): northeast, clouds	1. the <i>kan</i> trigram: back, water, the formation of Turtle and Snake	6. the <i>qian</i> trigram: northwest, the formation of Heaven

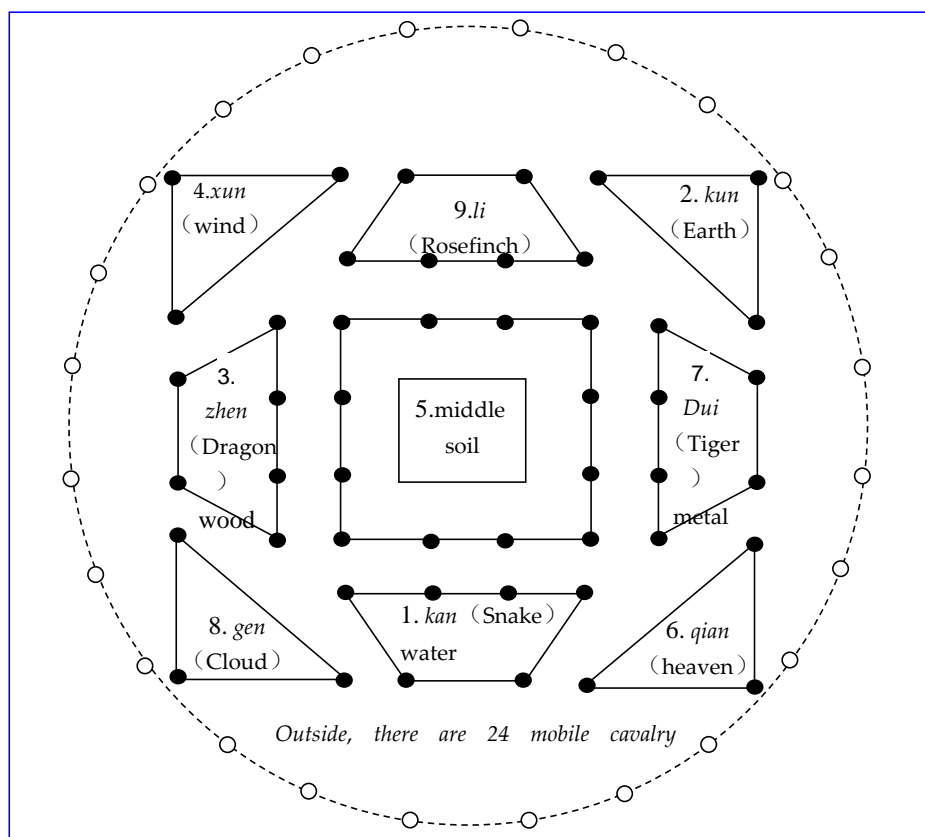


Figure 3. The Layout of Zhuge Liang's "Diagram of the Eight-Sided Battle Formation".

4.3. The Landscape Structure of "the Diagram of the Eight-Sided Battle Formation"

In accordance with the arrangement of "the Diagram of the Eight-Sided Battle Formation", Zhuge Village creates the temporal-spatial landscape structure of connecting mountains, rivers, fields and four seasons in the shape of "the eight trigrams", constructing the strength of heaven and earth surrounded by mountains and rivers (shown in Figure 4). Located in the center of the village, the grand hall is surrounded by mountains and rivers: the safeguarding mountain—Shilingxi on the left symbolizing Green Dragon, the safeguarding mountain—Gaolong City on the right symbolizing White Tiger, the distant mountains in the front symbolizing Rosefinch, the barrier-like Gaolong Ridge in the back symbolizing Turtle and Snake, all together forming the typical *Feng shui* model of "four deities protecting the center". The square, ponds, hills, arcades, the decorated archways, arches can all become the landscape nodes, and together with the passages, they form the link of network, the landmark complex or areas.

Located on the bottom land of the basin in the valley, Zhuge Village digs ponds and wells to meet the needs of irrigation, drainage, washing, and fire control in balance. Positioned in the center, the Taiji-shaped pond—Zhong Pond (Figure 5) extends in eight directions like "the Eight Trigrams" into eight lanes, and together with such the pond system spreading all through the village in the lower ground. Totally eight ponds, namely, Shangfang Pond, Jiqing Pond, Xiwu Pond, Beilou Pond, Julu Pond, Hongyi Pond, Shang Pond, and Xia Pond, are situated in eight different locations like the eight trigrams. These ponds are not only useful to prevent flood and drought, but also beautiful landscapes of the village.

