

REACTIVATING TRADITIONAL VILLAGES

Towards a sustainable cultural landscape for Yuanyang County

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Graduation lab
Flowscape- Circular Water Stories

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03

ACKNOWLEDGEMENT

This report presents the results of my postgraduate studies at TU Delft. Through the study and research in CWS lab, I have a deeper understanding and a stronger love for landscape architecture.

First of all, I would like to thank my mentors. It is their positive teaching and encouragement that supported me to continuously explore and overcome various difficulties during more than a year of study. I would not be where I am today without their patient guidance and help. Dr. Ir. Inge Bobbink gave me the freedom to explore and think, and gave me a lot of research and design suggestions during the whole project. Secondly, during the process, my second director, Willemijn Wilms Floet, also gave me a lot of tolerance and encouragement, and also gave me a lot of guidance on the architecture field and design thinking.

Secondly, I would like to thank the landscape students for their company and sharing. They have provided me with a lot of design help. In particular, I would like to thank my friend Maozhu Zhang. The discussion with her brought me a lot of design inspiration, and her listening and encouragement made my life no longer lonely.

In addition, I am very grateful to my parents. Thank you for the financial support, so that I can study in a foreign country with peace of mind and can be no worry about living. Thank you for your love and tolerance, so that I never despair when I am in trouble, and always have a solid spiritual backup.

Finally, I want to thank myself for working hard and not giving up. Thanks for all the encounters and contributions that have made up my wonderful and fulfilling postgraduate life.

ABSTRACT

The Yuanyang Rice Terraced Fields are located south of Ailao Mountain in Yuanyang County, Yunnan Province, China. They're at the core area of the Honghe Hani Terraced Fields, stretching for more than 166 square kilometres, and a wonder of terraced farming civilisation created by generations of Hani people using the steep hills of the unique geographical conditions. The villages within the Yuanyang Terraces bear witness to this long history.

Under the background of rapid urbanisation and tourism development in China, the rice terraces' beautiful scenery and unique culture have gradually attracted many tourists. However, these traditional villages are not prepared for tourism development. Unfortunately, many villagers give up the conventional way of life. However, modernisation is at the cost of destroying historic buildings and their culture and the activities of tourists contribute to destroying their living environment.

Furthermore, the region is affected by rapid climate change, causing a shortage of water resources, making the situation worse for the villages. Lower rainfall means less water for irrigation, which decreases the rice yield, affecting the farmers' income. The gradual disappearance of the paddy fields also means the disappearance of the thousand-year-old terrace culture and landscape. Traditional farming cannot provide villagers with the economic source to survive in modern society.

To reactivate the traditional villages, many things need to be considered: how to make the Yuanyang terraces ecologically sustainable and appropriately introduce modern technology and rural tourism into the farming civilisation and improve villagers' living standards.



The project takes Azheke Village, one of the most intact traditional villages, as an example to illustrate the possibilities of coping with the dilemmas of tradition versus modernisation, the climate crises and increasing tourism by design solutions. The design discusses the economic, ecological, and cultural development of Azheke Village by introducing a research station to experiment with new crops, which might increase the farmers' income. In terms of ecology, the problem of water and energy shortages is solved by building reservoirs and using renewable energy. In terms of culture, landscape elements such as forests, canals, terraces, rivers, buildings, roads, crops, etc., are enhanced to strengthen the landscape narrative potential of the site and emphasise its cultural value. In terms of economy, inhabitants' income could be increased by selling tickets, planting new cash crops, and selling agricultural products. The sustainable ecological environment and unique human landscape could make Azheke Village more competitive in terms of eco-tourism. Therefore, this design can bring new ecological, social, and economic values to the Azheke Village, which helps the villagers stay and be proud of their landscape.

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01.1 BACKGROUND

01

INTRODUCTION

01.1 Background

01.2 Location

01.3 Hani ethnic minority

01.4 Honghe Hani rice terraces system

The cultural landscape of Honghe Hani Terraced Fields is the world's first world cultural heritage named after an ethnic group. (李岩, 2013) It is a masterpiece of human-terraced fields and a miracle in the history of Chinese farming. However, with the development of heritage tourism and the impact of the market economy, Hani's traditional dwellings are decreasing daily, and the traditional working methods and living habits of terraced fields are gradually changing. At the same time, climate change has also had a negative impact on the development of terraced fields. The decrease in rainfall in Yunnan Province in recent years has made the terraced fields face the crisis of insufficient irrigation water.

Therefore it is urgent to explore the long-term development of this particular heritage considering three topics separately and integral: (1) protection of the settlement and landscape, (2) a socio-economical perspective keeping it alive and meeting contemporary standards and (3)making it adaptable to environmental changes and sustainable in the future.







Similar urban landscapes and distinctive rural landscapes

Over the past few decades, China has witnessed large cities' rapid expansion and development. In contrast, China's rural areas are neglected. While the urban infrastructure and technology are being upgraded on a large scale, some villages still face the crisis of water shortage and poor living conditions. The huge disparity in income and education between urban and rural China has led many people living in rural areas to move to cities. Therefore, the countryside has become synonymous with poverty and backwardness.

The pictures (from fig.1-1-4 to 1-1-11) show a clear developmental difference between the major large cities and the countryside. Similar skyscrapers and buildings make different cities look the same. The unique identity of the city has become difficult to trace. However, over the past thousand years, unlike the metropolis, villages in different regions of China have developed their own identities, which make them irreplaceable and attractive. In recent decades years, urban residents with great life pressure began to get tired of the long-term, monotonous and noisy city life, and they began to look for quiet places with beautiful natural scenery and unique culture as their first choice for a vacation to relax and enjoy life. Therefore, Chinese villages have gradually become popular tourist attractions.

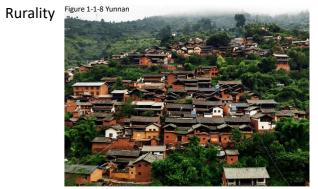
Initially, tourism boosted the village's economy and development. But, with the increase of tourists, the villagers gradually give up the traditional way of life, and more over-commercialized shops and hotels dominate these historical heritages. The villages face the problem of over-tourism, which leads to severe environmental pollution and damage to the original landscape, buildings and ways of living.

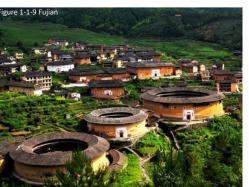








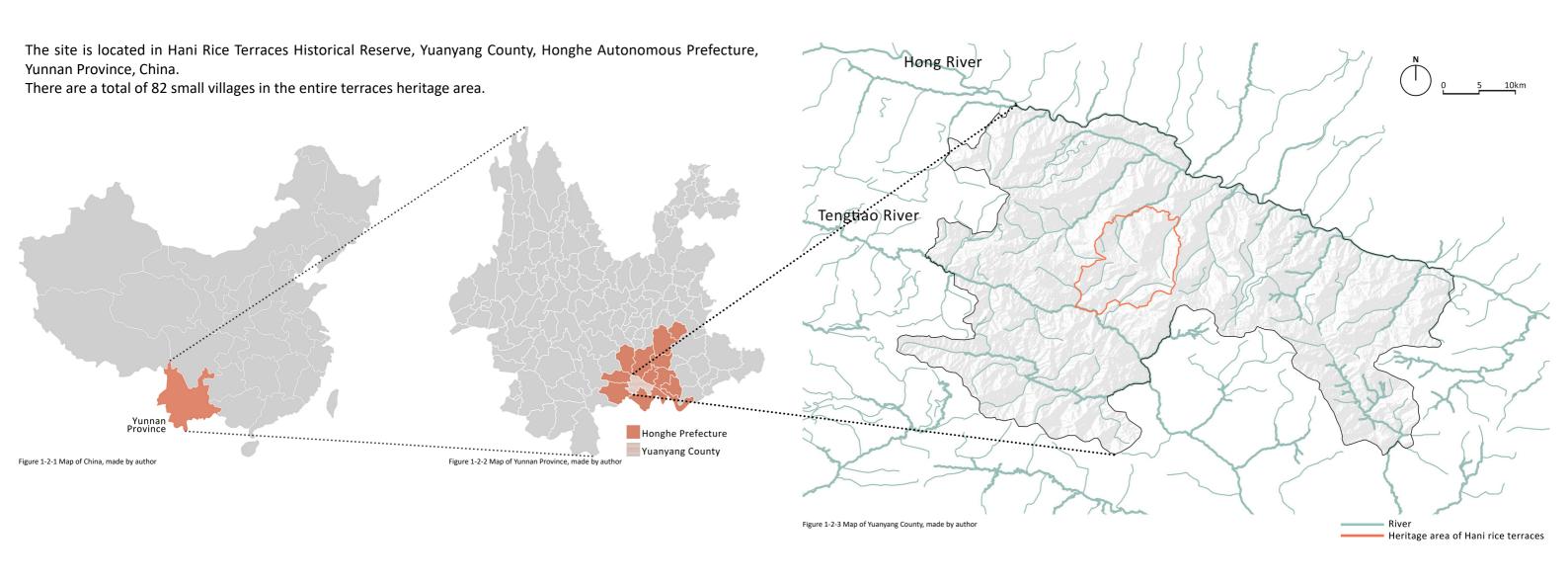








01.2 LOCATION



01.3 HANI ETHNIC MINORITY

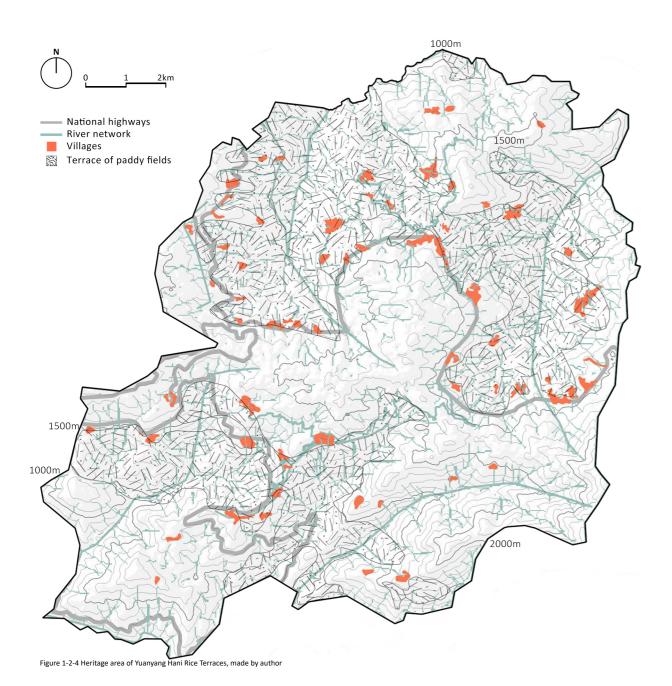
Yuanyang terraces in Yuanyang County were built by generations of Hani people, and it is also one of the main gathering places of the Hani people.

More than 2,000 years ago, due to factors such as war and politics, the Hani people began to migrate from north to south and divided into three routes: east, middle and west (fig. 1-3-1). (星球研究所, 2021)

About 1,300 years ago, one small group of Hani people settled in Yuanyang and began to take advantage of the unique terrain and natural conditions here to open up terraced fields and start the unique farming life of the Hani people (fig. 1-3-2).



Figure 1-3-1 Migration route of the Hani ethnic minority, redrawn by author

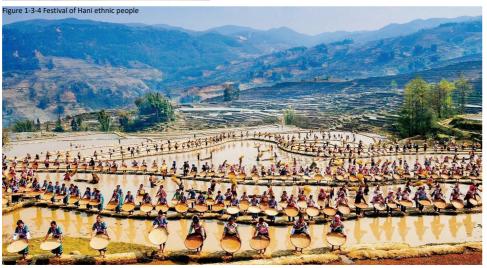


01.4 HONGHE HANI RICE TERRACES SYSTEM

The Hani people have formed their own unique festival culture. The Hani calendar divides the year into three seasons, each lasting four months. For them, October is the beginning of the year, so they celebrate the New Year in October. During the festival, they will worship the gods and ancestors (fig. 1-3-4), and set up long tables in the middle of the village street for a grand banquet. Everyone will prepare food and share it with others (fig. 1-3-3).







The Hani people have created a complex system of irrigated rice terraces in the dense forest.

The terraced landscape is an integrated system of the forest, water supply, terraces and houses, which has a vertical structure (fig. 1-4-1).

At the tops of the mountains, the forests act as a catchment for the rainfall and "recharge" the fields and terraces below (UNESCO, 2022). Precipitation forms surface runoff and percolates into the underground water system, and the water from the forests (surface runoff and groundwater runoff) runs through ditches to the villages and then to the terraces, and then goes into the river in the valley bottom by gravity. Furthermore, the water in the terraces and valley can evaporate and form clouds on the hilltops; it can form dews and finally swags and creeks in the forests.

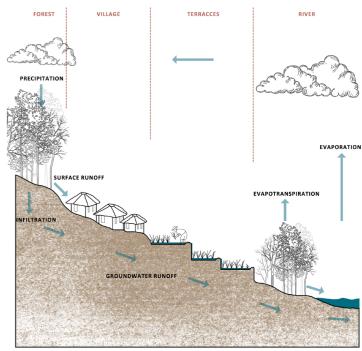
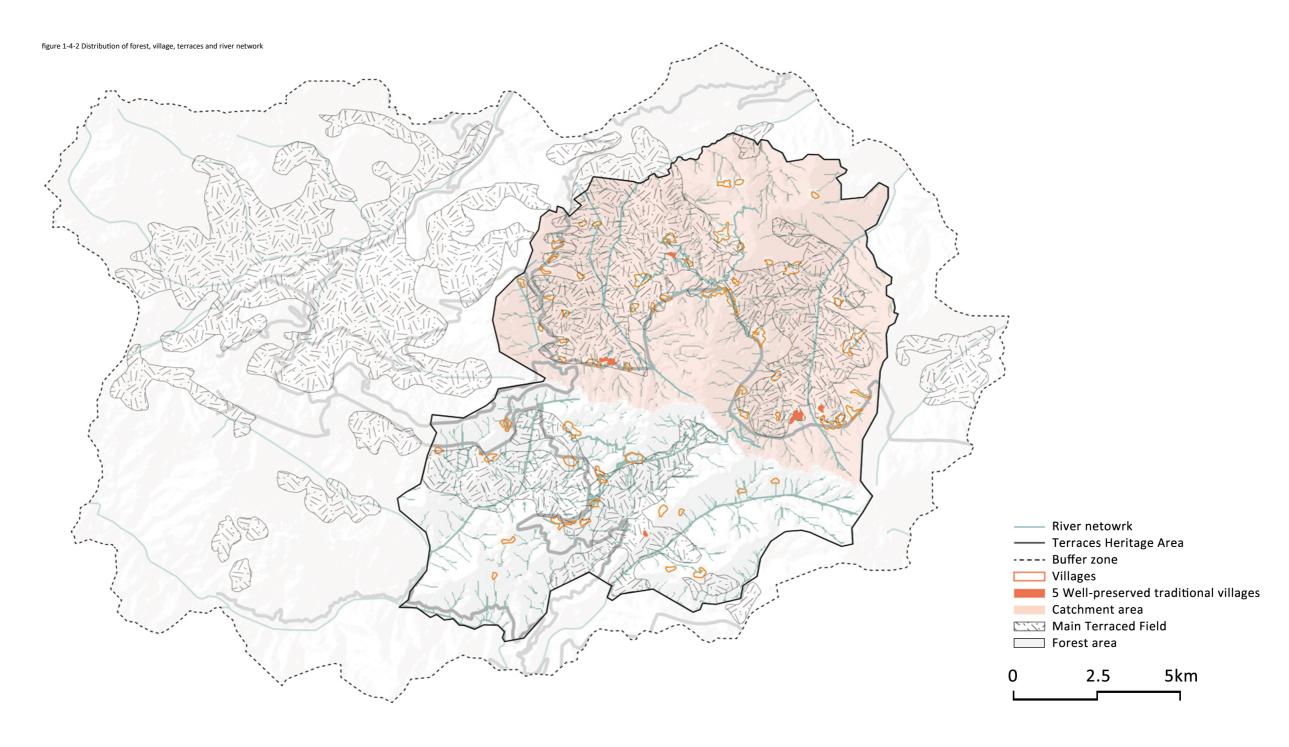


figure 1-4-1 'Forest-Village-Terrace-River' ecological landscape



A new integrated agricultural system of 'rice-fish-duck'.

