The renewal of hollow village
A research and proposal of Erhai area in YunNan, China

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Abstract

Under the background of rapid urbanization in China, hollowing phenomenon happened in several villages accompanies with the population loss, vacant houses and land abandonment. The Development is later in southwest of China than in the central and eastern regions. Thus, the research on problems during urbanization process is not deep and also lack of research for hollow village. Currently, southwest is under rapid urbanization development stage and due to the unique geography and resource, the development of Erhai area is influenced by urbanization and tourism. This paper mainly studies the influence factors and phenomenon and makes appropriate renewal suggestions through investigation and analysis of the Erhai area. This study belongs to the whole village space research, involving both urban design and industrial development impact, emphasizing the systematic analysis. Focused on three issues: 1) how do spatial factors influence in the process of hollowing in Erhai villages? 2) what are the changes and problems that appeared in Erhai villages? 3) how to renew the hollow villages based on regional potential in Erhai area?

This paper analyzes the spatial structure and factors in Erhai area from the perspective of urban planning. Through literature research on the concept, the classification and discussion the existing regulation mode of hollow village, I get a deeper understanding of the topic. Furthermore, spatial elements are used in analysis the case. Analysis contains two parts: the evolution of village spatial structure and the various changed elements within villages. Specifically, it analyzes the relationship between the spatial structure, evolution process and hollowing phenomenon. Then, more detailed analysis focuses on village changing in representative villages. It analyzes from the basic change in single building, building combinations and surrounding environment and tries to find problems. Finally, the author hopes to combine the development of tourism as well as the concept of city for people to look for the renewal method for the area.

The first finding of this paper is the underlying different development background, the problem has different variations, with strong regionalism. Therefore, there can be no uniform renewal mode for all hollow villages. Appearing of hollow village is caused by missing or imbalance of certain elements during the development process in the region. In the Erhai area, the village seems more probably hollowing which developed earlier, with convenient traffic conditions and the developed in tertiary industry. However, serious problems actually have more direct link with the government behavior and blind development, lack of reasonable planning. Hollowing not only performs in material terms, but also in terms of the loss of the humanities. The existing renewal mode for such issues always neglected the part of cultural loss. The author believes it needs to consider more for people, combine with the results of theoretical and case studies, and make the final suggestions. Finally, this paper puts XiZhou village as an object, a reasonable planning as method, to create a better living environment for the people as the aim to improving the problem Hollow Village. The theoretical significance: the paper is to expand the research method to the problem of villages hollow in space aspect and to fill the research on southwest hollow village and provide support for local authorities making measurement of hollow village. The practical contribution of this paper is helpfully to solve the specific problems of hollow villages in Erhai area.

Key words:
hollow village, Erhai area, spatial element, tourism, city for people, urban design, renewal planning, XiZhou
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Chapter 1. Introduction

1.1 Background

Under the background of rapid urbanization in China, several villages have turned to be “hollow village” (A phenomenon in the process of modernization in rural areas. The structural changes in the agricultural economy and employment caused idle area within the village land). It brings changes in the original social neighborhood relationship, family structure, living environment, life style, and causes the waste of land, the disappearance of traditional villages, and chaos in space structure. It is not a new phenomenon and has already common in many rural areas in China but it gets little attention.

With the constant urban development, in some outskirts of cities or fringe, traditional villages existing in different forms, affect the development of city. For various reasons, many villages and urban exist in multiple structures, cultural landscape and villages were reconstructed. On one hand, traditional villages affected by urbanization, absorb modern amenities and lifestyle, architectural forms and spatial structure constantly turn to modernize. On the other hand, cultural characteristics and structure of villages contain a kind of tradition which makes it keep the original state within a certain range. This is an issue that many cities and villages might face with during the process of urbanization. At present, researches on this topic mainly start from city as the point while fewer subject focus on the countryside.

The conception of “Hollow Village” has been put forward at the end of the 20th century, along with rural development, including several aspects. Since lack of village planning and other reasons, rural land can’t be reasonably and effective used (Li L, 2009). New houses are built in the outskirts of the village, but there is a lot of idle land within village. In the economy, with the urban industrialization, a large number of young move to city all the year round, except important festivals staying at home which making the rural population is almost elderly and children, so called "hollow village." Whether “hollow” or “empty”, in English, the word is “hollowing”, “hollow” or “hollow-out” (Li, L. 2009). At the very beginning, “hollow” was mainly used in the industrial economy, so called "industrial hollowing ". After that, the words were applied to urban, rural land and other areas, also appeared the conception "urban hollow" and "rural hollow" (Li, L. 2009). However, although it was used in all areas as "hollowing", there has been no a precise definition.

After the appearance of the hollow village, scholars studied it in different aspects which means there is no more than one conception. The article discusses about hollow village which is under the background of urbanization, missed some elements in some village such as the original inhabitants, land, economy, infrastructure, resulting in the vacant housing and idle of construction land, the changes in spatial structure.

This study includes two aspects: vacant residence and vacant construction land. The floatability of vacant land is relatively large and the construction land is re-used in a quickly way. As a result, the thesis main studies the residential vacant. Hollow village division mainly refers to vacant residence. First, the original villages influenced by non-agricultural industries, incomes keep increasing, but because of the policy system, farmer is not authorized to buy a house in city. Meanwhile, since the relaxation in rural planning and management, gradually affluent economic situation, villagers can’t wait to build houses in the outskirt, so the village began to hollow out.

1.2 Aims and research questions

Aims:

Based on previous studies of the Erhai area, through deep analysis and discussion of the cases, the paper aims to explore the spatial changes in traditional villages, the process of evolution and spatial structure in hollow villages and try to find the problems and potentials based on urbanization and what can be
improved based on people’s need.

The theoretical significance of the paper: will expand the research method to the problem of villages hollow in a space aspect, fill the research on southwest hollow village and provide support for local authorities making measurement of hollow village. The practical contribution of this paper is helpful to solve the specific problems of hollow villages in Erhai area.

Research questions:

- 1. How do spatial factors influence the process of hollowing in Erhai villages?
- 2. What are the changes and problems that appeared in Erhai villages?
- 3. How to renew the hollow villages based on regional potential in Erhai area?

1.3 Case introduction

The area locates in southwest of China, belong to Yunnan Province, in the central west (Fig1-1), across longitude 98 ° 52 ’~ 101 ° 03’, latitude 24 ° 41 ’~ 26 ° 42’ (http://baike.baidu.com). Erhai Lake is located in the middle of the state and the entire body is located in Dali range. There are 10 main towns around the lake: Xia Guan, Feng Yi, Da Li, Xi Zhou, Wan Qiao, Hai Dong, Wa Se, Shuang Guan, Shuang Lang, is a mainly Bai ethnic settlement, which accounted for 94 percent of Bai population. Until 2009, the total population was 47.74 million, of which the rural population was 25.38 million, the average population density was 425 / sq km. Cang Mountain located in the west, is Dali's major mountain ranges, made of 19 peaks form, 3500 to 4122 meters height. The highest peak reaches 4,122 meters (http://baike.baidu.com/view/161491.htm).

It has a long history, beautiful scenery, rich in natural and cultural tourism resources, and there are 130 tourism scenic spots there (http://baike.baidu.com/view/161491.htm). It is one of the first state-level historical and cultural cities, also one of the best tourist cities in China. These villages around Erhai lake are common in Bai architectural style, culture and customs, but different in geographical conditions, development model, spatial structure, different points towns morphology (Fig1-2~1-4).
1.4 Thesis structure

There are five parts in this thesis. In chapter 2, it talks about the methodology in this thesis. The main section explains the methods and materials I used in the case study. It contains the reasons why case-study is the chosen method, why these cases are chosen, how to collect the data and how to analyze.

The next chapter is a literature review that includes the current research on hollow village theory and my opinions about these theories. It begins with the conception of hollow village, the types and characteristic, and the way they are regulated. Then, it comes to the spatial structure theories which used in the analysis part. Followed that it discusses how the tourism opportunities and city for people inspire renewal thought and prepare for the design proposal.

In chapter 4, the case study provides specific and deep analysis on spatial elements of villages in Erhai area and explores the links with hollowing phenomenon. Two villages are picked up as a deeper analysis on detail changes. One of them is the location where the proposal will be made. And then finds the problems and opportunities for improving the villages. Based on the analysis, chapter 5 makes a design proposal based on the results mentioned in previous chapters. Finally, chapter 6 concludes the thesis and the limit of this thesis.
Chapter 2. Methodology

2.1 Motivation for a case study

Based on the aims and research questions, the purpose of the thesis is to analyze how the spatial factors influence the development of hollow village and find out the potentials and opportunities in renewal a hollow village. In order to answer these questions, case study is a direct way to research, and go deeper into the principles and then analyze how it work in a very specific location. A case study will explain the concept of hollow village in a specific way, analyze in a targeted way and will enrich the renewal principles which mentioned in literature in a realistic aspect.

There are several reasons why case study approach is used in this thesis:
1. Hollow village is a very common concept in China but not very well-known in Europe. A case study can make it more understandable in the beginning of explain of conception. And, when it goes to analyze stage, the theories will have a realistic carrier instead of a very general image. It aims to do a design proposal, only in a specific case, under real conditions, it can be achieved.
2. The study of each item can be conducted in depth and in details, for example, when it talks about spatial structure, local maps and shapes can be used to strengthen the point.
3. The method studies on the phenomenon not only in detailed description but also the reasons behind the phenomenon. It is more easy to answers "how" and "why" questions, and help researcher to grasp the context and nature of the event. The case comes from real world, so it is a comprehensive and objective reaction. The author can use it as a starting point to increase the effectiveness.

Nevertheless, the weakness of case study can’t be ignored although it is appropriate method for analyzing in this paper. The negative aspects: 1. The results from case study can’t be summarized as a general conclusion. 2. Case-study maybe take a long time, reports may also be massive but can’t reflect specific problems. 3. It can’t make more contribution on scientific generalization.

Thus, the analysis, findings and conclusions from the case-study in this paper doesn’t mean it can represent the same phenomenon in other locations.

2.2 Selection of a case

More domestic studies on hollow village are in the eastern cities which develop fast than the area of southwestern cities which development is relatively slow. Erhai area, in Yunnan province, is the southwestern of China. It is the settlement site for Bai ethnic minority with a superior geographic. Its natural environment and geographical factors, human religion, history development, social system, and other elements construct the uniqueness of the environment and development and also these characters brought a serious of opportunities for this area. It is a well-known tourist destination in China even in the world and has a long history can be traced to AD221. Nowadays, the phenomenon of hollow village appearing in Erhai areas caused by the changes in spatial structure, function of land and architectures, and several problems like waste of land, destruction of the traditional village landscape. Additionally, when tourism came into the area, it accelerated the hollowing process. The hollow villages in Erhai area perform in different stages and types, and they have relationship with tourism more or less. When it comes to research the question, it can find various performances in a sea of aspects. Therefore, this could be a special and interesting case worth paying attention and studying.

Personally, Yunnan is my home province that makes me familiar with the background and the minority culture. This is helpful when I do the study about the history, local habits and lives. What’s more, I have been there several times, to different villages and in different periods. Thus, when study on a map, it is more easy to associate the specific scene. Because of my hometown, the channels to collect information are wider and easier.
2.3 Collection data

Abundant data should be used in the following chapter of case-study. Literature review is a guidance and theoretical support for the thesis. Except that, other data also has been needed to be collected such as maps, photos, statistics. A lot of information can be searched on Yunnan digital rural network http://www.ynszxc.gov.cn, or the government work report and statistical data, or statistical yearbook of Dali. Also, during my own interview experience, I also have my several photos and digital maps of the villages.

2.4 How to analyze

In the following chapter of case-study, it will divide into two big parts. In the first part, aims to answer the first research question, the analysis will focus on the whole area which belongs to an overall study on spatial structure. Firstly, a general description of hollow villages in entire region should be made. Then, based on the literature mentioned about the spatial elements, the analysis will begin in regional spatial elements, analyzing the differences contact, the level of development between them, and advantage of location. Through studying the evolution of spatial elements and the pattern of evolution, find the factors of hollowing and how they affect it.

Secondly, it will come to research the morphological changes within the village. Two villages will be selected to analyze and find the changes. The main aspects of changes in the villages are: architecture changes, neighborhood mode, spatial nodes, and people. Based on the changes, try to find the problems and opportunities to improve.
Chapter 3. Literature review

3.1 Hollow village

3.1.1 Conception

From the perspective of land use: hollow village is a special structural layout which includes the blind expansion in the village area, a new multi-residential development outside the villages, emerged a large area of idle land within the villages. It is a special land use situation caused by joint action of national macro-control and local economic development (Zhang, S. 1998).

From the perspective of the village space form: It is a phenomenon in the process of modernization in rural areas. The structural changes in the agricultural economy and employment caused idle area within the village land. As a result, it is an alienation of a settlement spatial morphology (Zhang, J. 1999).

Hollow settlement is defined as: Households who live in rural settlements of the plains are driven by the desire to gradually move toward the surrounding with the new expansion. A new settlement pattern leads a decreasing in freshness of settlement, increasing in rate of non-residential houses, expansion of the ruins area, dropping in population density, sharp contrast with the new expansion (Cheng, L. Feng, W. 2001).

From the point of urbanization: hollow village happened in the unique Chinese urbanization process and is a performance of complex socio-economic processes in the physical form of the villages. Under the situation that urbanization lags behind the conditions of non-agricultural, it is caused by rapidly developing of village construction and backward of planning management system. It is spatial form differentiation which performs the extensive development outskirts of the village but Internal decay (Xue, L. 2001).

This thesis is from the aspect of rural planning to think about hollow village, in the background of China's urban-rural dual structure, with the rapid urbanization process. It is under the situation that urbanization lags behind the conditions of non-agricultural, caused by rapidly developing of village construction and backward of planning management system. It is spatial form differentiation which performs the extensive development outskirts of the village but Internal decay. Both expressed as a spatial phenomenon, and a social phenomenon. This decline of village phenomenon often accompanies with the population loss, vacant houses and land abandonment which is specific performance in not completed urbanization.

In terms of the rural development, during the process of consulting the new residential households, because of the lack of village planning, irrational address, not effectively utilized land resources, new residential buildings slowly concentrated towards the outside area of village and a lot of idle land existed within the village. As a result, it formed a condition that the land extension out of village but empty within it, the so-called "hollow village." Economically, according to the improvement of industrialization and the continuous progress of China's urbanization process, a large number of agricultural surplus-labor gets into the city to work. As a result, elderly and infants took huge part of population in rural area, so called "Hollow Village".