The whole space is as The Commentaries in the Book of Changes: The Appended Remarks states, "in the system of I there is the Grand Terminus, which produced the two elementary forms. Those two Forms produced the four emblematic symbols, which again produced the eight trigrams". In other words, the way of heaven and earth, from the Non-Ultimate to the Great Ultimate, is producing everything by *yin* and *yang*, localizing space from east, south, west and north, symbolizing the myriad

things in the universe, which reflects the interrelationship between man and nature, explains the growing process of everything, and constitutes a special cultural landscape model. Through field research, we found that there was “the Azimuth Diagram of the Eight Trigrams” painted on the screen wall (shown in Figure 6) beside Zhong Pond in the center of the village, and when we compared it with the real spatial layout, I also found that it proved that Zhuge Village, in accordance with “the Eight Trigrams” and in combination with mountains, rivers and the architectural spatial layout, created the landscape structure of inner and outer eight trigrams.

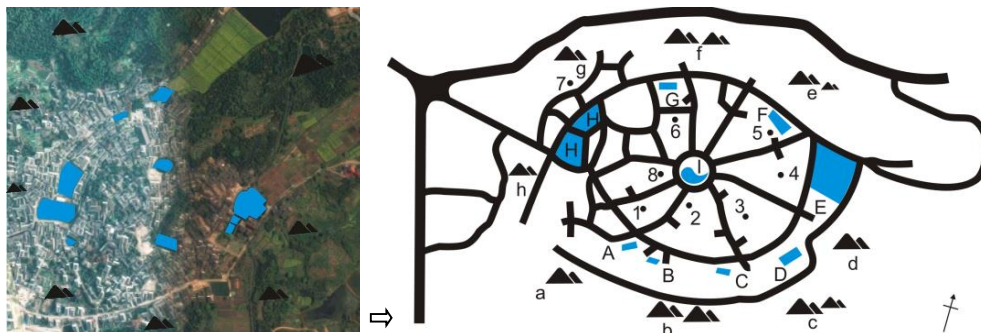


Figure 4. The spatial layout of mountains, water, and buildings in and surrounding Zhuge Village. Notes: **Mountain:** a. Shixia Hill; b. Mouse Hill; c. Zuzhai Hill; d. Jingtanghou Hill; e. Leigu Hill; f. Taigong Hill; g. Guotai Hill; h. Dayuan Hill. **Water:** A. Shangfang Pond; B. Xin Pond; C. Jiqing Pond; D. Xiwu Pond; E. Beilou Pond; F. Julu Pond; G. Hongyi Pond; H. Shang and Xia Ponds; I. Zhong Pond. **Building:** 1. Huaide Hall; 2. Chongxin Hall; 3. Shangli Hall; 4. Dunhou Hall; 5. Prime Minister Shrine; 6. Zhouji Hall; 7. Shangzhi Hall; 8. Dagong Hall. (Bird's eye view map: Google earth).



Figure 5. Reshooting the picture on the wall of the store in Zhuge Village.



Figure 6. Photographed in Zhuge Village: Image of “the Diagram of the Eight-Sided Battle Formation”.

5. Analysis and Discussion

5.1. Analysis

5.1.1. Eight-Sided Formations of Zhuge Village

Just as natural language, pattern language is a generation system, which tells us the rule of arrangement and shows us how to make the arrangement meet the rule as much as possible [1]. Influenced by the ancestor Zhuge Liang's art of war—"the Diagram of the Eight-Sided Battle Formation", the early settlers of Zhuge Village integrated mountains and rivers with buildings, creating the eight-trigram cultural landscape model of human settlement on the basis of *Taiji*, the four emblematic symbols, the inner and outer eight trigrams. Corresponding wholly to the real map of Zhuge Village, the spatial structure of the cultural landscape model is arranged by the use of mountains, rivers and buildings in accordance with the position of "the Eight Trigrams" (Table 3): According to the Map of Gaolong City in the Genealogy of the Zhuge Family, and the associations with the Eight-Sided Battle Formation, the halls within the village formed the inner eight trigrams, while the eight hills surrounding the village formed outer eight trigrams.

(1) Halls representing Inner Eight Trigrams

Dagong Hall in the north is positioned as "*Kan*", representing the snake formation in the Eight-Sided Battle Formations. Duhou Hall in the south is positioned as "*Li*", representing flying bird formation. East is Zhouji Hall positioned as "*Zhen*", symbolizing flying dragon formation. West is Chongxin Hall in position of "*Dui*", representing Tiger Wing Formation. Northeast is Shangzhi Hall in position of "*Gen*", symbolizing Cloud Formation. Southeast is Prime Minister Shrine in position of "*Xun*", representing Wind Formation. Southwest is Shangli Hall in position of "*Kun*", meaning the Earth Formation. Northwest is Huaide Hall in the position of "*Qian*", symbolizing the Heaven Formation.