About Hani terraces, only one crop of rice is planted throughout the year, so the output value is very low. Futhermore, these terraces have an almost all-year-round supply of water which has a high potential for fish-duck cultivation. Therefore, since 2012, experts have proposed an integrated agricultural model of 'rice-fish-duck', which has been successful after five years of experiments. At the same time, it also proves that this system has higher economic benefits than the traditional mono-rice-planting fields.

In order to introduce fish and ducks, some changes are needed in the traditional paddy fields. Usually, the ridges of terraced fields will be heightened and thickened. At the same time, a new clay wall will be built in the center of the terraces, and fish will live in this area.

In the selection of fish species, catfish, carp and loach should be selected as omnivorous species with fast growth rates, strong adaptability and tolerance to shallow water. It is necessary to select terraces with relatively large areas and regular shapes for fry culture. It is necessary to reinforce the ridge and then excavate the fish trench.

At the same time, people choose to breed local ducks. Because the local ducks have a high survival rate, fast growth, strong adaptability, and lay more eggs.

The 'rice-fish-duck' system also has a positive impact on the ecological environment of the terrace system. It turns out that the rice-fish-duck fields become less vulnerable to torrential rain and drought weather conditions. When the rainfall is heavy, the ability of the forest to conserve water is limited, and fish ponds can be used as small reservoirs to store part of the rainwater. In dry weather, many fish ponds are connected together, like a large reservoir, which can appropriately alleviate the problem of water shortage in the terraced fields. (王永锋, 2013)

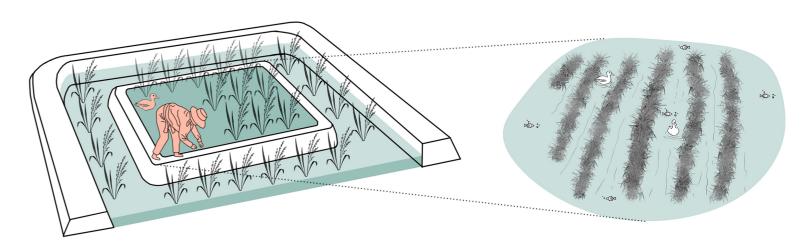


figure 1-4-3 'Rice-Fish-Duck' agricultural system, made by author

Honghe Hani Rice Terraces is famous for its beautiful terraced landscape, whose appearance changes year-round with the seasons.

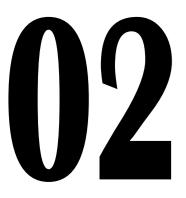
Every spring, the Hani people start to plough and sow in May. In summer, red rice flourishes. In autumn, the rice turns from green to orange, and the Hani people start harvesting. Winter is the fallow period of the Hani people, and the paddy fields are still full of water. The water in the fields helps to keep the ridges stable. The monthly minimum average temperature in Yuanyang County is 13°C, so it is rare to snow in winter. But in the winter of 2013, there was the snowfall that was once in a century.

Therefore, a large number of tourists come to Yuanyang Rice Terraces all year round. However, overcrowded and not coordinated tourism development has had a negative impact on the ecological environment of the Hani

Abandonment and erosion of the terraced field.

The rapid development of cities has led to the loss of the rural population, and more and more rural people want to settle in cities. It leads to the abandonment of farmland, making abandonment of farmland an increasingly serious local problem. Long-term unprotected fields will lead to erosion. In recent years, the area of abandoned farmland has expanded rapidly around the world, increasing the risk of natural disasters, changing the status quo of water resource utilization, and bringing about a series of social-environmental problems. Honghe Hani Terraces is a World Cultural Landscape Heritage, a World Agricultural Cultural Heritage and a National Wetland Park based on traditional rice farming. Cultivated land is the core element of heritage. In recent years, different scales of abandoned farming have occurred in the Hani Terraces in Yuanyang, threatening heritage stability and sustainable development. Terraces.





PROBLEM FIELDS

02.1 Nature - Extreme droughts in Yunnan Province

02.2 Nature - Decreased water storage capacity of forests

02.3 Society - 'Hollow' villages phenomenon

02.4 Society - The impact of tourism

02.1 NATURE - EXTREME DROUGHTS IN YUNNAN PROVINCE

Based on the data from 124 weather stations in Yunnan Province, the average annual precipitation of Yunnan province decreased from about 1120 mm to 1100 mm, and the annual air temperature increased from around 16°C to close 17°C from 1961 to 2005. Along with climate change, the frequency of droughts was found to be increasing. Table 2-1-1 summarizes the extreme droughts over the last 500 years in Yunnan province. From 1500 to 1800, there were about 4 extreme droughts per 100 years. It increased to 7 in the 19th century and to 12 in the 20th century. There were about 4 to 12 extreme droughts per 100 years before 2000, however, 4 extreme droughts have already occurred in the last decade.

The occurrence of extreme drought in Yunnan was caused directly by deficient rainfall. Characteristics of the record-breaking drought that persisted from autumn 2009 to spring 2010 in Yunnan have been studied (table 2-1-2). For the whole hydrologic year, rainfall in every month was less than normal except for April, and the total rainfall was 60.9% of a normal year. In the context of global climate change, we can predict that the annual decrease in rainfall in Yunnan Province will become the main trend in the future.

Table 2-1-1 Frequency of extreme drought event during the last five centuries in Yunnan Province, China.

Data Source: China Meteorological Disaster Dictionary: Yunnan Volume, redrawn by author

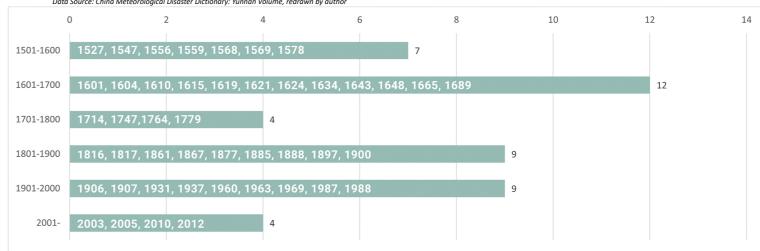


Table 2-1-2 Monthly rainfall in the 2009-2010 hydrological year and deviation from the normal year (mm).

Data Source: Statistical Yearhook of Yuanyana County, redrawn by author

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Month	7	8	9	10	11	12	1	2	3	4	5	6	Total
2009-2010 year	94.2	100.7	33.5	3.1	10.5	0.2	11.8	3	17.7	110.7	89	85.5	559.9
Normal year	164.4	124.6	64.1	69.3	41.9	19	26.5	19.2	35.9	79.7	130.4	143.9	918.9
Deviation(%)	-42.7	-19.2	-47.7	-95.5	-74.9	-98.9	-55.5	-84.4	-50.7	38.9	-31.7	-40.6	-42.7
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02.2 NATURE - FORESTS CONSERVATION AND WATER SUPPLY

Upland forests are 'natural reservoirs' for the terraced fields and play a crucial role in the stability and sustainability of the Hani Rice Terraces ecosystem. The interpretation results of remote sensing images in 2010 show that about 70% of the Hani Rice Terraces system was covered by forest. However, in 2021, the forest coverage of the Hani Terraces was only 57.32%. The reduction of forest area means the reduction of water storage capacity and the possible shortage of irrigation water.

The forests high on mountainsides play a critical role in the sustainable water supply of the Hani Rice Terraces System. Table 2-2-1 shows the estimated amount of water storage and supply of the forests. With a large canopy, thick forest litter, abundant roots, and porous soil, the forests in the Hani Terrace area have a high water storage capacity. The rainfall interception rate was found to be more than 30%, which is higher than other forest types in China.

The amount of penetrated water formed by infiltration of atmospheric precipitation through the gravity process is about 2.8x105m3/km2/a, while the annual surface runoff is about 7.5x105m3/km2/a in the Hani Rice Terraces region(table 2-2-1). These two are the major water sources for the terraces. The research shows that the water supply of such systems was about 60% from the direct surface runoff, and 30% was due to the infiltration storage of the forests.

During the rainy season (May-October), the main water supply for the Terrace is from direct precipitation and ditch water collection from upland forests. While in the dry season (November-April), the Terrace water supply mainly depends on ditch water (table 2-2-2). Our field investigation illustrated that the stability of the terraces depends on whether there was enough water during the dry season. In this manner, the storage and discharge of water from the upland forest play a critical role in sustainable water management in the Hani Terraces System.

Table 2-2-1 Water storage and supply function of the forests in the Hani Rice Terraces System.

Data Source: Statistical Yearbook of Yuanyang County, redrawn by author

Rainfall (10 ⁵ m³/km²/a)							
14							
Forest s	storage	Runoff	Others				
4.	.2						
Infiltration	Others	7.5	2.3				
2.8	1.4						

Table 2-2-2 Annual temperature and amount of rainfall of Yuanyang County

Data Source: Statistical Yearbook of Yuanyang County, redrawn by author

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Climate of Yuanvang (Yunnan, China)

02.3 SOCIETY - 'HOLLOW' VILLAGES PHENOMENON

'Hollow' village is a special phenomenon that appears in rural areas along with economic development. In the 1990s, with the development of the economy, there was a boom in building new houses in some traditional agricultural areas in China.

In the villages of Yunnan, a large number of newly built houses are moved closer to the main traffic roads out of consideration for convenience. Most of the newly built houses are concentrated on the periphery of the village, so a large number of vacant houses and vacant land are left in the village.

At the same time, the population loss in some traditional agricultural areas is serious. In many villages in Yunnan Province, a large number of young and middle-aged laborers go out to work, leaving only the elderly and children in the village, resulting in the phenomenon of "hollow villages".



Figure 2-3-1 Vacant house



Figure 2-3-2 Elderly living alone at home

02.4 SOCIETY - THE IMPACT OF TOURISM

With the rise of rural tourism, when a village is identified as a traditional village, it will be endowed with tourism value. The historical elements, landscape elements, cultural elements, traditional agricultural production and lifestyles close to nature in the villages will all become tourist attractions. In this way, many farmers were able to stay in the village due to their increased economic income.

In this sense, tourism has retained vitality for the village to a certain extent and saved the crisis of the village's demise. However, blind and unplanned tourism development will bring about a new round of ecological and cultural damage. For example, traditional buildings have been destroyed, landslides caused by excessive construction, ecological environment pollution and other problems. The protection of traditional villages faces a complex situation, which is a problem encountered by many traditional villages in China.

There are a total of 82 small villages in the entire terraced heritage area, some of which have developed tourism projects by the government. Among these 82 villages, 5 have not been developed for tourism, and they are relatively intact villages in terms of traditional culture and landscape. Azheke Village where the author wants to have deep research is one of them.



-4-1 A tourist town developed by the government in the terraced heritage are



2-4-2 Traditional buildings were replaced, resulting in a chaotic architectural style of the village

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03

RESEARCH STATEMENTS

03.1 Problem statement

03.2 Research questions

03.1 PROBLEM STATEMENT

01



Honghe Hani Rice terraces have a long history and rich culture.

One of China's ethnic minorities lives here — the Hani ethnic group. Over the past 1,300 years, the Hani people have developed a complex system of channels to bring water from the forested mountaintops to the terraces. They have also created an integrated farming system that involves water buffalos, ducks, carp and eel and supports the production of red rice, the area's primary crop (UNESCO, 2022). The resilient land management system of the rice terraces demonstrates extraordinary harmony between people and their environment, both visually and ecologically. In 2013, Honghe Hani Terraces was inscribed as UNESCO's World Heritage Site.

)2



The stable ecosystem of Yuanyang terraces has been destroyed, and the area of terraced fields in Yuanyang County has diminished year by year.

The first reason is the drought in Yunnan Province caused by global warming, with higher temperatures and lower precipitation. The second one is the water absorption and water storage capacity of the forests in is reduced, resulting in a shortage of water sources for irrigated terraced fields in the dry season. These two reasons lead to the collapse and abandonment of part of the terraces at the bottom. The third reason is that some paddy fields have been changed to dry fields. Due to the low economic benefits of traditional red rice, before the introduction of the 'rice-fish-duck' system in 2012, farmers had transformed a large number of terraced fields into ordinary farmland to grow crops with high economic value such as bananas and sugar cane.

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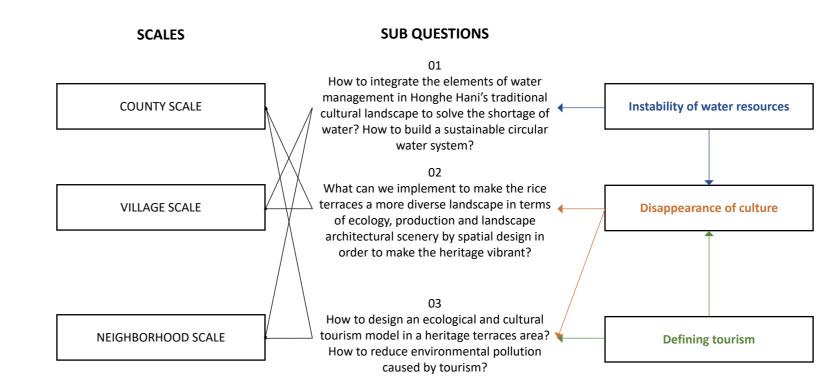
Unplanned tourism development affects the terraced ecosystem.

Honghe Hani Rice Terraces is famous for its spectacular terraced landscape, so it attracts a large number of tourists. Unfortunately, the disorderly development of tourism has had a negative impact on the ecological environment of the terraced fields. The unreasonable development of the scenic spots has caused the destruction of the original vegetation and soil structure. At the same time, since there is not a sufficiently powerful sewage treatment system in the rural area, the sewage generated by tourists will also pollute the terraces.

03.1 RESEARCH QUESTIONS

MAIN QUESTION:

How to make the existing Honghe Hani terrace landscape be more **climate adaptable** by strengthening its **cultural heritage**, and making the **community socially and economically** more vital by introducing a new model for **eco-friendly tourism**?