"Hollow Village" has a double meaning: the first is the economic sense which mentioned above. The second is a geographical sense. Specifically, it refers to migrant workers who work for years to earn the wages back home, when new construction for marriage, domicile and other reasons, did not take adequately account into the rational planning and other issues. It leads incompatibility between village planning and the infrastructure. Most new residences are concentrated in the outskirts of the village, most along the main road and landscape road. However, there is a lot of idle land which form a "hollow village" in a geographical sense.
3.1.2 Types

The types of hollow village can be classified as following the stage of development: early, medium and late stage (Fig3-1) (Wang, L. 2011).

![Fig3-1 A schematic diagram of Hollow Village](Source: Xue, L. 2001. Translated by author)

Different performance: Center fall Hollow Village/ Overall declined Hollow Village/ Seasonal idle Hollow Village/ Fractured Hollow Village (Li, L. 2009).

a. Center fall type

Extended area and boundary changes: In the process of village development, desire to build new house enhance all the way. Because there is no free base land in original region, it emerges new houses around the village and expansion of the village region and boundary to the surrounding area. In the extended region, there are obvious changes, one is village entrance, another is constantly extending outward road (Li L, 2009).

Node changes: With the development of hollowing, the central region is vacant, the node in original village center is abandoned and the original square isn’t used any more. New node occurs in the area of external expansion.

Path change: As the villagers to move to the region which has convenient traffic and more convenient farming, so the inside road is gradually been abandoned. New roads surrounding the village keep developing, but these roads may not have contact with the interior ones.

Landmark change: Since the expansion of boundary, the village’s entrance happened to change. Or the village entrance unchanged but it turns to be indefinable because of the expansion boundary, new residential surrounded by new residential construction.

b. Overall declined type

Most of residences moved out of the village, only left a few old people, women and children behind. A large numbers of idle and ruined houses in the original village, internal roads, toilets and other infrastructure are in poor conditions and the environment is dirty and messy. Village is far away from the town, with traffic inconvenience, and no service facility around (Li L, 2009).

c. Seasonal idle type

In the village developing process, it is a common type. The main labor migrant to work outside and they just have very concentrated and short time to live at home (Li, L. 2009). Except the new area around the village, there is no change in the boundaries of the village, nodes, paths, and landmark.

d. Fractured type

Residential houses gradually connected with each other but the garbage dumps and graveyard between villages had not been cleaned out of the village, then they are surrounded by new houses or roads. As a
result, it turns to be idle land in centre (Li, L.2009). It doesn’t only separate space but also has become a source of environmental pollution.

Villagers built new houses around original village but with a certain distance. It followed with regional variation and turn to be indefinable in some area. There are obvious changes, constantly extending outward road and entrance maybe change. Internal roads in the old village are still used and keep expanding outward. At the same time, new roads surrounding the village persistently develop and strengthen the connection between old and new region (Li, L.2009). Since the expansion of boundary, surrounded by new residential houses, village entrance is almost indefinable.

Summary

Types and characteristic are summarized with the chart. The combination of the key elements can reflect spatial changes of hollow villages in an overall way. Specifically, space changes may have differences. It doesn’t mean all of the elements can be reflected in the hollowing process. Thus, some can only reflect some elements instead of all.

<table>
<thead>
<tr>
<th>Type</th>
<th>Shape</th>
<th>Boundary</th>
<th>Node</th>
<th>Route</th>
<th>Landmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Center fall</td>
<td>Shape expands year by year.</td>
<td>Change with the village shape.</td>
<td>New nodes happen.</td>
<td>New routes come into being.</td>
<td>Village’s entrance maybe happen change.</td>
</tr>
<tr>
<td>Overall declined</td>
<td>New village regions occur.</td>
<td>Change with the new region.</td>
<td>No changes in the original village, but new nodes come into being in new region.</td>
<td>No changes in the original village, but new routes come into being in new region.</td>
<td>Village’s entrance has change.</td>
</tr>
<tr>
<td>Seasonal idle village</td>
<td>Almost no change</td>
<td>Almost no change</td>
<td>Almost no change</td>
<td>Almost no change</td>
<td>Almost no change</td>
</tr>
<tr>
<td>Fracture type</td>
<td>Shape expands along some directions with each passing year.</td>
<td>Change along some certain directions.</td>
<td>New nodes happen.</td>
<td>Expanding along a certain region, new route comes into being.</td>
<td>Village’s entrance maybe happen change.</td>
</tr>
</tbody>
</table>

Chart3-1 Types of hollow village
(Source: made by author)

3.1.3 Regulation mode of hollow village principles

1 The moving and merging village mode
Rural migration and merge is based on current situation and development conditions in a certain region of the village, through analyzing and comparing scale, economic, location and other factors to plan a corresponding center of the village which can attract villages developing toward the center. It aims to change the current situation of small population villages, small scale, large land occupied, poor infrastructure, scattered messy, concentrated form a larger village or a town center. Expanded center by merging the village, and the former farming village or returning the grain plots to forestry, achieve the coordinated development between the central town and village, socio-economic and natural environment (Wang, L.2011).
2 Situ remediation mode

Situ remediation mode means through strengthening the planning, adjusting inner space, renovating landscape and supporting infrastructure, to make full use of the land, improve the efficiency of existing construction land and fill existing idle lands. Speed up the transformation of dilapidated houses and function changes of long-vacant room and gradually tamp Hollow Village. Its core task is helping center declined site revive (Wang, L. 2011). Through transforming abandonment, harmony unordered buildings, improving the dirty environment, re-planning road network and group structure, integrating layout, it aims to make the center rejuvenated.

3 Overall construction mode

Planning area is located in the town, or village of ecological limited area, or annual affected by natural disasters, early happening coal mine collapse region, annual villages affected by floods, limited of landform, lack of conditions for development, should be moved to area with safety, convenient transportation and better conditions to be rebuilt. In the aspect of Hollow Village’s original site, if it is not fit to continue as village land construction for some reason any more, it can be considered for overall construction (Wang, L. 2011).

4 Transformation Mode

(1) A combination with urban and town

The transition remediation is a particular case of site remediation (Li, L. 2009). Comparing ordinary remediation of vacant villages, the transition remediation is emphasized city system, including advocating multi-storey apartments, curbing the construction of low storied buildings, conserving rural construction lands, considering energy and materials efficiency, planning road system reasonably and reducing road areas. While at the village planning, public facilities construction should be expedited by attaching importance to cultural recreation, business service and health care to improve peasant living standard. With the purpose of implementing vacant villages planning at former site, lands should be utilized effectively by restricting homestead areas, changing housing structure, utilizing multi-storey buildings and developing towards high altitude.

(2) A combination with industry

After coordination the land resource within village, combine with industrial development and utilization (Li L, 2009). According to village current situation including conditions of economic development, industrial development should always be a fundamental goal. The form layout of village should be based on the basis of industrial planning.

Combine with the agricultural industry.

Through certain organization, make measurement with human resources and land resources to carry out large-scale and mechanized agricultural production. It can change the situation of low productivity and low input-output rate which is lead by personal decentralized management and improve regional agricultural competitive (Li, L. 2009).

Combined with rural tourism

Relying on good rural tourism resources, on the basis of the original rural production and living (Li, L. 2009), it aims to create rural tourism as the leading industry which can offer visitors a variety of activities and unique experiences.

Combined with township enterprises

It is necessary to protect dynamic balance in farmland, but also develop economic (Li, L. 2009). It may be
able to effectively solve the contradiction between food and construction land-using through changing idle land to township enterprises land.

5 Discuss
First I will talk about the first three transformation modes. Mode 1(The moving and merging village mode), when take this mode, although the construction of central village is one of the methods to re-organize rural structure and promote rural urbanization, specific situation of local condition in different regions should be taken account when making measurement of reconstruction. Central village is more suitable for the villages in underdeveloped areas which have a low urbanization level, a small village scale, huge number, dispersed layout, backward construction and in the early stages of hollowing. Additionally, the cost mainly borne by the farmers themselves nowadays, so the fund issue is the biggest problem in every place. Therefore, it should do feasibility analysis first of all, to evaluate whether the region's economic strength can support planning.

Mode 2(Situ remediation mode), this mode is helpful for the continuation of the material culture and spiritual culture of traditional village. It did not overhaul major changes to the village, instead, depend on the original conditions, it does some reasonable improvement. First, local residents’ life was not affected by demolition, and followed by the new renovation, their life quality get improvement. Mode2 retains the original village shape in a higher extent than Mode1, and in a lower economic requirement to support remediation. It can be seen as a relatively easy to achieve mode. Specifically, author thought when there are these conditions in a village, it maybe can choose Mode2: (1) Village’s location is reasonable and land arrangement is not difficult, beneficial to village development, in a large scale. (2)The layout is loose, construction land per capita exceed standard, lots of cottages or existing houses in poor quality and residents have urgent desire to build new houses. When renew the center declined kind of hollow village, it maybe can take this mode.

Mode 3 (Overall construction mode) involves site selection, planning and design, building, relocation and several aspect issues. Thus, it must be careful making decisions, through scientific feasibility analysis. The specific issues should be solved such as relocation mobilization, village construction, the development and production in villages, living conditions. It should have a completed relocating planning and follow-up development plan. Scientific planning and living environment design for the new site to avoid mistakes resulting in greater waste. Compared with Mode1 and Mode2, mode3 needs to spend much more fund and time, and almost left no original elements of the village. This measurement also has huge influence in people’s life that they should motivate to a new site to begin with a new life. Author believes this mode should be taken more careful when chosen it.

From the extent of protecting the traditional village, Mode2 is higher than Mode1 then is Mode3. From the spending of these three measurements, it maybe Mode 3 is much than Mode 1 and Mode2. Undeniably, Mode3 seems like a exhaustive method to solve the hollowing problem under some certain situation.

Then it comes to talk about Mode4 (Transformation Mode). It is a particular case of situ remediation, so here discussing two parts (1.Combination with urban and town & 2.Combination with industry.).

Some villages located in the outskirts of the city and even within urban built-up areas, not only change in the occupation, settlement space, the natural land turns to urban land use, but also production, living conditions and infrastructure occur big change. These changes are reflected in the settlement shape, tend to perform a more serious hollowing, known as the city villages which hold back the further development in town. Thus, combine with city is a good solution for this kind of hollow village.

When it needs to chose a kind of industry, it really needs to do evaluate to find the village’s potentials. Specifically, combine with the agricultural industry requires a combination between political and
economic measurements. It can speed up the development and utilization of idle land, and effectively solve the problem of exceeding standard in per capita area. The successful implementation needs cooperation of the government and the justice department assistance.

Then, combine with rural tourism requests cooperating with family production and carrying on rural tourism as a family unit. Visitors can experience both the charm of a traditional farming culture, can promote the economic development of rural households. From the current operational situation, most rural tourist areas position themselves in providing leisure and recreation for urban residents like a garden. With the characteristic that modern city is vastly different with countryside, and villages, picking, Fishing, tasting, sightseeing and other activities can be planned to attract people on vacation and provide a short break.

Last, combine with township enterprises not only limits the use of farmland for non-agricultural construction projects, also provide adequate land for development of enterprises. It can be re-zoned land as an industry area such as farming, aquaculture, processing industry, handicrafts and other non-polluting industries. Also, it can be a way to sharing base land among residents, so that they can get participation in profit. Another way is skills training villagers to encourage them to become employees.

The measurement to renew hollow village should be selected according to the different land use characteristics and economic strength, and then take appropriate methods and strategies. For the plain area, moving and merging village mode can become a major trend in hollow village planning and development. Combined with industry mode aims in protecting farmland, on the basis of strict control the extension of the village, to explore and use the village homestead and internal idle land. Author thought Hollow Village renew has no a uniform method. The villages can select one or two or even three modes at same time based on specific circumstance and the ultimate goal is making full use of idle land.

3.1.4 Compare with other countries
Hollow Village is a special China's rural appearing phenomenon appearing in China's rural development process and other countries did not have special study on hollow village. Mainly studies on villages and towns of other countries focus on town planning, rural development. For example, the United States established a "village center" specialized research institutions in 1984 to solve the particular problems of rural areas (Knox, P. Pinch, S. 2000). British idealists Owen focused on social disease which are opposition and broken between with urban and rural areas brought by industrial revolution, proposed a "New Concord Village" theory and ideas(Macdonald, R. Jolliffe, L. 2003). Howard in 1898 proposed a "Garden city" theory hoping to solve the contradiction urban and rural areas (Mathieson, A. Wall, G. 1982). 1970s, the Korean government launched the "New Village Movement" to guide the development of rural economy and society (Mullins, P. 1991).

3.2 Spatial elements and structure
3.2.1 Spatial elements
American Geographers Haggett, presented six elements in region when describing the mode and order of spatial structure (Haggett P, Cliff A D and Frey A, 1997). It assumes there are mutual needs in a society which exists spatial differences, such as residents A trade with residents B, residents C need goods and services that they can’t be self sufficient, these lead exchange of trade, people, money, ideas among various regions. So the first element in the analysis of the spatial structure is sport mode. Because the movement should carry along a specific path, so the second element is on the path or network features. Network has edges and intersections, called node, the node is the third element. The fourth element is layer of spatial nodes. The fifth element is the land. There are full of nodes and networks cover the land, and different ground with different land use patterns. Changes will lead to spatial reconstruction and the mainly reason is spatial diffusion. Therefore spatial diffusion is the sixth element (Fig.3-1).
Another research suggests that apart from these visible static items, there is a dynamic content or non-material content in spatial structure. He then summed these three elements in the study, flow, networks and systems (Chen, X.Y. 2005). Flow is a kind of expression in material or non-material elements. Network is the performance of elements positional relationship of the elements. Spatial network is a relationship between actors, when this relationship projects to the space it forms a spatial network. System has a close link with Network structure. In the network structure, grade level is an important basis for division of labor in regional space. High grade is equipped better resource grade and industrial aims to a highly efficient output. It is the basic of a strong influence and driving ability, also is the controller of regional development, and also stabilizers.

3.2.2 Spatial structure

The evolution of the spatial structure of the region is divided into four stages and at different stages exhibit different forms (Friedman, J.R. 1996).

1 Pre-industrial Times low-level equilibrium stage

During this period, agriculture is the main industry in a very low productivity and the regional economic develop in a slow way. Generally, it is at a low level of equilibrium state. Spatial structure showed in a way of several scattered, isolated towns with closed center. Towns are lack of contact with each other and didn’t exist any division of work because of geographical conditions and weak traffic system.

2 The beginning of industrial period

A number of regions with advantage in location are selected since the start of industrialization and goes into rapid growing phase. It results a mode that a powerful economic center around by less developed outskirts after original space balance is broken. Spatial differences happens and results in a certain spatial gradient.

3 Mature stage of industrialization

Regional economy development brings a basic which can help to found comprehensive transportation
systems. The connection among productive departments increases and results in a multi-regional center system. Each economic center is surrounded by outskirts. These centers and outskirts improve the urban system together. They constitute a complex but orderly region structure.