(2) Hills Symbolizing the Outer Eight Trigrams

Dayuan Hill in the north is the position of Kan, following Jingtanghou hill in the south in the Li position, Taigong Hill in the east in the position of Zhen, Mouse Hill in the west in the position of Dui, Guotai Hill in the northeast in the position of gen, Leigu Hill in the southeast in the position of Xun, Zuzhai Hill in the Southwest in the position of Kun, and Shixia Hill in the northwest in the position of Qian.

(3) Eight Sights representing "Flying Position"

Apart from the inner and outer eight trigrams, the Eight Sights in Gaolong was recorded in the Genealogy of the Zhuge Family in Gaolong. It clearly shows the layout based on the eight trigrams. The Eight Sights of Gaolong directly connect with broader nature, reflecting the ancestors' passion for and spiritual pursuit of the pastoral, mountains and rivers, the life of part-time work and part-time study. The mountains and rivers of Zhuge Village feature unique shapes, continuous models, clear directions and visual development. After materialization, they represent and disintegrate the world, forming a unique cultural landscape model. The cultural landscape is not only the observer's point of view [25], but also the focus of changing steps and sights, which attracts observers to different extent and enhances the spatial richness.

Table 3. Eight-Sided Formations of Zhuge Village.

Elements of Eight-Sided Formations			Inside the Village		Outside the Village
Eight Directions	Nine Palaces	Eight Formations	Inner Eight Trigrams	Outer Eight Trigrams	Eight Sights of Gaolong (八景)
east	震 zhen	飞龙阵 flying dragon	Zhouji Hall	Taigong Hill	Nanyang Academy,
south	離 li	翔鸟阵 flying bird	Dunhou Hall	Jingtanghou Hill	Gu Pond Bright Moon
west	兌 dui	虎翼阵 tiger wing	Chongxin Hall	Mouse Hill	Yanshan Sunset
north	坎 kan	蛇蟠陣 snake	Dagong Hall	Danyuan Hill	Shiling Auspicious Clouds
northeast	艮 gen	云阵 cloud	Shangzhi Hall	Guotai Hill	Shuangjin Spring
northwest	乾 qian	天阵 heaven	Huaide Hall	Shixia Hill	Cuiyou Morning Bells
southeast	巽 xun	风阵 wind	Prime Minister Shrine	Leigu Hill	Qingxi Night Hulling,
southwest	坤 kun	地陣 earth	Shangli Hall	Zuzhai Hill	Xiban Farming
middle	中 centre	中軍 Middle troop		Taiji pond	

5.1.2. Cultural Landscape of Zhuge Village

Traditional Chinese living communities focus on the unity of families with the emphasis of interdependence and completeness. In terms of space, there is a clear distinction between inside and outside. Inside is the living space for human beings. Outside is for activities [32]. The constructions of Zhuge village strictly followed the Eight-Sided Battle Formation, showing the wisdom of the art of war by Zhege Liang. In the center of the village is Zhong Pond, with eight lanes pointing to eight different directions forming the inner eight trigrams. Outside and surrounding the village are eight hills, naturally forming the outer eight trigrams. The inner and outer trigrams have made Zhuge village an ideal living place for human beings, as shown in Figure 7. Inside buildings are: Huide Hall in Northwest representing *Qian* (E), Shangli Hall in Southwest representing *Kun* (B), Zhaoji Hall in the east representing *Zhen* (C), Prime Minister Shrine in the southeast representing *Xun* (D), Dagong Hall in the north representing *Kan* (A), Dunhou Hall in the south representing *Li* (H), Shangzhi Hall in the northeast representing *Gen* (G), and Chongxin Hall in the west representing *Dui* (F). Outside are the eight hills representing eight battle formations with Shixia Hill in the northwest symbolizing Heaven (e), Zuzhai Hill in the southwest symbolizing Earth (b), Leigu Hill in the southeast symbolizing Wind (d), Guotai Hill in the northeast for Cloud (g), Taigong Hill in the east for Dragon (c), Mouse Hill in the west for Tiger (f), Jingtanghou Hill in the south for Bird (h), and Dayuan Hill in the north for Snake (a). The earlier settlers in the Zhuge village ideally combined nature and human wisdom. The eight sights in Zhuge village are like eight moving battle positions in the Eight-Sided battle formations. The whole environment in Zhuge village reflects the life philosophy of Zhuge Liang: One cannot show high ideals without simple living. One cannot have lofty aspirations without a peaceful state of mind.