04

METHODOLOGY

04.1 Theoretical framework04.2 Research and design approach

04.1 THEORETICAL FRAMEWORK

01 Water Management and Resilient Landscape

Water management is to control the movement and the storage of water resources to maximize efficient beneficial use in the rural Hongha Hani terraced fields. A resilient landscape means having the capacity to persist in the face of change and to continue to develop in ever-changing environments (Folke,2016). The whole environment of the terraced areas is in constant flux to climate change and changes in economies, so the relevant issues of adaptation and resiliency are increasingly more significant in the landscape design process.

02 Cultural Landscape

As defined by the World Heritage Committee, Cultural landscape is the "cultural properties [that] represent the combined works of nature and of man" (UNESCO, 2022). The Honghe Hani Rice terraces are such a cultural landscape that was designed and created intentionally by man thousand years ago. We need to know that heritage places or heritage sites are not isolated islands. In fact, people, social structures, landscapes and associated ecosystems are interdependent. It means that all parts of the landscape have inter-connected cultural histories, associations and meanings resulting from long-term and ongoing human-environmental interactions (Taylor, 2011). Most cultural landscapes are living landscapes. They develop over time in a series of layers, each of which tells us a human story (Taylor, 2011). Therefore, we must learn to read the stories contained in the cultural landscape and create new stories that belong to it and its users.

03 Landscape Narratives

In the book Landscape Narratives-design practices for telling stories by Matthew Potteiger and Jamie Purinton (1998), the term landscape narrative designates the interplay and mutual relationship that develops between landscape and narrative. People are living in a story and using the stores to shape the world(Potteiger,1998). The landscape narrative is not only a story itself, but also a medium for telling the landscape, which is often implied in natural and cultural processes. It can transform the cultural landscape into a clear and understandable story, which leads to more tangible stories for readers. The process of landscape narrative is open and requires the participation of the reader. Readers need to combine their own experiences to understand the meaning of the landscape.

Fascination 04.2 RESEARCH AND DESIGN APPROACH Site Background Theoretical Framework Water Management and Resilient Landscape Problem Statement Site Analysis Cultural Landscape Landscape Narratives **Research Question** How to make the existing Honghe Hani terrace landscape be more climate adaptable by strengthening its cultural heritage, and making the community socially and economically more vital by introducing a new model for eco-friendly tourism? Subquestion How to integrate the elements of water How to design an ecological and cultural tourism model in a management in Honghe Hani's traditional What can we implement to make the rice terraces a more diverse landscape in cultural landscape to solve the shortage of terms of ecology, production and landscape architectural scenery by spatial heritage terraces area? How to reduce environmental water? How to build a sustainable circular design in order to make the heritage vibrant? pollution caused by tourism? water system? Scale Method and Approaches Design Concept Heritage Activation Tourism Plan & Resilient Design Design Principles & Design Strategies Hiking route | Cableway | Cultural route Multiscale Design Route Design: Village scale & Neighborhood `-----Ethnography Modelling Literature Review Interpretation Reflection ·

Figure 4-2-1 Research and design approach framework, made by author

05.1 THE TERRACES

05

ANALYSIS

05.1 The terraces

05.2 Topography

05.3 Azheke Village

05.4 Local residents

05.5 Plant species

05.6 Traffic conditions analysis

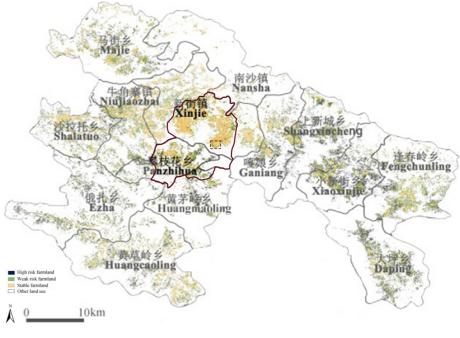
05.7 Stakeholders analysis of tourism

05.8 Conclusions

40

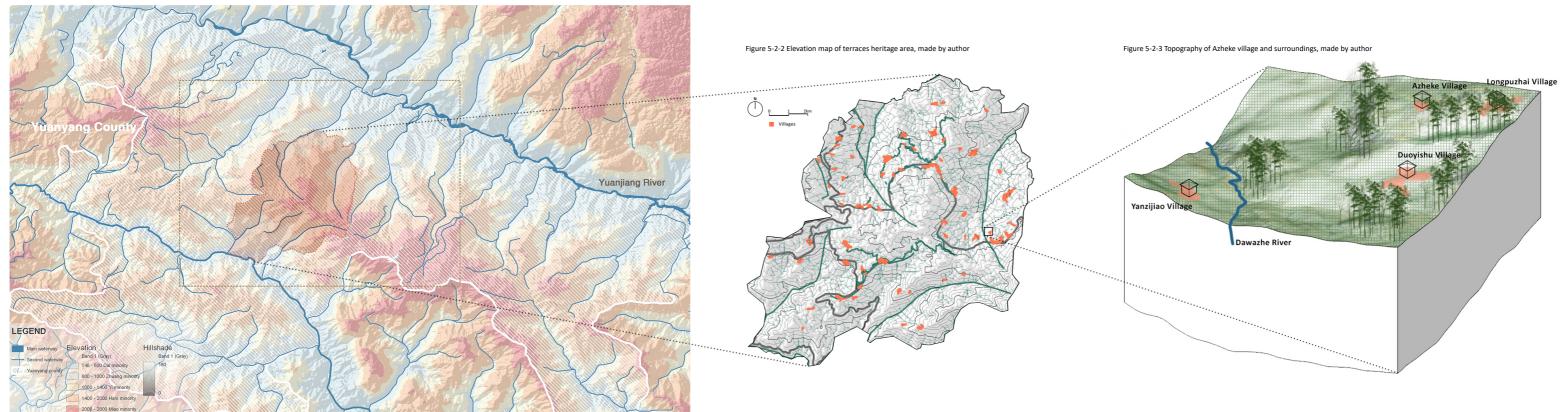
Cultivated land is the core component of heritage. In recent years, different scales of abandoned cultivation have occurred in the Yuanyang Hani Terraces. According to the cultivated land data of Yuanyang County in 2010, 2015 and 2017, the cultivated land in Yuanyang County decreased by 84.16km2 in 7 years. According to Liu Zhilin's analysis (刘志林,2022) of potential risk farmland identification and abandoned farmland risk index (FARI), terraced fields can be divided into three types: stable farmland, abandoned farmland with low risk, and abandoned farmland with high risk. Among them, the high-risk areas of abandoned farmland are mainly distributed in the border area of Yuanyang County, which has a high altitude, large slope and small population. The Azheke Village, which the author wants to have in-depth research on, is located in a high-risk area of abandoned farmland.

Figure 5-1-1 Potential risk of abandoned farmland in Yuanyang County, redrawn by author $\,$



05.2 TOPOGRAPHY

Figure 5-2-1 Elevation map of Yuanyang county, made by author



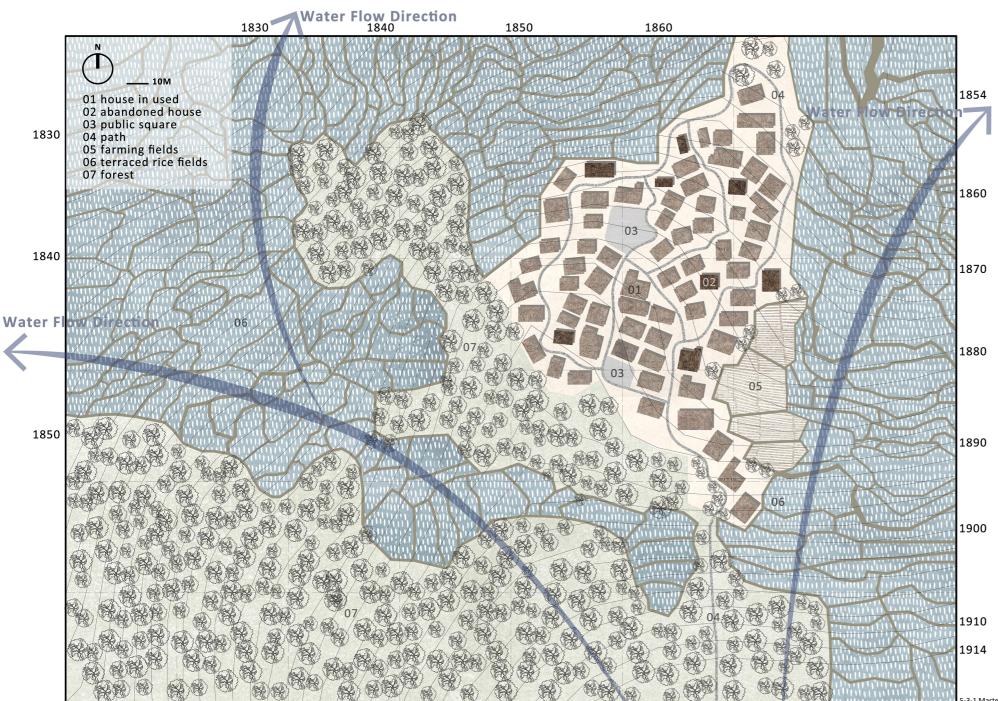
The topography of the Yuanyang Hani Terraces Heritage Area has changed significantly, and the overall topography is high in the middle and low in the north and south. The height difference from the highest point to the lowest point is about 1500 meters. The whole area is dominated by mountains, and the mountainous area is relatively steep, with a slope between 30°-60°. Yuanjiang River, a major river in Yuanyang County, is located on the north side of the Terraced Fields Heritage Area. Surface runoff from the heritage area eventually flows into the Yuanjiang River at the lower level due to the height difference.

Zooming in to the area of Azheke VIllage Scale, it could be found that the site presents a terrain with high sides and low middle. The Dawazha River is located in the valley, and the streams in the area will eventually converge here.

05.3 AZHEKE VILLAGE _ Masterplan related to waterflow

1880

1890



1914



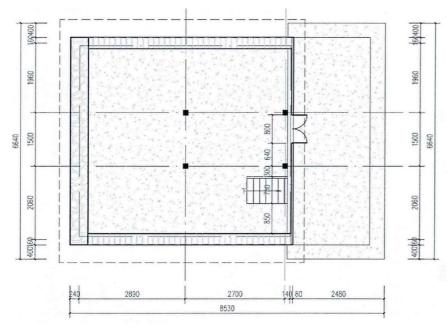
Figure 5-3-2 Aerial view of Azheke villa

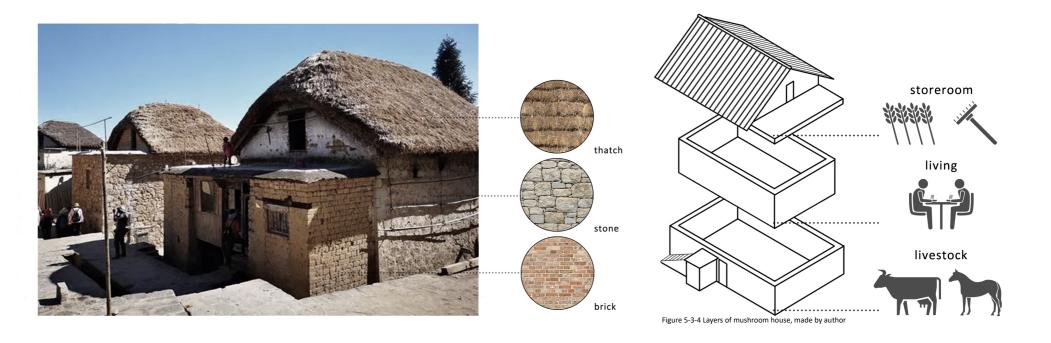
Azheke Village is located in the terraced fields surrounding by forests, and the road is arranged along the contour line from south to north. The path in the village is so narrow as 2 meters that vehicles can not pass. The inhabitant area is about 180 meters long from north to south and 110 meters wide from east to west. The village has two public spaces surrounded by houses. Azheke Village has 56 houses in use and 8 abandoned houses.

5-3-1 Masterplan and water flow of Azheke village, made by author

05.3 AZHEKE VILLAGE _ Mushroom house

Top view





Left view







The mushroom house is a traditional house of the Hani people in Yunnan. It is shaped like a mushroom. Its walls are made of stone or brick, and the roof is covered with thatch in four slopes (figure 5-3-3).

As figure 5-3-4 shown, the mushroom house has three stories, and the bottom story is used to keep livestock such as horses or cattle. The top layer is used to prevent food and other materials. The middle story is where the owner lives, and on one side of this level there is a door leading to the balcony.

Figure 5-3-3 Three views of mushroom house, Sourse: 哈尼族传统民居建造体系研究——以云南元阳梯田核心区四个村寨为例,redrawn by author

05.4 LOCAL RESIDENTS

The Azheke village has a population of 479 people, including 267 males and 212 females. There are 287 labourers in the village, of which 60 are working outside.

The author collected and organized interviews with villagers living in villages of Yuanyang County on the Internet and in related literature. These interviews show their real living conditions and their views on terraced fields and tourism from different perspectives.

Source: https://youtu.be/26jGVwMTmc4 https://youtu.be/YWXRyqZJeVM



Zhuang, a migrant worker

He said that the long-term low income made the young and middle-aged people in the village choose to go out to work. If they rely on traditional production and lifestyle, their family can only earn 500 euros a year and cannot get a better life. They are more concerned about how to raise their income than whether the village where they have lived for many years becomes a World Heritage Site.



Lin, an old man living in a village

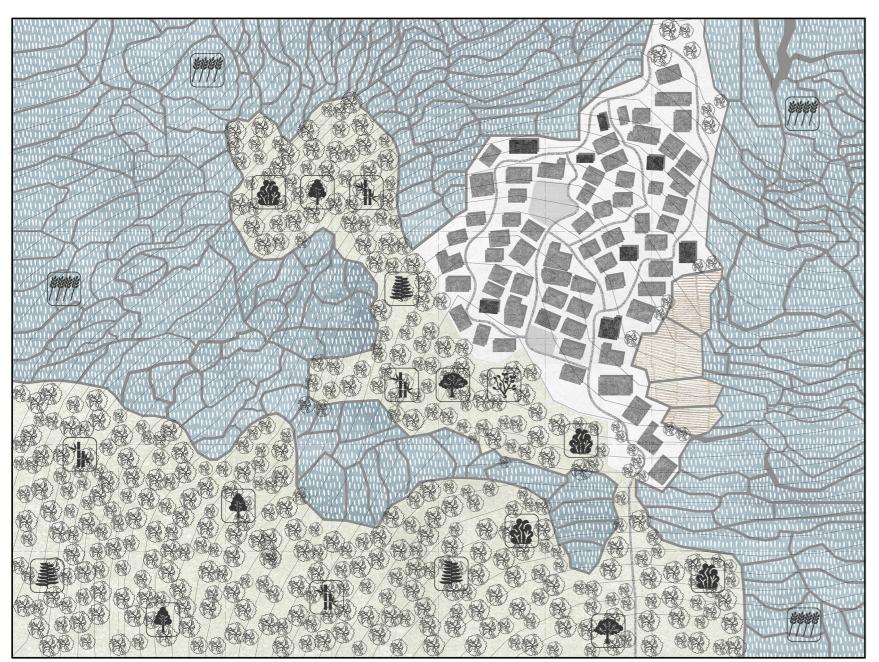
He said that after most of the young people left, the elderly and the women in the family were in charge of farming. Few of the new generation of young people know how to repair ridges, and how to plough, sow, and harvest. At the same time, due to the reduction of the labour force, some terraced fields had to be abandoned, resulting in the collapse of the terraced ridge.