4 Post-industrial phase

With economic development to a higher level, the boundaries between center and outskirts gradually disappear. Multi-center spatial structure emerges in the region forming a completed special structure with functional system.

3.2.3 Discussion

Spatial elements and structure can help to analysis a region in a very overall aspect. When do analysis of an actual area, the elements point can be used. Point is the location of all the villages on the map, representing the concentration sites of people in the region. Each point has particular industry. Marking each point in space position and adding industry labeling on hollowing villages, is the first step in the study of the elements. Lines, includes roads, railways and waterways. Transportation plays a vital role in the development of a region. The purpose of the analysis lines is to find the relationship between all points with hollowing phenomenon. Flow, more precisely, traffic flow, is another spatial element based on line. It exists in the form of non-material, changing with each point varies. It can directly reflect an internal point situation. For example, when a point development has not present the road or boundary in a certain period, it is probably reflected in the traffic flow. Network is the performance of positional relationship between the compositions of regional spatial objects. Spatial structure of the network is a relationship among actors, and when the relations project onto the space, it forms a spatial network. Based on the location and competitiveness, different nodes have different control on networks. Generally, the density of lines can reflect the influence of nodes in the network. Settlement can constitute a network, and industry contacts can also be formed a network. Usually, regional spatial channel links them together into a network line. Finally, the grade mentioned above, which author believed more accurately can be called the range of influence. Each point has a relationship with the surrounding points in which exists who influenced whom. It maybe just say that in one respect, A villages were affected by B, B on the other hand may be affected by A. Therefore, the study needs to be controlled only in the range of the overall outstanding performance in hollow villages.

Spatial variation analysis can be divided into stages, helping analyzing in more clearly and coherently way on the geographic variation, morphology and boundary. It may helpful to investigate the historical development of the entire region when research the influenced elements. Thus, those four stages can serve as a basis for the analysis, according to time going, how the industries act on spatial structure. Undeniably, not absolutely somewhere gave a full performance in one state in a certain period. Village is a complex synthesis with performance in all aspects which keep varying during a same period. Depending on Friedman theory, Erhai region can be divided into four stages and each stage will feature recognizable change, but it does not mean that at this stage there is only one feature. For example, during the period of the industrial development, the spatial structure mainly develop following the direction of industrial performance but which also contains the interaction between agriculture and the tertiary industry. Through such kind of analyzing on time line, perhaps it can find how historical development factors influenced hollow problem.

3.3 Tourism industry oriented villages and towns’ planning

3.3.1 Tourism opportunities

In China, National Tourism Bureau defined the theme as the "China Urban and Rural Tour" in 1998, "China Rural Tourism Year" in 2006, “Harmony Tour in urban and rural ”in 2007, "China Ecotourism Year" in 2009 and “Chinese cultural tourism” in 2010 which pointed the need for making full protection
and utilization of rural ecological environment, the further development in rural tourism. (Wu, D. 2012). The changed tourism theme in recent years have proved that “close to nature, go into the country” has increasingly become the subject of tourism. It created a good opportunity for development of village’s transformation.

With the reform of national holiday system, leisure and tourism activities in a short time and distance are further stimulated. At the same time, continuous growth in disposable income and transformation in consumption attitude lead a higher demand for travel. Many regions in countryside catch the opportunity to build and develop rural tourism. Village Located in the outskirts of town with its unique geographical strength can rely on the support of economy, information, technology from city and develop during the process in combining construction and tourism. Most villages have a great landscape, honest and unspoiled residents, or a long history, lots of monuments. They gradually being discovered turn to be tourist site with different characteristics.

Relying on various types of tourism resources to create a tourist-oriented industry is a method in bridging the gap between rural and urban (Ma, J. 2008). Furthermore, it’s a vital method to relieve employment pressure and enhance connection between rural and urban area. Development of tourism industry-oriented village can make sustainable use of resources, increase farmers' income and promote regional economic development.

Tourism Urbanization concept was first proposed in 1991 by Mullins, he believes tourism urbanization is an urban form based on postmodern view of consumer attitudes and city concept (focus on enjoyment, pleasure), and a process of urbanization caused by the tour (Wang, H. 2010). It is a mode of urbanization which is built on the basis of selling pleasure.

Currently, the definition of tourism urbanization focused on urban development impacted by tourism, while ignored its impact on the surrounding villages. In fact, when tourism promotes urban expansion and functional optimization, it also affects the development of surrounding villages. The author believes the definition of tourism urbanization should also contain tourism influence in countryside. With urban development, tourism can turn to be a motivation through economic restructuring, space structure and cultural reconstruction to promote surrounding area transformation. Tourism activities extends from city to rural areas, economic exchanges increasing between urban which result urban Promoting the development of surrounding villages.

3.3.2 Example

To further demonstrate the impact of tourism on the traditional village development, the following example will be used as a specific way to verify.

ShuHe is 4km to the northwest of the old town of Lijiang, is one of the earliest ancestors of the Naxi people gathering site. UNESCO (United Nations Educational, Scientific and Cultural Organization) has listed it as an important component of Lijiang as it is a well-preserved example of a town along the ancient tea route. Until 2008, the village had 662 households, 2650 people. Before 2003, the village was mainly in agriculture, economic grew slowly and per capita net income was less than 800 yuan. After development of tourism in 2003, the village economy total income increased from 9,934,800 yuan to 25,485,200 yuan in 2008 (Wang, T. 2010).

After tourism development, traditional streets and commercial streets existed within village. It happened some certain changes in street space:

(1)Changes in the street function:

Before 2003, the street was the traditional bazaars and the main place for daily life activity, and houses scattered around the street.
After 2003 tourism development, there have been a number of stalls for selling travel goods in the street. Some of the houses have become shops and pubs around it after renovation (Fig.3-2)(Yang, G. 2004).

(2) Changes in communication methods:

Once, people often on the streets in spontaneous gathered on the street, eating or chatting. Street space had a strong positive atmosphere and very lively.

And now, due to tourism development, a large number of visitors and vehicles frequently pass through the street, less residents prefer to stay and talk in the streets.

(3) Changes in the shape of street:

Along with the tourism development, buildings almost have been transformed on both sides of the main street, increased in height, and built new houses on vacant ground. In addition, aimed at the convenience of tourists walking, the original natural paved road was changed into the brick road pavement.
(4) Disposal of the traditional houses of the villagers mainly in the following two ways:

a. Rent out: tourism development attracted a large number of businessmen, led to the price of houses gradually increased, so many villagers rent out their houses. Operators changed houses function into business travel services through transformation and renovation of the houses (Wang, T. 2010).

b. Demolition of the old and build new: Villagers began the demolition of old buildings to build new houses after saving money. On both sides of the main street, houses were transformed to face the street for engaging tour operators. This recovery was only a partial reconstruction and has little effect for the architecture. In the new project, a lot of traditional materials were used for coordination houses.

3.3.3 Discussion

Relying on various types of tourism resources to create a tourist-oriented industry is a method in bridging the gap between rural and urban. Furthermore, it’s a vital method to relieve employment pressure and enhance connection between rural and urban area. Development of tourism industry-oriented village can
make sustainable use of resources, increase farmers' income and promote regional economic development.

On the other hand, the tourism also brings a negative impact. It is very easy out of control once individuals are aware of the huge benefits from tourism. The blind overexploited is probably taken. It will lead to damage the village, loose of a long history and traditional village culture, and no longer obvious in geographical features. More importantly, the residents’ daily lives suffer disturbed by visitors. Like mentioned in the example, due to the tourists, the lives of the villagers and original way of communication were influenced and also the quiet village was broken. Residents itself is the soul of a village and their lively life scenes are most able to convey local culture.

The author believes, tourism development is a method to provide people with better living conditions instead of an aim. The aim is to improve the living conditions for local people through several methods. Thus, when it comes to discuss the influence of tourism development in a village, it really needs in a very objective way.

3.4 City for people
This chapter will demonstrate the ideas to development space for people. Most towns and villages in China retain the historical layout which is in small scale, with more comfortable dimension compared with the big cities. Large portions of the population in these places are elderly and children. This requires high safety levels.

In China, a planning project has almost no public participation. This requires planners to be able to realize local resident itself is the ultimate experiencing one in a project, not a government, not the developer, nor a scholar critic. The soul of a site is created by the users. So it should retain the local people to keep a local aboriginal culture. No matter how beautiful and modern a space is, it not means really successful if no people use. In the certain aspect, hollow village is a series of problems caused by population loss and also the site lost its attraction for residents which leading their left. Whether this migration is spontaneous or forced, they took away the scenes of daily life which means a loss of precious Chinese traditional culture. “By introducing the notion of Locus, Rossi established a clear link between the Jungian Archetype and the architecture of living spaces of human memory which, much more than merely telling us historical and material facts, touch our individual lives through our memories and feelings. The book also defined the forgotten dimension of the “Human Condition” as a counterpoint to the modernist idea of treating urban tissues as a sum of structures able to “command” peoples’ lifestyles and their notion of progress” (Revedin, J. 2014).

Thus, this chapter focuses on the creating lively space and safe space for people.

3.4.1 Importance of human in lively space
Lively city can be a goal in itself, it is also the starting point for holistic city planning that encompasses the vital qualities that make a city safe, sustainable, and healthy. Planners needs to focus expands from merely providing sufficient space for movement to the much more important challenge of enabling people to have direct contact with the society around them (Gehl, J. 2010, p63). In turn this means that public space must be alive, with many different groups of people using it.

Nothing makes a more poignant statement about functional and emotional qualities of life and activity in the common space of the city than its opposite: the lifeless city. The lively city sends friendly and welcoming signals with the promise of social interaction. The presence of other people in itself signals which places are worthwhile. The lively city and the lifeless city also send completely different signals. “Architecture perspective drawings always show groups of happy people between buildings” (Gehl, J. 2010, p63), it tells us that life in public places is a key urban attraction.

A few people walking in the narrow country road easily demonstrate a kind of lively, exciting interface.
This is not about numbers, the crowd and the city the size of things, but about feeling, feeling that urban space is an attractive, meaningful place.

“One plus one quickly becomes more than three” (Gehl, J. 2010, p65). Individuals are spontaneously inspired and attracted by activity and the presence of others. Children see other children playing outdoors through the windows, they will rush to join them.

Experience Life is a pleasant thing. Life scenes are taking place with changes in every minute. Several can be seen: the behavior, face, color and feel, these experiences are related to one of the most important themes in human life -- people. Throughout life has always been about people, about life, new information about the surrounding society, all have different needs. No matter where people will have a collection of new information which are carried out in urban space. The Subject of “city for people” is human. Planners aim will be to providing better and more comfortable life for all individuals in the site. At the beginning, human creates urban space, human behavior affected the development of space elements. Then, the space also influenced people's behavior. In this paper, author believed all planning proposal is for people, service for the ordinary residents. It aims to renew space elements based on specific situation to improve the living environment for people to make them stay.

3.4.2 Safe space

Sense of security can make people love this city. Jan Gehl mentioned that traffic safety, about the relationship between cars and the walkers, cyclists. In Chinese village, due to the spatial developed in a slow way, such security problem has not happened. Most roads can only support used by one motor vehicle because of the width. Mostly, people use cycling and walking, or carts tools within village. Less motor vehicle makes contribution in environmental protection and village protection.

Since the majority of the rural population is elderly and children, the space should be designed to give them more consideration in security aspect. First, most rural buildings no more than three floors, neighbors are quite familiar with each other, the direction of windows and doors facing the street, these are the so-called "street observer"(Gehl, J.2010,p73) which improves safety for streets. The revealing light from the windows Residential area also sent comfortable and peaceful signal to people nearby.

Furthermore, activity in low-storey of a building is mentioned by Jan Gehl mentioned as "soft border"(Gehl, J.2010,p75). When people walk passing the building, they can see the inside, at the same time, the inside people can see everything that happens outside. Life in frontage and street, mixed function and friendly boundary region, all can improve security along the street. What’s more, the layout of the space can be helpful. In the road network, there is a clear visual features among connection between architecture. Also, space has different characteristics. Especially at night walking, sign, signage and good lighting are key elements supporting a sense of belonging and security (Gehl, J.2010,p98).

3.4.3 Discussion

City for people emphasized how urban space influenced human behavior. Space was created one form, individual’s behavior is affected to perform a homologous behavior. Seemingly, hollow village has a great relationship with national policies and local economies, and little relevance with urban design. However, author believes it can attempt to change or update the physical space to enhance people's sense of belonging to the site and increase central force, and also to guide and regulate human behavior. Simply, for example, in the 2010 Shanghai World Expo, after a very long queue, there was a mess on the ground in the waiting area and often can see carelessly thrown away garbage in the entire park, or a lot of garbage scattered around the bins. It shows the number of bins was not enough in the park and the speed was not quick enough to clean up the trash. After that, the organizers placed a large garbage bag every few steps in the queue, the ground was obviously clean. The number of people in the queue was almost no change, and the only variable is addition of a new rubbish bag. Then, back to hollow problem, a lot of the official
renewal principles previously mentioned are with great broadness and not specific enough. For instance, to environmental problems like garbage all over the ground the vacant regional, if it can consider adding an appropriate waste collection point, maybe the situation can be improved. The official regulation mode only plays a guiding role in some extent and often seems feeble in the specific implementation. This may be one factor in lack of planning guidance during the regional developing. There are roughly two approaches, one is undone, but did not mention where the original people to go and how to keep life. The second is the site remediation, still no mention of how to protect indigenous people. The helping of these principles just stop at providing a renewal direction. In this article, author wants to bring the idea of “city for people” in the renewal suggestion, insist to renew based on human perception and needs.

3.5 Conclusion
Chapter 4. Case study

4.1 Analysis of whole area in Erhai

This part will first introduce the hollowing situation in the whole area and analyze various elements. It aims to find the answer of the question “How do spatial factors influence in process of hollowing in Erhai villages?”

4.1.1 Overall hollow situation description

The basic situation "hollow village": Xiaguan, DaLi, YinQiao, WanQiao, Xizhou, WaSe, HaiDong, FengYi, 8 towns and Economic Development Zones have the phenomenon of "hollow village", and ShangGuan Town, ShuangLang town have no "hollow village" (Fig.4-1) (http://www.ynszxc.gov.cn).

Hollow Village in Erhai area, especially west area is relatively common. Through field investigation, instead of hollowing phenomenon in some villages, it was just a simple village area expansion. Based on the literature review about different stages and hollow classify, it classify different types of hollow villages in Erhai area. Through this detailed classification, to explain the situation throughout the region hollow.

Erhai area hollow village can be divided into three stages, early, middle and late (Chart4-1). In the early stage, house vacancy rate is less than 30% and vacant houses began to appear. Middle stage, house vacancy rate is 30% -70%, and a large area of vacant houses form in village resulting deterioration of the environment within the village. Late stage, house vacancy rate is more than 70%
Village performs an overall vacancy situation and the village may be renaissance or renewal of land use.