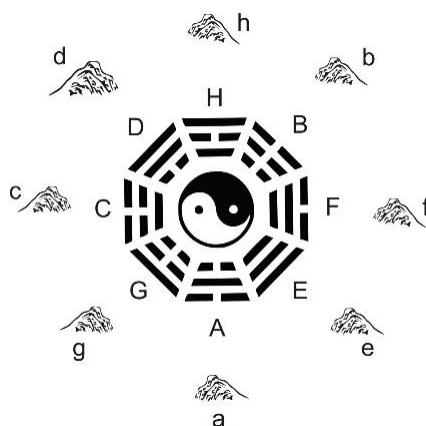


Figure 7. The cultural landscape model of “the Eight Trigrams” of Zhuge Village.

5.2. Discussion

From 1018 to 2018, Zhuge Village has maintained a 1000-year life and space creation, reflecting the sustainable settlement culture landscape model. Based on the abovementioned spatial construction method of Zhuge Village, this paper further analyzes and discusses the characteristics of its landscape pattern. Zhuge Village creates a landscape image of sustainable “Diagram of the Eight-Sided Battle Formation”, and strengthens the sustainability of its place spirit through the settlement of ancestral sacrifices. Following the dialectical opposition in the process of development and change, this paper discusses the sustainable changes in the cultural landscape model of Zhuge Village.

5.2.1. The Landscape Image of “the Diagram of the Eight-Sided Battle Formation”

A whole environment includes not only a single all-inclusive image, but also many overlapping and interrelated groups of images [33]. Based on Christopher Alexander (1994) [1], the image of environment can be analyzed through three elements: Characteristics, structure, and meaning.

The constructed images of Zhuge village are shown in Figure 6. First, the spatial design of Zhuge settlement is very recognizable. With “Zhong Pond” in the center, the pond and its riparian line have formed *Taiji* graphics of *yin* and *yang*, which symbolizes the construction of *Taiji* space and becomes unique morphological characteristics. Moreover, in accordance with the images of “the Eight Trigrams”, Zhuge village designs such physical spatial structures as mountain, water and the building complex, extends eight lanes in eight directions from the center of “Zhong Pond”, and places the settlement in eights positions. Last, based on “the Diagram of the Eight-Sided Battle Formation” of Zhuge Liang, the village has formed a cultural landscape model, from which both the inhabitants and observers can be linked to the spiritual sphere through the cultural essence of “the Eight Trigrams”. Though Zhuge Village is an objective existence, the inhabitants and observers will look differently upon the image of the living being because of their different perspectives; however, the images of “the Eight Trigrams” are shared by both psychologically, the commonality of which can exist in the interaction of single entity, common culture and basic physiological nature [33].

5.2.2. The Landscape Activities of “the Diagram of the Eight-Sided Battle Formation”

The activities of worshipping their ancestor Zhuge Liang has passed down in Zhuge Village, which not only enhances the cultural landscape model of the settlement, but also increases the cohesion of the whole family [34]. According to “The Preface to the Ancestral Hall” of the Genealogy of the Zhuge Family in Gaolong, since the Jiajing (嘉靖) period of the Ming dynasty, the standard ritual of ancestor worship has started, and developed with the ongoing expansion of the ancestral hall for the Prime Minister Zhuge Liang. However, the worship ritual suffered repeated interruptions and experienced restoration, and up till now, it has been performed in total accordance with the traditional process since 1990s [9].

The traditional worship process in Zhuge Village is closely tied to the spatial battle formation of “the Diagram of the Eight-Sided Battle Formation”, with the parading route, the band composition, the color of the guard of honor, the parading number corresponding to the spatial formation of the eight trigrams in Zhuge Village and five elements in the traditional Chinese culture. The ritual parade marches through main cultural landscape places, and the parading route surrounds “*Taiji*”-shaped Zhong Pond, diverging and meeting in line with the diagram of the five elements and the eight trigrams. The parade is composed of over two hundred people and divided into eight small teams from front to back—the fire spear team, the military drum team, the gong team, the band, the guard of honor, the team of sacred pigs and sheep, the processional banner team, and the dragon and lion dance team [21].