Hua, a woman living in a village

In addition to farming, she and other women also find time to weave fabrics, she said. On weekends, they would go to the market to sell the fabric for money. Every year some tourists visit the village, and she charges the tourists and acts as their tour guide. But sometimes tourists disturb the villagers' lives and leave garbage, which makes her very unhappy.

05.5 PLANT SPECIES



50

Red Rice Oryza



Chinses Fir Cunninghamia lanceolata



Chinese Magnolia



Arrow Bamboo







Chinese Maple Alangium chinense

Nepalese alder



only grows once a year, sown in May and harvested around November. But a single type of crop reduces the stability of ecosystems, and fragile ecosystems are not

build their houses and furniture.

equipped to deal with unknown risks. The forest surrounding Azheke Village is a mixed

The types of arable land in Azhike Village are very simple, and only red rice is cultivated on a large scale. Red rice

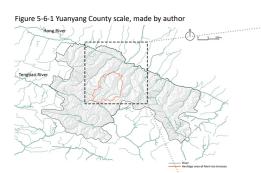
coniferous and broad-leaved forest. The main plant species are Holly, Chinese Magnolia, Chinese Fir, Arrow Bamboo, Nepalese alder and Chinese Maple.



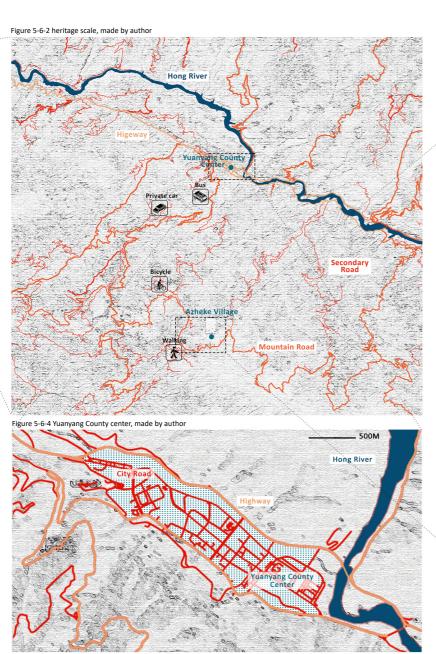
Villagers often use wood such as bamboo and alder to

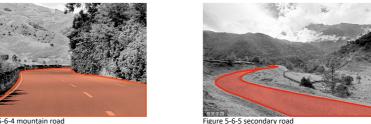
Figure 5-5-1 Main plant species of Azheke village, made by author

05.6 TRAFFIC CONDITIONS ANALYSIS



There are 82 villages in the Yuanyang Terraced Fields Heritage Area, which are distributed in the vast terraced fields. Since the area is all mountainous, there are still many villages that cannot be easily reached even with the construction of the winding mountain road that can be passed by trucks. The isolated geographical location and low transportation connectivity largely limit the development of villages, as is the case in Azhake Village. For Azhike Village, there is a winding mountain road built in the south, but it is not directly connected to the village. If toursit want to reach the village, you have to walk past the Longpuzhai Village on the south side.

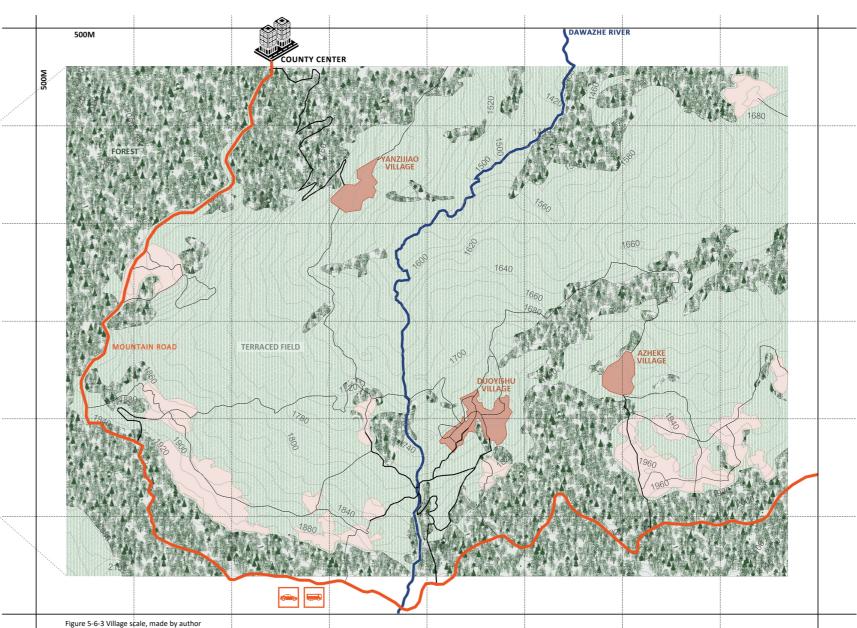












05.7 STAKEHOLDERS ANALYSIS OF TOURISM

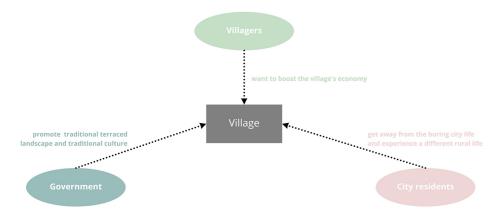


Figure 5-7-1 The potential of developing existing tourism in Azheke Village, made by author

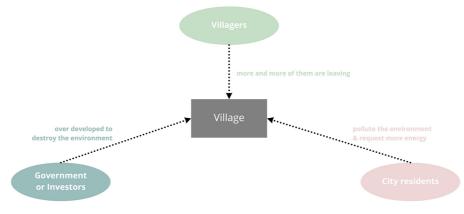


Figure 5-7-2 The challenges of developing existing tourism in Azheke Village, made by author

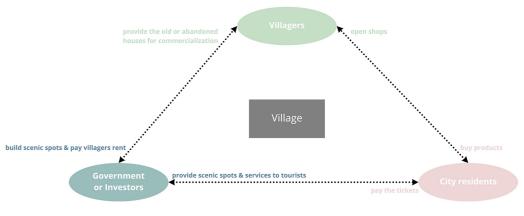


Figure 5-7-3 Set up the tourism model of Azheke Village, made by author



06 CONCEPTUAL DESIGN

06.1 Design concept

06.2 Design principles

06.3 Design strategies

06.1 DESIGN CONCEPT

Combined with the current situation of the site to generate a design concept (Fig. 6-1-1). First of all, explore the natural and cultural advantages and potential of the site, eg: forests and rivers as natural resources, as well as architecture, beliefs, and farming as cultural resources. These resources will become important elements of site design. Secondly, new elements adapted to the site should be incorporated into the design, such as water reservoirs, renewable energy, eco-tourism, etc., to solve the ecological and economic problems faced by the

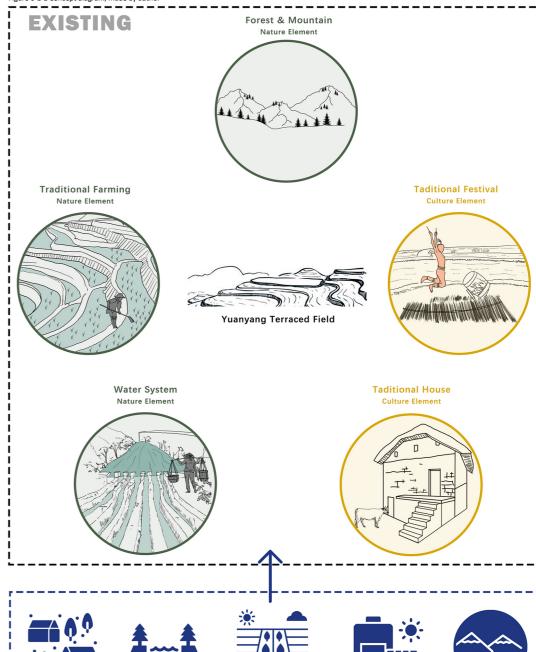
The project takes the traditional Azheke Village as an example to discover its potential and try to activate the villages from three aspects: ecology, culture, history and economy, so that they can better adapt to the development of the times, and become sustainable.

Integrate design with theoretical approaches. First of all, the ecological environment is the basis for the sustainable development of Azheke VIllage. Therefore, water resource management and elastic landscape are used as theoretical guidance to solve the problem of insufficient water resources in the dry season of the site through ecological and technical means.

Secondly, the unique cultural background and long history are the spiritual core of Azheke VIIllage. According to the cultural landscape theory, the design needs to break the status quo of Azheke Village as a cultural island, and establish the connection between people, society and landscape. Through the development of tourism, the cultural landscape of Azheke Village will be displayed to every visitor, and the village will be rejuvenated.

Finally, integrate the Landscape Narratives theory into the process of landscape design. Using Landscape Narratives as a medium, the abstract culture is transformed into the story of the site and space, so that visitors can interpret the story of the site in combination with their own experience in the experience.

Figure 6-1-1 Concept diagram, made by author







Water Reservoir



Experimental Fields

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Renewable Energy



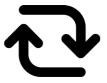
ECO-Tourism

06.2 DESIGN PRINCIPLES



01 Respect and preservation

The design is based on the protection and management of the natural and cultural aspects of the Yuanyang terraced landscape. In the design, the existing topography, vegetation distribution, terraced fields and canals should be preserved to the greatest extent. Or by restoring the original topography or vegetation of the site to highlight the memory of the site and give them new functions. The superposition of old and new narrative layers can enrich readers' interpretation of the site's story.



02 Refresh and innovation

With the development of science and technology, traditional terraced fields can also be better developed by introducing modern technology. For example, using renewable energy sources such as solar energy etc. Solar panels could be a good combination of heritage and new interventions.



03 Preserve and renew cultural heritage

First, discover the distinctive contents of the terraced field culture and the traditional culture of the Hani people, such as the dense forests used by the Hani people for sacrifice, the artificially constructed canal system, the farming culture that is completely different from urban life, the traditional mushroom houses, and the traditional Hani people. Holidays and more. Combined with landscape narrative theory, these features are both the story itself and the medium of narrative. These features transform the abstract cultural landscape into a clear story, and people interpret the meaning of the landscape by traveling through the characteristic cultural landscape.



04 Future proof ecology

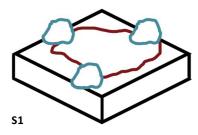
Design should adapt to environmental changes. Improve the water retention capacity of the site to cope with periods of drought. Add a water purification system and water circulation system to reduce the waste of water. Increase the biodiversity of the terraced field. Improve the stability of agroecosystems by growing different types of crops.



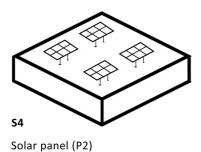
05 Atmospheres

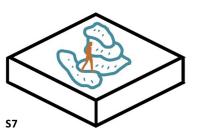
Emphasize the feelings of site users. Change and shape different spaces through changes in light, topography, sound, color, vegetation and other factors. Users reading the story of the site while experiencing the space.

06.3 DESIGN STRATEGIES



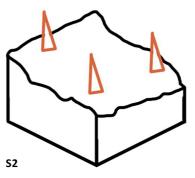
Connecting isolated village (P5)





Touring path experience (P5)

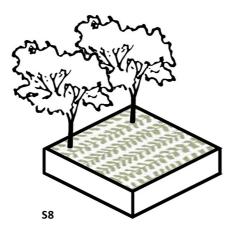
Figure 6-3-1 Design strategy diagrams, made by author



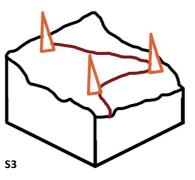
Highlight the landscape with cultural & heritage identity (P1 & P3)



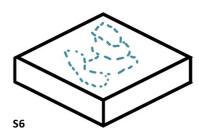
Water Storage (P4)



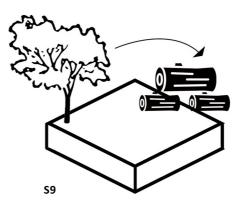
Increase the Biodiversity (P4)



Design tour routing based on the existing terrain (P1 & P3)



Recreate the pattern of faded terraced field (P1 & P3)



Local material (P1)

- P1 Respect and preservation
- P2 Refresh and innovation
- P3 Preserve and renew cultural heritage
- P4 Future proof ecology
- P5 Atmospheres

07.1 DESIGN FRAMEWORK







What can we implement to make the rice terraces a more diverse landscape in terms of ecology, production and landscape architectural scenery by spatial design in order to make the heritage vibrant?

CULTURE HERITAGE

07.1 Design framework

07.2 Water management - water reservoir

07.3 Tourism plan - travel routes design

07.3.1 parking lot & entrance of Azheke village

07.3.2 long-distance hiking route - embracing the nature

07.3.3 cableway - viewing as bird

07.3.4 cultural route of Azheke village - living as Hani

07.3.5 tour sequence planning

07.4 Timeline of construction

DESIGN

64

WATER MANAGEMENT

How to integrate the elements of water management in Honghe Hani's traditional cultural landscape to solve the shortage of water? How to build a sustainable circular water system?