<table>
<thead>
<tr>
<th>Town</th>
<th>Hollow village</th>
<th>Hollow stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>XiaGuan</td>
<td>HuXing</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>DaZhuang</td>
<td>Late</td>
</tr>
<tr>
<td>DaLi</td>
<td>XiaJiYi/LongFeng</td>
<td>Early</td>
</tr>
<tr>
<td></td>
<td>LongXi</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>XiaDui</td>
<td>Late</td>
</tr>
<tr>
<td>XiZhou</td>
<td>XiZhou/TaoYuan/WenGe</td>
<td>Early</td>
</tr>
<tr>
<td></td>
<td>QingDong/ZhouCheng</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>JinHe</td>
<td>Late</td>
</tr>
<tr>
<td>WanQiao</td>
<td>ShangYangXi/XiangYangXi</td>
<td>Early</td>
</tr>
<tr>
<td>YinQiao</td>
<td>YangBo/YinQiao/XinYi</td>
<td>Early</td>
</tr>
<tr>
<td></td>
<td>ShuangYang</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>PanQu</td>
<td>Late</td>
</tr>
<tr>
<td>HaiDong</td>
<td>ShangDeng/ShangHe</td>
<td>Early</td>
</tr>
<tr>
<td>WaSe</td>
<td>(No)</td>
<td></td>
</tr>
<tr>
<td>ShangGuan</td>
<td>(No)</td>
<td></td>
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<tr>
<td>ShuangLang</td>
<td>(No)</td>
<td></td>
</tr>
</tbody>
</table>

Chart4-1 Each village situation and stage  
(Source: made by author)

Overall Decline type: the village people mostly have migrated, and only a few villagers lived in old houses. The situation is a large area of idle houses, poor infrastructure and environment, and villages are far away from the market, or have extremely inconvenient traffic. Like Luo Qu village in Yin Qiao town, it is halfway up the mountain, belonged to the mountains position (Zhu, H.L. 2012).

Center fall type: villagers built houses along the main roads or outside the village edges. New residential area continued to expand, and a large number of decrepit buildings which were empty or only elderly stayed in. Additionally, some are only used for poultry, piling debris, tools. Thus, it forms the decline in center. Like Da Zhuang village in Xia Guan town.

Season vacancy-type villages: this kind is more common. Young migrant work and only return home in the busy season or important festival. As a result, village is desolate and only elderly and children are left behind. Xi Zhou village is in this type (Zhu, H.L. 2012).

Fracture type: original villages merged with the new villages, boundaries of old and new village are blurry and houses connect together. But some corners have not been dealt with such as garbage dump
sites. Some space is surrounded by houses or roads, forming a center idle. Fracture is also a pollute point in whole environment. Zhou Cheng village is this kind (Chart4-2).

<table>
<thead>
<tr>
<th>Town</th>
<th>Overall Decline type</th>
<th>Center fall type</th>
<th>Fracture type</th>
<th>Season vacancy type</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>XiaGuan</td>
<td></td>
<td>DaZhuang</td>
<td>HuXing</td>
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<tr>
<td>DaLi</td>
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<td>TaoYuan</td>
<td>ZhouCheng</td>
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<td>XiZhou/ JinHe</td>
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<td>XiangYangXi</td>
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<tr>
<td>YinQiao</td>
<td>PanQu</td>
<td>YangBo /XinYi</td>
<td></td>
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<td>XinYi</td>
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<tr>
<td>HaiDong</td>
<td>ShangHe</td>
<td>ShangDeng</td>
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</table>

Chart4-2Each village hollowing type
(Source: made by author)

The Changes in various villages are different during 2000-2011. Before 2000, based self-renewal needs residential grew in the villages and with the development of the village, it formed early hollow village. Then, from the vacant center, it developed and expanded and finally evolved into hollow villages in different forms and different stages (Zhu, H.L. 2012). Thus, central vacancy is a common characteristic in hollowing (Chart4-3).

<table>
<thead>
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<tbody>
<tr>
<td>Zhou Cheng</td>
<td>Idem</td>
<td>New buildings kept growing especially along 214 national road and the space between village and Butterfly Spring. Hollow households</td>
<td>Buildings kept growing and Village developed into a &quot;几&quot; shaped. Center turned to be vacant.</td>
<td>Along 241 national road and the space between village and Butterfly Spring, buildings kept growing. Hollowing phenomenon kept growing.</td>
<td>Arrived in middle stage of hollowing and went on increasing.</td>
</tr>
</tbody>
</table>
Pan Qu  
Idem  
New buildings kept growing along village road. Hollowing appeared.

Da Zhuan  
Idem  
Buildings increased in a huge number and expanded around and outward village. Hollow households appeared.

<table>
<thead>
<tr>
<th><strong>Point</strong></th>
<th><strong>Idem</strong></th>
<th><strong>Renaissance</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>New buildings kept growing along village road.</td>
<td>Combined with the new rural construction, made transformation in hollow village.</td>
<td>On the late stage, a large area appeared vacant, and has not yet appeared renaissance.</td>
</tr>
<tr>
<td>Village developed into a &quot;—&quot; shaped.</td>
<td>Central hollowing kept growing.</td>
<td>Part of vacant houses used in a better way.</td>
</tr>
</tbody>
</table>

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4.1.2 Spatial elements analysis

4.1.2.1 Point

1. Agriculture

Erhai mainly agricultural industry is planting food and cash crops, forestry, fisheries and animal husbandry, forming an agricultural multi-point network. With the aspect of the whole spatial pattern, Erhai area has rich agricultural resources, such as shoal, dam, lake, backing mountain, which result in different agricultural development. Distribution of food crops:

Rice concentrates in Xi Zhou, Wan Qiao, the flat lakeside and dam zone in west of Erhai. Corn and wheat is mainly grown in the flat terrain of HaiDong villages. Greenhouse vegetable cultivation has the largest proportion in Haidong and XiaGuan. Flower cultivation is mainly concentrated in Shang Guan. Forestry is mainly in Haidong, WaSe, ShuangLang which are hilly, mountainous terrain. Animal husbandry is auxiliary industries of grain, mainly in Xi Zhou, WaSe, ShuangLang, WanQiao. Fisheries are mainly distributed in some villages closed to Erhai Lake. Fruit, tobacco and other crops are mainly in east of Erhai such as HaiDong, WaSe, ShuangLang (Dali City Statistical Yearbook, 2007).

2 Industry

Cigarette and accessories industry, cement manufacturing industry, food and beverage industry, electricity industry has become a pillar industry of Erhai area. Industry is mainly concentrated in the YinQiao, Haidong and ShuangLang. Green Industrial Park, stone processing, and domestic famous enterprises Wahaha is located in YinQiao town. Aluminum foil composite paper production, cigarettes, perfume industry and other industrial processing, cement processing is in HaiDong. Food, preserved fruit processing industries are mainly in ShuangLang (Dali City Statistical Yearbook, 2007).

3 Tertiary Industry

In recent years, the traditional transportation, telecommunications, warehousing, wholesale trade and catering industry developed steadily in Erhai. Modern service industry such as Intermediary services,
information consulting, tourism, were rapid developing, promoting the rapid formation of a network of rural business services. Erhai region has rich tourism resources, and tourism has occupied the main tertiary industry in Erhai. With high-profile attractions are: Dali, Three Pagodas, ZhouCheng Butterfly Spring, XiZhou Bai residential buildings, ShangGuan park, Mountain, Lake, Island (Dali City Statistical Yearbook, 2007).

The Distribution of settlements combines with three major industries which resulting each spatial node (Fig.4-2).

![Fig.4-2 Points distribution of Erhai area](Image)

(Source: made by author)

Result:

Depending on the data of regional economic development and industrial distribution, these towns have a better situation in economic development: XiaGuan, DaLi, YinQiao, and relatively worse are XiZhou, HaiDong, ShangGuan, ShuangLang, WaSe.

From the view of agricultural, there is no prominent agricultural industry in YinQiao, DaLi and XiaGuan regions which have more serious hollowing phenomenon. The agricultural industry are more prominent in HaiDong, XiZhou, WanQiao, WaSe which are in different stages of hollowing, no obvious common feature. The developed industry sites, HaiDong and ShuangLang have no common features in hollowing phenomenon. The tertiary industry, the tourist attractions are concentrated in XiGuan, DaLi, XiZhou which are part of serious hollowing area. Therefore, the impact of tourism on the hollowing can’t be ignored. The more developed tourism in an area, the more likely to produce hollowing phenomenon.

It also can be found in the figure, hollowing degree has relationship with the distance to city.
ShangGuan, ShuangLang have longer distance to DaLi city than XiaGuan, DaLi, YinQiao, WanQiao, XiQhou, WaSe, HaiDong, FengYi. This relationship can be described as distance on the map, also shows influence of central city in rural development in every as such as economic, population. Additionally, the hollowing phenomenon in west is serious than east, so the village is in a higher degree of hollowing when it is developed; hollowing almost did not appear in less developed region.

4.1.2.2 Line

Line (also called channels) refers to certain social activities in the geographical space showing a linear distribution pattern. Depending on the social activities, line includes the transit lines, communication lines, energy supply lines, drainage lines. Similar kinds of lines but in different levels cooperate with each other and together to accomplish a certain kind of economic activity.

Special terrain which is a lake between two mountains created a zonal distribution from north to south. transport facilities is the mainly line to connect every points in this area. Dali is in western Yunnan, east to Chuxiong and Kunming, west to Baoshan, Lijiang. With the construction of railways and highways through Dali, advantages of traffic in Erhai will become more apparent. Currently, There are national highways and provincial roads, Water Route in Erhai lake and Dali Airport in Haidong, forming, land, water, air-dimensional transport network. Transport facilities distribution presents the West Coast area has convenient transportation, excellent condition; Haidong area affected by terrain, the situation is complex.

1 Road

By the end of 2004, the region's highway mileage went to 667.81 km, highway density of 0.59 km / sq km (Dali City Statistical Yearbook, 2007). The county road persistently grows and, the technical level of county road condition gradually improves. Currently, heavy Traffic are mainly in State Road 214, DaLi provincial highway, East sea road, and now is planning to construct highway from Dali to Lijiang, which will promote space development in Erhai.

2 Water line

There are 6 cruise shipping companies, 5 cruise ships, 10 small boats, daily carrying more than 4,000 and Dali Port XiaGuan marina was found in 1997. In 2001, TaoYuan marina and 13 simple havens were built. Waterway transportation improves the development of fisheries and water tourism (Dali City Statistical Yearbook, 2007).

3 Railway

There is now a regional railway under construction, railway leading from Dali to Lijiang. Railway will be built in three towns support from Haidong skeleton, led the construction of infrastructure in the three towns, thus boosting economic development Haidong three towns (Fig.4-3).
Result:

The west has more convenient transportation and better regional development potential because the transportation developed earlier, the conditions are ripe. As a result, hollow village appeared earlier in this area. With the aspect of hollowing extent, western is heavier than eastern so that there is obviously links between hollowing and transport development. Western, in which transportation developed early, has more convenient roads to provide migration and a foundation for economic development. These are conditions for hollowing. Due to the development of land and water transportation among villages, it promotes trade, exchanges in population, increasing income, also leads to hollow village.

4.1.2.3 Network

In the Erhai area, there is a network constituted with three roads and one water transportation which connect various settlements. Various towns and villages constitute a network; another is industry network which made up by these lines of communication and population flow, material flow, technology flow, information flow and capital flow network of industry. The axis of vertical is main three: along 214 national road, the distribution of towns and villages composed the system; along Dali road, the distribution of towns and villages composed the system; and along east sea road ones. Horizontal axis is the point-axis relationship between the primary node to other nodes and its impact on the region. Vertical and horizontal axis interweave together to form a network of regional spatial structure of Erhai.

4.1.2.4 Influence

1. Towns

Xiaguan Town is the location of Dali city government, so its influence and radiation involves the whole
Erhai area. Xiaguan can be seen as the first node in spatial structure.

Dali town influence range is beyond the scope of administrative divisions, and the north of Xiaguan and south of Yinqiao are attracted by Dali town. Their direction is toward Dali town and the flow of traffic also exceeds their town center. The northern part of Wanqiao is attracted by Xizhou in which the flow direction turns to Xizhou and flow also increase to Xizhou and beyond the scope of administrative region (Che, Z.Y. 2008). Thus, Xizhou town and Dali town can be seen as the secondary nodes.

The attraction and influence of Shuanglang town, wase town and haidong town are weaker than dali and xizhou, and the range limits within administrative region.

Yinqiao and Qiaowan Town not only limit in radiation, but also are affected by the edges of other towns. Therefore, the both can be seen as the fourth nodes among towns in Erhai area.

2 Villages

Flows among the villages mainly perform in bazaar. The bazaar takes place twice a week in Wan Qiao village, but every day in Xi Zhou. Thus, the northern villages of Wan Qiao town are attracted by XiaGuan village, which makes the villages’ flow are towards Xizhou. Therefore, among villages where each government of towns locates in the area, Xizhou village has stronger radiation.

In Chou cheng village, bazaars begin at about three in the afternoon each day and it influence expands to the surrounding villages. However, according to the author understood, before the market not yet open, the flow is mainly towards Xizhou. Thus, although the population and area are more than Xizhou village, ZhouCheng is affected by Xizhou and the influence is still weaker than Xizhou village (Fig.4-4).
Result:

Large influence means there are more resources which can be used to create more communication opportunities with the surrounding area. The regions with higher influence also appeared higher hollowing level at the same time. However, the fourth nodes, although Yinqiao and Qiaowan have weak influence, they have the same level of hollowing with the first nodes. Therefore, the influence of one region could be seen as one of factors.

4.1.3 Spatial evolution process

DaLi, as the center of Erhai area, is almost throughout the entire history of this region. It had been capital of Nanzhao Dali, the aristocratic regime of a minority in Yunnan more than 500 years. Cangshan in the west, Erhai Lake in the east, as well as the flat and and fertile dam which extending to the east from the foot of Cangshan to the east of Erhai Lake, these geographical conditions have pregnant formation and development of the traditional village of Dali. Superior geographical environment is an important reason that early formation and development of settlement and central region.

AD221-AD618:

Apart from Dianchi Lake region was dominated by agriculture, the economy in other vast areas was still in a state of nomadic. Settled population was limited and the process of urban-rural separation did not start (Yang, Y.H. Yin, M.J. 2003).

After the Nanzhao moved the center to west coast of Erhai Lake, the spatial structure of ancient settlements in Erhai area initially developed. It formed three regional centers. During this period, the construction industry and the textile industry in the region developed (Yang YH, Yin MJ, 2003). Gradually, it emerged an agricultural settlement pattern of ancient urban settlement patterns and the surrounding area.