Through the five elements, the five directions, the five colors, the five sounds and the eight trigrams, the parade associates the public space with the public behavior, forming the spectacular activity and cultural landscapes of the settlement. The green, white, red, black and yellow banners of the processional banner team symbolize the five directions such as east, west, south, north, middle and divide Heaven and Earth into those directions, and the drum team consists of eight drums. Starting from the ancestral hall for the prime minister, the parade first marches towards the entrance to the village, then goes back and circles around the commercial Tai Chi street of Shangtang, and at last ends in front of the grand hall. The close connection Tai Chi between the ritual parading activity landscape and the cultural landscape constructs a cultural landscape model of virtual-actual combination, bearing the traditional Chinese culture, extending the art of war spirit of “the Diagram of the Eight-Sided Battle Formation”, and symbolizing defense, misfortune removal, blessings, peace-seeking.

5.2.3. The Landscape Change of “the Diagram of the Eight-Sided Battle Formation”

Zhu Xi, a famous scholar of the Neo-Confucianism in the Ming Dynasty, holds that everything contains the rule of the universe, has its special position, and links itself to other things to produce its relative position and relationship [35]. Integrating mountains and rivers and imitating the layout of “the Diagram of the Eight-Sided Battle Formation”, Zhuge Village creates the unique traditional Chinese

cultural landscape model. First, based on the theoretical basis of *Taiji* and the eight trigrams, the model connects the spatial cultural landscape elements, whose combination fashions the changing relationship of reinforcing and echoing each other as well as harmonizing as a whole. Second, the model makes one associate it with the spiritual connotation of the Eight Trigrams of Book of Changes (the version of the Zhou Dynasty). The development and change of everything is in the dialectical opposition like *yin* and *yang*, and controls space with time as its spindle, forming the spatial-temporal integration [35]. Third, just as the cosmology of The Commentaries in the Book of Changes: The Appended Remarks describes, “in the system of I there is the Grand Terminus, which produced the two elementary forms. Those two Forms produced the four emblematic symbols, which again produced the eight trigrams”. The model reflects the constructing order of the spatial structure in the cultural landscape from *Taiji* to the eight trigrams.

Liu An once said in *Huai Nan Zi*: Searching out Tao that, “Tao supports Heaven, carries Earth, extends into all the four directions and extends into the remotest areas in all eight directions”. [36] In accordance with “the Diagram of the Eight-Sided Battle Formation”, Zhuge Village builds up the spatial organic system and connects with the outer things through the division of border and area by time and space, holding the universe and symbolizing everything. Heidegger once said, “the border is not the stop of something, but is, as the Greek realized, that something begins to appear here” [37].

While doing research on the eight trigrams, Wenwang of the Zhou Dynasty found that, compared with “the Early Eight Trigrams”, the corresponding directions of “the Azimuth Eight Trigrams” could be more adaptable to the changes in nature; thus, with the border shaped according to “the Azimuth Eight Trigrams”, Zhuge Village links human to architecture space, mountains and rivers, and reveals the changing relationship between human and nature through displaying “the Eight Sights of Gaolong” in the open field. The model can stimulate the observer in it to produce a rich imagination and divide it into different areas referring to the traditional etiquette and patriarchal clan system, ritual activities, the distance of the clan relationship, which contains rich and systematic social relationship—the *Taiji*-pattern Zhong Pond in the center just like the venerable in the middle, all the areas designed according to “the Diagram of the Eight-Sided Battle Formation”. In a word, it combines the landscape space, activities and images, and becomes a unique cultural landscape model with a clear landscape order and a changing landscape relationship.

6. Conclusions

Through the overall cognition and research on the field investigation and literature of Zhuge Village, we discover that referring to the settlement’s ancestor and the Chinese ancient strategist Zhuge Liang’s art of war—“the Eight-Sided battle formation”, Zhuge Village constructs a clear spatial pattern and an integrated cultural landscape model in accordance with the traditional Chinese universe (宇宙觀) symbols such as *Taiji* (太極), the five elements (五行), the eight trigrams (八卦), Originating from the ancient art of war “the Diagram of the Eight-Sided Battle Formation”, the spatial wisdom offers a unique designing idea of the cultural landscape:

- (1) An orderly cultural landscape model could be entrusted with the human spiritual belief and creating the residential environment of “living and working in peace and happiness” for the settlers;
- (2) A unique spatial image could enhance the transition from human experience and wisdom to spatial construction, building up the harmonious relationship between human and nature, and create a sustainable living space.

The outlook of constructing an integrated cultural landscape model can not only form discernable landscape graphical representations, but also integrate the complex landscape order, maintain space sustainability, carrying traditional Chinese culture and creating a place spirit, and maintain space sustainability. Facing the noisy, complex and disturbing urban spatial environment, if the spatial

theory could be put into practical design, it may be of some help to the urban public landscape design in China.

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