Belong

65

TOURISM DEVELOPMENT

How to design an ecological and cultural tourism model in a heritage terraces area? How to reduce environmental pollution caused by tourism?



experimental fields





renewable energy

forest & mountain

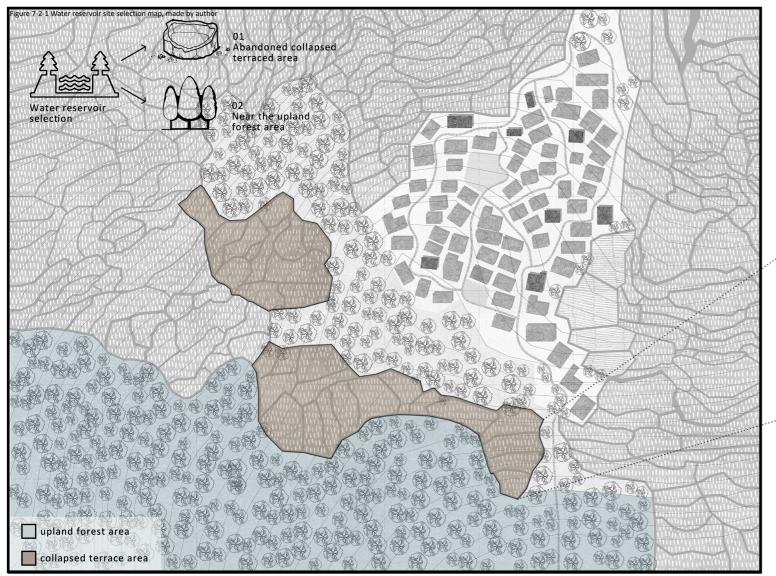
traditional water system

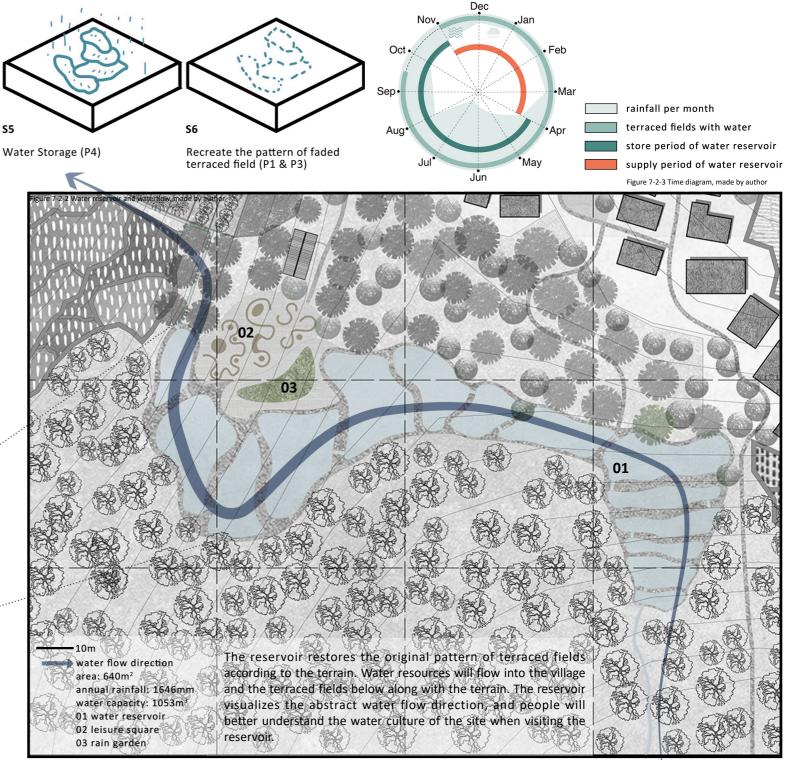
water reservoir

07.2 WATER MANAGEMENT - WATER RESERVOIR

Water resources are the basis for the sustainable development of terraced landscapes, so the author needs to solve the problem of insufficient irrigation water resources in the dry season first if he wants to revitalize the village. As shown in Fig. 7-2-3, November to March is the dry season in Yuanyang, while other months have abundant rainfall. Therefore, Azheke Village needs to solve the water problem by building a reservoir. According to the terrain

conditions, the reservoir needs to be located above the village, preferably close to the forest. Azheke Village has two terraced field areas that have been abandoned. In contrast, the land on the south side is more suitable for building terraced fields.

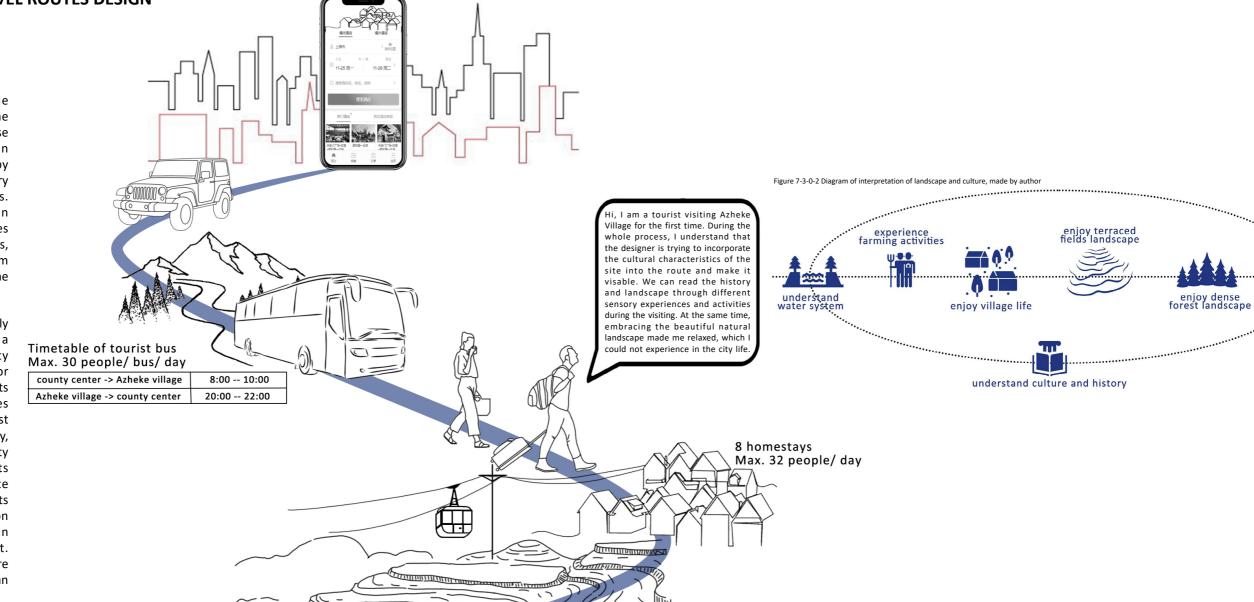




07.3 TOURISM PLAN - TRAVEL ROUTES DESIGN

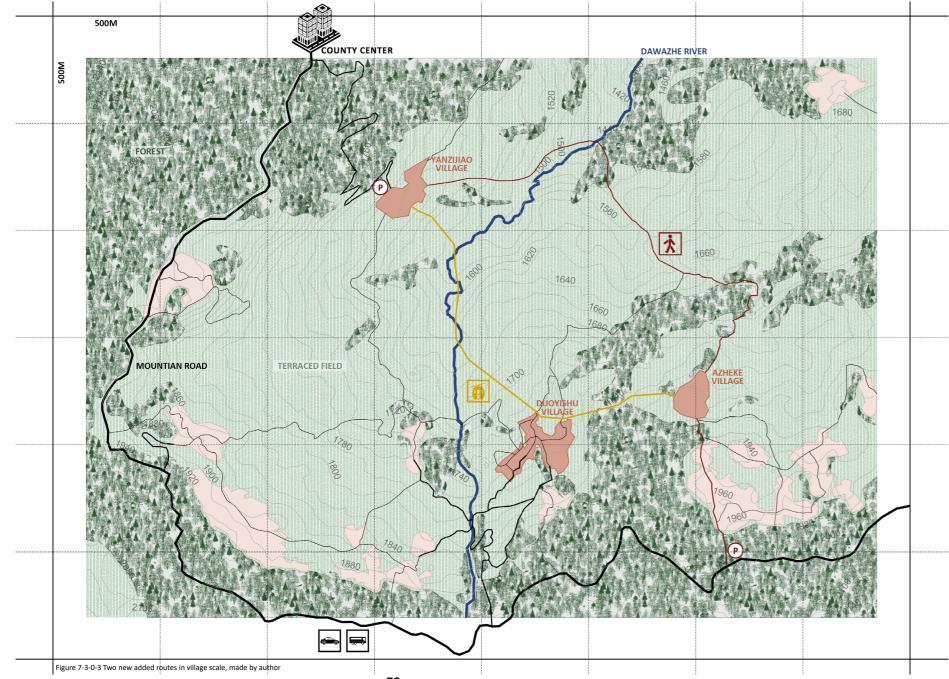
For people who have lived in the city for a long time, traveling to the countryside is a good way to get close to nature and relax. Nowadays in China, people tend to go to nearby villages with beautiful natural scenery for short-term travel on weekends. Therefore, for residents living in Yuanyang County and nearby cities like Kunming etc., Hani Rice Terraces, which is two hours away from Yuanyang County center by car, is the best choice.

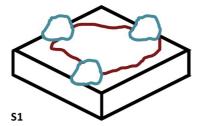
Azheke Village is located in a relatively remote mountainous area, so a tourist bus from Yuanyang County to the village is specially set up for tourists. Tourists can order bus tickets and homestays for specified dates on Azheke's official website. Tourist buses run back and forth once a day, with a maximum passenger capacity of 30 people. In addition, tourists can also choose to drive a private car to reach Azheke Village. Tourists can choose to go back and forth on the same day or choose to stay in Azheke's homestay for one night. Regarding accommodation, there are eight homestays in Azheke, which can accommodate up to 32 tourists.



07.3 TOURISM PLAN - TRAVEL ROUTES DESIGN

| Masterplan on village scale





Connecting isolated village (P5)

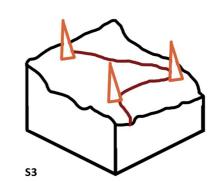
On village scale, Azheke village is not directly connected with the mountain road. If people want to reach Azheke village, they have to go through Longpuzhai village in the south. The connectivity between Azheke village and neighboring Duoyishu village and Yanzijiao village is also extremely weak. The blocked road conditions are extremely unfavorable for economic and cultural exchanges between villages.

Therefore, two new roads connect the isolated Azheke village with adjacent villages. One is a hiking route through terraced fields, and the other is a quick route with a cable car. For the villagers, the cable car route reduces the difficulty of their travel. For tourists, different route designs provide them with completely different landscape experience.

07.3.1 Parking lot & entrance of Azheke village



Figure 7-3-1-1 Masterplan of parking lot, made by author



Design tour routing based on the existing terrain (P1 & P3)

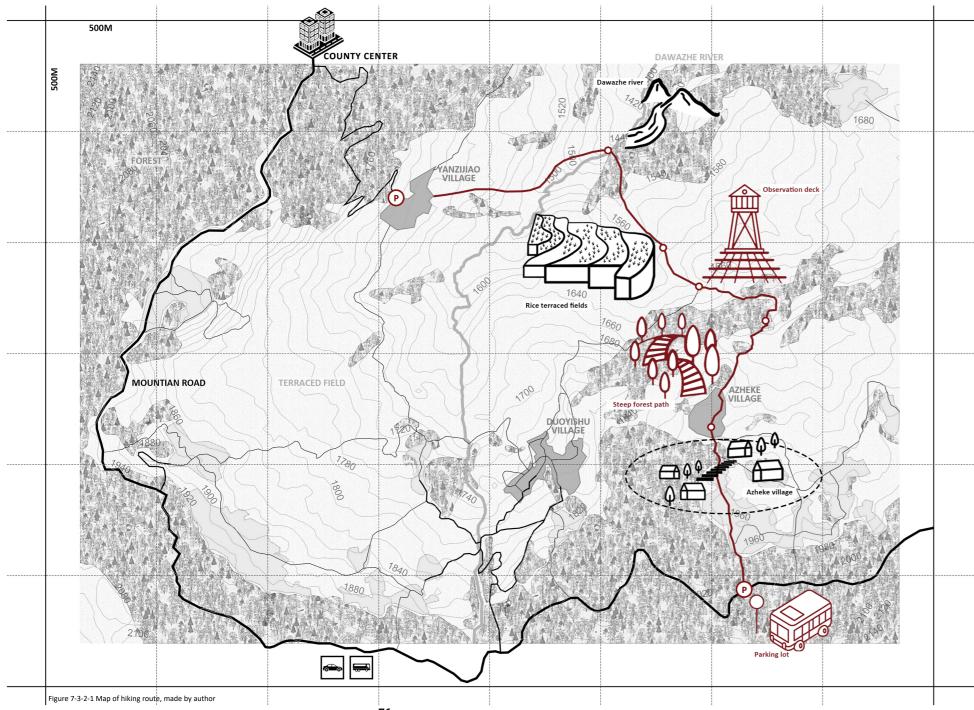
At the intersection of the path leading to Azheke village and Daping Mountain Road, a parking lot is built base on the existing terrain. The height of the mountain road is higher than the parking lot, making the whole parking lot seem to be hidden in the woods. There are two bus parking spaces and 21 private parking spaces in the parking lot. Furthermore, there is an information kiosk at the end of the parking lot, where people can get guide maps and hire tour guides.

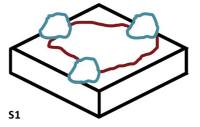


Figure 7-3-1-2 Section of parking lot, made by author

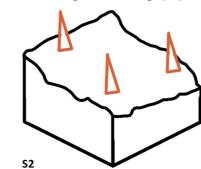


07.3.2 Long-distance hiking route - embracing the nature





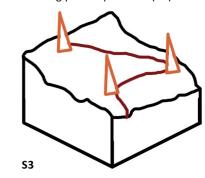
Connecting isolated village (P5)



Highlight the landscape with cultural & heritage identity (P1 & P3)



Touring path experience (P5)



Design tour routing based on the existing terrain (P1 & P3)

The hiking route connects Azheke village and Yanzijiao village, and the whole journey is about 2.5km long. The route connects the most important natural elements of the entire terrace system, including forests, villages, terraces and rivers. Visitors can experience magnificent rice terraces, dense forests and steep hillsides through different senses throughout the whole trekking process. On the way, there is a viewing platform where visitors can look and rest, which can also serve as a landmark to guide the direction. The viewing time of the whole journey takes about 2-3 hours.