In this period, the development of Erhai area was at a distinct point formation stage. Southwest Silk Road and the ancient Tea-Horse Road opened which made an extended in western region (Fig.4-5).

![Fig.4-5 AD221~AD618](Source: made by author)
AD1274:

Administrative center moved from Dali to Kunming, Dali is no longer a regional center of Yunnan. In the Ming dynasty, since development of the handicraft industry, it appeared villages which specializing in the production and processing of marble near the Three Pagodas. At the same time, mining industry began to flourish in the Dali and Wan Qiao Town had a historic record of mining (Yang YH, Yin MJ, 2003). This period, bazaars and night markets emerged and town initially formed. The spatial structure of the traditional villages in Erhai was constituted by Limited market towns and widely distributed villages (Fig.4-6).

![Fig.4-6 AD1274](Source: made by author)

In the period of 1949 to 1978:

The Construction of the 214 National Road brought infrastructure developed. Generally, the Development of towns and villages are along the main traffic lines, but traffic among the villages is not completed (Yang Y.H, Yin M.J, 2003). Thus, the spatial structure of town at this time mainly evolved along national Road. Evolution of the spatial structure of rural development was not obvious. To the east of the townships became underdeveloped because of traffic, and lagging behind in the development of the western, so the rural spatial structure did not get much development.

The transportation was mainly in the 214 National Road and waterway. It provided a road along which the towns and villages can go stable development. Regional spatial development during this period was in the axial expansion phase (Fig.4-7).
Until nowadays:

In 1998 Dali road opened to traffic, the construction of transport facilities and rapid increasing in population, made the spatial structure develop in a new direction and promote linkages among villages and towns in West Coast. Gradually, between the village Dali Road and State Road 214, it turned that settlements gathered along the road and farmland was in the middle.

In 2000, East sea highway completely opened up the eastern space, strengthened connection between north and south towns. In the spatial structure, it promoted growth of east spatial axis, and deeper development from south to north (Fig.4-8).

Result:

Regional road development strengthened the connection between village and village, town and village,
and also made the rural economy and transportation facilities be well developed. The first development of the western region provided economic conditions and the traffic environment for the emergence of a hollow village. From north to south direction, the birthplace was in the north and the developing direction was from north to south. The degree of hollowing was similarity from north to south accompanied with incremental phenomenon and the serious hollowing happened near the main city in the south. Then compared the east-west direction, only after the western developed to a certain stage, the east par began to develop and hollowing degree in west was also higher than east. It can be said the region which more early developed and has abundant material conditions, it is more likely hollowing.

4.1.4 Distribution mode

The spatial structure of the distribution in western is axis-Point model, they are respectively:

Along the foot of mountain; Along 214 national road; Between 214 national road and Da Li road; Along Da Li road; Between the road and the Erhai lake; Along Erhai Lake distributed.

1 Villages developed along the mountain foot distributing in north-south linear model and only a few villages is in a trend of extending towards 214 national road (Fig.4-9).

2 Along 214 national road

(1) The main village located on one side of national road (Fig.4-10).

Generally, village is mainly distributed in the west of road, because the terrain goes down from west to east, and east is lower than west so that it is not conducive to drainage. Therefore, the development of the village is mainly in the west of national road and few buildings extending across the road to the other side. Development of village is mainly along the National Road towards the north and south direction. The typical village is Zhou Cheng Village.

Due to the shortage of housing, no extra homestead within village, new houses were along 214 national road in Zhou Chen Village. The shape changed from square to "几" shape. In recent years, new buildings gradually increased on both sides of Road year by year. Around 2000, buildings grew along 214 national road, and houses gradually were constructed within village towards surrounding roads. With the increasing in new residential area, the village began to appear changes internal architecture, but not obvious. There are some houses in the village appeared the phenomenon of hollow households.

(2) Located on both sides of national road (Fig.4-11).

Main body was across 214 road and villages developed towards north and south sides. The typical village is Wuliqiao and Wanqiao.
(3) Between the 214 national road and DaLi road (Fig.4-12).

Village is between 214 Road and Dali road and both ends developed towards 214 road and Dali road. There is lots of farmland but rarely buildings occurring in middle part. With the rural development, the village also had a tendency to fill the middle of farmland.

3 Along Da Li road

(1) Both sides of the road (Fig.4-13).

It is same with national one. Main body was across 214 road and villages developed towards north and south sides

(2) On one side of the road (Fig.4-14).

Development of villages located on one side of Da Li road. The construction began across road and developed towards the other side. The typical village is Xizhou.

Eastern part developed earlier where the old residential houses concentrated. With the village development and road construction, village-scale developed across the road to the west which was newer than east. Thus, vacant houses mainly concentrated in the east.

4 Between the road and the Erhai lake (Fig.4-15).

Villages mainly distributed between dali road and Erhai. There are entrances on Dali road to these villages and often developed in North-South directions. Until growth arrived in both sides of borders, it changed to develop in east-west direction.

5 Along Erhai Lake distributed (Fig.4-16).

Villages along the Erhai Lake dominated fisheries. There are two Development modes: one is towards north and south along the Erhai linear; second, the mainly towards Dali road which in the west, both north and south slug development.

Result:

Each representative villages of each mode has different hollowing situation, basically no common characteristics. XiZhou and ZhouCheng Village, both of them have obviously hollow phenomenon and closely link with the roads. However, other villages also develop along the direction of the road. Thus, it can’t explain the distribution mode has necessarily linked with hollowing phenomenon.

4.1.5 Conclusion

The village is a dynamic, complex system with a self-organizational model, changing and developing along the time line, and with the self-renewal capacity. During the self-renewal process, village is the main action. People’s lifestyle, ideology are affected by social modernization and construction activities are affected by materials and technologies subject. Village is an open system, connecting with the outside world in a stable way in communicating information. Self-organization is affected by external and complex factors. Self-renewal capacity imbalances result in spontaneity and blindness in construction and development. This imbalance can cause blindness updates, such as blindly imitate the city, the pursuit of short-term interests, hollow villages also born out in this process.

The traditional village households are mainly engaged in agriculture. The production mode and lifestyle
are substantially same and also the shape of villages and rural houses show similar characteristics. With gradually increasing income gap between farmers, a large number of farmers with good conditions already have the ability to update their houses, so that might produce hollow village. China's rapid urbanization and tourism development in certain areas pull village hollowing. Cities and tourism development promote young workers continue to migrant, but it is more difficult to settle down in a new place. Rural workers create a short-time migrant flow, so often appear "seasonal idle" in homestead.

From the historical change, hollowing is the product of regional development to a certain stage, a result of the succession of the village, and also is the villagers' choice when village develop to a certain stage. Hollow village embodies a composite result leading by social, economic and environment. The regional with more developed traffic system and developed earlier may have better economic condition where hollowing phenomenon earliest appeared. Whether from the network structure, or spatial distribution, the village which is located near the traffic system has more influence on the surrounding area and also has high probability in hollowing.

4.2 Analysis of specific villages

The following part will try to find the answers of question “What are the changes and problems that appeared in Erhai villages? ” “How to renew the hollow villages based on regional potential in Erhai area? ”

It is impossible to analyze the changes in every hollow villages in Erhai area, so two typical villages are chosen. It might be more persuasive compared with one. And one of them will be the site for design proposal. The selection is based on the following four aspects:

First, cases are similar in geography but differences in economic environment; second, the cases are chosen in different stages of hollow development; third, cases are chosen with accessibility, easy collecting relevant data. Fourth, the main point of this article is the case in the West Coast because of the better economic development and the hollow phenomenon is obviously and relatively with strong representative.

To explore the changes, the following part will compare the old and new buildings, roads and nodes and people. These changes may be related with the hollowing, or may be irrelevant. Hollowing might be a result, or could be a reason for the change. The problems and potentials also might be found in this process.

4.2.1 Hollow situation

4.2.1.1 XiZhou

Background

XiZhou village belonged to XiZhou town, locates in the center of town (the Administrative village), with convenient transport facilities. It is 34 km north to Dali and 6 km northwest to Dali's famous tourist attractions "butterfly spring." Additionally, it locates in the Flat area between the mountain to the sea and with fertile land source. In late Qing Dynasty, with the development of transportation, XiZhou became the birthplace of the industrial and commercial region (Che Z.Y , 2008). So far, the village holds a large number of Ming and Qing dynasty relics, and 100 houses are well preserved which collected the essence of the Bai houses. In 1987, Bai residential buildings in XiZhou were included in Yunnan cultural heritage objects and in 2001, were included in the fifth national key cultural relics protection object.

Economic

In 2002, the main source of income came from agriculture, and the per capita rural income was only 1,917 yuan. In 2006, with the development of tourism, the per capita rural income was 4,396 yuan (http://www.ynszxc.gov.cn). From the main indicators of economic development, the recent economy has maintained steady and rapid development (Chart4-4). The agricultural and industrial outputs also have a
certain growth that has laid a good economic foundation for tourism and cultural industry development.

<table>
<thead>
<tr>
<th>Xi Zhou (year)</th>
<th>Population</th>
<th>Net income (yuan)</th>
<th>Total income (million yuan)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>60605</td>
<td>1917</td>
<td>488</td>
</tr>
<tr>
<td>2002</td>
<td>62756</td>
<td>3602</td>
<td>920</td>
</tr>
<tr>
<td>2003</td>
<td>62756</td>
<td>3291</td>
<td>786</td>
</tr>
<tr>
<td>2006</td>
<td>64857</td>
<td>4310</td>
<td>1057</td>
</tr>
<tr>
<td>2008</td>
<td>65735</td>
<td>4310</td>
<td>2096</td>
</tr>
<tr>
<td>2010</td>
<td>66925</td>
<td>6187</td>
<td>21375</td>
</tr>
</tbody>
</table>

*Chart 4-4 XiZhou economic chart  
(Source: made by author based on http://www.ynszxc.gov.cn)*

**Hollow phenomenon**

Before 2000, the new construction was need for housing because of the village population growth. From 2000 to 2004, the government acquired the land of bankrupt enterprises and built the central square for XiZhou. Also, it developed and constructed a 40-acre residential Bai district (still expanding) (Zhu H.L, 2012). Affluent villagers preferred to build new houses around the village with better conditions area, along the road or around a large square. Gradually, the entire village was almost surrounded by new houses. Once, Xizhou was in difficult housing conditions, more than a dozen families lived in a residential compound. After economic conditions improved, one family or a few families moved out, vacant phenomenon appeared, but without entire idle courtyard. Villages appeared vacant households and hollow started to show (Fig.4-17).
Since 2005, "XiZhou Development Co., Ltd." was established, village tourism started to practice. The entire project includes three phases, and the first phase focused on construction in Xizhou administrative village. After 2006, houses which facing the street were removed and then another project was implemented. The project played in a 64.48 acres area in west entrance, including a number of Bai-style tourism, real estate, water landscape, green landscape and road plaza (Fig.4-18). (Already built until now) (Zhu H.L., 2012).
From 2005 to 2010 with the town development progresses, new and old farm house in the village phenomenon was more obvious differences. Since a big population and little land, requisition of land from government, it resulted in loss of survival land for farmers and migrant work had become their main way of life (Zhu H.L, 2012). Migrant working increased the income which leaded increasing in housing will and constantly increasing new buildings surrounding village. It developed tourism resources of Bai style, which planned the northwest as villager resettlement area, removing existing public buildings such as cinema, supply and marketing cooperatives, hospital, technical school of farmers and others. The project did construction of water landscape in the village entrance and tourist shops, developing the western villa area, transformation around Sifang Square, delineation "Zhao House" residential protection, moved the original "Zhao House" and the surrounding villagers to resettlement areas. However, due to lack of relevant procedures, the less than 10% of tourism business district were sold. Additionally, the villagers felt the compensation for demolition was too low and the land utilization of resettlement area was less than 10% (Zhu H.L, 2012). Luxury villas were vacation places for visitors and 30% of houses have paid a deposit. However, even if someone subscribed, most of the time was also vacant. Due to the emergence of government-led vacant region accounted for 40% of the original area (Zhu H.L, 2012). By contrast, the number of vacant houses was relatively less caused by spontaneously action of inhabitants (Fig.4-19).
Prior to the development of village tourism, village residential, commercial, public service facilities did not appear spatial differentiation. After tourism developed, it forced an increase in space for providing tourism services. What’s more, the unbalanced development caused differentiation in village space (Fig.4-20).

(1) Commercial district
The main attractions and the surroundings formed a Commercial district providing tourist services such as shops, pubs, restaurants and so on. This plan went far beyond the needs of tourists and resulted in commercial district vacancy near the entrance of village. Housing price for the local economy varied widely, the tourism retail price reaching a high of 6,000 yuan/㎡, while the local residents' per capita net income of only 6,187 yuan annual(Wang Y.Y, 2010). Villagers can’t afford to buy the new items.

(2) Residential area
During the process of Government forced the development, it formed Bai residential area, relocation of villager resettlement areas, luxury villas, Muslim villagers living area and the original village residential area. Among them, Bai residential area was mostly working-class and migrate businessmen and only facing street part was rented.

Currently, there are two vacant housing situations: ① Government expropriation of farmland, villagers lost their land, so they went out to work which increased seasonal vacant houses in the village. ② Villagers with good economic conditions built new houses in the surrounding, old houses abandoned, which increased vacancy.

(3) Infrastructure
The original village public service facilities such as the main temple, shrine, Square and residential region showed a balance. However, after tourism development, Public service facilities for the villagers
demolished such as supply and marketing cooperatives, cinemas, courts, bus stations, grain management, hospital. Public services were mostly built into the new area and there was almost no infrastructure in original village (except temples and schools), so that infrastructure appeared differentiation on spatial structure.

![Fig.4-20 Land uses in XiZhou](Source: based on Wang Y.Y ,2010, fixed by author)

### 4.2.1.2 ZhouCheng

#### Background

Zhou cheng, administration under the Dali Xizhou town, has the most population among Bai villages. It is 7 km away from the town government and 40 km from the city. The town road is covered by asphalt and 214 Road goes through the village which brings a convenient transportation. It Locates in the northern of Dali City center, Yunnong Peak of mountain in the west, Taoyuan dock in the east, 25 kilometers away to Dali Ancient City, the famous Butterfly Spring attraction in the north. By 2010, the population was 10,470, of which 9370 was agricultural population, 1100 was temporary residence and non-agricultural population, 99% was Bai population (Wang Y.Y, 2010).

Zhou cheng has a very long history and it was an important military stronghold of NanZhao Kingdom in the Tang Dynasty. It composed of more than 1,400 Bai Courtyard without much vacant land in middle and most houses were built during the Qing Dynasty and the Republic of China, with "Chinese Bai village" in the title. The roadway is gentle slope village status and width is 2-3 meters but only a meter wide tunnel in entrance (Wang Y.Y, 2010). Village trees, ancient stage, temples, houses and other ancient buildings and folk customs, beautiful national costumes constituted the unique folk customs, history and culture of ZhouCheng.
Economic

Before liberation, Ancient Tea Horse Road went through the village and after the liberation, 214 national road went through the village, both of which promoted local tourism and business activities. The proportion of agriculture income kept reducing in recent years. Influenced by Butterfly Spring, ZhouCheng attracted tourists by folk Culture.