07.3.2 Long-distance hiking route - embracing the nature

| Section of hiking route

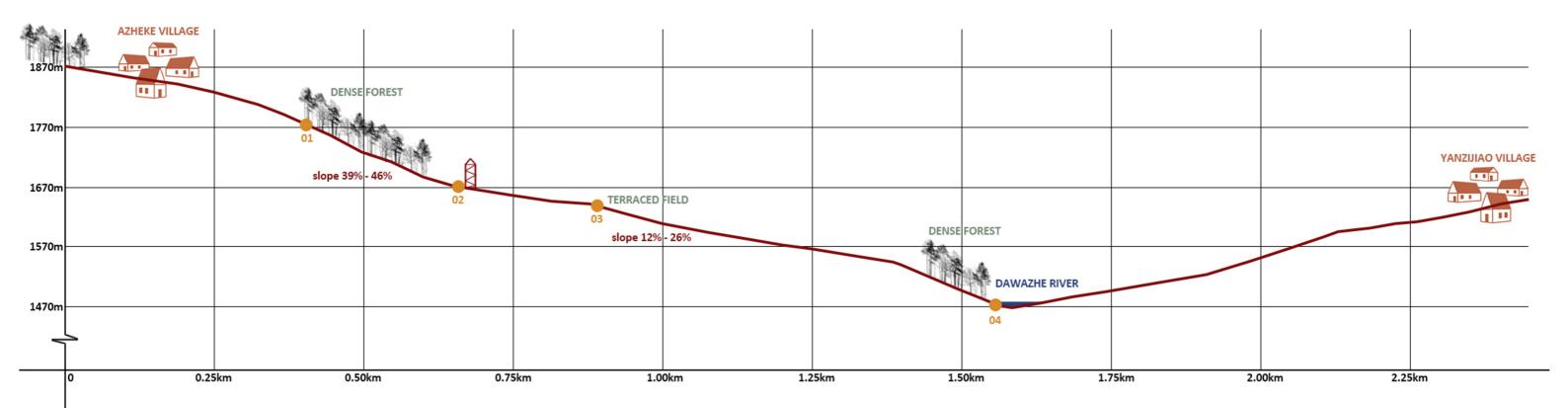
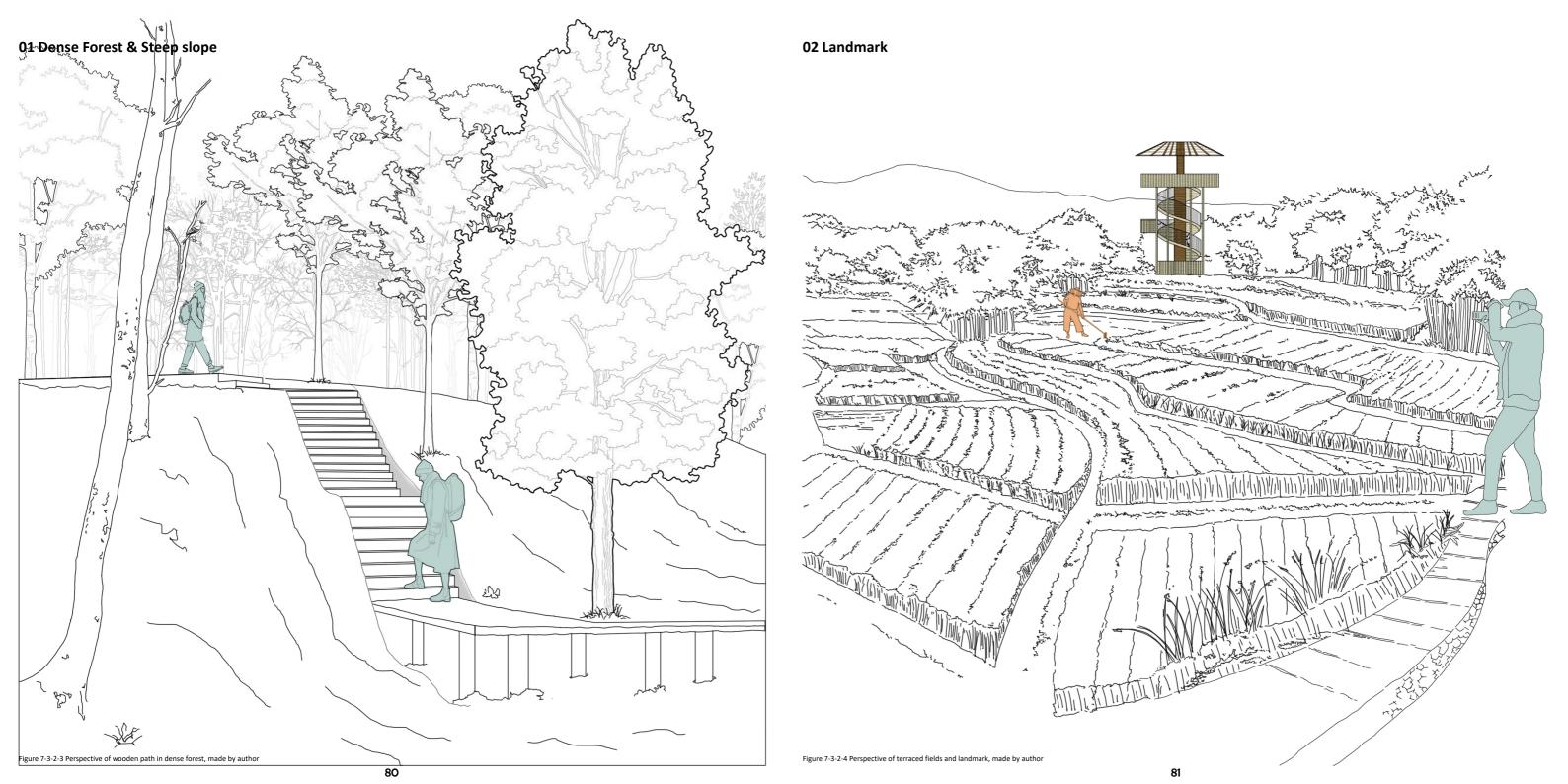


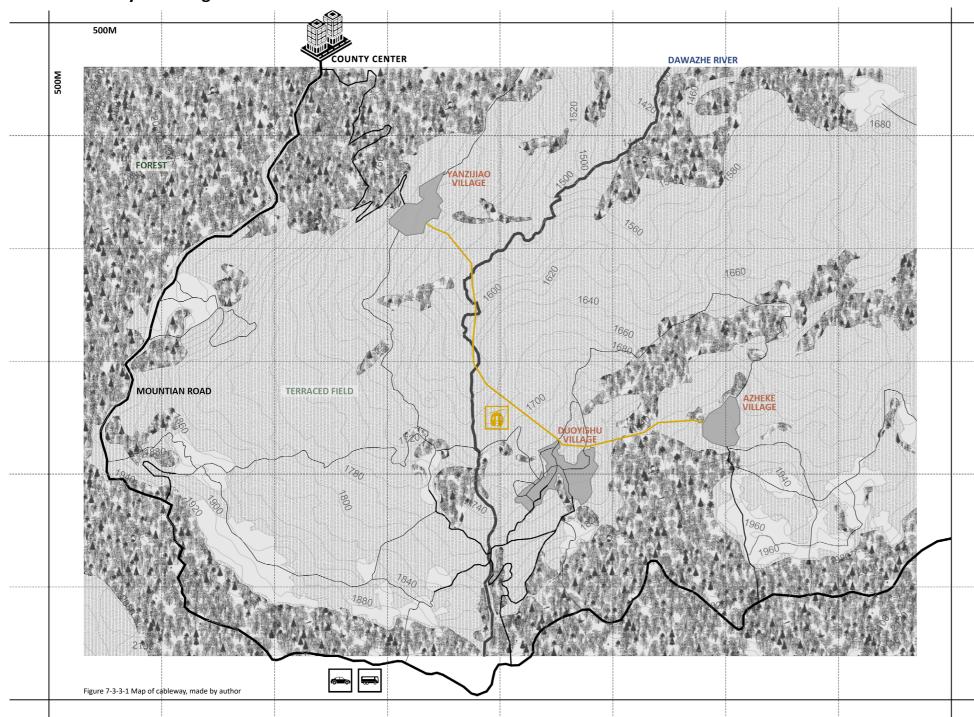
Figure 7-3-2-2 Section of hiking route, made by author

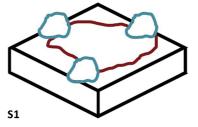
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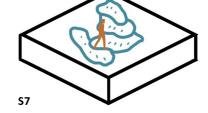


03 Terraced Fields 04 Dawazhe River Plaure 7-3-2-5 Perspective of terraced fields, made by thousand the second seco Figure 7-3-2-5 Perspective of water platform, made by author

07.3.3 Cableway - viewing as bird







Connecting isolated village (P5)

Touring path experience (P5)

The cableway connects Azheke village, Duoyishu village and Dawazhe village, which is about 2.25km. The cable car takes about 10 minutes one way. Both residents and tourists can use the cable car. For the villagers, the cable route shortens the travel time between the villages, and it is more convenient to carry more items. It promotes material exchange, economic, social and even educational development between villages. For tourists, the cable route provides another experiential perspective of enjoying the terraced landscape from the air.

07.3.3 Cableway - viewing as bird

| Section of cableway

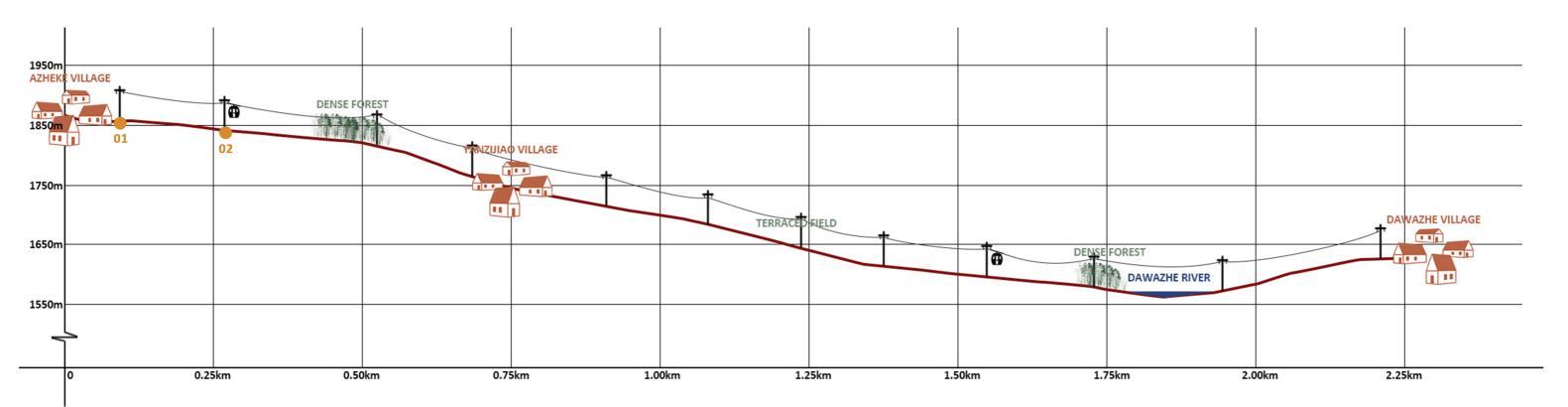


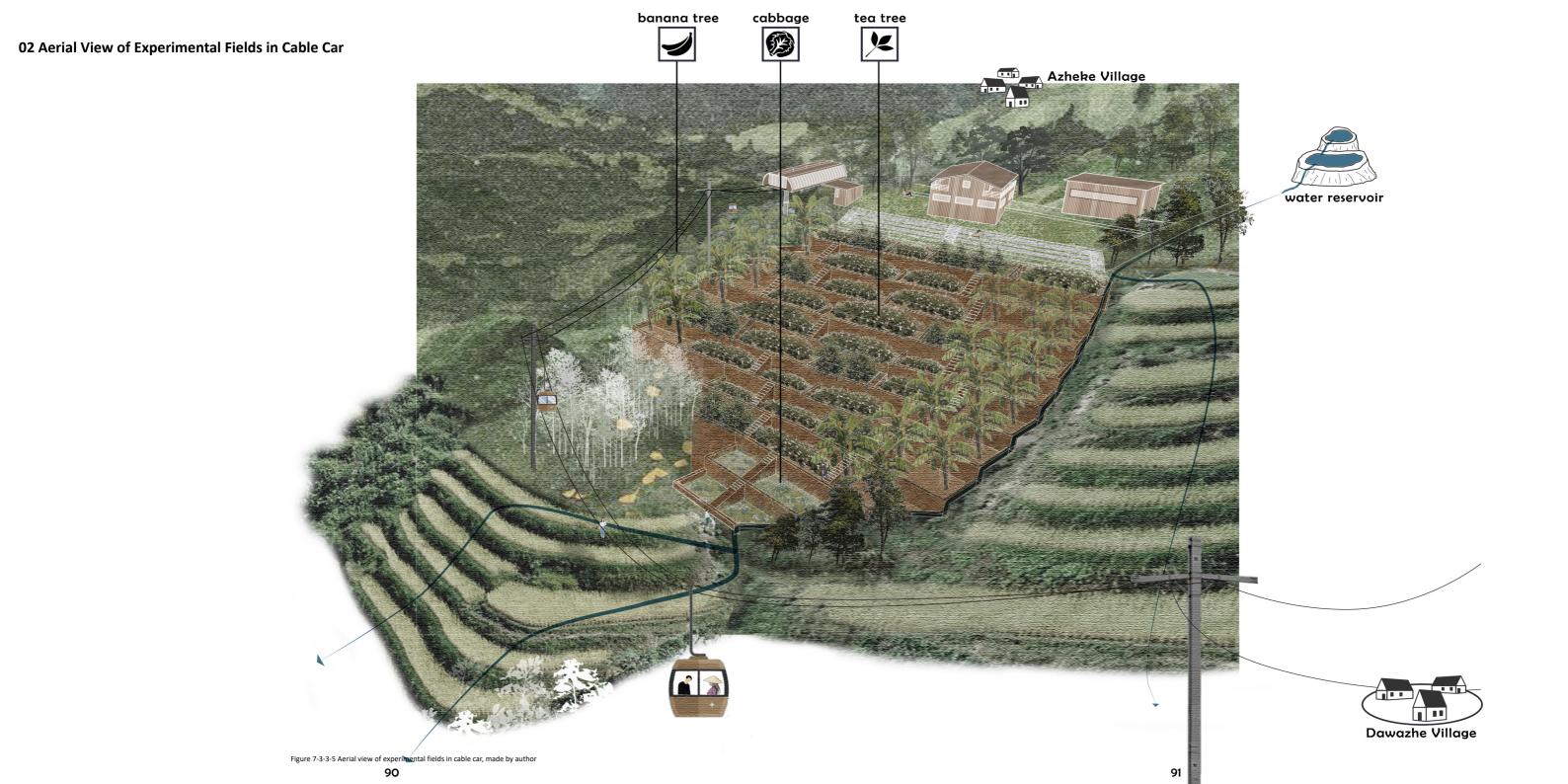
Figure 7-3-3-2 Section of cableway, made by author