In 2010, total income was 283.4 million yuan and the income of the second and tertiary industries accounted 269.88 million yuan, migrant labor income taking part in 9.08 million yuan (http://www.ynszxc.gov.cn/tj/tj/tj_s.aspx). The second and tertiary industries played main part in income of farmers.

Hollow phenomenon

![Fig.4-21 ZhouCheng village shape changing map](Source: made by author)
2000 years ago, houses were gradually built along 214 national road and within village rely on the sounded road which is the natural growth (Wang Y.Y, 2010). With the increase in new residential, the village began to appear changes in internal architectures, but not obvious. Villages appeared vacant households and hollow started to show.

2000-2010, Village kept growing in north-south direction. The number of houses continued to increase in north area near Butterfly Spring forming a new district. Zhoucheng connected with Renhe and Butterfly Spring which made it is difficult to identify the boundaries of distinction. At the same time, the facilities which provide service for cars gradually increased and the entire village shaped in north-south stretching along 214 national road.

2010, new lines of 214 road were constructed, with certain distance from Zhou villages. Because of the rerouted, the entrance of Butterfly Spring also changed which moved nearer ZhouCheng. New houses along the road on both sides gradually increased, also increasing along new 214 road (Fig.4-21).

The villagers spontaneously migrated to new area caused population loss in old villages and original village was surrounded by new houses, a typical hollow village phenomenon. According to statistics, in 2009, there were 117 hollow courtyards in village and several hollow households but because of scattered situation, hollow household can’t be statistics (Zhu H.L, 2012). Many courtyards were shared together by several families and some moved out but left one or two families still living in it. Thus, it can say the overall vacancy village phenomenon is serious.

With the development of Butterfly Spring after 2008, the area of services for tourists increased and along the main tour, tourism commodity business developed into an independent area which resulted changes in residential area (Fig.4-22).

4.2.2 Architecture analysis

1 Buildings and environment

XiZhou

The demolition area was approximately 17,530 square meters for tourism construction and most buildings were with more than 30 years of history, a blend of the essence of Bai residence (www.ynszxc.gov.cn). It is an important part of traditional village landscape. A large area of demolition was likely to cause
destroyed in typical traditional villages. After the villagers moved out of the village, nobody maintained the old houses, houses serious aging and the surrounding environment gradually deteriorated (Fig.4-23, Fig.4-24).

ZhouCheng

After the villagers moved to new houses, they abandoned the old oneself, but they didn’t want to sell their homestead leading to the old village environmental degradation (Zhu H.L, 2012). Some vacant houses fell into disrepair, some even collapsed and weeds grown in half meter height. Roads within village were narrow and most were dirt and gravel roads, no lighting facilities. There were more than a dozen tie-dyed workshops in different sizes, since the lack of drainage facilities, tie-dyed sewage spread on the village roads, and made unpleasant stench where sewage blocked (Fig.4-25).

2 Materials

Erhai area well preserved traditional architecture system takes a wooden frame as a load-bearing for brick and civil architecture which are widely used in the region (Fig.4-26). The traditional materials mainly
include wood, adobe bricks, rammed earth and stones. With the increasing in people who build a new house, timber became too less to buy, so ordinary people basically choose brick to built houses (Fig.4-27).

In the last 10 years, some of the towns and villages houses have been replaced by two or three-story buildings with reinforced concrete or brick structures (Xiang Z.H, 2008). Some towns were no longer the traditional courtyard-style architecture. The building began to set the layout individually and the roof is also turned to be flat.

In ZhouCheng, because of tourism development and the protection of village, the area which appeared hollow phenomenon has not been much change, but outside the village along the road, there have been a lot of new houses with concrete structures. The concrete buildings shortened construction period, complied with the needs of tourism development and investment.

3 Architecture plan

The traditional Bai residential combinations are “Three square a screen wall (三坊一照壁)” and “Five mixture patio (四合五天井)” (Fig.4-28) (Yang D.Y, 1997). “Three square a screen wall” typical layout is made up of three houses (namely one main room and two side rooms) and a screen wall forming a courtyard with vegetations. Houses are three-bay and two-storey, and depths are almost equal. The first floor is used for living and second floor for storing. Between the Rooms, there is respectively a patio where the kitchen located.

“Five mixture patio” is also the typical layout of Bai nationality which combined with four rooms. With the traditional quadrangle Courtyard different, except the large courtyard, it is in addition to five small courtyards called drain corner patio, total in five yards. Except no screen wall, it is more like “Three square a screen wall” (Yang D.Y, 1997).
In ZhouCheng, some residents changed the bottom of the building into a workshop to fulfill the needs of production and processing traditional handicrafts. Thus, the first floor became family workshop room (Fig. 4-29). As can be seen from the plan, in order to meet production while also meet the needs of life, they removed one patio, added a room in 3 to 4 layers (Wang Y.Y, 2010). The plan form has been different with traditional Bai houses.

![Family workshop in ZhouCheng](first floor) ![Family workshop in ZhouCheng](second floor)

**Fig.4-29 Architecture plan in ZhouCheng**
(Source: made by author)

The main function of the new buildings on both sides of 214 national road are tourists reception, which include shops, dining reception, family-style hotel. The plan form has been different with traditional Bai houses and street side wall has been broken to open a door. The overall plan is still courtyard-style, but each room has become a standard hotel room with an increased on the scale than the traditional architecture. Additionally, some hotel buildings provide parking courtyard so that the courtyard sizes increased. Compared with traditional architecture, the overall depth of new buildings has increased. The situation is very similar with Zhoucheng that new buildings on both sides of DaLi road.

4 Combination mode analysis

Bai dwellings are almost courtyard with rectangular unit structure (Yang D.Y, 1997). The combination of these basic units are mostly rectangular joining, a simple relationship of splice. Ancient village building reflects the texture of ancient village, diagrams can be used to describe. Here took the main entrance direction of the building as the central axis.

ZhouCheng

The buildings in four sites were selected, two in center of village and this part still kept the original texture. Two in the edge of village, one in the southern end extending site, this part developed in natural way; another one in the northern end near Butterfly Spring area, has been influenced by tourist attractions and shops.

Combinations

1. Center

Residential buildings within the village preserved relatively intact. In recent years, there were no major demolition and construction, so the combination of the internal architecture of the village still can reflect the ancient village texture in ZhouCheng (Hao X, Zhu B.X, Zhong Q.L, 2001).

2. Edge

As the economic development, increasing in population and Butterfly Spring scenic area development, residential buildings grew in north and south directions. The combination in the edge of the village has
been different with that combination within village (Wang Y.Y, 2010).

From the comparison of the diagrams, since experienced not major changes, texture remained relatively intact where hollow phenomenon appeared. While the new area near attractions, aimed to be convenient for travel, business and tourist reception, buildings carried a uniform layout, forming a uniform combination (Fig.4-30).

![Building combination in ZhouCheng](Source: made by author)

XiZhou

The buildings in four sites were selected, two in center of village and this part still kept the original texture. Two in the edge of village, one was in the northern connecting with farmland; one was in the southern end near YanBaoCheng Scenic area which affected by tourist attractions and shops.

1. Center

Tourism resources in XiZhou featured with Bai dwellings, no major demolition and construction, so the combination of the internal architecture of the village still can reflect the ancient village texture (Zhao Q, 1999).

2. Edge

In the Edge of village, buildings and farmland have been in the form of a finger-like development which is in a coordinated relationship (Wang Y.Y, 2010). A small square near the town government, is a tourist hub in the region, and usually parked many vehicles of tour groups. Since the concentration of tourists, several shops nearby, the combinations in that area are different with other edge regions of other villages.

From the comparison of the diagrams, since experienced not major changes, texture remained relatively intact where hollow phenomenon appeared. Away from the center, in edge of the village, the area near farmland still kept the original texture, but the area happened mutations near attractions (Fig.4-31).
4.2.3 Interface analysis

Surface includes street interface, and all internal roadway surface.

Each road in Erhai area can be divided into two classes, the first class is cross-border road such as 214 national road, Dali road and highway around lake. In general, the commercial facilities concentrated on both sides of these roads. The second class roads include village roads which contact a large area of residential groups, and some spaces and squares at the intersection of these roads in order to meet. The third are roads between the building and roadway, slightly narrower, and some just passing tunnel, not able to stay.

1 ZhouCheng

(1) Along 214 road

The route to scenic is mainly 214 national road. On both sides of road, the buildings were unified repaired with Bai style to provide service for tourists. The shops along one side of road were uniform in style with sloping roof (Fig.4-32).
(2) Roadway

From north square to Longquan Temple, on both sides of the road are almost the gable walls of houses. The direction of residential doors follows the roadway which derived from the road. Since the road goes from the village square to interior, so the changes are obvious from the modern to the ancient on both sides of surface (Fig.4-33).

![Fig.4-33 Interface of roadway in ZhouCheng](http://image.baidu.com)

2. XiZhou

(1) Along DaLi Road

In the west side of the road, there is a newly developed residential area and a visitors center whose surface is a unified style with sloping roof. The east of road is under construction tourism development project, and a landscape design was planned closed to the road entrance (Fig.4-34) (Che Z.Y, 2008).

![Fig.4-34 Interface along DaLi road in XiZhou](http://image.baidu.com)

(2) Road within village

From bus station to Yan BaoCheng mansion house—Fuchun—SiFang street—ShiPing street, because of close to attractions, the surface is a consistent style storefront from bus station to Yan BaoCheng mansion house on both sides of the road. The architecture external form is complex in Fuchun road which include Bai residential outer wall and some inconsistencies new residential style buildings. In addition to the surface of Yan Courtyard and Agricultural Bank, the area is surrounded by a circle of traditional houses (Fig.4-35).
(3) Roadway

Roadways within the village well reflected ancient village charm like the uniform style of Bai residential façade. The entire roadway has a strong form sense because of the continuous Bai residential buildings (Fig.4-36).

4.2.4 Nodes/square

Node is a point to show village changes. The formation of space nodes has inseparable relationship with architectures. When a Building group is constructed, nodes grow at the same time.

With the development of rural economic and increasing needs in tourism, some changes happened in the shape and function of squares in villages. This part will try to find if vacant phenomenon has any influence on village square.

1 ZhouCheng

ZhouCheng has two main village squares: South square and North Square. Both squares are planted with marker of Bai ethnic—Ficus altissma(大青树). The connection between north and south squares is the ancient Tea Horse Road. The main function of the north and south of the square is the villagers’ meetings and fairs. There is a stage in north square and the annual gathering of the major festivals all take place in north square(Fig.4-37). Thus, the function of north square is stronger than south (Liu R.Y, 2006).

With the changes of mass tourism development and architectural features, square happened some changes (Wang Y.Y, 2010). First, in the South square, the plan has no too much changes, just several new public buildings and facilities were added surround the square. The main function is commercial use such as shops, operates clothing and home appliances, only changes in content.
The situation in North is similar with South Square. North square just added public buildings such as elderly activity center. In the aspect of function, in major holiday or celebration, North Square is still the village center and in other times it plays the role of village market. The changes took place in operating time. The previous week, according to local villagers said, the fairs started around 3p.m. before, and now it went almost a whole day. A great market influence grew in North square which attracting individuals from surrounding villages to trade.

Although vacant houses appeared within village, little influence acted on the use of the square. Two squares in the village are still important activity places. Vacant phenomenon lead the loss of population, but tourism brought the population made contribute in promoting events happening. From the functional point, only changes in store management contents around the square but did not cause problems.

2 XiZhou

There are two squares in XiZhou, one is Sifang Square, another is villagers ZhengYi Leisure Square.

Sifang Square is a public space for meeting in XiZhou, surrounded by shops serving to villagers, and also filled with stands selling Bai snacks (Fig.4-38). The west end closes to one of tourist attractions, so tourists often occur in square. Sifang Square has preserved the original form and the villagers who run a business or do activities have not been much affected by tourism.

ZhengYi Leisure Square, the government built it aimed to provide a space to do activities for residents (Fig.4-39). Most of the square was paved with hard-based, also made the landscape with bridges and water (Yu C, 2009). However, because of the south of square linked with tourism sites and the demolition is planned in the north, so the users mainly from the residents in the east and the new district in the west. Since hollow phenomenon has appeared in eastern part which already had population loss, while the western part was too new and was cut off with a highway in middle, resulting in low utilization of the
square.

After hollowing appears, leisure square was influenced more which mainly function was to provide activities for residents. There didn’t affect too much on the square with fairs and cultural events. Because this kind of square is belong to tourism, so the square will develop with tourism. Contrasted with residential square, the utilization rate may decline with the loss of population and once the phenomenon experienced a long time, dilapidated mess and security risks probably happen in the square.

4.2.5 People

Until 2011, the entire Dali Bai Autonomous Prefecture population was 308 million people, 191.26 million labor accounting for 62.1% of the population. Migrant labor was 42.16 million, accounting for 22.04% of the total migrant labor, which including 32.5 million (77.3%) perennial migrant labor, increased 4.3% than last year (http://www.ynszxc.gov.cn).

XiZhou

Since tourism developed, the original residents migrated to centralized resettlement areas, lead loss of local residents (Zhu H.L, 2012). This caused hollowing in local villagers. The number of floating population increased, while the local number declined, which resulted in the loss in flavor of rural life. Local resident is the root of cultural tourism resources. Even if loss of local residents, it maybe make traditional village culture disappear.

In XiZhou, the obvious contradiction is between too requisite much people and little land. After the government requisition land, more surplus labor grew in village. In order to make more money, the surplus labor migrated to work, increasing the degree of hollowing. Based on the current situation in China, the employment situation is grim, fierce competition in migrant workers. However, villagers expect to migrant work although the proceeds are not high, it can become a second income. They feel very good, and look forward to continuing to work outside.

There are many seasonal vacant houses in the village and villagers who engaged in agriculture accounted for only 20% of the population (Zhu H.L, 2012) (Chart4-5). Migrated labors return home only in major festivals, which resulted in a waste of land. Currently, mostly elderly and children were left behind in village.

<table>
<thead>
<tr>
<th>Population</th>
<th>Labor</th>
<th>Agriculture labor</th>
<th>Migrant labor</th>
<th>labor(22.04%)</th>
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</thead>
<tbody>
<tr>
<td>2329</td>
<td>1600</td>
<td>530</td>
<td>352</td>
<td></td>
</tr>
</tbody>
</table>

Chart4-5 Data of population in XiZhou
(Source: made by author)
ZhouCheng

In recent years, the region near Butterfly Spring has a rapid development, which attracted affluent villagers moving to new residential area and some moved to both sides of 214 national road because of the convenient transportation (Zhu H.L, 2012)(Chart4-6). The population living in villages declined and vacant houses increased. Some seniors considered houses are their ancestral home, so they still live in old houses.

More elderly are left behind in the old village which is further expanding premonition of hollow. Now elderly kept living in houses and even if the elderly passing away, these houses will be vacant. Inconvenient transportation within village also brings a lot of security risks for the elderly left behind.

<table>
<thead>
<tr>
<th>Population</th>
<th>Labor</th>
<th>Agriculture labor</th>
<th>Migrant labor</th>
<th>labor(22.04%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9592</td>
<td>6169</td>
<td>1480</td>
<td>1359</td>
<td></td>
</tr>
</tbody>
</table>

Chart4-6 Data of population in ZhouCheng
(Source: made by author)

Overall, the elderly and children have constituted the resident population because mostly young people migrated to work. Once prosperous town due to the loss of economic basis, occurred hollowing phenomenon, which is very common existence in many ancient villages. In the visit, it was easy to take photos of the elderly and children and it clearly showed the old man not only should take care of grandchildren, but also take up farming responsibilities. Young people went to the city to find more work opportunities. The place with hundreds or even thousands of years of history and cultural heritage can’t meet their needs for life.

Thus, when it comes to protect and develop tourism in an ancient village, increasing job opportunities for local villagers. In the process, not only avoiding hollowing, restoring the vitality of the town, it also need to make benefit to local villagers. It aims to bring opportunities for increasing revenue at hometown so that they can both be engaged in agriculture and take care of elderly and children.

4.2.6 Summary

Compared with the new buildings surrounding village and the old buildings within the village, the combination and the plane of architecture are different. The vacant buildings due to the old material, making living conditions can’t meet modern requirements. The traditional enclosed building plan might restrict the development of local business, so the changes in the construction came up. The vacant houses tend to be considered no potential for the development or the villagers have no idea how to re-use it. After the hollowing happened, the activities have no too much changes in village nodes. Especially the nodes associated with tourist attractions, the activities increased instead of decreased. Additionally, the street which changes the direction of the door’s opening along the street, and the interface changes might reflect the communication intentions of residents.

Therefore, after the hollowing appeared, the changes mainly reflect on the plane of the old and new buildings, changes in building materials, combinations and changes in building facades along the street, demographic changes, and environmental changes. But it does not mean that these changes are brought about by the hollow village. They might interact with each other and hollow village is both the reason and result.

Physical space extending is not the essential factor which causes hollowing phenomenon in a village. From the aspect of space, whether there will be hollowing depending on the how strong of cohesion the village itself. During this process, tourism and tourism-related economic enhancing the degree of concentration play a vital role. Large-scale development of tourism by companies will lead to the physical
shape goes ahead of urbanization, which means socio-economic and cultural changes are left behind the changes in physical space. It will accelerate the development of the hollowing in a village such as dilapidated old village, villagers migration and blindly developing tourism made villagers were forced to move out.

4.3 Problems

4.3.1 Homestead and houses

Most houses are old and shabby, with not very reasonable structural design. Also, it has to coordinate neighborhood when a demolition planed to practice. Old homestead also face traffic and drainage problems. Additionally, to build a new house on old homestead doesn’t save much cost, so a lot of people abandon the old one and find new homestead outside of village to built houses which is much easier.

Secondly, most homesteads and houses are ancestral, residents are reluctant to the old courtyard, unwilling demolished the old buildings although they have a new one. They think the geomancy in ancestral house is good and prefer to keep the houses empty instead of selling. For most people, affected by various factors such as traditional practices, no matter how much they own, they will not give up the old homestead in the center of village which resulting in a lot of waste in land resources.

The vacant houses are lack of care and most are made by clay or brick. These houses have a long history and since a long time in disrepair, it is easy to collapse and injure passers-by.

4.3.2 Facilities

Although achieving the aim that water facilities spread to every household, because of the economy and terrain conditions, majority of water supply pipe network has not been a system and water supply capacity is inadequate. The situation of loss of water or leakage often happens. Daily water needs and health conditions can’t be effectively protected in villages.

Lack of sewage treatment facilities and garbage piled facilities, domestic wastewater directly discharge into the Lake without purification process causing water pollution. What’s more, the wastewater bare discharges, somewhere even clogged leading the bad smell. It caused "dirty, chaotic, and poor" in whole environment and many health blind corners.

Due to the remote location, surrounded by population decline area, caused public leisure square deserted, there are security risks. Not only causing land waste, more importantly, it failed to provide a real entertainment and leisure space for residents instead of full of tourism elements.

4.3.3 Children and elder left behind

Children

In the case of both parents out of work, elder is necessary to do farm work and also bear the heavy housework. As limited energy and advanced age, they are not able to very careful in the care of the child's diet and other items (Chart4-7).
Grandparents most are in a low level of education. Their level of education principally is no schooling or only primary school. Because of its restricted levels of education, those grandparents face challenges in the education of children left behind (Chart 4-8).

When parents (especially father) migrant work, children probably have the burden of farm work. In the situation of no change in total amount of labor needs and reduce in labor number, not only increase in the amount of labor burden in guardians of children, also in children (Chart 4-9).
Elder

Most of elderly live in a poor quality condition and labor-intensive situation. In the economy, they mainly depend on their children supplying, not ask for the quality of food and clothing. There are many young people in a poor economy condition and have no ability to provide adequate alimony. Thus, so many elderly people had to rely on their own labor to sustain life. They even picked up the tools again become the protagonist of the actual farming (Fig.4-40).

![Fig 4-40 Elderly in XiZhou and ZhouCheng](Source: http://image.baidu.com)

Health care situation is not optimistic. Rural "Left elderly" because of physical, age factors, physical indicators declined. However, at present in China, rural medical institutions, especially in midwest area, the system has been poor. Specifically, medical standards, personnel and facilities are extremely limited. Also, the elder is lack of mental comfort and emotional life. This shows the importance of neighborhood relations in the countryside. In country, neighbor always can be accompanied with each other for generations and they take care of each other as spiritual comfort. This is also one of the reasons that elderly people refuse to move out of the old house, and they have nostalgia to familiar stuff.

There is lots of security risks. "Left elderly" are generally in advanced age and mobility. Furthermore, part of them owns some meager income or savings, which makes them likely to become the object of some criminals, resulting in personal safety hazard.

4.3.4 Tourism development

After tourism development appearing, more tourist facilities, merchandise, parking, and attractions appeared which bring a space with specialized services in the tourist. The force of tourism gathering increases in the area and the tourism economy influences in surrounding space. For tourism development hollowing phenomenon lead by tourism development mainly includes two parts
(1) Land was requisitioned by tourism but without making full use of which leading vacant.
(2) Migration of local residents caused local culture hollow. Tourism here is largely based on attraction of national culture and local cultural attraction which come from the local people. Loss of residents means the loss of culture.
Tourism undeveloped villages since lack of industry, the number of migrant workers is more than tourism village. The village committee work has focused on the coordination and treatment on left behind individuals. Furthermore, there is less competition for profit among the villagers and fewer conflicts.

Driven by no tourism, physical space still continues to update in a self-organized way in the village. Villager committee decides in consultation about living space expansion mode and exchange aimed at improving living condition to meet the needs of the residents. After tourism comes, more space factor should be considered about the profit. Regardless of the factors involved tourism, village will show evolution in the gradual transforming way. The greatest problem seems that the government carried out the purpose of tourism development to make the demolition, push the original residents move out, aims to introduce business. However, the degree of tourism developing failed to coordinate with the investment plans which leading to a more serious vacant. Back in 1961, Jane Jacobs criticized this "flood of dramatic changes", the costly but contributed little; does not really reduce the slums, but merely move slums to elsewhere, to create new slums in a larger context.

Tourism is a two-sided problem for hollowing. Tourism causes the hollow phenomenon which previously mentioned is attributed to several aspects of economic and policy. Actually, Tourism development has a positive impact on the ancient village

1 It has created more employment opportunities because of tourism. Relying on the development of tourism, they opened a family -run shops, hotels, restaurants which improve the quality of life. More importantly, they truly have new revenue channel at home and no longer survive separated from their children.
2 Visitors increased the flow of people or even to stay settled. Among the resident population here, there already has been a lot of outsiders and even foreigners. Because of their unique ethnic customs here, they settled here and some married with the locals becoming new occupants. It is like injecting new blood for the ancient village and make up for the loss of labor in a certain extent.
3 It promotes the exchange between village and the outside world, including economic and cultural. It opened a channel to the outside world for later generations. With the development of tourism, more and more people understand the village which is no longer a closed place.

4.4 Opportunities and suggestions

According to the analysis of the problems, the author thought the renewal in Erhai Hollow Village should aim at inheriting the traditional culture and retaining local population. Through readjusting the space, to enhance living environment and protect and reuse the existing vacant buildings.

4.4.1 Reform and protection

From the aspect of the overall environmental, the way to renewal includes protecting and reforming. Renewal of the village should have a certain size and needs a modest improvement.

Features Protection

Features Protection should be carried out in the village which is able to highlight the distinctive features and local customs of Bai. In this kind of villages, through the improving of environment and facilities, it aims to strengthen the inheritance and protection in culture. Featured protection includes protection of material and non-material. In addition to the protection of the building, it is essential to retain the daily life. Residents are the soul of the village, the part can’t be lost for a site.

Based on consideration of current situation and the long-term development of the village, focus on the protection of the village which preserved the natural landscape in a intact way or has good conditions for tourism development. Strengthen connection between rural and urban, in order to promote the development of outskirts relying on urban strength.
Reform

For these villages, since the limitation of poor conditions, although architectures can be retained and allowing in situ transformation, it should limit the expansion of the scale. Depend on fully respect the wishes of residents, several optimization measurements can be planned for villages. Through increasing investment funds, to do transformation and removal of dilapidated buildings and the architectures which impact landscape. Optimize the layout of the village, improving the living conditions for the villagers. At the same time, it needs to equip with infrastructure and public service facilities for living.

4.4.2 Space renewal

Specifically, there can be three elements of renewal plan in specific space, infrastructure and architecture. Most renewal plan carried out on the basis of rural settlements for the hollowing village problem. In aspect of spatial distribution patterns, it prefer to keep original spatial distribution texture and historical features of traditional villages, make true the road systems and open space can meet the lifestyle of rural residents and the local characteristics. Additionally, it is better to maintain keep balance between village and surrounding natural environment. There mainly are two aspects: 1. to highlight the role of the village center 2. to enhance the role of street space.

(1)Center

Mostly traditional Public spaces are surrounded with public buildings, located in the village center. Nodes become an important space for daily activities. Completing public spaces can promote social communication among individuals, enhance communication and formation a sense of belonging. Hollow Village, lack of cohesion often leads residents prefer the external space when select homestead. Usually center located in population concentration area, the residents are very frequent activity and similar in distance to all directions. Secondly, public facilities arranged around the center, a sense of enclosure can meet the needs including the sense of awareness, psychological needs, a sense of the field and belonging. Thirdly, a small scale can be utilized to divide and organize space, in order to create a pleasant scale, make the activity more intensive. Fourth, some leisure or landscape facilities can be supported, such as water landscape, vegetation, bench, architectural pieces, fitness equipment which can attract participation for residents. At the same time, taking into account the limited financial resources of the village, the measurement can be phased construction works.

(2)Street space

In the tradition of rural life, street space not only bear the traffic role, as well as viewing, neighborhood contacts, entertainment and other casual social functions. It is the most active places. Neighborhood contact plays an important part of rural life, the site where the daily interactions happen in the highest frequency in the streets. It can enhance neighborhood concept in villages’ mind and help harmonious relationship between the villagers.

A variety of measurements can be used to divide the space, creating a suitable space for contacts. It may take the measurements like flower beds, green belts, and different heights of land to divide space, or use pergolas, scaffolding, trees and others to define space and communication facilities. Neighborhood contacts activities are mainly talking, chess, card, dining and others, so the facilities should include bench and table.

The selection of Location should be convenient for gathering with several landmarks such as trees, water, stage, etc. Additionally, the site can be chosen where their daily contact happens or must pass through, such as roadway entrance or corner. In the streets crossing can furnish some markers or doing special handling so that enrich the street space.

4.4.3 Facilities system

Improvement of public facilities systems on one hand, to select the appropriate criteria based on the actual
situation and affordability. On the other hand, it needs to depend on different transformation process to take appropriate layout form. Roadway and other township roads should be included, also improving water supply and drainage, sanitation, public service infrastructure to meet the majority residents and improve their living environment, quality of life. Active area should be located near the center of the village or the main road for villagers easy to use. Instead of setting uniform standard for sports and entertainment facilities, it prefers to configure according to the actual needs and capabilities. In practice, it should be effectively utilized idle architecture, add new function such as cultural activity stations, indoor sports venues and other recreational facilities. While, the surface can make pavement combine with vegetation in rural public space.

4.4.4 Architecture

a. Control
About the hollow village residential planning, firstly should control the building scale, which means to follow the strict regulations redline, to leave space for future planning. Secondly, it should take into account the natural population growth which has needs in residential land, to prevent squatter settlements phenomenon. Control the shape of new buildings which impacting village so that prevent traditional texture of village in the process of the growth and development. Additionally, when reconstruction and transformation come to practice, it should make true the overall landscape is not destroyed in town or village. This plays a vital role in renewal and development of village, also in inheritance of traditional texture.

b. Protect
Residential renewal rely on reality, give fully respect to the local culture and customs. Traditional culture elements can be used in new residential buildings and plan buildings with rich rural landscape features. About existing vacant houses, proper renewal measurements should be carried out depending on the characteristics and needs of residents and location characteristic, through painting, adding modern facilities into the building to achieve the aim. Residential buildings should provide good natural ventilation and comfortable lighting, meet the needs of modern life and in greatest extent retaining the traditional architectural culture elements. Most Rural residential layout is in lower-detached, townhouse-style which can be more flexible combinations. Through different types of residential, high and low, Siamese mix, derangement, it is able to enhance recognition and identifiablity and bring a richly varied group space.

c. Combine
The combination of modern and traditional Modern building materials, construction methods and modern structure all affect the construction of villages and morphology. Thus, when do architectural design, modern building materials can be combined with traditional architectural style. Innovation In traditional architectural design is able to better meet the needs of rural people's lives.

4.4.5 Improve tourism development
Tourism development should coordinate relations among tourism development, historical environment protection, improvement of living condition. It can take historical environment protection as the basis, tourism development as the method to improve the living environment and living standards which is the ultimate goal. The own unique natural environment resources turned into tourism industry is an effective way to achieve development in some villages in Erhai. In XiZhou, the tourism development goals are ancient houses and buildings of the Ming and Qing image. The residents are essential part of showing the overall style and
farming culture, social cultural. The method of relocation villages only keeps empty shells of traditional architecture. Visitors can’t see the production life and village culture, attractions are likely to gradually decline, loss of vitality.