01 Start Station of Cableway



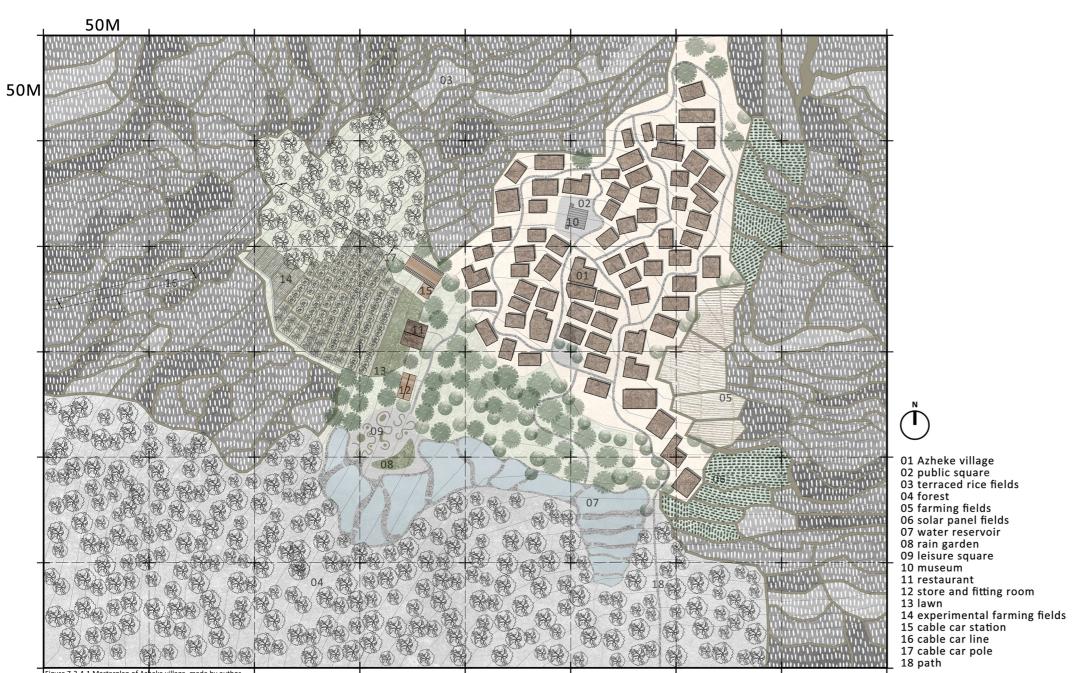


Figure 7-3-3-4 Section of cable car station, made by author



07.3.4 Cultural route of Azheke village - living as Hani

| Masterplan on neighbourhood scale



| Landscape layers

Figure 7-3-4-2



Figure 7-3-4-3 Path & public square



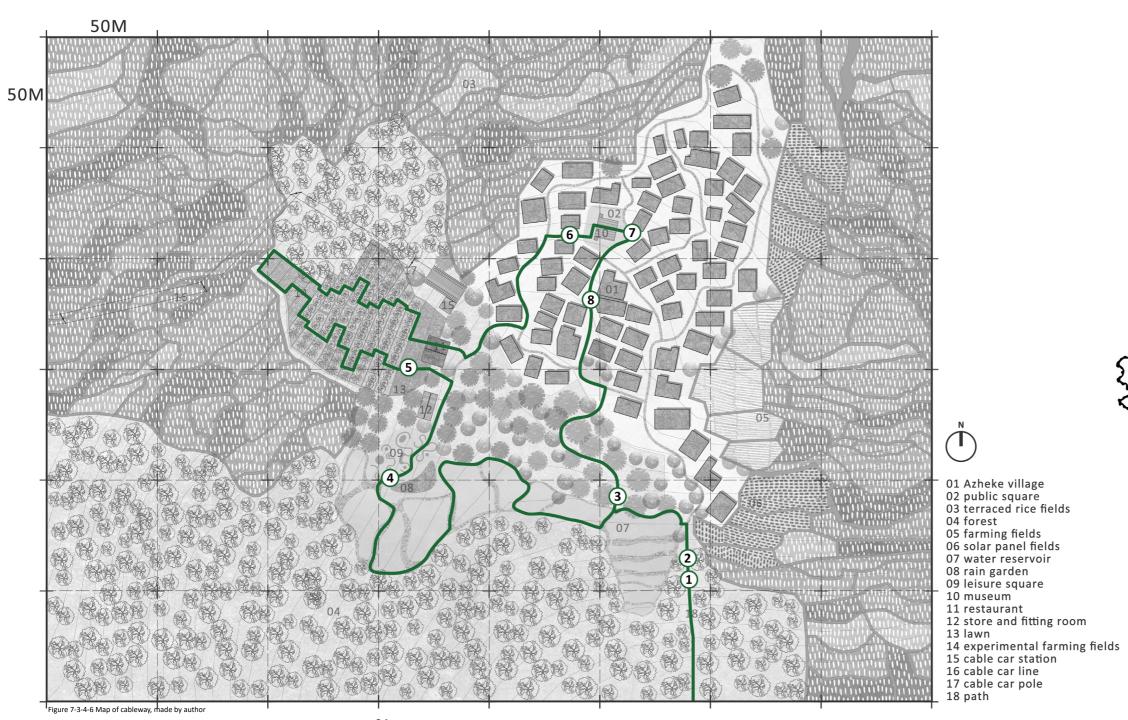
Figure 7-3-4-4

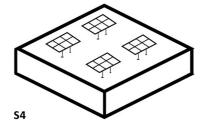


Figure 7-3-4-5 New added path

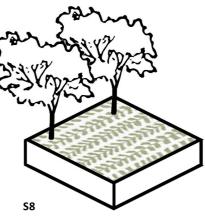


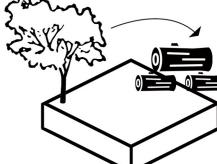
07.3.4 Cultural route of Azheke village - living as Hani





Solar panel (P2)





Increase the Biodiversity (P4)

Local material (P1)

The Cultural route mainly connects 5 representative scenic spots in the village, allowing tourists to better experience a day as a Hani people and understand the unique culture of the village.

The 5 scenic spots are respectively water resevoir, solar panels fields, leisure park, experimental fields and museum.

01 Water reservoir



02 Solar panels fields

buffalo

grassland

energy conversion

97

Area: 5000m²
Outputs: 3.6kwh/m²/day
18000kwh/day



rice paddy

sol<u>ar pa</u>nel

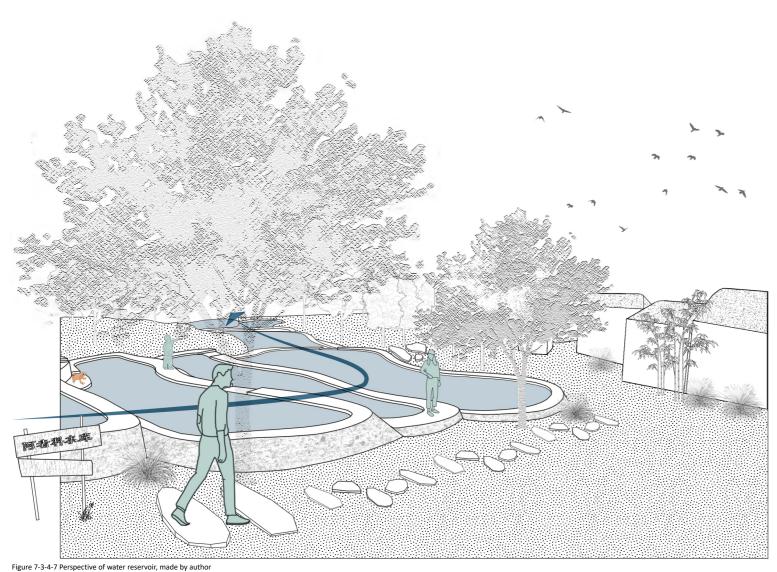
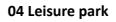


Figure 7-3-4-8 Perspective of solar panel fields, made by author

electricity









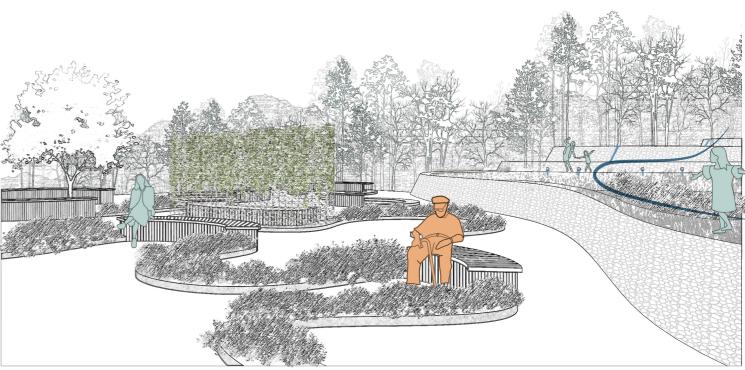
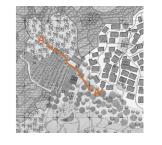


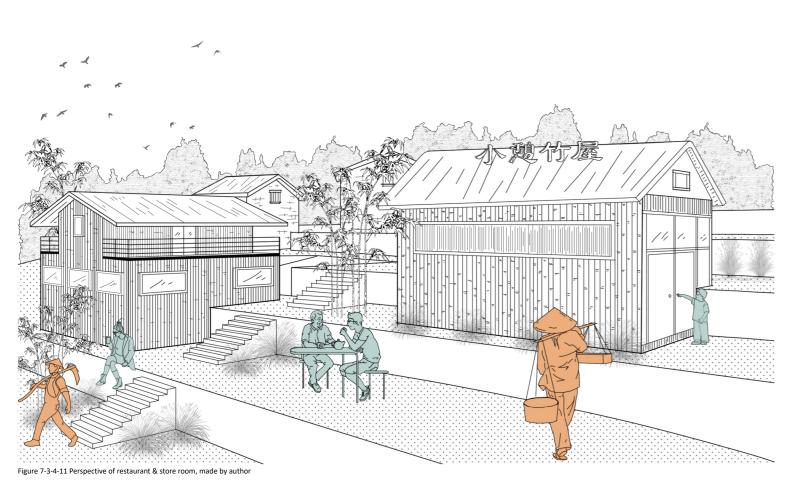
Figure 7-3-4-10 Perspective of leisure park, made by author



05 Restaurant & store room

| Sections of restaruant



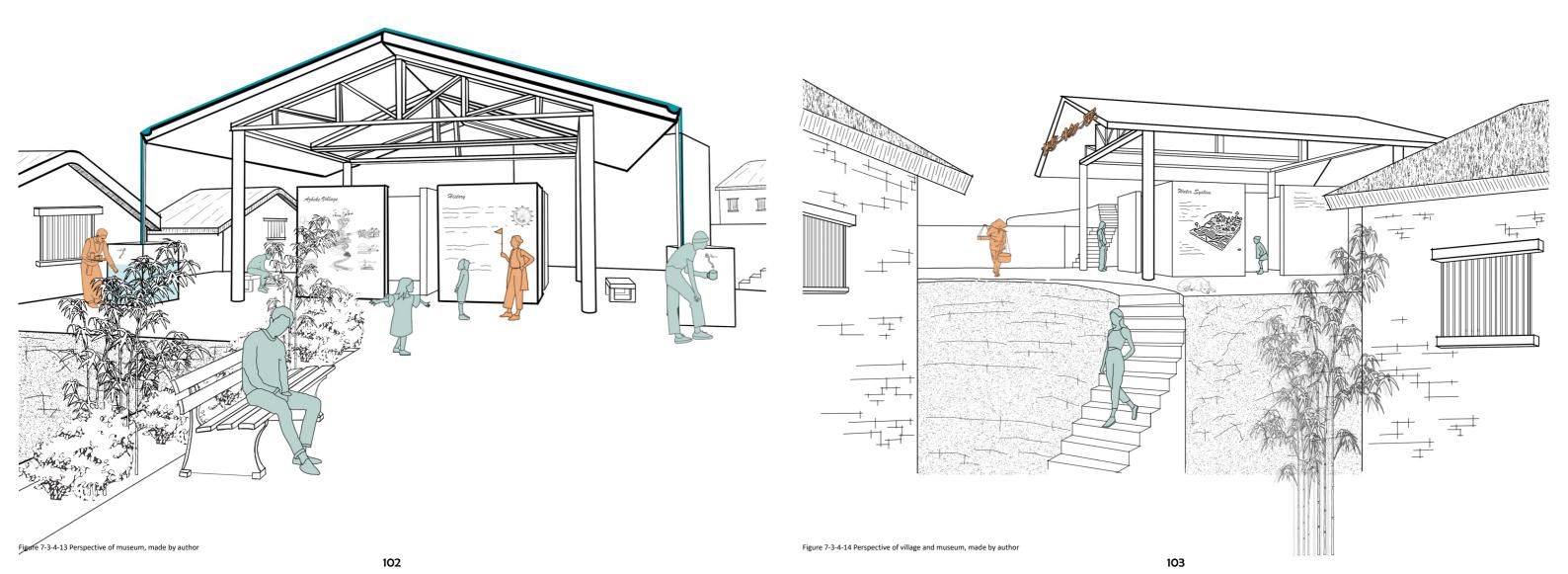






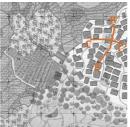






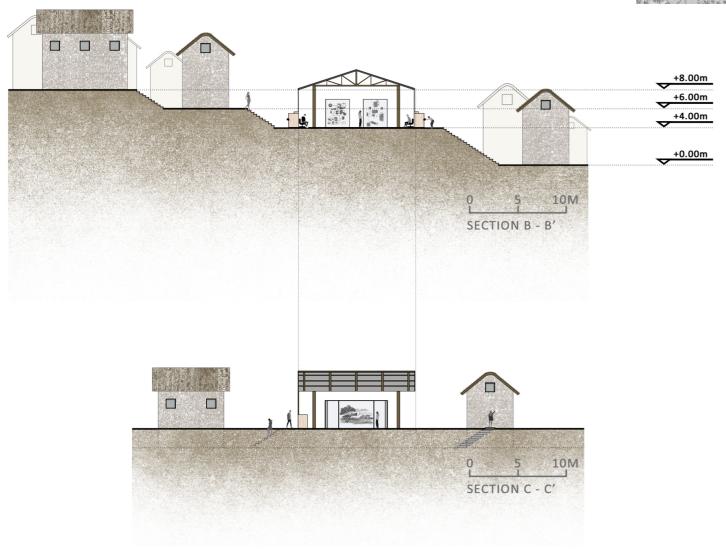
07 Azheke Village Museum

| Sections of museum

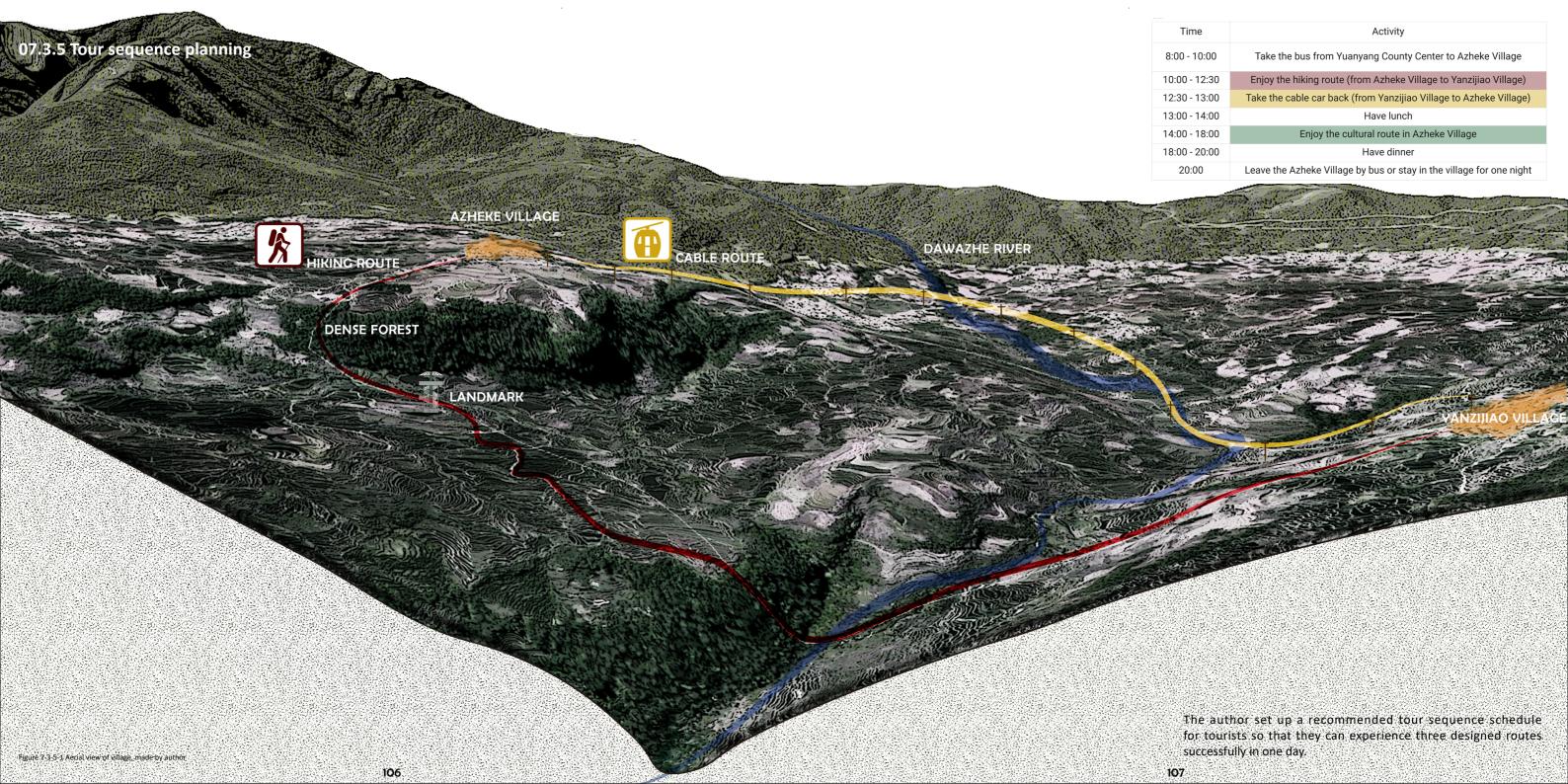


08 Signs in the Village









07.4 TIMELINE OF CONSTRUCTION



ECOLOGICAL NEEDS

In the process of activating the village, a good ecological environment is the most basic condition for the village to adapt to future development. Therefore, projects that meet the ecological needs of the site should be constructed first, such as water reservoir and experimental fields. Secondly, it is necessary to strengthen the traffic conditions of Azheke Village, and meet the social needs of residents. Finally, carry out the tourism projects of the village, in order to increase the economic income.