(1) To maintain tradition and local nature
Tradition and local nature tourists have the greatest attraction which means a kind of unique resources to develop tourism. However, during the process of Tourism development, there are several problems such as strong commercial atmosphere and traditional living during off, parts of new or renovated buildings far different with traditional ones. In this paper, it insists to maintain tradition and local nature in villages, including a whole style, living environment and ethnic customs. Thus, it may try to add several living spaces on both sides of the streets for leisure to recover the atmosphere of life.

(2) Enrich the product type and cultural connotations
Culture is the soul of tourism and only can attract tourists with cultural connotation. Traditional culture includes material cultural heritage and non-material cultural heritage. Therefore, tourism development not only should renew buildings, also awake folk custom. For example, ethnic and cultural exhibitions and activities can be carried out so that culture may become the driving force of cultural protection and development, and promote the healthy development of the tourism industry.
Chapter 5. Design proposal

5.1 Design basis

According to the problems and possibilities in last chapter, author chose XiZhou Village as a site-specific to do a renewal design.

1. XiZhou is belonged to seasonal vacant village and in the early hollowing stage. Mode 2(Situ remediation mode) and Mode 4 (Transformation Mode/combine with rural tourism) can be used based on the situation. The location is reasonable and land arrangement is not difficult. There are enough sources to be developed. Lots of cottages and existing houses in poor quality and residents have urgent desire to do something developing the houses.

2. It is necessary to understand the idea of local residents' attitudes to tourism development in village and thoughts about village development. According to the survey data of subject of YunNan Social Science Research Base, the information can be known. In 2010, author had participated in analyzing data for this subject. (Data came from the 2007 and 2010, two times survey. In 2007, there were 350 questionnaires in total, 290 questionnaires were recovered, 280 valid questionnaires. In 2010, there were 200 questionnaires, 180 recovered, 160 valid questionnaires.)

(1) Aimed to survey whether the residents are satisfied with the living state, the questions were made in the questionnaire "Do you have any idea to rent or sold the house to others?" "Would you prefer to keep staying in the village" (Chart 5-1).

(2) Evaluation of the expected amount of the tourists "the more the better" significantly reduced. The attitudes toward tourism development went more rational (Chart 5-2).

(3) 80% villagers were willing to develop their own houses. More people tend to develop by themselves. For cooperation with the government, tourism companies or joint ventures, villagers were lack of confidence (Chart 5-3, Chart 5-4).
<table>
<thead>
<tr>
<th>Tourism developing mode</th>
<th>By themselves</th>
<th>With government</th>
<th>With tourism companies</th>
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</thead>
<tbody>
<tr>
<td>Percentage</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2007</td>
<td>42.37%</td>
<td>26.27%</td>
<td>31.36%</td>
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<td>2010</td>
<td>49.2%</td>
<td>18%</td>
<td>32.8%</td>
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</tbody>
</table>

Chart 5-4 Survey on developing mode.
(Source: YunNan Social Science Research Base, made by author)

(4) The concern increased on sanitation and architectural style. Except for focus on roads, public toilets and other infrastructure, more concern on neighborhood relations (Chart 5-5).

<table>
<thead>
<tr>
<th>Developed thoughts</th>
<th>Percentage 2007</th>
<th>Make management to litter</th>
<th>Control Architecture style</th>
<th>Control tourist's number</th>
<th>Control new building's number</th>
<th>Maintain ancient buildings</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2007</td>
<td>77.86%</td>
<td>36.43%</td>
<td>16.43%</td>
<td>21.43%</td>
<td>56.43%</td>
<td>13.57%</td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td>80%</td>
<td>43.7%</td>
<td>15%</td>
<td>22.5%</td>
<td>47.5%</td>
<td>12.5%</td>
</tr>
</tbody>
</table>

Chart 5-5 survey on villagers’ developed thoughts.
(Source: YunNan Social Science Research Base, made by author)

Additionally, villagers hoped these parts can be improved: improving infrastructure, increasing public facilities especially cultural entertainment, improved sanitation, remediation construction, making more people take part in tourism development.

5.2 Design proposal

This design focus on renew the idle land spontaneously led by villagers. It doesn’t involve the issue caused by government blindly developing. Based on the actual situation in XiZhou, the discussion and the residents’ thoughts about village developing, also the feasibility is taken into consideration, four objectives can be developed.

1. Design for the needs of the elderly and children, thinking about their safety and life.
2. Increase public green and improve infrastructure to achieve a better life environment.
3. Strengthen the central attraction of the public space to make a lively village.
4. Continue the tourist commercial street, make the tourism harmonious with daily life.
5.2.1 Overall planning

Original land function

The vacant buildings and land which caused by spontaneous behavior of residents distribute in a very dispersive way and in small size of each region. These areas are near the schools, some are closed to the street, and some are just in the east entrance, with lots of possibility. Tourism business is mainly developing along the main attractions, concentrated near the entrance and around the SiFang Square (Fig.5-1).

The new plan mainly focuses on re-used the vacant buildings and land re-used. According to various surrounding environment and people's needs, the method may be different. The road to west entrance, it will do something to enhance the landscape and guide it into a new tourism commercial street, and new nodes are added to increase the rhythm in the entire street. Based on the protection of traditional square shape, author believes there is no need to do any space changes in the square. Although the entire site is surrounded by large-scale farmland, it is lack of public green space and green system. The infrastructure only meets the basic needs for survival and lack of activity space for general population and lack of care for children and elderly.

Fig.5-1 Original land use in XiZhou
(Made by author)
**Master plan**

First, because there are two schools and one kindergarten in the west, it can arrange a care center near them which can provide help the children whose parents can’t take care of them, such as accommodation and catering. In addition, many children living with the elderly, so the service center may combine the function with caring elderly and children. Then, for new commercial street, the nearly vacant building can be developed as an accessible area, instead of staying in the streets. In the entrance area, create a small open square. Originally, it can see wells everywhere which seems an important place for local residents staying and meeting. Thus, around three wells, open green space will be planned in the original vacant area. Several vacant buildings in the east are in intact quality, especially in the east entrance ones. They can be re-defined as family-style hotels, due to the location near the entrance and not far from the central square, surrounded by mostly quiet residential environment. Finally, as a link between the west entrance, care center, park and hotels line, a green line is added in (Fig.5-2).

![Master plan](image-url)
Zonings

From north to south, it is respectively farmland, mixed residential and tourism area, housing and local public service area. In order to ensure the normal daily life of the locals undisturbed, author hopes that the new green system can buffer the impact brought by tourism. But it doesn’t mean green space can separate the space, just through green such a soft material make sense in improving life environment and decreasing the uncomfortable feeling from commercial. Including the newly added family-style hotel, green parks, they are all belonged to mixed-use area (Fig.5-3).
Traffic lines

The widest road does not exceed 4.5 meters width, the narrowest roadway less than one meter, there are few motorized vehicles. Generally, tourist vehicles only drive ending in the entrance and residents rarely own a private car. Most people adopt walking within village. In order to maintain the traditional appearance of the ancient village, the village road is defined as pedestrian. In addition to the highway, external connections between the entrances and the roadway connecting care center and hospital are vehicle ways. New added roads: 1) the new green walking trail connecting school and care center green walking trail can also separate from it commercial street. 2) From the central square it can go straight to hotel. 3) from the new commercial node can directly reach an attraction (Fig. 5-4).
**Green**

New green is mainly an axis from west to east. Green along the road from the west began distributing and this section is with broad view, safe for children and elderly. Except passing, it also provides the public a leisure area. The middle part aims to produce a visual guide, and then go east a green park can be found. It belongs to the public park, with three wells as the main points and with circuitous path (Fig.5-5).

![Fig.5-5 Greens](Made by author)
Nodes

There was only one hotel before, a very ordinary one, and not strong in geographical features. Compared with that, family-style hotels’ location and characteristics are better, and will be cheaper and so more attractive. Newly added the small square is mainly used to stay and meeting for tourists. As the central square is one of attractions and a transport junction, is not suitable for long-term stays and then the new square can share the workload with it (Fig.5-6).

Node 1, 4, 5 are green spaces in which node 1 is a road which mainly gives service for the residents. It aims to avoid the tourism commercial street and layout accessibility sparse grass and low vegetation on both sides of the road. Node 4 and 5 are public green spaces between the houses. The entire small village living environment can be seen as a residential area, so these green spaces like the activity space among the various living groups.

Node 2 is a care center providing services for the elderly and children (Fig.5-7). It is built in the vacant area and the style is harmony with the surrounding environment, controlled at two levels, with modern infrastructure. It locates between the residential buildings, connecting with the newly added green road,
close to each campus.

Node 3 is tourism business, snack service area after repairing the vacant houses with a small square to attract visitors coming. Although the buildings are vacant in nodes 6, 7, 8 but the quality is intact (Fig.5-8). In addition, they are located near the east entrance and center square and no more than ten minutes walking can arrive attractions and business district. They can serve as a family-style hotel through not too much repaired. Even it can be added the modern materials which is cheap but strong, such as the hotels in Lijiang and Dali (Fig.5-9). They are all controlled by the residents themselves and bring a better life.
Fig. 5-9 Family-style intentions
5.2.2 Details

1 Design idea: Rhythmed & Lively

The width of original street is between 4 to 4.5 meters, buildings and streets connecting and continuing in very straight line and shops randomly distribute on both sides of the street in the first floor. Because of not obvious characteristics and boring sense of space, although there are shops throughout the neighborhood, attractive seems very low. The improvement measure adds wood seat with small-scale green (Fig.5-11). Frequently, it can be seen some residents sitting in front of the store on the streets so the seats might be also very useful to residents. Secondly, some buildings can be rebuilt if it is too old and in a low quality. When rebuilding the architecture, it might give a distance about one meter to the streets, breaking the line shape, increasing rhythm (Fig.5-12~14). Walking in the city leaves ample time to experience everything that ground floors have to offer and to savor the wealth of detail and information. (Gehl J, 2010, p77).

New two-story buildings are arranged balconies, creating vision exchange between inside and outside building. Ground floors with primarily vertical façade rhythms make walks more interesting. (Gehl J, 2010, p78) It is important to consider the lines of vision between and outside. (Gehl J, 2010, p150)
Fig. 5-13 Section B-B’

Fig. 5-14 Rendering of the pedestrian
2 Design idea: Accessible & Inviting

Among the small square, pergola, seats and trees are arranged. It is an inviting signal, hope people can go into and look inside space. It is also a meeting place where people can stop taking pictures and sitting down (Fig.5-16~17). Among the city’s façade elements, “caves” and inches take top billing as particularly attractive places for staying. (Gehl J, 2010, p139)

3 Design idea: Opened & Safe

The width of pedestrian is about three meters with soft materials such as plastic, so there might be not too much harm even the elderly or children falling down. There is 8-10 m green between the road and living houses (Fig.5-19~21). In this distance, adding streetlights, low and sparse vegetations, make the whole space safe, transparent and visible day and night. It might place funny infrastructure and elderly fitness equipment to invite more activities.
Fig. 5-19 Design idea

Original: buildings surrounded by empty land.

Idea: to add a green way with safe thoughts for elder and child.

A new way with green and several activity space. Also can arrive to the care center.

Fig. 5-20 Section C-C'

Residential houses
Low and sparse green Activity space
Plastic aisle
Low and sparse green Children activity space
Residential houses

Fig. 5-21 Section at night C-C’
4 Design idea: Wells & Green

Until now, there are as much as hundreds old wells preserved in this village. It easily can see different shapes of wells, well space with different interest in the streets (Fig.5-23). For residents, well space is a good place where they relax, chat and meet. In the node 5, there are three wells in original site. The new walking trails connecting three new wells and adding seats around wells, aims to weight the activity which is brought by the well (Fig.5-24).
Chapter 6. Conclusion

Space evolution is a traditional content of urban planning and human geography research, previous studies on the village are more static studies, few studies on morphological changes. On hollow village, most studies are broadly, and less for the analysis of specific physical form. The thesis took hollowing phenomenon in Erhai as the starting point to analyze relationship among spatial factors. Research on specific changes in physical elements and try to find renewal suggestion for it.

Erhai area with traditional Bai villages, the existing traditional Republican period of the Ming and Qing Bai architecture, the beauty and harmony shape are in natural ways without any professionals involved. It belongs to an invaluable part in Chinese city culture. The evolution and future spatial structure development are all deserved our more concern.

In this paper, the final finds: 1. Hollow village is loss of rural population, resources, and low levels of rural economic, slow development in infrastructure and facilities. Residential area differentiation from the center to the edge, it is a performance of a loss of "gravity" in center. In the Erhai area, the village seems more probably hollowing which developed earlier, with convenient traffic conditions and the developed in tertiary industry. However, serious problems actually have more direct link with the government behavior and blind development, lack of reasonable planning. 2. It takes up a lot of land, waste of land resources, and aggravates contradictory between human and land. Within the village, because no one to clean up, sewers and piles of garbage, weeds all do harm the rural environment. At the same time, population loss leads to lack of talent in rural area. The changes mainly reflect on the plane of the old and new buildings, changes in building materials, combinations and changes in building facades along the street, demographic changes, and environmental changes. 3. The renewal method requires specific analysis of the actual situation in each village. This thesis based on problems and potential of Erhai area, presents renewal suggestions for homestead, housing, public facilities, residential and tourism industry. Specifically, to XiZhou Village, the authors believe that enhance the attractiveness of the center at the site, increasing the sense of belonging might be an effective renewal way.

Development of tourism in the Erhai area in the village might accelerate the development of hollowing not means tourism does harm to the site. More attributed to 1) Chinese urban-rural dual structure, a policy and historical issues. 2) the lack of planning and construction guidance during village development. 3) the lack of government funding to support rural infrastructure results in the conditions left behind city, which also belongs to the political issue. In this article, author rarely mentioned on the economic and social questions because they are difficult to discuss. But space exists in the society, the users of space objects also exist in society, society includes political, economic, and so space will be affected by these factors. As planners can only attempt to improve in space and hope that the problem can be alleviated.

The thesis is on the basis of individual case analysis and so the conclusion has particularity. Limited by conditions and personal power, collecting information is very limited, but the hollow village is a complex dynamic system. On the design part, the author did not take into account whether the village really has the economic conditions to achieve those changes. Accordingly, the study has some limitations.
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Attachment

Data came from the 2007 and 2010, two times survey. In 2007, there were 350 questionnaires in total, 290 questionnaires were recovered, 280 valid questionnaires. In 2010, there were 200 questionnaires, 180 recovered, 160 valid questionnaires.