TRANSPORTATION & SOCIAL NEEDS

TOURISM NEEDS

08 REFLECTION

01 research method and approach in relation to the graduation studio

As a member of the Circular Water Stories lab, first, draw on the site's traditional water knowledge from history. And excavate the advantages and cultural values of traditional water systems. For example, in my project, I chose to study the traditional water system of the Honghe Hani Terraces, to explore the current conditions of this 1300-year-old irrigation system. The second step is to extract the problems and potentials faced by the design site through more detailed information collection and research in different scales from nature and culture aspects. For example, my site is facing the problem of drought, the disappearance of culture and chaotic tourism. At the same time, specific research questions are raised. The third step is to study related theories and form a theoretical framework that can be used for site design. In the fourth step, the theory is applied to the specific site design to address the research questions raised earlier.

02 the relationship between research and design

The research of this project includes three aspects, the first aspect is the study of the traditional water system of the Honghe Hani terraces; the second aspect is how to make the cultural heritage landscape dynamic; the third aspect is to seek the balance between tourism development and heritage protection. Correspondingly, the author also constructs the theoretical framework of the project from three aspects: water management, cultural landscape and landscape narrative. Through the exploration of these three theories, the relationship between the three research topics is constructed. Then, in the design process, the research method is applied to the site of different scales, and different conclusions are obtained. The conclusions obtained from the research part need to be used to guide the design. At the same time, it is necessary to continuously give feedback, reflect and revise the research part. In the process, the project's logical framework is made more coherent.

03 the relationship between circular water lab and landscape architecture

My graduation topic is to create a sustainable Yuanyang terraced ecosystem in terms of ecology, culture, and economy. The traditional Yuanyang terraced ecosystem is composed of forests, villages, terraces, and rivers. Therefore, water plays a vital role in the entire ecosystem, which is highly related to the studio topic: Circular Water Stories. The CWS lab focuses on the water stories, encouraging us to explore possibilities behind the main project topic and to provide a set of methods to design for the water issue. Under the guidance of the studio topic, I learn about the stories behind the traditional water system and learn how the Hani people in the past managed water, used water, symbiosis with water, and so on. In this way, it helps me to understand the role of water in the production, life, entertainment, and cultural beliefs of the Hani rice terraced fields, which is the first step of my landscape architecture design.

04 the transferability of the project results

This project attempts to use the Azheke Village in Yuanyang Hani terraces as a case to explore the interactive strategies of tourism and traditional ecological culture and to further think about the symbiosis approach of tourism and traditional ecological culture. On a small scale, the theme of developing eco-cultural tourism can be applied to the other 81 villages in Yuanyang Rice Terraces. From a broad perspective, facing the increasingly popular rural tourism in China today, it is necessary to emphasize the development of scenic spots with the theme of protecting the environment and promoting local culture before the rural ecology is destroyed. How to find a balance between tourism development and cultural protection is an important issue for Chinese rural landscape design.

05 the limitation of the project

I have to say that during the whole design process, the part of collecting and researching the site was relatively difficult. The design site is located in China, Yunnan Province, Honghe Prefecture, Yuanyang County, a village located in a mountainous area. Therefore, it is relatively difficult to obtain accurate elevation data and satellite images. Secondly, due to the epidemic, it was hard to return to China, so I did not have site research. It's difficult for me to directly feel the environment and atmosphere of the site and set up an emotional connection with it. In order to solve some doubts and problems, I had to collect more information on the Internet and seek answers from relevant papers. Although I contacted some locals through social media, it cannot be denied that the limited sample size can lead to one-sided conclusions. Therefore, inevitable errors may occur in some parts of the project, which may lead to the lack of applicability of the landscape design.

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APPENDIX

CIRCULAR WATER STORIES

| Water landscape elements



Canal / Qu - 渠

The Hani people dug ditches in the mountains and channelled the water stored in the forest to the villages and terraces below through the canals. The tree canopies that cover the canals can also provide shades to prevent evaporation.

Project: Honghe Hani Rice Terraces

Climate: Monsoon climate
Year: 720 A.D till now
Water Type: Fresh water

Landscape: Agricultural landscape

Altitude: Above 2000m
Soil Condition: Red clay
Material: Soil and stone
Period: the whole year

Form: Surface

Use or Function: Transport water



Terraces Field / Ti tian - 梯田

The Hani people dug terraces of different areas and shape according to the slope of the mountain in the mountains to grow red rice. Throughout the year, except for the second half of September and October, there is always water in the terraces field, can be seen as connected small reservoirs...

Project: Honghe Hani Rice Terraces

Climate: Monsoon climate
Year: 720 A.D till now
Water Type: Fresh water

Landscape: Agricultural landscape

Altitude: 144 - 2939m
Soil Condition: Red clay
Material: Soil and stone
Period: Jan-Sep & Nov-Dec

Form: Surface

Use or Function: Rice planting

| Water works



Water divider / Fen shui mu ke - 分水木刻

The Water divider divides the water in the main canal into 7 equal parts, and then leads to different villages below through the branched canals.

Project: Honghe Hani Rice Terraces

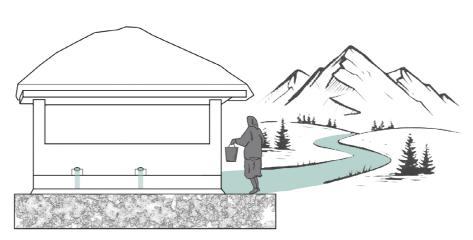
Climate: Monsoon climate
Year: 720 A.D till now
Water Type: Fresh water

Landscape: Agricultural landscape

Altitude: Above 2000m Soil Condition: Red clay

Material: Wood and stone Period: the whole year

Form: Surface Use or Function: Divide water



Basin / Shui chi - 水池

People set up Basin in the village to provide the villagers with water for daily life. The water in the basin comes from rainwater stored in the upland forest.

Project: Honghe Hani Rice Terraces

Climate: Monsoon climate Year: 720 A.D till now Water Type: Fresh water

Landscape: Agricultural landscape

Altitude: 144 - 2939m Soil Condition: Red clay

Material: Stone, wood and thatch Period: the whole year

Period: the whole Form: Surface Use or Function: Living

| Water works



Waterwheel / Shui che - 水车

People use waterwheels as an irrigation tool to inject water into the aqueduct to the paddy that needs to be irrigated. At the same time, people use the energy generated by the waterwheel to crush the rice husks.

Project: Honghe Hani Rice Terraces

Climate: Monsoon climate
Year: 720 A.D till now
Water Type: Fresh water

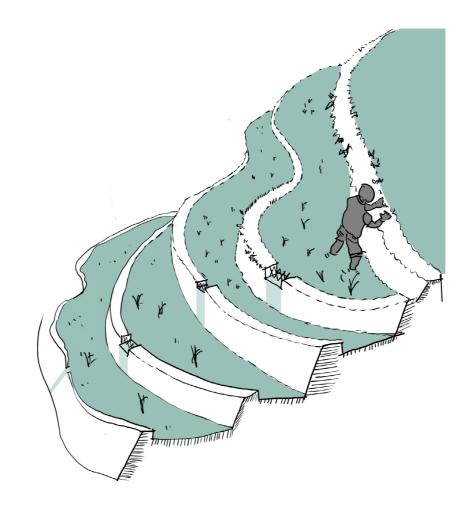
Landscape: Agricultural landscape

Altitude: Above 2000m Soil Condition: Red clay Material: Wood

Period: the whole year

Form: Surface

Use or Function: Transport water



Sluice / Shui Fa - 水阀

Hand-made sluices by taking out material at the edges to release water to the next terraces or by closing the gap to keep the water from running downwards.

Project: Honghe Hani Rice Terraces

Climate: Monsoon climate Year: 720 A.D till now

Water Type: Fresh water

Landscape: Agricultural landscape
Altitude: 144 - 2939m

Altitude: 144 - 293 Soil Condition: Red clay

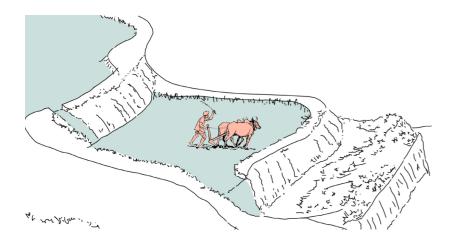
Material: Soil

Period: the whole year

Form: Surface

Use or Function: Transform water

| Water works



Sowing and Plowing / Geng zhong bo zhong - 耕种播种

Every spring, farmers use cattle to plow the land and sow seeds.

Project:

Climate:

Year:

Water Type:

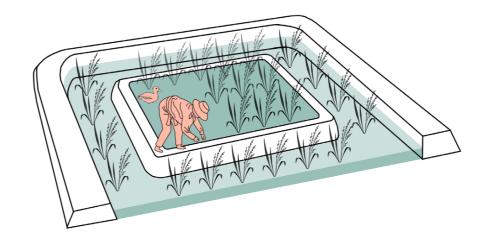
Landscape: Altitude:

Soil Condition:

Material:

Period: Form:

Use or Function:



Rice-fish-duck symbios system / Yu dao ya xi tong - 鱼稻鸭系统

In May each year, farmers plant red rice and raise fry and ducks in terraces fields at the same time to get more income.

Project:

Climate:

Year:

Water Type: Landscape:

Altitude:

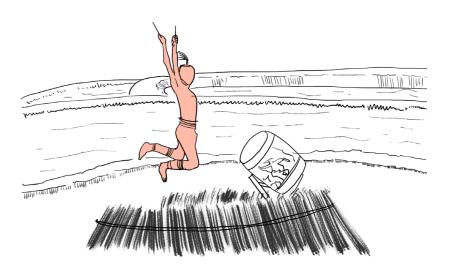
Soil Condition:

Material:

Period:

Form:

Use or Function:



Sacrifice festival / Ji si jie ti - 祭祀节日

The Hani people worship water, believing that water gives them life, so every year after the harvest, they will hold water sacrifice activities on the terraces.

Project: Honghe Hani Rice Terraces

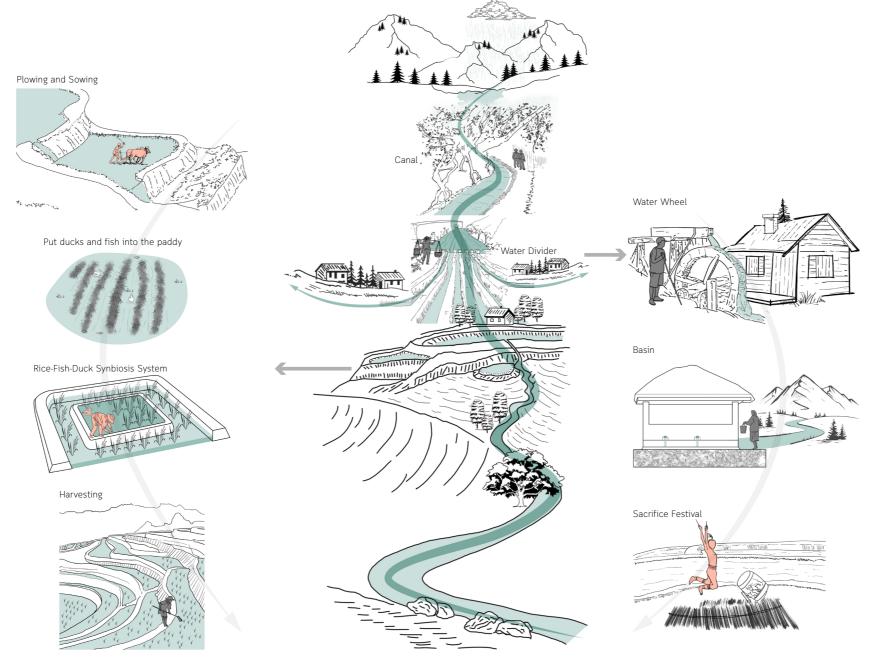
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Year: 720 A.D till now
Water Type: Fresh water

Landscape: Agricultural landscape

Altitude: 144 - 2939m
Soil Condition: Red clay
Material: Thatch
Period: October
Form: Surface

Use or Function: Water sacrifice

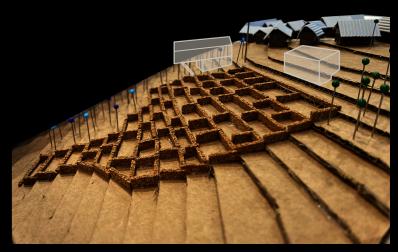
| Circularity

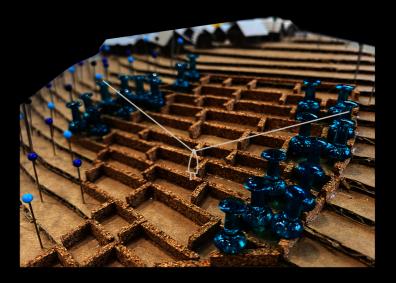


PROCESS MODEL

| Experimental fields







Use the process model to experience the terrain of the site, deliberate on the planting of the trees, the layout of buildings and the analysis of sightlines.

TERRACED FIELDS ARE THE WISDOM OF THE ANCIENT VILLAGES IS OUR WISDOM

01.2023
DELFT THE NETHERLANDS

All the state of t